Toward the Effect of Audit Quality on Earnings Management[*]

——Empirical Evidence from Manufacturing Enterprises Listed in Shanghai Stock Market

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Abstract: Nowadays, earnings management is a hot issue, but most of the researches focus on the incentives of earnings management and few of them refer to the effect of audit quality on earnings management. In this study, we directly examine the effect of external audit quality on earnings management by using discretionary accruals. We find that the discretionary accruals of non-dual audit companies are significantly greater than those of dual audit companies. We also find that clients of non-First Ten auditors intend to report greater discretionary accruals than those of First Ten auditors.

Key words: audit quality; earnings management; discretionary accruals; dual audit; non-dual Audit; First Ten auditors; non-First Ten auditors

1. Introduction

Financial statement is the main information source of enterprises. Primarily depending on the analysis of financial statement, investors make their decisions. However, the asymmetry of information between external investors and the "insiders" makes it possible for "insiders" to distort financial statement information. Generally speaking, the infidelity of accounting information involves two aspects: the first is accounting information fraud, which relates to illegal behaviors violating accounting regulations; the second is earnings management, which refers to legal behaviors manipulating accounting data by using the flexibility of accounting regulations. The three hypotheses of positive accounting theory point out that corporation insiders will conduct earnings management under some conditions, therefore distort earnings. Large-scale bad earnings management can mislead investors' decision, and bring great loss to investors. The financial scandals of Enron, WorldCom, "Guang Xia (Yinchuan)"and "Zhengzhou Baiwen" are all related to CPAs' inefficient management or ignorance, and even their collusion with managements. These events illustrate the importance of earnings management and external audit quality judgements.

The purpose of this paper is to directly examine the effect of external audit quality on earnings management by using discretionary accruals. The paper mainly answers following questions: Is there any significant

differences between the effects of different audit types (First Ten and non-First Ten[1])? Are the discretionary accruals of dual audit companies significantly lower than those of non-dual audit companies?

2. Literature Review and Hypothesis

2.1 Literature Review

Our purpose is to examine the effect of audit quality on earnings management through discretional accruals. The motivation of executives to manipulate earnings is to maximize the properties both of the corporation and themselves. According to the existing studies, such motivation is established by series of contracts based upon reported earnings (e.g., management compensation plans and debt covenants). Most of the researches on earnings management concentrate on studying these motivations and presume that management's ability to manipulate earnings is the same across companies. However, it is not the case. Many other factors, such as corporate governance (Dechow, Sloan and Sweeney, 1996) and previous accounting decisions (Sweeney, 1994), eliminate the possibility to manipulate companies' earnings, thus eliminate management's ability to conduct earnings management. In this paper, we only focus on one of these factors——external audit quality.

The main function of auditing is to reduce the information risk resulting from the information asymmetry between managers and stockholders to improve the credibility of financial statements. The effectiveness of auditing and its ability to limit earnings management vary with the quality of the auditor (Becker, DeFond, Jiambalvo, Subramanyam, 1998). Compared with low-quality auditors, high-quality auditors are more likely to detect questionable accounting practices and issue the qualified audit reports. Therefore, high-quality audit can constrain earnings management effectively because management's reputation is likely to be damaged and firm value is reduced if misstatement is revealed. Thus, we predict that earnings management is greater in companies audited by lower-quality auditors than that in those audited by higher-quality auditors.

In the U.S., many studies indicate that Big Six auditors provide higher quality audits than non-Big Six auditors (DeAngelo, 1981). DeAngelo (1981) finds that larger audit firms are more likely to detect and reveal management's misstatement. Teoh and Wong (1993) find that clients of Big Six auditors have higher earnings response coefficients than clients of non-Big Six auditors, which is consistent with DeAngelo's analysis. Furthermore, St. Pierre and Anderson (1984) find fewer litigations against Big Six auditors compared with non-Big Six auditors. DeFond and Jiambalvo (1991) judge errors and irregularities as a form of earnings management and suppose that clients of Big Six firms are less likely to have errors and irregularities. DeFond and Jiambalvo (1993) indicate that disagreements between auditors and clients result from incentives to manage earnings and such disagreements are more likely to occur when companies are audited by Big Six auditors.

Recently, with the development of China's capital market, numerous empirical studies on earnings management of listed companies have been published, most of which focus on studying earnings management under special regulation polices of capital market. Aharony et al. (1999) find that China's listed companies intend to report greater earnings in order to enhance prices when they are initial public offering (IPO). Yujian Lu (2002) studies earnings management behaviors of listed companies of A-share in China, and find that listed companies maintain ROE at the line little above 0 (6% or 7%) by earnings management to avoid deficit or attain stock

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[1] According to 21st Century Economic Report, the First Ten audit firms are Ernst & Young Da Hua, Ernst & Young Huaming, Beijing Jingdu, KPMG Huazhen, Deloitte Huayong, Hubei Daxin, PricewaterhouseCoopers Zhongtian, Shu Lun Pan of Shanghai, Shenzhen Dahua Tiancheng, and Pan-China audit firms; and the others are non-First Ten audit firms. Here, we define the above 10 firms as "First Ten", and the others as "non-First Ten".

dividend rights. He provides evidence that listed companies change earnings management behaviors with the change of stock dividend policy. These studies indicate that China's listed companies normally conduct earnings management to deal with the special regulation policies. Lijun Xia et al. (2002) study listed companies' annual reports to analyze the relationship between types of audit opinion of listed companies and earnings management induced by regulation policies. Their research reveals that CPAs have not detected earnings management and CPAs' audit quality is troublesome. Weiguo Zhang and Xia Wang (2004) take A-share companies with incidence of adjusting accounting errors in the 1999-2001 annual reports as samples. They study the incentives of earnings overstatement and find that external audit has no power on earnings overstatement, while First Ten audit firms play little role in constraining accounting errors.

In this paper, we assume that non-First Ten auditors allow more income-increasing earnings management via discretionary accruals than First Ten auditors, and non-Dual Audit allows more than Dual Audit. We focus on income-increasing discretionary choices for two reasons. First, managers are more likely to overstate than understate earnings (DeFond and Jiambalvo, 1991, 1993; Kinney and Martin, 1994). Second, evidence shows that audit firms are usually sued for overstating earnings rather than understating earnings (St. Pierre and Anderson, 1984).

We test the relationship between discretionary accruals and firm scale (First Ten or non-First Ten) in a multivariate setting using a sample of 343 manufacturing firms listed in Shanghai Stock Market. Discretionary accruals are estimated by the Modified Cross-sectional Jones Model. We find that companies with non-Dual Audit report significantly greater discretionary accruals than companies with Dual Audit and clients of non-First Ten auditors report greater discretionary accruals than clients of First Ten auditors. Although our hypothesis mainly focuses on income-increasing accruals, we also examine the variation in discretionary accruals. Our study shows that Dual Audit and First Ten audit firms delegating higher-quality auditing can constrain discretionary accruals.

The discretionary accruals is one of the primary measures for earnings management, thus we directly test the relationship between audit quality and discretionary accruals. Former studies have generally focused on the secondary characteristics of earnings management (such as litigation rates, pricing of services and earnings response coefficients). Becker, DeFond, Jiambalvo and Subramanyam (1998) find that in the U.S., clients of Big Six auditors report significantly greater discretionary accruals than those of non-Big Six auditors by directly testing the relationship between audit quality and discretionary accruals.

Because of the limitation of data as well as the difficulties to observe and estimate unaudited earnings management, we never take the examination of the unaudited discretionary accruals under different auditing forms into account. We leave this investigation to future research.

The remainder of this paper is to further discuss our development of hypothesis, sample selection, research design, results and conclusions.

2.2 Development of Hypothesis

Auditing is an effective monitoring means to reduce agency costs between debt holders and stockholders (Jensen and Meckling, 1976; Watts and Zimmerman, 1983). Auditing can reduce the information risk of financial misstatements. Kinney and Martin (1994) find that auditing decreases positive bias in unaudited net assets and net earnings. Hirst (1994) concludes that auditors are extremely sensitive to earnings management and concentrate on management's incentives to overstate earnings.

According to the studies above, we assume that audit quality varies with the quality of the audit firm varies. Watts and Zimmerman (1980), DeAngelo (1981) define audit quality as the possibility of detecting and reporting

errors in financial statements, which depends on the auditor's independence. Higher-quality auditors are more likely to refuse questionable financial statements and to detect and report errors as well as irregularities. The most common proxy for audit quality is a dummy variable for First Ten/non-First Ten membership. Several studies have supported this surrogate (Nichols and Smith, 1983; Simunic and Stein, 1987; Palmrose, 1988; Francis and Wilson, 1988; DeFond, 1992; DeFond and Jiambalvo, 1991, 1993; Davidson and Neu, 1993). In an empirical research on the hypothesis of the audit firms' reputation of short-run underpricing on the stocks of IPO in China, Haiming Chen and Dong Li (2004) define Big Ten and non-Big Ten audit firms according to the scale of total clients and total assets from January 1996 to March 2003. We use the variables of First Ten and non-First Ten, because the size of audit firms can surrogate audit quality (DeAngelo, 1981; Dopuch and Simunic, 1982). The First Ten are the largest audit firms in China. However, their larger size means that the First Ten have more to lose in the event of losing reputation, therefore they have greater incentive to be independent compared with non-First Ten firms.

The higher quality of First Ten auditors is expected to reduce the income-increasing earnings management. As noted above, if managers are more likely to overstate rather than understate earnings, auditors are more probably to focus on income-increasing earnings management (DeFond and Jiambalvo, 1991,1993; Kinney and Martin, 1994). Kinney and Martin find that most of the audit-related adjustments are negative. St. Pierre and Anderson (1984) report that auditors are always sued for allowing income overstatement. Thus, the First Ten auditors' reputation is more likely to be damaged by the income-increasing discretionary accrual choices. Based on these arguments and results, we develop the first hypothesis as follows.

Hypothesis 1: Firms audited by non-First Ten auditors report relatively higher discretionary accruals compared to firms audited by First Ten auditors.

Although auditors are more frequently concerned about earnings overstatements, high quality auditing should also take actions to detect earnings understatements. Warfield, Wild, and Wild (1995) show that the absolute value of discretionary accruals is a good surrogate of income-increasing and income-decreasing earnings management decisions. We also analyze the differences of absolute value of discretionary accruals in firms with First Ten and non-First Ten auditors.

On December 31st, 2001, China Securities Regulatory Commission (CSRC) issued *Standards for the Content and Format for Information Disclosure of Listed Companies No.16——Tentative Requirements on Supplementary Auditing in A-Share Companies* (short for "NO.16" as following). According to No.16, A-share companies should hire domestic audit firms qualifying to conduct security and option services to audit financial reports when they are initial public offering (IPO) or refinancing. Additionally, such companies should also hire international audit firms qualified by CSRC and Ministry of Finance (MOF) to audit the supplementary financial reports prepared according to international accounting standards.

In fact, the procedure of dual audit is a process that international audit firms interact with domestic audit firms, which can help domestic audit firms move toward international practices and make international audit firms to be more familiar with the situation in China. Moreover, dual audit can help domestic CPAs sustain proper opinion and guarantee audit quality.

The core of dual audit is to introduce international audit firms' audit when A-share companies are IPO or refinancing. The main purpose of dual audit is to enhance auditors' independence and the quality of accounting information by adding aspects of external governance.

Since audit firms conducting dual audit are generally big international firms or their joint ventures in China,

and there is an interaction between audit firms conducting dual audit and those conducting statutory audit, we take the view that dual audit represents higher audit quality. Similar to hypothesis 1, we develop the second hypothesis of this paper as follows.

Hypothesis 2: Dual audit companies report significantly lower discretionary accruals than non-audit companies.

3. Sample Selection and Descriptive Statistics

3.1 Sample Selection

We selected 343 listed manufacturing companies from Shanghai Stock Market in 2002 as our sample. On one hand, with First Ten auditors or not as a criterion, this sample contains 101 companies audited by First Ten auditors and 242 companies audited by non-First Ten auditors. On the other hand, with dual audit or not as a criterion, the sample contains 29 dual audit companies and 314 non-dual audit companies. Our tests compare the discretionary accruals of the two groups of sample companies. We select listed companies from manufacturing industry mainly to reduce the effect of industry regulation. In addition, by studying the companies from the same industry, we can partly reduce the influence of industry differences. To assure each company's auditor's type is constant, we select 2002 as our test period, since the longer the period analyzed, the fewer the observations that meet the criterion. Moreover, *Standards for the Content and Format for Information Disclosure of Listed Companies No.16——Tentative Requirements on Supplementary Auditing in A-Share Companies* was put in force on Jan. 1st 2002. The variation of policies is another reason why we select 2002 as the sample period. We also exclude companies with insufficient data to compute discretionary accruals and firms with ROE outside the range of [-100%, 100%].

The source of data is CSMAR database and relevant annual financial reports of listed companies. Information about audit firms is attained from annual reports. These financial reports are collected from the website of China Securities Regulatory Commission (http://www.csrc.gov.cn). We classify listed companies according to the classification of CSMAR and consult corresponding information published by Shanghai Stock Exchange.

3.2 Descriptive Statistics

Table 1 presents financial variables of our sample firms. Section A and Section B of Part 1 present variables for dual audit companies and non-dual audit companies respectively, while section A and section B of Part 2 respectively present variables for clients of First Ten and non-First Ten audit firms. Sections C present the results of parametric and nonparametric tests comparing the two groups of each part. Table 1 shows that dual audit sample companies tend to have substantially greater assets and be more profitable than the non-dual audit sample companies. The median of the log of assets for the dual audit sample companies is 7.7461 million compared to 7.1067 million for the non-dual audit sample companies. The median operating profits/total assets for dual audit sample companies is 1.6% compared to 3.38% for non-dual audit sample companies. The statistics indicates that the median operating cash flows/total assets is not significantly different across the groups.

Although the mean total accrual is negative, the nonparametric test indicates that the absolute value of the total accrual is smaller for non-dual audit sample companies than that for dual audit sample companies at p=0.2422.

Part 2 of Table 1 shows that the asset scale and operating cash flows are significantly larger for First Ten

sample than those for non-First Ten sample. The median of the log of assets for the First Ten sample is 7.2362 million compared to 7.1144 million for the non-First Ten sample. The median operating profits/total assets is not significantly different across the groups. The median operating cash flows for the First Ten sample (6.44% of total assets) is significantly higher than that for the non-First Ten sample (4.87% of total assets).

While the mean total accrual is negative, the nonparametric test also shows that the absolute value of the total accrual is smaller for the non-First Ten sample at p=0.0178.

Table 1 indicates the differences between the Dual Audit and non-Dual Audit samples as well as the differences between the First Ten and non-First Ten samples with respect to asset scale, operating cash flows, earnings and discretionary accruals. Thus, in addition to a univariate test of our hypothesis, we also undertake a multivariate test including several control variables for the log of assets, operating cash flows, and discretionary accruals. To eliminate multicollinearity, we do not refer to a control variable for earnings in the multivariate test, because discretionary accruals are a component of earnings.

4. Research Design

4.1 Estimation of Discretionary Accruals

There have been various methodologies to detect the effects of accounting choices on reported earnings in previous studies. McNichols and Wilson (1998) examined the estimation of bad debt reserves. Sweeney (1994) studied changes in special accounting choices that potentially affected reported earnings include accruals estimations and specific method choices (Schipper, 1989). In order to capture the net effect of all accounting choices that have an effect on reported earnings, we examine the behavior of total discretionary accruals as Becker, DeFond et al. (1998) do in their studies.

In the existing researches, the most common method to measure earnings management is to separate total accruals into discretionary and nondiscretionary components. Discretionary accruals are the revenues and expenses that do not directly form cash flows, but should be recognized as current profits and losses according to accounting on the accrual basis and the matching principle. Analysis of earnings management often focuses on management's use of discretionary accruals. Such research requires a model to estimate the discretionary components of reported income. There are four primary models and some other models derived from them. The four primary models are respectively Healy Model (1985), DeAngelo Model (1986), Jones Model (1991) and Industry Model (Dechow and Sloan, 1991). We measure earnings management of listed companies by the Modified Cross-sectional Jones Model that is derived from the Jones Model (1991). The parameters in the Cross-sectional Jones Model are estimated by cross-sectional data rather than time-series data. In the Modified Cross-sectional Jones Model, nondiscretionary accruals are estimated by event-period data:

$$NDA_t = \alpha_1\left(1/A_{t-1}\right) + \alpha_2\left[\left(\Delta REV_t - \Delta REC_t\right)/A_{t-1}\right] + \alpha_3\left(PPE_t / A_{t-1}\right) \qquad (1)$$

Where:

NDA_t = adjusted nondiscretionary accruals of year t;

REV_t = revenues in year t less revenues in year t-1 scaled by total assets at t-1;

REC_t = net receivables in year t less net receivables in year t-1 scaled by total assets at t-1;

PPE_t = gross property plant and equipment in year t scaled by total assets at t-1;

A_{t-1} = total assets at t-1;

α_1, α_2, α_3 = firm-specific parameters.

Estimates of the firm-specific parameters, $_1$, $_2$, $_3$ are generated by using the following model in the estimation period:

$$TA_t / A_{t-1} = a_1(1/A_{t-1}) + a_2(\Delta REV_t / A_{t-1}) + a_3(PPE_t / A_{t-1}) + \varepsilon_t \qquad (2)$$

Where: a1, a2 and a3 denote the OLS estimates of $_1$, $_2$, $_3$. TA_t is the total accruals of year t. $_t$ is the residual, which represents the discretionary components of total accruals (Subramanyam, 1996; DeFond and Park, 1997). Other variables are the same as equation (1).

$$DA_t = TA_t / A_{t-1} - NDA_t \qquad (3)$$

Total accruals can be measured through two ways——balance sheet approach and cash flow statement approach. We use the latter approach to measure total accruals:

$$TA_t = EBXI_t - OCF_t \qquad (4)$$

Where: TA_t is the total accruals of year t; $EBXI_t$ is defined as income before extraordinary items; OCF_t refers to net operating cash flows of year t.

We use the cash flow statement approach because it is better than balance sheet approach for measuring total accruals under some conditions (Collins and Hribar, 2000). For example, when the sample companies are characterized by merging, inpersistant items or foreign currency exchange activities, balance sheet approach will contain accruals generated by these special events and include them in the discretionary accruals, which leads to errors in the study results. Some recent studies had noticed this problem (Batov, Gul and Tsui, 2001) and made special analysis on these sample companies.

4.2 Approach to Testing

The purpose of our test is to compare the discretionary accruals across First Ten and non-First Ten samples as well as the discretionary accruals across the dual audit and non-dual audit samples. We conduct a multivariate test on the basis of a number of univariate tests. In the multivariate analysis, discretionary accruals are regressed on several control variables and two dummy variables indicating the auditors' type and whether the company is dual audited.

Since we assume that whether the company implement dual audit or not and whether it is audited by the First Ten audit firms or not (the indicators of audit quality) will affect discretionary accruals, we set a dummy variable indicating the type of auditors and a dummy variable indicating whether the company implement dual audit or not in the regression.

The descriptive data in Table 1 indicate that there is a difference in operating cash flows across the two sample groups. Thus, operating cash flows are included in the multivariate regression. Table 1 also indicates the size difference of the two sample groups. We adopt the log of total assets to control the potential effects of companies' size on discretionary accruals.

Francis, Maydew and Sparks (1996) argue that firms with greater potential to generate accruals have greater uncertainty about earnings because it is difficult for outsiders to distinguish discretionary accruals and non-discretionary accruals. Francis et al. find that in the U.S., companies with greater accruals intend to hire Big Six audit firms to gain the signal that earnings management is being constrained by the Big Six auditors. Becker et al. (1998) argue that clients of Big Six have more conservative discretionary accruals. However, to control the possibility that firms with larger absolute value of total accruals also have larger discretionary accruals, we adopt a control variable denoting the absolute value of total accruals in the multivariate regression.

DeFond and Subramanyam (1997) find that companies that change auditors intend to report negative discretionary accruals at the last year before the change and the first year after the change. Taking this factor into

account, we add a dummy variable to reflect the auditor change. If there is an auditor change, the dummy variable equals to 1.

Table 1   Descriptive Statistics for Sample Firms

Part 1	Section A Dual Audit sample n=29			Section B Non-Dual Audit sample n=314			Section C Tests of null A B	
	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation	t-statistic (p-value)	z-statistic (p-value)
Natural log of assets (million)	7.8979	7.7461	0.8547	7.1673	7.1067	0.8179	4.5850 0.0000	4.2287 0.0000
Operating profits/Total assets	0.0161	0.0160	0.0446	0.0296	0.0338	0.0571	1.2466 0.2134	2.0913 0.0365
Operating cash flows/Total assets	0.0527	0.0721	0.0642	0.0539	0.0496	0.0727	0.0924 0.9264	0.3631 0.7166
Total liabilities/Total assets	0.5109	0.5031	0.1713	0.4586	0.4266	0.3898	0.7154 0.4749	2.2205 0.0264
Total accruals/Total assets	-0.0366	-0.0469	0.0639	-0.0243	-0.0220	0.0693	0.9202 (0.3581)	1.1695 0.2422
Absolute value of total accruals/ Total assets	0.0570	0.0499	0.0458	0.0514	0.0353	0.0524	0.5658 0.5719	1.2947 0.1954

Part 2	Section A First Ten sample (n=101)			Section B Non-First Ten sample (n=242)			Section C Tests of null A B	
	Mean	Median	Standard Deviation	Mean	Median	Standard Deviation	t-statistic (p-value)	z-statistic (p-value)
Natural log of assets (million)	7.3581	7.2362	0.9382	7.1753	7.1144	0.7984	1.8329 0.0677	1.5250 0.1273
Operating profits/Total assets	0.0298	0.0308	0.0501	0.0279	0.0319	0.0586	0.2782 0.7810	0.0006 0.9995
Operating cash flows/Total assets	0.0662	0.0644	0.0724	0.0487	0.0429	0.0712	2.0679 0.0394	2.1808 (0.0292)
Total liabilities/Total assets	0.4437	0.4467	0.1761	0.4711	0.4275	0.4335	0.6137 0.5398	0.4175 0.6763
Total accruals/Total assets	-0.0364	-0.0325	0.0622	-0.0207	-0.0176	0.0710	1.9308 0.0543	2.3696 0.0178
Absolute value of total accruals/ Total assets	0.0520	0.0430	0.0499	0.0518	0.0355	0.0527	0.0299 0.9762	0.7544 0.4506

Notes: Tests are two-tailed. T-statistics are from t-tests of the differences in the means and Z-statistics are from Wilcoxon

two-sample tests.

Yihong Jiang (1998), Haw, Qi, Wu and zhana (1998), Jie Liu (1999), Zheng Sun and Yuetang Wang (1999), Xiaoyue Chen, Xing Xiao, Xiaoyan Guo (2000) examine the ROE frequency distribution of listed companies. They find that listed companies concentrate on the right of stock dividend lifeline (ROE equals to 10%) and conclude that listed companies varnish over profits to meet the requirements of stock dividend. Xiaoyue Chen et al. (2000) examine listed companies' earnings management behaviors and find that firms at the threshold of having stock dividing right have significantly higher total accruals than their counterparts which are not at the threshold. This finding reveals the possibility that firms conduct earnings management by using accruals. Based on studies above, we can get the conclusion that a firm is more likely to conduct earnings management when its ROE is between 6% and 7%. Thus, we adopt a dummy variable——SixSeven in the regression. If ROE ranges from 6% to 7%, the dummy variable equals to 1.

The multivariate analysis is performed by estimating the coefficients in the following regression model:

$$DA = b_0 + b_1 TEN + b_2 Dual + b_3 OCF + b_4 Assets + b_5 AbsAccr + b_6 Continue + b_7 SixSeven + e \qquad (5)$$

Where:

DA=estimated discretionary accruals;

Dual=dummy variable equals to 1 if the company is dual audited;

TEN=dummy variable equals to 1 if the auditor is First Ten;

OCF=operating cash flows;

Assets=natural log of total assets;

AbsAccr=the absolute value of total accruals;

Continue=dummy variable equals to 1 if there is an auditor change;

SixSeven=dummy variable equals to 1 if ROE is between 6% and 7%.

Discretionary accruals are estimated by the Modified Cross-sectional Jones Model, which is described earlier in this paper. Relevant information about audit firms is attained from 2002 annual reports of manufacturing companies listed in Shanghai Stock Exchange. The remaining data are computed from the CSMAR database. We exclude observations with information not available and obviously abnormal.

5. Empirical Results and Analysis

5.1 Univariate Analysis

In Table 2, mean and median discretionary accruals and the absolute value of discretionary accruals are presented for the dual audit/non-dual audit samples and the First Ten/non-First Ten samples in section A and section B. Section C presents the differences of means and medians along with the results of t-tests and Wilcoxon two-sample tests. The results show that both mean and median discretionary accruals are different across the samples. The discretionary accruals of non-dual audit companies are greater than those of dual audit companies. Dual audit companies report mean (median) discretionary accruals of 0.29% (0.00%) of total assets, which is not significantly different from 0. On the other hand, non-dual audit companies report mean (median) discretionary accruals of 1.4% (1.84%) of total assets, which is significantly different from 0. The mean (median) discretionary accruals of non-dual audit companies is 0.0112 (0.0184) more than that of dual audit companies, which is consistent with our hypothesis.

The absolute value of discretionary accruals is a supplementary measure of the degree to which management

is allowed to exercise manipulation of reported earnings. Section A and section B represent the mean and median absolute value of the percentage of discretionary accruals to total assets for dual audit companies and non-dual audit companies. The results indicate that the absolute value of the percentage of discretionary accruals to total assets for non-dual audit companies is greater than that for dual audit companies, which is also consistent with our hypothesis.

Part 2 of Table 2 shows that the discretionary accruals and its absolute value are significantly different across the First Ten and non-First Ten samples. Clients of non-First Ten report significantly greater discretionary accruals than clients of First Ten do. Clients of First Ten report mean (median) discretionary accruals of –0.19% (0.00%) of total assets, which is not significantly different from 0. Meanwhile, clients of non-First Ten report mean (median) discretionary accruals of 1.93% (2.27%) of total assets, which is significantly different from 0. The mean (median) discretionary accruals of non-First Ten samples is 0.0212 (0.0228) more than that of First Ten samples. The results of t-tests and Wilcoxon two-sample tests both indicate the significant difference between the two samples, which is consistent with our hypothesis.

As with the analysis of the absolute value of discretionary accruals, the results of section A and section B show that the mean (median) absolute value of the percentage of discretionary accruals to total assets for clients of non-First Ten is 5.88% (4.31%), while that for clients of First Ten is 4.69% (3.33%), the four data are significantly different from 0. Tests of the differences between the two sample groups indicate that the absolute value of the percentage of discretionary accruals to total assets for clients of non-First Ten is significantly greater than that for clients of First Ten, the mean and median of which is 0.0118 and 0.0099 greater separately.

Table 2　Univariate Analysis

| | Section A | | | Section B | | | Section C | |
| | Dual audit sample | | | Non-dual audit sample | | | Difference across samples B-A | |
	Observations	Mean	Median	Observations	Mean	Median	Mean	Median
Discretionary accruals (DA)	29	0.0029	0.0000	314	0.0140	0.0184	0.0112	0.0184
P-value		0.8029	0.7621		0.0013	0.0001	0.4457	0.2165
Absolute value of DA	29	0.0477	0.0361	314	0.0560	0.0421	0.0083	0.0060
P-value		0.0000	0.0000		0.0000	0.0000	0.4189	0.7624

| | Section A | | | Section B | | | Section C | |
| | First Ten sample | | | Non-First Ten sample | | | Difference across samples B-A | |
	Observations	Mean	Median	Observations	Mean	Median	Mean	Median
Discretionary accruals (DA)	101	-0.0019	0.0000	242	0.0193	0.0227	0.0212	0.0228
P-value		0.7700	0.9811		0.0002	0.0000	0.0172	0.0061
Absolute value of DA	101	0.0469	0.0333	242	0.0588	0.0431	0.0118	0.0099
P-value		0.0000	0.0000		0.0000	0.0000	0.0577	0.0693

Notes: In section A and section B, P-values for the means are from t-tests and P-values for the medians are from signed rank

tests. In section C, P-values for the means are t-tests and P-values for the medians are from Wilcoxon two-sample tests.

5.2 Multivariate Analysis

Obviously, the univariate analysis ignores some key variables that may affect the accuracy of our results. Therefore, we further conduct a multivariate analysis. In Table 3, we present the result of a multivariate analysis with the dummy variables denoting dual audit and First Ten as well as some control variables discussed in the research design section. The first coefficient in the regression in Table 3 is related to a dummy variable representing dual audit, which is significant at 10% level. The value of this coefficient is unanimous to the univariate analysis. In Table 2, mean discretionary accruals of the non-dual audit sample exceeds that of the dual audit sample by 0.0112, while the median exceeds by 0.0184. The negative coefficient (-0.0055) of the dual audit dummy variable also indicates that the discretionary accruals of non-dual audit sample exceed those of dual audit sample by 0.0055. Although the multivariate analysis reduces differences, it still supports our hypothesis.

The second coefficient in the regression in Table 3 is related to a dummy variable denoting First Ten audit firms. Since the P-value is 0.0000, and the coefficient is negative, it is consistent with our hypothesis (in Table 2, the difference between mean discretionary accruals of First Ten sample and that of non-First Ten sample is 0.0212, and the difference between the medians is 0.0228). The result again supports our hypothesis that discretionary accruals of First Ten clients are significantly lower than those of non-First Ten clients.

In the multivariate regression represented by Table 3, there are series of control variables relating to discretionary accruals. The negative coefficient on the operating cash flow variable is consistent with the Dechow et al. (1995), who find that discretionary accruals are negatively correlated with operating cash flows. The negative coefficient on the absolute value of total accruals to total assets suggests that managers of firms with greater absolute value of total accruals intend to reduce earnings. Because of depreciation, nondiscretionary accruals tend to be negative. Therefore, negative discretionary accruals can increase the absolute value of total accruals (the sum of discretionary accruals and nondiscretionary accruals). On the other hand, positive discretionary accruals decrease the absolute value. This result brings on a negative relationship between discretionary accruals and the absolute value of total accruals, which explains the findings in Table 3.

Table 3   Multivariate Analysis
OLS Regression of Discretionary Accruals on Dual Audit, First Ten and Control Variables

Independent variable	Estimate t-statistic p-value	Wald-statistic P-value
Intercept	0.1013 8.8194 0.0000	 77.7812 0.0000
Audit (dummy)	-0.0055 -1.9341 0.0539	 3.7406 0.0539
First Ten	-0.0098 -5.8887 0.0000	 34.6772 0.0000

Operating cash flows/Total assets	-0.1303	
	-4.4214	19.5490
	0.0000	0.0000
Log of total assets	-0.0085	
	-5.3718	28.8558
	0.0000	0.0000
Absolute value of total accruals/ Total assets	-0.1527	
	-1.4239	2.0275
	0.1554	0.1554
Continuing audit firms	0.0094	
	3.4801	12.1112
	0.0006	0.0006
ROE between 6% and 7%	-0.0132	
	-6.1108	37.3425
	0.0000	0.0000
Adjusted R-squared	0.2211	
F-statistic	26.6943	
Number of observations	343	

6. Research conclusion

The issues about earnings management are always hot in the empirical accounting research, but most of the studies focus on studying the incentives of earnings management and few of which refer to restriction factors of earnings management. Our study focuses on one of the factors——the quality of the external auditor. We suppose that First Ten auditors have higher audit quality than non-First Ten auditors, which means that First Ten auditors are more likely to detect and restrain questionable accounting practices, thus qualify the audit report. We also suppose that dual audit has higher audit quality than non-dual audit, since dual audit is more likely to check questionable accounting practices. Earnings management is measured in terms of discretionary accruals estimated using a modified cross-sectional Jones model. We find that non-dual audit companies report significantly higher discretionary accruals than dual audit companies, and clients of non-First Ten report significantly higher discretionary accruals than clients of First Ten. Our results reveal that dual audit and First Ten can partly restrain earnings management.

In China, there are many research literatures concerning the relationship between earnings management and audit quality, but few of which directly study the relationship between earnings management and audit firms hired by companies. Our results add to the literature by demonstrating a direct relationship between audit quality and earnings management. However, prior studies typically demonstrate a relationship between audit quality and an indirect indicator of earnings management (such as litigation rates, pricing of services, and earnings response coefficients). Moreover, we refer to China's unique dual audit system in our study. To make our study more reliable, we also amply consider the effects of industry factors.

However, we do not refer to unaudited earnings management. It is possible that non-dual audit companies or

clients of non-First Ten have greater earnings management before auditing, thus it is normal that these firms have greater discretionary accruals after auditing. Because of the difficulties to measure unaudited discretionary accruals, our conclusion that dual audit or First Ten can better constrain earnings management may be open to doubt. We have left this problem to future research.

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