

# 審計委員會是否較監察人更能提升盈餘品質

## Can Audit Committee Improve Earnings Quality More than the Supervisors in Taiwan?

許文馨 / 國立臺灣大學會計系副教授  
Audrey Wen-Hsin Hsu, Associate Professor, Department of Accounting, National Taiwan University

*Received 2011/1, Final revision received 2011/6*

### 摘要

本文主要探討從監察人制度轉換成審計委員會制度之公司，其盈餘品質是否提升。比較採用審計委員會制度的公司前、後期間之盈餘品質，相對於維持監察人制度之公司兩個時期的盈餘品質之變化，本文發現採用審計委員會制度之公司較能提升盈餘品質。此發現表示公司採用審計委員會制度者會比維持監察人制度之公司較為注重股東的權益。

【關鍵字】 審計委員會、監察人、盈餘

### Abstract

This study examines whether companies that are allowed to switch to the audit committee from the supervisors can achieve better earnings quality. I compare earnings quality for firms that switch to the audit committee between pre-adoption and post-adoption periods, relative to the corresponding change for a matched sample that retain the supervisors. I find that firms can improve earnings quality after they switch from the supervisors to audit committee. My findings suggest that firms adopting audit committee can embrace shareholder primacy to a larger extent than those that retain the supervisors.

【Keywords】 audit committee, supervisors, earnings quality

## 1. Introduction

Conventionally, companies in Taiwan are required to establish a board of directors and appoint a certain number of supervisors as the governance structure. From January 1, 2007 on, listed companies in Taiwan are allowed to replace the supervisors with the audit committee (Securities Exchange Act Article 14-4).<sup>1</sup> While the supervisors are established separately from the board of directors (hereafter “Supervisor Scheme”) and the audit committee is set up within the board of directors (hereafter “AC Scheme”), the supervisor and the AC are both responsible for the quality of financial reporting. In the speech delivered to Taiwan Think-tank Symposium 2006, former Chief Justice Lai, Ying-Chao argued that the two governance schemes are functionally the same. He regarded the “AC scheme” as another label for the “supervisor scheme” because the responsibilities under the two schemes appear to be similar. Article 14-4 of Securities Exchange Act specifies that the AC shall be responsible for those responsibilities of supervisors that are specified under the Securities Exchange Act, the Company Law and other laws. However, during the Symposium, CEO of Fubon Securities, Chang, Kuo-Chun held a different view. He argued that the AC can play a more important role than the supervisors. Under the current two-tier structure (board of directors and supervisors), the board of director is in charge with the accounting-and auditing-related decisions, including hiring the auditors, whereas the supervisors are responsible for the audits of financial reporting. When the organ hiring the auditor is not responsible for supervising auditing quality, the auditing quality cannot be enhanced easily. Conversely, under the AC scheme, the AC is designed to set up within the board of directors, which means that the AC participates in all accounting-related decision making and supervisions. Thus, CEO Chang expects that accounting quality is higher under the AC scheme than under the supervisor scheme.

I expect that three unique features can ensure that the AC scheme achieves better earnings quality than the supervisor scheme in Taiwan. First, different from the supervisor scheme, all directors in the AC should be independent (Securities Exchange Act 14-4). Prior studies (Carcello and Neal, 2000, 2003; Klein, 2002; Abbott, Parker, Peters, and

---

1 Before 2007, several firms also set up audit committee (AC) within the board of directors. But the specification of the AC is different from the requirement specified in Article 14-4 of Securities Exchange Act in that a firm did not need to abolish the supervisor scheme when they set up AC before 2007, but a firm can only choose either “supervisor scheme” or “AC scheme” pursuant to Article 14-4 of Securities Exchange Act. Thus, the government expresses the audit committee set up before 2007 or set up coexistent with the supervisor scheme as “quasi audit committee”. My study only focuses on the AC set up following Article 14-4 of Securities Exchange Act, and thus focuses on the sample after 2007.

Raghunandan, 2003) suggest that the independent AC members in the U.S can assure the quality of financial reporting and also serves as an important governance mechanism. As all members in the AC need to be independent, these members would face potential litigation risk and reputation impairment if they do not pay due diligence and discharge their responsibility effectively. Besides, pursuant to the Company Law in Taiwan, a natural person can serve as a supervisor in his personal capacity or as the representative of another legal entity (i.e., institutional shareholder), but the regulation only allows a natural person in his personal capacity to be an “independent director” or the AC member. The concern over a person representing another company to serve as a company’s supervisor is that these representatives are not independent and do not speak frankly in front of the board of directors (Lin, 1999, 2002; Huang, 2000). For example, if an ultimate controller appoints one affiliate as a member of the board of directors and another affiliate as a supervisor, this supervisor cannot monitor the board of directors effectively (Huang, 2007). Since the AC scheme requires that all AC members be independent directors, it would not allow any director representing an affiliate to participate in the AC, which in turn can enhance the monitoring power.

Second, different from the supervisor scheme, Article 14-4 of Securities Exchange Act requires that at least one director should have accounting or financial expertise in the AC. This requirement highlights the importance of the financial literacy and expertise of AC members. Prior studies have shown that financial expertise is important to deal with the complexities of financial reporting (Kalbers and Fogarty, 1993), to reduce the occurrence of financial restatements and internal control problems (Abbott, Parker, and Peters, 2004; Krishnan, 2005), and to detect material misstatements (Scarborough, Rama, and Raghunandan, 1998; Raghunandan, Rama, and Read, 2001). DeZoort and Salterio (2001) find that directors with financial expertise are more likely to understand auditor judgments and support the auditor in auditor-management disagreements. Thus, the requirement of financial expertise in the AC can enhance earnings quality.

Finally, Company Law requires that all matters be decided by resolutions of the board of directors (Company Law Article 193 and 201). Under the supervisor scheme, the supervisors are a separate organ from the board of directors and do not join the decision making, whereas under the AC scheme, the AC is a committee within the board of directors that involves in the decision making process. Thus, only under the AC scheme can the voting rights and the supervision rights be exercised by the same independent directors. This is crucial to achieve better earnings quality. Thus, with these three features taken together, I

expect that firms switching to the AC scheme from the supervisor scheme can improve earnings quality.

My sample consists of 29 listed non-financial firms that adopt AC during 2007-2009. I use each AC firm as its own control and compare the same firms' accounting quality both before and after the establishment of AC. Following prior literature (Klein, 2002), I employ a modified cross-sectional Jones model (Dechow, Sloan, and Sweeney, 1995) and performance-matched discretionary accruals (Kothari, Leone, and Wasley, 2005) to measure accrual-based earnings management. I examine the association between estimated discretionary accruals and the indicator where 1 represents the pre-adoption period and 0 the post-adoption period. If the switch to the AC scheme results in an improvement of earnings quality, I would expect a decrease in discretionary accruals from the pre-adoption period to the post-adoption period. The results show that discretionary accruals decrease after a firm switches from the supervisor scheme to the AC scheme. However, the improvements can be confounded by other factors such as the change in macroeconomics or the change in accounting standards over time.

To further address this concern, I use a difference-in-difference design by comparing the earnings quality before and after the adoption year, relative to the corresponding changes for control firms (Li, 2010). Following prior studies (e.g., Lang, Raedy, and Wilson, 2006), I match these firms to a sample of control firms that do not adopt the AC scheme based on industry, size and performance. My sample of firms thus consists of 29 AC adopters and 29 matched non-AC adopters, and 224 observations during the period 2007-2009. I find that the switch to the AC scheme has a significant improvement in earnings quality as measured by discretionary accruals, relative to non-AC adopters. In the robustness tests, I also employ Earnings Response Coefficient (ERC) as a measure for earnings quality and the results are the same. The results are robust after taking into account the strength of other corporate governance features. Overall, my evidence suggests that the AC scheme is a better scheme to improve earnings quality than the supervisor scheme.

This paper makes several contributions to the literature. It is the first to investigate the earnings quality effect of the switch from the supervisor scheme to the AC scheme since 2007 when companies in Taiwan were allowed to voluntarily choose either the supervisor scheme or the AC scheme. As discussed in the beginning, there is a debate on whether the AC scheme can provide more benefits in safeguarding financial reporting than the supervisor scheme, or whether the AC scheme is simply a different label for the supervisor scheme. The results show that the AC scheme does have a significant and positive impact on earnings

quality. Second, I provide empirical evidence on the intended effect of setting up an AC in the board of directors. This finding suggests the potential benefits of setting up other functional committees in the board, which echoes the recent legislative passage of requiring listed companies in Taiwan to set up a compensation committee in the board of directors to prevent corporate executives from being overpaid. Finally, this paper adds to the literature on global convergence of corporate governance and to the debate about whether the U.S. AC scheme can fit all countries as a means to enhancing monitoring power (Dallas and Scott, 2006; Gilson, 2001).

The remainder of the paper is organized as follows. Section 2 introduces the institutional background in Taiwan and develops my hypothesis. I describe the research design in Section 3 and present the sample and results in Section 4. Section 5 conducts additional analyses, and I conclude in Section 6.

## **2. Institutional Background in Taiwan and Hypothesis Development**

To strengthen corporate governance of companies in Taiwan, effective from January 1, 2007 on, the Financial Supervisor Commission (FSC) under the authorization of Securities Exchange Act required a public firm either to establish the AC scheme or to retain the conventional supervisor scheme (Securities Exchange Act 14-4). The conventional governance model of corporation in Taiwan is a two-tier structure that consists of a board of directors, and supervisors. The board of directors holds discretionary powers from the delegation of shareholders and performs the functions of management. Supervisors monitor the affairs of the directors and ensure the accuracy of financial statements. If companies decide to switch to the AC scheme, they replace the two-tier structure with a one-tier structure by not establishing supervisors and instead setting up the AC within the board of directors.

### **2.1 Supervisors and Financial Reporting**

To counterbalance the power of the board of directors, the Company Law in Taiwan requires each firm to establish supervisors, separate from the board of directors, to supervise the affairs of the directors and to ensure the accuracy of financial statements (Company Law Article 216). The firms should have at least one supervisor for private firms (Company Law Article 216), two supervisors for public firms (Company Law Article 216) and three supervisors for listed firms (Provision 9 of Taiwan Stock Exchange Corporation Rules Governing Review of Securities Listings). As supervisors are elected by shareholders to

enhance independence, they could not concurrently serve as directors, executive officers or other staff members (Company Law Article 222).

Further, supervisors fulfill their duties by providing an independent and objective review of the financial reporting process, internal controls and the audit function. Specifically, the major duties and power of supervisors include (1) investigation of financial condition (Company Law Article 218); (2) inspection of corporate records and giving reports in connection with the company's financial statements at shareholders' meetings (Company Law Article 219); (3) attending the board of directors meeting and express opinions without a voting right (Company Law Article 218-2); (4) giving notification to the directors, when appropriate, to cease acting in contravention of applicable laws, regulations, articles of incorporation or beyond the scope of business (Company Law Article 218-2).

Among all the duties, note that the supervisors are designed to safeguard earnings quality under the conventional two-tier structure. However, in practice, the supervisors in Taiwan are considered weak in terms of supervision. Many have observed that supervisors do not speak frankly in front of the board of directors and lack the courage to intervene in company affairs as long as the board of directors is not breaking the law or failing to comply with reporting standards. Section 2.3 will describe three reasons that cause the weakening power of supervisors.

## **2.2 Audit Committee and Financial Reporting**

Recently, many countries such as China, Japan and many Asian countries have been active in promoting the U.S-typed audit committee to safeguard high quality of financial reporting (Cernat, 2004). Similarly, in Taiwan, from January 1, 2007 on, pursuant to Articles 14-4 of Securities Exchange Act, a firm can establish the AC scheme to replace its supervisor scheme. According to Article 14-4, the AC shall be responsible for those responsibilities of supervisors specified under the Securities Exchange Act, the Company Law and other laws applicable to the supervisors. This seems to suggest that the AC scheme should function similarly as the supervisor scheme in Taiwan.

However, some requirements are different between the supervisor scheme and the AC scheme. According to Articles 14-4, a public company's AC should consist of at least three members, all of which should be independent and at least one of which should have accounting or financial expertise. In particular, matters required to be reviewed by the AC are broader than supervisors. They include the company's financial reports, auditing and accounting policies and procedures, internal control systems, substantial amount of asset

transactions or derivatives transactions; offering or issuance of any equity-type securities, hiring or dismissal of an attesting auditor, the determination of audit fees, and appointment or discharge of financial, accounting, or internal auditing officers. As supervisors are positioned separately from the board of directors, they do not have the decision rights to appoint/discharge of financial-related staff or auditors.

An important feature to note is about “quasi audit committee.” Before 2007, many companies claimed that they had set up an AC within the board of directors to enhance the supervising function of the board. But, since the specification of their AC is different from the requirement under Article 14-4 of Securities Exchange Act, it is termed “quasi audit committee.” Different from the AC under Article 14-4, if companies choose quasi audit committee, they do not need to abolish the supervisor scheme under the two-tier structure before they set up the AC within the board of directors. Instead, the board of directors with the AC scheme can coexist with the supervisor scheme. It is very common that the quasi audit committee consists of both directors and supervisors. Thus, it has been claimed that for those companies that set up a quasi AC, the co-existence of supervisors and directors in the AC leads to the concern over the independence and the monitoring function of the AC (Chen, 2010). Another important difference is the the AC members are not required to have accounting or finance expertise.

Finally, there are many countries under two-tier governance structures that have introduced audit committees to enhance the monitoring of financial reporting. For example, in 2003, Japan revised Commercial Code to strengthen the supervisory power of statutory auditors (similar to the supervisory board in Taiwan), and introduced, as an alternative, the one-tier board structure, along with the committee system (i.e., committees for auditing, nomination and compensation). However, the way audit committees are formed can vary in other countries (Collier and Zaman, 2005). In contrast to Taiwan, other countries with two-tier governance such as Germany or Netherlands have not introduced one-tier board committee systems as a second governance model, but directly require firms to set up an audit committee as a subcommittee within the supervisory board. German Corporate Governance Code recommends that the supervisory board with more than six members in German publicly listed companies establish an audit committee composed of supervisory board members. As the supervisory board consists of representatives of employees and shareholders, co-determination (i.e., employee representatives) in the audit committee is evident (Köhler, 2005).

## 2.3 Hypothesis Developments

In this study, I argue that the AC scheme is better than the supervisor scheme in safeguarding earnings quality. Although no previous study has investigated the effectiveness of the AC scheme as opposed to the supervisor scheme in Taiwan, several studies have analyzed the role of AC in constraining earnings management in the U.S. and U.K.<sup>2</sup> They all suggest that firms setting up an AC are less likely to overstate earnings (Klein, 2002; Peasnell, Pope, and Young, 2005) and tend to have higher earnings response coefficients (Wild, 1994; Chen, Duh, and Shiue, 2008). McMullen (1996) provides evidence that firms with an AC are associated with fewer shareholder lawsuits alleging fraud, fewer quarterly earnings restatements, and fewer SEC enforcement actions.

In Taiwan, there are three features that distinguish the AC scheme from the supervisor scheme, which in turn can ensure the AC scheme to safeguard earnings quality better than the supervisor scheme.

### 2.3.1 Independence

The Securities Exchange Act (Article 14-4) requires every member in the AC to be independent, but there is no corresponding requirement for the supervisor scheme. Taiwan Stock Exchange Corporation Rules Governing Review of Securities Listings article (GreTai Securities Market Rules for Review of Over-the-Counter (OTC) Listing of Securities) only requires a firm to have at least two (one) independent director(s) if they retain the supervisor scheme. The difference in the independence requirement under the two schemes may lead to the differential effect on earnings quality of the two schemes. The reason is that the degree of independence can mitigate the agency costs between shareholders and managers (Fama, 1980; Fama and Jensen, 1983; Klein, 2002). Independent directors are better monitors of management than are inside directors (DeFond and Francis, 2005) and earnings quality is positively associated with the independence of the AC (Carcello and Neal, 2000, 2003; Klein, 2002). Bronson, Carcello, Hollingsworth, and Neal (2009) also suggest that the benefits of independence are achieved only when all the AC members are independent directors. Thus, as the AC members are subject to more stringent requirement of

---

2 Chiu and Tsai (2009) investigate the relationship between audit committee and earnings management. Two main concerns arise from the study. The first concern is that they combine “quasi audit committee” and “audit committee.” As quasi audit committee is set up within the two tier structure and audit committee under article 14-4 is set up within one-tier structure, they are conceptually different products and cannot be treated equally. Second, their study is based on one-year AC sample and does not compare discretionary accruals of AC firms in 2008 relative to the period before the adoption or relative to the firms that have never adopted the AC. Thus, it is difficult to ascertain whether the earnings quality effect is associated with the AC adoption.



independence than the supervisors, I expect that the AC scheme can enhance the transparency of the financial reporting process better than the supervisor scheme.

### 2.3.2 Financial Expertise

Second, different from the supervisors, the AC is required to include at least one director having accounting or financial expertise (Securities Exchange Law 14-4). This requirement highlights the importance of the financial literacy and expertise of AC members in dealing with the complexities of financial reporting (Kalbers and Fogarty, 1993), reducing the occurrence of financial restatements and internal control problems (Abbott et al., 2004; Krishnan, 2005), and detecting material misstatements (Scarborough et al., 1998; Raghunandan et al., 2001). DeZoort and Salterio (2001) find that directors with financial expertise are more likely to understand auditor judgments and support the auditor in auditor-management disagreements. Since there is no corresponding requirement of financial expertise under the supervisor scheme, I thus expect that the AC scheme can improve earnings quality better than the supervisor scheme.

### 2.3.3 Voting Rights

The last feature relates to the voting rights. The supervisors in Taiwan have no voting rights on accounting-related decisions in the board of directors but the AC members do. Company Law requires that all matters be decided by resolutions of the board of directors (Company Law Articles 193 and 202). Since the AC members come from the board of directors, they participate the accounting and auditing-related decisions. In contrast, the supervisors cannot be directors at the same time because they are positioned separately from the board of directors.

While supervisor(s) are permitted to attend the board meeting and to express opinions (Company Law Articles 218 and 218-2), the main purpose is to immediately notify the board of directors to terminate the decisions if the board violates laws and regulations or the articles of incorporation. However, they do not have the voting rights. They cannot have the power to ensure that all decisions act in the best interests of shareholders.

Conversely, all accounting and finance-related decisions should be voted in the AC first before submitting to the board of director meeting. That is, the resolution for important financial issues must be first passed by at least half of the AC members (Securities Exchange Act Article 14-6), followed by a vote of more than half of all directors in the board of directors meeting.<sup>3</sup> For example, the AC is in charge with the decision to appoint/terminate

---

3 Without the AC resolution, the resolutions require an affirmative vote of more than two-thirds of all directors.

the company's external auditors, and to approve audit and non-audit fees to auditors. Conversely, the supervisors do not have the power to recruit or terminate accounting-related staff or auditors. The effectiveness of monitoring power under the supervisor scheme can be rather constrained.

With the above three reasons taken together, I expect that firms switching to the AC scheme from the supervisor scheme can improve earnings quality. This leads to the following hypothesis:

**H1: Firms switching to the AC scheme can improve earnings quality**

### 3. Research Design

To investigate the impact on accounting quality, I examine one commonly used metric for estimating earnings quality: discretionary accruals. In addition, I employ a difference-in-difference design to compare the change in earnings quality before and after the AC adoption, relative to the corresponding change in a benchmark group of non-AC adopters. Including non-AC adopters ensure a proper control for possible confounding factors that can also impact earnings quality during the period. Following prior studies (e.g., Barth, Landsman, and Lang, 2008), I use a matching procedure to select the sample of non-AC adopters. Comparing changes before and after the AC adoption can help mitigate potential bias related to heterogeneous characteristics across the AC adopters and non-AC adopters if unobserved differences between the two groups are time-invariant.

#### 3.1 Measures for Earnings Management

##### 3.1.1 Modified Jones Model

My primary model for estimating discretionary accruals is a modified cross-sectional Jones model (Jones, 1991; Dechow et al., 1995). I estimate discretionary accruals as total accruals minus non-discretionary accruals, which are estimated using Model (1). In Model (1), I first separately estimate for each of TEJ industry code in each year to obtain industry-year estimates of the coefficient. The modified Jones cross-sectional model can control for industry effects on accruals and also allow for coefficient variation across years (Kasznik, 1999; DeFond and Jiambalvo, 1994). I then use the parameter coefficients obtained from equation (1) to estimate nondiscretionary accruals in equation (2).

$$\frac{TA_{it}}{Asset_{i,t-1}} = \alpha_0 \frac{1}{Asset_{i,t-1}} + \alpha_1 \frac{\Delta REV_{it}}{Asset_{i,t-1}} + \alpha_2 \frac{PPE}{Asset_{i,t-1}} + \varepsilon_{it} \quad (1)$$

$$\frac{NDA_{it}}{Asset_{i,t-1}} = \alpha_0 \frac{1}{Asset_{i,t-1}} + \alpha_1 \frac{(\Delta REV_{it} - \Delta AR_{it})}{Asset_{i,t-1}} + \alpha_2 \frac{PPE_{it}}{Asset_{i,t-1}} \quad (2)$$

where  $TA_{it}$  (dependent variable) is total accruals, measured as the difference between ordinary income (earnings before extraordinary items) and operating cash flows for firm  $i$  in year  $t$ ;  $\Delta REV_{it}$  is the change in net revenue for firm  $i$  in year  $t$ ;  $\Delta AR_{it}$  is the change in accounts receivable for firm  $i$  in year  $t$ ;  $PPE_{it}$  is property, plant and equipment for firm  $i$  in year  $t$ ;  $Asset_{i,t-1}$  is total assets for firm  $i$  in year  $t-1$ ;  $NDA_{it}$  is nondiscretionary accruals for firm  $i$  in year  $t$ .

### 3.1.2 Performance-matched Discretionary Accruals

In addition, I also adjust the resulting discretionary accruals using a performance-matching approach to control for the effect of performance on measured discretionary accruals (Kothari et al., 2005; McNichols, 2000). Kothari et al. (2005) argue that earnings management may vary with firm performance, and it is important to use a control sample to reduce the likelihood of model misspecification. Thus, I match each firm-year observation with another observation from the same year and same TEJ industry code, along with the closest return on assets in the current year, and adjust discretionary accruals for the sample firm with the discretionary accruals estimated from the matched sample. I measure earnings quality with the unsigned discretionary accruals and unsigned performance-matched discretionary accruals.

## 3.2 Regression Models

To test whether the shift to the AC scheme can help reduce earnings management, I adopt the following equation:

$$ABS\_DA_{it} = \alpha_0 + \alpha_1 AC_{it} + \alpha_2 POST_{it} + \alpha_3 AC_{it} \times POST_{it} + \alpha_4 SIZE_{it} + \alpha_5 LEV_{it} + \alpha_6 OCF_{it} + \alpha_7 VOL\_OCF_{it} + \alpha_8 BIG4_{it} + \alpha_9 LOSS_{it} + \alpha_{10} GROWTH_{it} + \varepsilon_{it} \quad (3)$$

The dependent variable ( $ABS\_DA_{it}$ ) is the absolute value of discretionary accruals for firm  $i$  in year  $t$  and the independent variables of interest include two dummy variables capturing AC adoption in Taiwan and the post adoption period. The first dummy variable,  $AC_{it}$ , is an indicator variable that is equal to one when a firm adopts the AC scheme in year  $t$  and 0 otherwise. The second dummy variable,  $POST_{it}$ , is an indicator variable that is equal to one when the firm-year observation falls in the post-adoption period and zero otherwise. The coefficient ( $\alpha_3$ ) on the interaction of  $AC_{it}$  with  $POST_{it}$  is of interest because it captures the

change in discretionary accruals after the adoption period for AC adopters, relative to firms that do not switch to the AC scheme.

Following prior studies (e.g., Lang et al., 2006) I identify comparable non-AC adopters for each firm-year observations by matching year, industry, listed exchange, market value of equity and sales. Since non-AC adopters do not experience AC adoption but are influenced by other confounding effects, they serve as a direct control sample. Kothari et al. (2005) suggest that matching is superior to the control variable approach since it does not impose specific functional form on the relation associating the variable of interest on the control variables. Barber and Lyon (1996) also suggest that the matching firm approach yields well-specified and powerful test statistics.

### 3.2.1 Control Variables

I also include other control variables used in prior research that can account for discretionary accruals (Becker, DeFond, Jiambalvo, and Subramanyam, 1998; Choi and Wong, 2007; DeFond and Jiambalvo, 1994; Dechow and Dichev, 2002; Kasznik, 1999; Klein, 2002; Kothari et al., 2005).  $SIZE_{it}$  is the size of each firm, defined as the natural logarithm of total sales for the current period  $t$ ;  $LEV_{it}$  is financial leverage, defined as the ratio of total debts to total shareholders' equity, to control for greater incentives for earnings management in highly leveraged firms;  $OCF_{it}$  is operating cash flows to control for potential correlation between accruals and cash flows;  $VOL\_OCF_{it}$  is the standard deviation of  $OCF_{it}$  over the current and prior four years. I control for  $VOL\_OCF_{it}$  because Hribar and Nichols (2007) argue that unsigned abnormal accruals may reflect performance volatility rather than the level of earnings managements.  $BIG4_{it}$  is an indicator variable with a value of 1 when firm  $i$  chooses a Big 4 audit firm and 0 otherwise;  $LOSS_{it}$  is an indicator for firms having losses and zero otherwise;  $GROWTH_{it}$  is growth opportunities, defined as the book-to-market ratio of shareholder's equity.

## 4. Sample Selection and Empirical Results

### 4.1 Sample Selection

I initially identified a list of firms that adopt the AC scheme during 2007-2009 from the website of Market Observation Post System. I exclude firms from financial industries and firms that are not listed on Taiwan Stock Exchange or GreiTai Security Market. I then obtain the sample of 31 listed firms. As the purpose of the study is to examine whether firms voluntarily adopt AC can improve earnings quality, I eliminate two firms (company

code=3519 and company code=8163) to reduce the confounding effects as the year they adopt the AC scheme coincides with the year of initial public offering.<sup>4</sup> Thus, my sample includes 29 AC adopters during the period 2007-2009.

To construct the matched sample, I first identify the sample that does not adopt the AC scheme. Non-adopters refer to those firms that had not adopted the AC scheme during the period 2007-2009. Each firm-year observation for the AC adopter is matched with a firm-year observation for the non-AC adopter that is in the same year, exchange and industry (TEJ industry code) and has market value of equity and sales that are closest to the AC adopter's at the end of its adoption year.<sup>5</sup> Once a nonapplying firm is selected as a match, it is not considered as a potential match for other AC adopters. As a result, I obtain 29 non-AC adopters. This matching procedure helps minimize possible omitted variables problems and self-selection bias.

Specifically, for AC adopters and non-AC adopters, I collect accounting and financial data for the period between the adoption years and 2009, and attain 58 firms (29 AC adopters vs. 29 non-AC adopters) and 112 observations (56 observations for the AC adopters vs. 56 observations for non-AC adopters) for the matched-pair sample during the post-adoption period. The details can refer to Panel A of Table 1. To test whether the adoption improves earnings quality, I also collect accounting and financial data for the pre-adoption periods. Consistency requires the duration for the pre-adoption period to be the same as the duration for the post-adoption period. For example, if a firm adopts AC in 2008, the post-adoption period is 2008-2009 and the pre-adoption period is 2006-2007. My final sample thus consists of 224 observations (AC scheme: pre-adoption 56, post-adoption 56; supervisor scheme: pre-adoption 56, post-adoption 56) representing 58 distinct firms during the period 2004-2009. Panel A of Table 1 provides the sample distribution by year. Panel B of Table 1 provides the industry distribution based on the industry classification of the TEJ industry classification. In the final sample, only one firm is from steel industry, one firm is from real estate industry, and the rest belongs to the electronic industry.

---

4 3519 is the company code for Green Energy Technology, and 8163 is for Darfon Electronics.

5 For robustness test, I also use TSE classification for industry and TEJ new classification on electronics industry as a basis for matching. The results are the same.

Table 1 Distribution of Samples by Year and Industry

## Panel A: sample distribution by years

AC adoption firms				
	2007	2008	2009	Total
Firms	7	13	9	29
Firm-year observations	7	20	29	56
Non-AC adoption firms				
Firms	7	13	9	29
Firm-year observations	7	20	29	56

## Panel B: sample distribution by industry

	Firms	AC adopters: Firm-year observations	Non-AC adopters: Firm-year observations	Total observations
Steel (code=20)	1	4	4	
Electronics (code=23)	27	102	102	
Others (code=99)	1	6	6	
Total	29	112	112	224

## Panel C: Summary statistics for AC sample

AC adoption firms						
Variables	Pre-adoption periods (n=56)			Post-adoption periods (n=56)		
	Mean	Median	Std dev.	Mean	Median	Std dev.
$ABS\_DA_{it}$ (modified Jones)	0.157	0.116	0.209	0.077**	0.061	0.076
$ABS\_DA_{it}$ (performance-matched)	0.150	0.110	0.204	0.076*	0.063	0.070
$SIZE_{it}$	16.362	15.890	1.995	16.524	16.269	1.985
$LEV_{it}$	0.345	0.321	0.200	0.362	0.351	0.209
$VOL\_OCF_{it}$	0.163	0.093	0.410	0.102	0.080	0.106
$OCF_{it}$	0.106	0.120	0.226	0.131	0.121	0.126
$BIG4_{it}$	0.875	1.000	0.334	0.875	1.000	0.334
$LOSS_{it}$	0.107	0.000	0.312	0.250*	0.000	0.437
$GROWTH_{it}$	2.833	2.023	2.663	2.519	1.598	2.561
Non-AC adoption firms						
Variables	Pre-adoption periods (n=56)			Post-adoption periods (n=56)		
	Mean	Median	Std dev.	Mean	Median	Std dev.
$ABS\_DA_{it}$ (modified Jones)	0.056	0.061	0.048	0.080*	0.062	0.051
$ABS\_DA_{it}$ (performance-matched)	0.071	0.037	0.059	0.072	0.038	0.059
$SIZE_{it}$	17.225	14.811	2.602	17.639	18.043	2.740
$LEV_{it}$	0.259	0.182	0.132	0.396*	0.443	0.143
$VOL\_OCF_{it}$	0.055	0.046	0.033	0.075*	0.053	0.042
$OCF_{it}$	0.217	0.196	0.175	0.142	0.111	0.135
$BIG4_{it}$	1.000	1.000	0.000	1.000	1.000	0.000

$LOSS_{it}$	0.000	0.000	0.000	0.000	0.000	0.000
$GROWTH_{it}$	2.192	1.912	1.311	2.845*	2.896	1.353

Variable definitions:  $ABS\_DA_{it}$  is the absolute value of discretionary accruals;  $SIZE_{it}$  is the natural log of total sales;  $LEV_{it}$  is financial leverage, defined as the ratio of total debts to total shareholders' equity;  $VOL\_OCF_{it}$  is the standard deviation of operating cash flows over the current and past four years;  $OCF_{it}$  is operating cash flows;  $BIG4_{it}$  is equal to one if a firm is audited by a Big 4 auditor and 0 otherwise;  $LOSS_{it}$  is an indicator equal to one when the firm incurs losses and zero otherwise;  $GROWTH_{it}$  is the market-to-book ratio of shareholders' equity.

\*, \*\*, and \*\*\* indicate significance for the difference in the mean value of variables between pre-adoption period and post-adoption period at the 10%, 5%, and 1% level respectively in a two-tailed test.

## 4.2 Descriptive Statistics

Panel C of Table 1 presents descriptive statistics for the variables for AC adopters and non-AC adopters in the regression models. Within each group, I separately report the mean, median and standard deviation for each variable during the pre-adoption period and the post-adoption period.

Starting from the AC adopters, the mean value for the absolute value of discretionary accruals,  $ABS\_DA_{it}$  (*modified Jones*), is 0.157 (0.077) during pre-adoption period (post-adoption period), with the difference being significant at 1% level. Similarly, the mean value for  $ABS\_DA_{it}$  (*performance matched*) during pre-adoption period (0.150) is significantly higher than that for the post-adoption period (0.076). However, with regard to the other variables, the mean value across the two periods is similar for  $SIZE_{it}$ ,  $LEV_{it}$ ,  $VOL\_OCF_{it}$ ,  $OCF_{it}$ ,  $BIG4_{it}$  and  $GROWTH_{it}$ .  $LOSS_{it}$  is much higher during the post-adoption period than the pre-adoption period.

Further, I examine non-AC adopters. Different from what I have observed for AC adopters, the mean value for  $ABS\_DA_{it}$  (*modified Jones*) is 0.056 (0.080) during the pre-adoption period (post-adoption period), with the difference being significant at 1% level. However, the mean value for  $ABS\_DA_{it}$  (*performance matched*) during pre-adoption period (0.071) is not different from that for the post-adoption period (0.072). I also find that  $LEV_{it}$ ,  $VOL\_OCF_{it}$  and  $GROWTH_{it}$  are higher during the post-adoption period than the pre-adoption period.<sup>6</sup>

Table 2 presents the pair-wise Pearson correlations among the major variables that I use in regression models for the whole sample. Panel A (Panel B) shows the results for AC

6 To provide more insights for the two groups across two periods, I conduct a difference in difference analysis in Table 3.

Table 2 Pearson Correlations

Panel A: AC adopters		ABS_DA <sub>it</sub> (modified Jones)	ABS_DA <sub>it</sub> (performance matched)	POST <sub>it</sub>	SIZE <sub>it</sub>	LEV <sub>it</sub>	VOL_OCF <sub>it</sub>	OCF <sub>it</sub>	BIG4 <sub>it</sub>	LOSS <sub>it</sub>	GROWTH <sub>it</sub>
POST <sub>it</sub>		1.000									
ABS_DA <sub>it</sub> (modified Jones)		-0.248***	1.000								
ABS_DA <sub>it</sub> (performance matched)		-0.238**	0.986***	1.000							
SIZE <sub>it</sub>		0.041	0.066	1.000							
LEV <sub>it</sub>		0.040	0.347***	0.357***	0.227***	1.000					
VOL_OCF <sub>it</sub>		-0.101	0.903**	0.871**	-0.122	0.176	1.000				
OCF <sub>it</sub>		0.070	-0.682**	-0.679**	0.128	-0.408**	-0.668*	1.000			
BIG4 <sub>it</sub>		-0.032	0.082	0.090	0.230***	-0.024	0.009	0.248*	1.000		
LOSS <sub>it</sub>		0.186*	0.020	0.001	0.099	0.128	-0.067	-0.021	0.131	1.000	
GROWTH <sub>it</sub>		-0.061	0.020	0.011	-0.304***	0.142	0.054	-0.094	-0.343*	-0.203	1.000
Panel B: Non-AC adopters		ABS_DA <sub>it</sub> (modified Jones)	ABS_DA <sub>it</sub> (performance matched)	POST <sub>it</sub>	SIZE <sub>it</sub>	LEV <sub>it</sub>	VOL_OCF <sub>it</sub>	OCF <sub>it</sub>	BIG4 <sub>it</sub>	LOSS <sub>it</sub>	GROWTH <sub>it</sub>
POST <sub>it</sub>		1.000									
ABS_DA <sub>it</sub> (modified Jones)		0.234*	1.000								
ABS_DA <sub>it</sub> (performance matched)		0.014	0.841***	1.000							
SIZE <sub>it</sub>		0.078	0.007	0.055	1.000						
LEV <sub>it</sub>		0.449**	0.535***	0.429***	0.155	1.000					
VOL_OCF <sub>it</sub>		0.265**	0.102	0.054	-0.052	-0.514	1.000	0.702			
OCF <sub>it</sub>		-0.112	-0.557**	-0.464**	-0.443**	0.618	-0.532**	-0.653**			
BIG4 <sub>it</sub>		0.319**	0.038	0.064	-0.443	0.618	-0.532	-0.653	1.000		
LOSS <sub>it</sub>		-0.215**	0.073	0.050	0.012	-0.501	0.769	0.830	-0.599	1.000	
GROWTH <sub>it</sub>		0.239**	0.173	0.094	0.130	-0.572**	0.136	0.150	-0.533**	0.174	1.000

Notes: This table reports Pearson correlations for AC adopters (Panel A) and non-AC adopters (Panel B). The sample covers both adopters of audit committees as well as the control group that of firms that retained the supervisor scheme over the period 2007 to 2009. Variable definitions: ABS\_DA<sub>it</sub> is the absolute value of discretionary accruals; SIZE<sub>it</sub> is the natural log of total sales; LEV<sub>it</sub> is financial leverage, defined as the ratio of total debts to total shareholders' equity; VOL\_OCF<sub>it</sub> is the standard deviation of operating cash flows over the current and past four years; OCF<sub>it</sub> is operating cash flows; BIG4<sub>it</sub> is equal to one if a firm is audited by a Big 4 auditor and 0 otherwise; LOSS<sub>it</sub> is an indicator equal to one when the firm incurs losses and zero otherwise; GROWTH<sub>it</sub> is the market-to-book ratio of shareholders' equity.

\*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% level respectively in a two-tailed test.



adopters (non-AC adopters). Panel A shows that both the correlation coefficient between  $POST_{it}$  and  $ABS\_DA_{it}$  (*modified Jones*) and the correlation coefficient between  $POST_{it}$  and  $ABS\_DA_{it}$  (*performance matched*) are significantly negative. This suggests that earnings quality can improve after firms adopt the AC scheme. However, Panel B shows that the correlation between  $POST$  and  $ABS\_DA_{it}$  (*modified Jones*) is significantly positive and the correlation between  $POST_{it}$  and  $ABS\_DA_{it}$  (*performance matched*) is insignificant.

### 4.3 Regression Analysis

Table 3 presents the results of the test of hypothesis H1 through a multivariate regression (equation 3). All  $t$ -statistics are adjusted for firm cluster. The first two columns (the last two columns) are based on absolute discretionary accruals under the modified Jones model (performance matched model). Columns (1) and (3) focus only on AC firms alone and compare earnings quality between the pre-adoption period and the post-adoption period. The coefficient on the variable of interest,  $POST_{it}$ , is significantly negative in column (1) ( $t = -0.058$ ) and column (3) ( $t = -3.27$ ). This suggests that adopting the AC scheme has a positive impact on earnings quality. However, the results can be potentially confounded by other factors such as the change in macroeconomics or other factors.

Columns (2) and (4) are based on a difference-in-difference design, in which I use a matched non-AC sample as a control sample as they do not adopt AC during 2007-2009 but can also be influenced by other confounding events. In column (2), notice that the coefficient on  $AC_{it}$  (0.045,  $t = 3.50$ ) is significantly positive while the coefficient on the interactive term  $AC_{it} \times POST_{it}$  (-0.063,  $t = -3.70$ ) is significantly negative. This suggests that AC adopters are more likely to engage in earnings management than their comparable non-AC adopters during the pre-adoption period, but this effect is significantly reduced afterwards. In column (4), while I do not find any significance for the coefficient on AC, I still observe that the coefficient on the interactive term  $AC_{it} \times POST_{it}$  (-0.034,  $t = -2.89$ ) is significantly negative. Since the comparable non-AC adopters that are matched by year, industry, market value of equity and sales do not experience the same reduction of discretionary accruals during the post-adoption period, these findings support my prediction in H1 that this change is due to the voluntary adoption of the AC scheme. My evidence is also robust to controls for  $SIZE_{it}$ ,  $LEV_{it}$ ,  $OCF_{it}$ ,  $VOL\_OCF_{it}$ ,  $BIG4_{it}$ ,  $LOSS_{it}$ , and  $GROWTH_{it}$ .

Table 3 Discretionary Accruals and AC Adoption

	Modified Jones		Performance matched	
	(1) AC firms only	(2) Whole sample	(3) AC firms only	(4) Whole sample
Intercept	-0.048 (-0.72)	-0.055 (-1.23)	-0.082 (-1.20)	-0.034 (-0.71)
$AC_{it}$		0.045 (3.50)***		0.031 (1.18)
$POST_{it}$	-0.058 (-3.88)***	0.004 (0.44)	-0.050 (-3.27)**	-0.018 (-1.78)
$AC_{it} \times POST_{it}$		-0.063 (-3.70)***		-0.034 (-2.89)**
$SIZE_{it}$	0.008 (2.09)*	0.005 (3.10)**	0.011 (2.75)**	0.004 (2.54)*
$LEV_{it}$	0.038 (0.89)	0.038 (1.20)	0.042 (0.97)	0.070 (2.20)*
$OCF_{it}$	-0.104 (-1.30)	-0.006 (-0.11)	-0.104 (-1.20)	0.045 (0.87)
$VOL\_OCF_{it}$	03.39 (9.38)***	0.431 (12.75)***	0.372 (8.81)***	0.425 (12.64)***
$BIG4_{it}$	-0.007 (-0.16)	-0.015 (-0.36)	-0.014 (-0.32)	-0.027 (-0.62)
$LOSS_{it}$	0.026 (0.96)	0.037 (1.45)	-0.006 (-0.22)	0.007 (0.28)
$GROWTH_{it}$	0.005 (0.99)	0.005 (1.26)	0.002 (0.54)	0.002 (0.51)
Adjusted R <sup>2</sup>	0.713	0.689	0.677	0.626
Obs.	112	224	112	224

Notes: This table reports the results of equation (3).

$$ABS\_DA_{it} = \alpha_0 + \alpha_1 AC_{it} + \alpha_2 POST_{it} + \alpha_3 AC_{it} \times POST_{it} + \alpha_4 SIZE_{it} + \alpha_5 LEV_{it} + \alpha_6 OCF_{it} + \alpha_7 VOL\_OCF_{it} + \alpha_8 BIG4_{it} + \alpha_9 LOSS_{it} + \alpha_{10} GROWTH_{it} + \varepsilon_{it} \quad (3)$$

Variable definitions:  $ABS\_DA_{it}$  is the absolute value of discretionary accruals;  $AC_{it}$  is an indicator variable that is equal to one when a firm adopts the audit committee structure in year t and 0 otherwise;  $POST_{it}$  is an indicator variable that is equal to one when the firm-year observation falls in the post-adoption period and zero otherwise.  $SIZE_{it}$  is the natural log of total sales;  $LEV_{it}$  is financial leverage, defined as the ratio of total debts to total shareholders' equity;  $VOL\_OCF_{it}$  is the standard deviation of operating cash flows over the current and past four years;  $OCF_{it}$  is operating cash flows;  $BIG4_{it}$  is equal to one if a firm is audited by a Big 4 auditor and 0 otherwise;  $LOSS_{it}$  is an indicator equal to one when

the firm incurs losses and zero otherwise;  $GROWTH_{it}$  is the market-to-book ratio of shareholders' equity.

T-statistics are reported in the parentheses. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% level respectively in a two-tailed test.

## 5. Additional Tests

### 5.1 Corporate Governance Geaturesand the Adoption of Function

The primary results indicate that the AC scheme can improve earnings quality better than the supervisor scheme. However, it is likely that the results are driven by other governance features such as ownership and board structure. To rule out this possibility, I employ equation (4) and control for these governance features ( $GOV_{it}$ ).

$$ABS\_DA_{it} = \alpha_0 + \alpha_1 AC_{it} + \alpha_2 POST_{it} + \alpha_3 AC_{it} \times POST_{it} + \alpha_4 SIZE_{it} + \alpha_5 LEV_{it} + \alpha_6 OCF_{it} + \alpha_7 VOL\_OCF_{it} + \alpha_8 BIG4_{it} + \alpha_9 LOSS_{it} + \alpha_{10} GROWTH_{it} + \alpha_{11} GOV_{it} + \varepsilon_{it} \quad (4)$$

#### 5.1.1 Measures for Other Governance Features

I create a composite index ( $GOV_{it}$ ) that captures governance features other than the set up of AC. Prior studies (e.g., Bushman, Chen, Engel, and Smith, 2004; Young and Wu, 2009) suggest that the comprehensive measure of governance can capture the multi-dimensions of the governance mechanism better than any single governance measure. Further, a composite measure can achieve better parsimony of analysis. I create a composite measure that incorporates the following six governance features: (a)  $FIN_{it}$ , the percentage of shareholdings by foreign financial institutions (e.g., Chung, Firth, and Kim, 2002); (b)  $BDSH_{it}$ , the percentage of shareholdings by board members (e.g., Patton and Baker, 1987); (c)  $DUALITY_{it}$ , an indicator that equals one if the CEO and the chairman of the board is not the same individual and 0 otherwise: CEOs who are not chairman of the board can provide more effective monitoring (e.g., Beasley, 1996); (d)  $IND_{it}$ , the percentage of independent board members (e.g., Beasley, 1996); (e)  $BFSIZE_{it}$ , the size of the board; (f)  $BLOCK_{it}$ , the percentage of shareholdings by blockholders who own at least 5% of the common stock (e.g., Shivdasani, 1993). Principal component analysis indicates that only one factor with an eigenvalue greater than one can be extracted, suggseting that the six measures represent a common underlying factor. To create this summary variable, I first create dichotomous measures of each of the six governance characteristics employed in prior research (e.g., Young and Wu, 2009). The value for these six indicators is positively associated with good governance practice. I code the observation "1" if the value of the firm-specific governance

indicator is greater than the sample median for  $FIN_{it}$ ,  $BDSH_{it}$ ,  $DUALITY_{it}$ ,  $IND_{it}$ ,  $BFSIZE_{it}$  and  $BLOCK_{it}$ , and 0 otherwise. The values of 1 indicate strong governance and values of 0 indicate weak governance. The six dichotomized variables are then added up to obtain a composite index. Since there is no theoretical basis regarding which governance characteristic is more important relative to the others, this summary measure, ranging from 0 to 6, is an equally-weighted aggregation of the six characteristics.

Table 4 reports the results of examining whether the reduction of earnings management among firms following the AC adoption is driven by the governance features other than the set up of AC. Table 4 confirms that the coefficient on the interactive term  $AC_{it} \times POST_{it}$  is significantly negative after controlling for the other governance features. The results show that the coefficient on  $AC_{it} \times POST_{it}$  is -0.036 for performance-matched model, significant at the 5% significance level. My evidence suggests that the findings of H1 are not driven by the other features of governance.

Table 4 Discretionary Accruals, Corporate Governance and AC Adoption

	Performance matched
Intercept	-0.115 (-2.43)*
$AC_{it}$	-0.012 (-0.71)
$POST_{it}$	0.040 (2.90)**
$AC_{it} \times POST_{it}$	-0.036 (-1.97)*
$SIZE_{it}$	0.006 (2.13)*
$LEV_{it}$	0.023 (0.52)
$OCF_{it}$	-0.050 (-1.12)
$VOL\_OCF_{it}$	0.431 (16.66)***
$BIG4_{it}$	-0.028 (-1.01)
$LOSS_{it}$	0.067 (3.02)**

<i>GROWTH<sub>it</sub></i>	0.003 (0.82)
<i>COMPOSITE<sub>it</sub></i>	-0.016 (-2.01)*
Adjusted R2	0.457
Obs.	224

$$ABS\_DA_{it} = \alpha_0 + \alpha_1 AC_{it} + \alpha_2 POST_{it} + \alpha_3 AC_{it} \times POST_{it} + \alpha_4 SIZE_{it} + \alpha_5 LEV_{it} + \alpha_6 OCF_{it} + \alpha_7 VOL\_OCF_{it} + \alpha_8 BIG4_{it} + \alpha_9 LOSS_{it} + \alpha_{10} GROWTH_{it} + \alpha_{11} GOV_{ij} + \varepsilon_{it} \quad (4)$$

Notes: Variable definitions: *ABS\_DA<sub>it</sub>* is the absolute value of discretionary accruals; *AC<sub>it</sub>* is an indicator variable that is equal to one when a firm adopts the audit committee structure in year *t* and 0 otherwise; *POST<sub>it</sub>* is an indicator variable that is equal to one when the firm-year observation falls in the post-adoption period and zero otherwise. *SIZE<sub>it</sub>* is the natural log of total sales; *LEV<sub>it</sub>* is financial leverage, defined as the ratio of total debts to total shareholders' equity; *VOL\_OCF<sub>it</sub>* is the standard deviation of operating cash flows over the current and past four years; *OCF<sub>it</sub>* is operating cash flows; *BIG4<sub>it</sub>* is equal to one if a firm is audited by a Big 4 auditor and 0 otherwise; *LOSS<sub>it</sub>* is an indicator equal to one when the firm incurs losses and zero otherwise; *GROWTH<sub>it</sub>* is the market-to-book ratio of shareholders' equity. I use the following six variables to construct the composite score (*GOV<sub>it</sub>*): *FIN<sub>it</sub>* indicates the percentage of shareholdings by foreign financial institutions; *BDSH<sub>it</sub>* indicates the percentage of shareholdings by board members; *DUALITY<sub>it</sub>*, an indicator that equals one if the CEO and the chairman of the board is not the same individual and 0 otherwise; *IND<sub>it</sub>* indicates the percentage of independent board members; *BFSIZE<sub>it</sub>* indicates the size of the board; *BLOCK<sub>it</sub>* indicates the percentage of shareholdings by blockholders who own at least 5% of the common stock. T-statistics are reported in the parentheses. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% level respectively in a two-tailed test.

## 5.2 Earnings Response Coefficient (ERC)

In addition to the two measures of discretionary accruals, I consider value relevance as another measure of earnings quality. Specifically, following Chen et al. (2008), I examine whether the informativeness of earnings, proxied by the ERC, increases with the establishment of AC. I regress annual returns on earnings change.

First, I regress annual returns on earnings change (denoted as  $\Delta EARN_{it}$ ) to test the value relevance of accounting earnings (i.e., their effect on contemporaneous stock performance). I construct an interaction term  $\Delta EARN_{it} \times POST_{it}$  ( $\Delta EARN_{it} \times AC_{it}$ ) to capture the incremental informativeness of earnings between pre-adoption period and post-adoption period (between AC adopters and non-AC adopters). The variable of interest is the interaction term

$\Delta EARN_{it} \times POST_{it} \times AC_{it}$ , for which the coefficient captures the change in earnings informativeness for AC adopters relative to non-AC adopters, across the pre-adoption and post-adoption period.

Following prior literature (Warfield, Wild, and Wild, 1995; DeFond and Jiambalvo, 1994), I also control for size ( $SIZE_{it}$ ), leverage ( $LEV_{it}$ ), operating cash flows ( $CFO_{it}$ ), audit firms ( $BIG4_{it}$ ) and growth ( $GROWTH_{it}$ ), each of which is interacted with  $\Delta EARN_{it}$ .

$$RET_{it} = \alpha_0 + \alpha_1 \Delta EARN_{it} + \alpha_2 POST_{it} + \alpha_3 \Delta EARN_{it} \times POST_{it} + \alpha_4 AC_{it} + \alpha_5 \Delta EARN_{it} \times AC_{it} + \alpha_6 POST_{it} \times AC_{it} + \alpha_7 \Delta EARN_{it} \times POST_{it} \times AC_{it} + \alpha_8 \Delta EARN_{it} \times SIZE_{it} + \alpha_9 \Delta EARN_{it} \times LEV_{it} + \alpha_{10} \Delta EARN_{it} \times CFO_{it} + \alpha_{11} \Delta EARN_{it} \times BIG4_{it} + \alpha_{12} \Delta EARN_{it} \times LOSS_{it} + \alpha_{13} \Delta EARN_{it} \times GROWTH_{it} + \varepsilon_{it} \quad (5)$$

Where  $RET_{it}$  is the cumulative market-adjusted returns for the twelve-month period ending four months after the fiscal year-end;  $\Delta EARN_{it}$  is the difference between income before extraordinary items for the current year and that of last year deflated by market value of equity at the beginning of the year. The rest of the variables are defined as before.

Table 5 reports the results. Column (1) first shows that the coefficient on  $\Delta EARN_{it} \times POST_{it}$  is 2.130, significant at 5% level. This suggests that ERC during the post-adoption period is higher than ERC during the pre-adoption periods. In column (2), I report the results for equation (5). This reconfirms H1 that AC adoption can improve earnings informativeness. I find that the coefficient on  $\Delta EARN_{it} \times POST_{it} \times AC_{it}$  is significantly positive (2.514,  $t=2.83$ ).

To further enhance the rigor of analysis, I use the composite measure ( $GOV_{it}$ ) defined above to control for the effects of governance features other than the set up of AC. The results in column (3) show that the coefficient on  $\Delta EARN_{it} \times POST_{it} \times AC_{it}$  is significantly positive. Thus, the results reconfirm H1 that the switch from the supervisor scheme to the AC scheme can improve earnings quality, after taking into consideration of other governance features.

Table 5 Earnings Response Coefficient, Corporate Governance, and AC Adoption

	(1) $RET_{it}$	(2) $RET_{it}$	(3) $RET_{it}$
Intercept	0.094 (2.47)*	0.941 (2.63)**	0.699 (1.87)
$\Delta EARN_{it}$	0.828 (1.89)	-1.910 (-2.80)**	-0.601 (-0.93)
$POST_{it}$	0.391 (4.07)***	0.116 (1.09)	-0.370 (-5.00)***

$\Delta EARN_{it} \times POST_{it}$	2.130 (1.95)*	2.514 (2.83)**	2.189 (3.45)***
$AC_{it}$		-0.254 (-2.23)*	-0.147 (-1.56)
$\Delta EARN_{it} \times AC_{it}$		0.004 (0.02)	2.097 (2.04)*
$POST_{it} \times AC_{it}$		3.376 (2.97)**	0.066 (0.59)
$\Delta EARN_{it} \times POST_{it} \times AC_{it}$		2.735 (2.80)**	2.263 (2.63)**
$\Delta EARN_{it} \times SIZE_{it}$		-0.055 (-2.61)**	-0.009 (-0.53)
$\Delta EARN_{it} \times LEV_{it}$		1.197 (2.79)**	0.138 (0.47)
$\Delta EARN_{it} \times CFO_{it}$		0.946 (2.83)**	0.239 (0.78)
$\Delta EARN_{it} \times BIG4_{it}$		-0.213 (-0.60)	-0.520 (-1.17)
$\Delta EARN_{it} \times LOSS_{it}$		-0.351 (-1.96)	-0.178 (-1.49)
$\Delta EARN_{it} \times GROWTH_{it}$		-0.003 (-0.12)	-0.027 (-1.46)
$\Delta EARN_{it} \times GOV_{it}$			0.035 (0.87)
Adjusted R <sup>2</sup>	0.166	0.459	0.559
Obs.	224	224	224

Notes: This table reports the results of equation (3) across good and bad governance.

$$\begin{aligned}
 RET_{it} = & \alpha_0 + \alpha_1 \Delta EARN_{it} + \alpha_2 POST_{it} + \alpha_3 \Delta EARN_{it} \times POST_{it} + \alpha_4 AC_{it} + \alpha_5 \Delta EARN_{it} \times AC_{it} \\
 & + \alpha_6 POST_{it} \times AC_{it} + \alpha_7 \Delta EARN_{it} \times POST_{it} \times AC_{it} + \alpha_8 \Delta EARN_{it} \times SIZE_{it} + \alpha_9 \Delta EARN_{it} \times LEV_{it} + \alpha_{10} \Delta EARN_{it} \times CFO_{it} \\
 & + \alpha_{11} \Delta EARN_{it} \times BIG4_{it} + \alpha_{12} \Delta EARN_{it} \times LOSS_{it} + \alpha_{13} \Delta EARN_{it} \times GROWTH_{it} + \alpha_{14} \Delta EARN_{it} \times GOV_{it} + \varepsilon_{it}
 \end{aligned} \quad (5)$$

Variable definitions:  $RET_{it}$  is the cumulative market-adjusted returns for the twelve-month period ending four months after the fiscal year-end;  $\Delta EARN_{it}$  is the difference between income before extraordinary items for the current year and that of last year deflated by market value of equity at the beginning of the year.  $ABS\_DA_{it}$  is the absolute value of discretionary accruals;  $AC_{it}$  is an indicator variable that is equal to one when a firm adopts the audit committee structure in year t and 0 otherwise;  $POST_{it}$  is an indicator variable that is equal to one when the firm-year observation falls in the post-adoption period and zero otherwise.  $SIZE_{it}$  is the natural log of total sales;  $LEV_{it}$  is financial leverage, defined as the ratio of total debts to total shareholders' equity;  $VOL\_OCF_{it}$  is the standard deviation of operating cash flows over the current and past four years;  $OCF_{it}$  is operating cash flows;  $BIG4_{it}$  is equal to one if a firm

is audited by a Big 4 auditor and 0 otherwise;  $LOSS_{it}$  is an indicator equal to one when the firm incurs losses and zero otherwise;  $GROWTH_{it}$  is the market-to-book ratio of shareholders' equity. I use the following six variables to construct the composite score ( $GOV_{it}$ ):  $FIN_{it}$  indicates the percentage of shareholdings by foreign financial institutions;  $BDSH_{it}$  indicates the percentage of shareholdings by board members;  $DUALITY_{it}$ , an indicator that equals one if the CEO and the chairman of the board is not the same individual and 0 otherwise;  $IND_{it}$  indicates the percentage of independent board members;  $BFSIZE_{it}$  indicates the size of the board;  $BLOCK_{it}$  indicates the percentage of shareholdings by blockholders who own at least 5% of the common stock. T-statistics are reported in the parentheses. \*, \*\*, and \*\*\* indicate significance at the 10%, 5%, and 1% level respectively in a two-tailed test.

## 6. Conclusion

This study examines the change in earnings quality for firms that switch from the supervisor scheme to the AC scheme from 2007 on. Specifically, I investigate effects on discretionary accruals under modified Jones model and performance-matched model. I find that, on average, relative to a control group of matched sample that does not switch to the AC scheme, firms that switch from the supervisor scheme to the AC scheme experience a significant decrease in discretionary accruals. I also conduct sensitivity tests and find that my results are robust with the strength of other corporate governance features and another measure of earnings quality (ERC). Taken together, my findings suggest that the switch from the supervisor scheme to the AC scheme does have a positive impact on earnings quality.

My study contributes to the regulatory debate over the monitoring effectiveness on financial reporting between the AC scheme and the supervisor scheme. My findings will be of interest to accounting and security regulators. My results do not support that the AC adopted by the firms in the sample is simply a different label of the supervisors, but are in support of the view that the US-typed AC scheme can improve earnings quality. The provision 14-4 of Securities Exchange Act requires (1) the 100% independence and (2) financial expertise in the AC. Also, the AC members have decision making rights in addition to the monitoring power. These factors altogether can contribute to the high effectiveness of the AC scheme.

Given the potential importance of these implications, it is worthwhile for future research to validate the findings of the study. There is also room to extend the sample size and to expand the scope of analysis. In particular, as few firms in Taiwan establish the AC scheme to replace its supervisor scheme pursuant to Articles 14-4 of Securities Exchange Act, small sample size may limit the findings' generalizability. However, there still exist many possibilities for further refinements. First, future researchers can compare earnings quality for



firms adopting audit committee pursuant to Articles 14-4 of Securities Exchange Act and firms that adopt “quasi audit committee.” The government terms the audit committee set up before 2007 or set up coexistent with the supervisor scheme as “quasi audit committee.” My study only focuses on the AC set up following Article 14-4 of Securities Exchange Act, and thus focuses on the sample after 2007. I believe comparing earnings quality between “quasi audit committee” and “audit committee” can help answer the question whether abolishing “supervisory scheme” is a necessary condition to achieve a high quality of audit committee schema. I am not able to conduct the test because of data limitations. Through the “Market Observation Post System” (MOPS), I can only identify firms that currently adopt “quasi audit committee” and cannot trace back the adoption history in the previous years. Thus, if future researchers are able to hand collect the sample for “quasi audit committee” in the past few years, comparing earnings quality under “quasi audit committee” with that under “audit committee scheme pursuant to Article 14-4 of Securities Exchange Act” can help validate my findings. It can also help understand whether it is necessary to “abolish the supervisory scheme” in order to adopt audit committee.

Finally, one direction particularly worth of pursuit is to explore the determinants associated with the choice of the AC scheme in Taiwan after 2007. As this study has pointed out a low demand for AC in Taiwan, future research should explore any factors that make companies hesitate to adopt AC or any reasons that prompt companies to choose “quasi-audit committee” rather than audit committee under Article 14-4 of Securities Exchange Act. The findings can provide more implications for the government. If audit committee can safeguard better earnings quality, policy makers should develop some policies to encourage the AC adoption.

## References

- Abbott, L. J., Parker, S., and Peters, G. F. 2004. Audit committee characteristics and restatements. *Auditing: A Journal of Practice and Theory*, 23 (1): 69-87.
- Abbott, L. J., Parker, S., Peters, G. F., and Raghunandan, K. 2003. The association between audit committee characteristics and audit fees. *Auditing: A Journal of Practice and Theory*, 22 (2): 17-32.
- Barber, B. M., and Lyon, J. D. 1996. Detecting abnormal operating performance: The empirical power and specification of test statistics. *Journal of Financial Economics*, 41 (3): 359-399.
- Barth, M., Landsman, W., and Lang, M. 2008. International accounting standards and accounting quality. *Journal of Accounting Research*, 46 (3): 467-498.
- Beasley, M. S. 1996. An empirical analysis of the relation between the board of director composition and financial statement fraud. *The Accounting Review*, 71 (4): 443-465.
- Becker, C., DeFond, M., Jiambalvo, J., and Subramanyam, K. 1998. The effect of audit quality on earnings management. *Contemporary Accounting Research*, 15 (1): 1-24.
- Bronson, S. N., Carcello, J. V., Hollingsworth, C. W., and Neal, T. L. 2009. Are fully independent audit committees really necessary? *Journal of Accounting and Public Policy*, 28 (4): 265-280.
- Bushman, R., Chen, Q., Engel, E., and Smith, A. 2004. Financial accounting information, organizational complexity and corporate governance systems. *Journal of Accounting and Economics*, 37 (2): 167-201.
- Carcello, J. V., and Neal, T. L. 2000. Audit committee composition and auditor reporting. *The Accounting Review*, 75 (4): 453-467.
- \_\_\_\_\_. 2003. Audit committee characteristics and auditor dismissals following new going-concern reports. *The Accounting Review*, 78 (1): 95-117.
- Cernat, L. 2004. The emerging European corporate governance model: Anglo-Saxon, Continental, or still the century of diversity? *Journal of European Public Policy*, 11 (1): 147-166.
- Chen, C. H. 2010. *Corporate governance: Establishing audit committee to align with global trend (in Chinese)*. Commerical Times, November 23: D4.
- Chen, J., Duh, R., and Shiue, F. 2008. The effect of audit committees on earnings-return

- association: Evidence from foreign registrants in the United States. *Corporate Governance: An International Review*, 16 (1): 32-40.
- Chiu, H. C., and Tsai, Y. 2009. *Characteristics of audit committee and earnings management*. Paper presented at the International Conference on Business Expertise and Ethics, Taichung.
- Choi, J., and Wong, T. J. 2007. Auditors' governance functions and legal environments: An international investigation. *Contemporary Accounting Research*, 24 (1): 13-46.
- Chung, R., Firth, M., and Kim, J. 2002. Institutional monitoring and opportunistic earnings management. *Journal of Corporate Finance*, 8 (1): 29-48.
- Collier, P., and Zaman, M. 2005. Convergence in European corporate governance: The audit committee concept. *Corporate Governance: An International Review*, 13 (6): 753-768.
- Dallas, G., and Scott, H. 2006. Can one set of results fit all? Mandatory corporate behavior. *Corporate Governance Law Review*, 2 (2): 117-144.
- Dechow, P. M., and Dichev, I. 2002. The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, 77 (Supplement): 35-59.
- Dechow, P. M., Sloan, R., and Sweeney, A. 1995. Detecting earnings management. *The Accounting Review*, 70 (2): 193-225.
- DeFond, M. L., and Francis, J. R. 2005. Audit research after Sarbanes-Oxley. *Auditing: A Journal of Practice and Theory*, 24 (Supplement): 5-30.
- DeFond, M. L., and Jiambalvo, J. 1994. Debt covenant violation and manipulation of accruals. *Journal of Accounting and Economics*, 17 (1-2): 145-176.
- DeZoort, F., and Salterio, S. 2001. The effects of corporate governance experience and financial reporting and audit knowledge on audit committee members' judgments. *Auditing: A Journal of Practice and Theory*, 20 (2): 31-47.
- Fama, E. 1980. Agency problems and the theory of the firm. *Journal of Political Economy*, 88 (2): 288-307.
- Fama, E., and Jensen, M. C. 1983. Separation of ownership and control. *Journal of Law and Economics*, 26 (2): 301-325.
- Gilson, R. 2001. Globalizing corporate governance: Convergence of form or function. *The American Journal of Comparative Law*, 49 (2): 329-357.
- Hribar, P., and Nichols, D. 2007. The use of unsigned earnings quality measures in tests of earnings management. *Journal of Accounting Research*, 45 (5): 1017-1053.
- Huang, H. H. 2000. The legal issues for government or institutional shareholders as

- representative of corporate directors and supervisors (in Chinese). *FT Law Review*, 110: 62-73.
- Huang, M. C. 2007. Investigation of corporate governance and financial securities issue from the Rebar Fraud (in Chinese)? *Financial and Economic Law Review*, 8: 1-28.
- Jones, J. 1991. Earnings management during import relief investigations. *Journal of Accounting Research*, 29 (2): 193-228.
- Kalbers, L., and Fogarty, T. 1993. Audit committee effectiveness: An empirical investigation of the contribution of power. *Auditing: A Journal of Practice & Theory*, 12 (1): 24-49.
- Kaszniak, R. 1999. On the association between voluntary disclosure and earnings management. *Journal of Accounting Research*, 37 (1): 57-81.
- Klein, A. 2002. Audit committee, board of director characteristics, and earnings management. *Journal of Accounting and Economics*, 33 (3): 375-400.
- Köhler, A. G. 2005. Audit committees in Germany: Theoretical reasoning and empirical evidence. *Schmalenbach Business Review*, 57 (7): 229-252.
- Kothari, S., Leone, A., and Wasley, C. 2005. Performance matched discretionary accrual measures. *Journal of Accounting and Economics*, 39 (1): 163-197.
- Krishnan, J. 2005. Audit committee quality and internal control: An empirical analysis. *The Accounting Review*, 80 (2): 649-675.
- Lang, M., Raedy, J., and Wilson, W. 2006. Earnings management and cross listing: Are reconciled earnings comparable to US earnings? *Journal of Accounting and Economics*, 42 (1-2): 255-283.
- Li, S. 2010. Does mandatory adoption of International Accounting Standards in the European Union reduce the cost of equity capital? *The Accounting Review*, 85 (2): 607-636.
- Lin, K. C. 1999. Directors and supervisors as the representative of another legal entity (in Chinese). *The Taiwan Law Review*, 49: 16-17.
- \_\_\_\_\_. 2002. Can legal entity be eligible for directors of Corporation Limited (in Chinese)? *The Taiwan Law Review*, 84: 20-21.
- McMullen, D. A. 1996. Audit committee performance: An investigation of the consequences associated with audit committees. *Auditing: A Journal of Practice and Theory*, 15 (1): 87-103.
- McNichols, M. 2000. Research design issues in earnings management studies. *Journal of Accounting and Public Policy*, 19 (4-5): 313-345.
- Patton, A., and Baker, J. 1987. Why do not directors rock the boat? *Harvard Business*

*Review*, 65 (11): 10-12.

- Peasnell, K., Pope, P., and Young, S. 2005. Board monitoring and earnings management: Do outside directors influence abnormal accruals? *Journal of Business Finance and Accounting*, 32 (7-8): 1311-1346.
- Raghunandan, K., Rama, D., and Read, W. 2001. Audit committee composition, gray directors, and interaction with internal auditing. *Accounting Horizons*, 15 (2): 105-118.
- Scarborough, D., Rama, D., and Raghunandan, K. 1998. Audit committee composition and interaction with internal auditing: Canadian evidence. *Accounting Horizons*, 12 (1): 51-62.
- Shivdasani, A. 1993. Board composition, ownership structure, and hostile takeovers. *Journal of Accounting and Economics*, 16 (1-3): 167-198.
- Warfield, T., Wild, J., and Wild, K. 1995. Managerial ownership, accounting choices, and informativeness of earnings. *Journal of Accounting and Economics*, 20 (1): 61-91.
- Wild, J. J. 1994. Managerial accountability to shareholders: Audit committees and the explanatory power of earnings for returns. *British Accounting Review*, 26 (4): 353-374.
- Young, C., and Wu, S. 2009. The determinants and effects on earnings informativeness of asset impairments: The role of corporate governance (in Chinese). *International Journal of Accounting Studies*, 48 (1): 68-114.

## 作者簡介

### 許文馨

台大會計系副教授。她於英國蘭開斯特大學取得會計與財務博士。她擁有台灣會計師執照以及通過美國財務分析師三個階段。她的研究領域主要著重於資本市場研究，財務會計品質，國際會計準則以及財務危機等議題。她曾發表學術論文於國內期刊，包括會計評論和中山管理評論，以及發表學術論文於國外期刊 *Abacus*, *Accounting Horizons*, *Asia Pacific Journal of Accounting and Economics*, *Contemporary Accounting Research*, *Corporate governance: an international review*, *European Accounting Review*, *Journal of Business Finance & Accounting*, *Journal of Contemporary Accounting and Economics*, *Omega*, *The International Journal of Management*, *The International Journal of Accounting*, *Total Quality Management & Business Excellence*, *Review of Quantitative Finance and Accounting* 等重要國際期刊。

---

\* E-mail: [audreyhsu@ntu.edu.tw](mailto:audreyhsu@ntu.edu.tw)