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Effects of audit quality on earnings management Chinese listed firms

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ABSTRACT

There are many factors influencing earnings management. Audit quality is one of the influencing factors on earnings management. In this study, the purpose focus on the effects of audit quality on earnings management, especially in Chinese listed firms. The data are collected from CSMAR-CSRC Industry Classification 2012 Edition in 2014-2016. There are other control variables: cash flow from operating activities, the natural logarithm of total assets, the absolute value of total accruals, the ratio of market value to book value of equity, dummy variable indicating whether the firm is among the highest decile of leverage. Using Big 4 (PwC, DTT, KPMG, EY) or not Big 4 to measure audit quality, discretionary accruals to measure earnings management, we find audit quality would have a significant negative effect on discretionary accruals. As a result, the audit quality has a significant negative effect on earnings management, especially in Chinese listed firms.

Keywords: audit quality, earnings management, big 4, discretionary accruals

JEL Codes: M41, M42, M48

I. INTRODUCTION

The research question is studying the effects of audit quality on earnings management, especially in Chinese listed firms. Audit quality could be measured by Big 4 or not Big 4. Earnings management could be measured by discretionary accruals. Through other control variables, the result will show the relationship between audit quality and earnings management in Chinese listed firms.

Auditing is related to the accounting field. An audit is generally a check of a company's internal and external financial statements. Audit quality is important for companies' financial management. Audit quality could influence earnings management. In this study, the following study focus on Chinese listed firms' audit quality and earnings management.

In previous studies, DeAngelo (1981) shows that Big 4 auditing firms would provide higher audit quality than not Big 4 auditing firms. Some studies use an audit firm size to measure audit quality (Dopuch and Simunic 1982). Big 4 auditing firms also offer more reliable financial statements than not Big 4 auditing firms (Krishnan 2003). Besides, Big 4 auditing firms are better at constraining earnings management than the non-Big 4 auditing firms; they find that non-Big 4 auditing firms have higher earnings management (Ahsen 2011). These studies show that Big four auditing firms have higher audit quality with lower earnings management.

The results would be provided by Stata. Dependent variable: discretionary accruals, independent variable: audit quality and other control variables: cash flow from operating activities, the natural logarithm of total assets, the absolute value of total accruals, the ratio of

market value to book value of equity, a dummy variable indicating whether a firm is among the highest decile of leverage. Through the CSMAR database, there are 2838 useful observations. The data about every variable from 2012 to 2016. Regarding the relationship between audit quality and earnings management, the coefficient is -0.000^* , which means the p-value is smaller than 0.1. Therefore, there is a significant negative effect on earnings management in Chinese listed firms.

After getting the result of the regression, it is obvious that there is a significant negative relationship between audit quality and earnings management in Chinese listed firms. There are kinds of many kinds of researches that have already studied the relationship between audit quality and earnings management in different countries or companies. However, this research is studying the data from 2012 to 2016. The result could be more timeliness. For Chinese listed firms, it is useful and important to consider the opposite relationship between audit quality and earnings management. For future studies, this study provides the method of data collection, the methodology, the efficient results and some details about these variables definitions.

The remainder of the study: the second section is a literature review about the audit quality and earnings management. The third section is the hypothesis development of the relationship between audit quality and earnings management. The fourth section is the methodology or research design of the following study. The fifth section is empirical results through doing Stata analysis. The sixth section is the conclusion and some limitations of the study. After the conclusion and limitation, some definitions of variables and references are shown in the next.

II. LITERATURE REVIEW

In the previous articles, the authors think the audit quality would affect earnings management. However, the audit quality will have a different impact on earnings management of different companies. So, it's not that high audit quality is good for all companies' earnings management. Auditing is also a kind of accounting field. This topic has great significance to the accounting students' learning and future work. In the following article, it is important to continue to study the effects of audit quality on earnings management, especially in Chinese listed firms.

First of all, it is important to know the details and concepts of audit quality and its influencing factors. The paper "Audit Quality: Insights from the Academic Literature" provides some information on audit quality. The quality of the audit depends on the audit team. A lot of studies think some errors of auditing could be used techniques to reduce these errors. A good audit is a process of performing a good review process by an appropriate approach. "Some factors of audit quality include customer knowledge, industry experience, audit committee, compliance with auditing standards, auditing of company ethics, auditor's economic independence, audit partner rotation, and audit checking" (Knechel et al. 2013).

The following content shows some influencing factors of audit quality. Among them, auditor tenure and audit quality", auditor's tenure will be related to the quality of the audit. The article finds that as the audit tenure increases, the impact of past income on future income forecasts will increase. More importantly, it shows a positive relationship between audit quality and tenure of an auditor. Some companies believe that auditors' tenure can improve audit

quality (Ghosh et al. 2003). Their research is that strengthen auditor-client relationships may bring unexpected costs to the capital market.

Besides, as the auditor's tenure increases, audit quality would affect a continuing business opinion for a company. It concludes that the benefits of audit firm rotation are useless for the extra costs with change auditors (Jackson et al. 2007). Therefore, before doing an auditing firm rotation, other measures need to be addressed and thought related to auditor tenure and audit quality.

There are many articles to study the topic: the effects of audit quality on earnings management from different countries. For example, the article "Effects of Audit Quality on Earnings Management and Cost of Equity Capital" writes about the impact of audit quality is different in a different company with the ownership structure. They study state-owned enterprises and non-state-owned enterprises. State-owned enterprises are less motivated to engage in earnings management than non-state-owned enterprises (Chen et al. 2010). As a result of the study, compared with non-state-owned enterprises, state-owned enterprises' audit quality has a greater impact on reducing earnings management than state-owned enterprises.

Another article studies the topic: "Audit Quality and Earnings Management in France" analyzes the impact of audit quality on earnings management in listed companies in France. The authors think companies hire highly qualified auditors to have lower levels of earnings management. "Audit quality has made a significant influence on the role of corporate governance monitoring mechanisms, which is reflected in the impact on earnings management" (Piot et al. 2005).

After knowing the influencing factors of audit quality and effects of audit quality on earnings management in different countries. The following content could use these previous pieces of evidence to continue to study the specific topic-effects of audit quality on earnings management.

III. HYPOTHESIS DEVELOPMENT

Some previous researches have already got a similar result. The relationship between audit quality and earnings management is opposite.

According to DeAngelo (1981), he analyzes and proves that the size of auditing firms is related to audit quality, so they have a positive relationship. Many kinds of research show that the audit quality of Big 4 auditing firms is higher than not Big 4. Because Big 4 has more ability to restrain the clients' earnings management than not Big 4. For example, Teoh and Wong (1993) prove that the response of a client of Big 4 higher is higher than not Big 4. Beatty (1989) suggests that the stock price of Big 4 is higher than not Big 4. Palmrose (1986) finds there is a positive relationship between the audit fee and the size of auditing firms. Besides, Palmrose (1988) finds that compared with not Big 4, the rate of litigation of Big 4 is lower.

However, the researches show the relationship between audit quality and earnings management usually done in the United States. These countries have an effective supervision mechanism for auditing firms. For example, Jeong and Rho (2004) study whether the audit quality of Big 6 auditing firms is higher than not Big 6. Besides, Vander and Willekens (2004)

find that in French, Belgium, and Greece, there is no difference between the discretionary accruals and the audit quality of auditing firms.

Therefore, if the set of agents is not bringing high audit quality, the auditing firms may not restrain the earning management of companies.

H0: For Chinese listed firms, the improvement of audit quality will have a negative impact on earnings management.

IV. METHODOLOGY (RESEARCH DESIGN)

Discretionary accruals are a measurement of earnings management is. Auditing firm's size is a measurement of audit quality. A linear-multiple regression analysis was used to show the relationship between the dependent variable of discretionary accruals and the independent variables of audit quality.

Primary model:

$$DA_t = \beta_0 + \beta_1 \text{Aud}_t + \beta_2 \text{Cfot}_t + \beta_3 \text{Sizelogat}_t + \beta_4 \text{Abs_acct}_t + \beta_5 \text{Mkbkt}_t + \beta_6 \text{Hilevt}_t$$

Note: DA_t = discretionary accruals; Aud_t = audit quality of listed firms; Cfot_t = cash flow from operating activities; Sizelogat_t = the natural logarithm of total assets; Abs_acct_t = the absolute value of total accruals; Mkbkt_t = the ratio of market value to book value of equity; Hilevt_t = a dummy variable indicating whether a firm is among the highest decile of leverage.

Measuring the earnings management:

Discretionary accruals (DA) are the difference between total accruals (TA) and non-discretionary accruals (NDA).

First of all, to get discretionary accruals and calculate total accruals (TA) as follows (Collins and Hriber 2002; Shah et al. 2009):

$$TAt = Nit - Cfot$$

Where: TAt, is total accrual in year t.; Nit, is net income in year t; and Cfot, is cash flow from operating activities in year t.

Second, to calculate non-discretionary accruals (NDA) use the DeAngelo model (1986). The DeAngelo (1986) model uses the last year's total accruals (TAt - 1) divide total assets (At - 2) as nondiscretionary accruals. The equation is the following:

$$NDA_t = TAt - 1 / At - 2$$

Finally, to calculate discretionary accruals (DA) to measure earnings management as follows (Shah et al. 2009):

$$DA_t = TAt - NDA_t$$

Where: DA_t, is a discretionary component of accruals in year t; TAt, is total accrual in year t; and NDA_t, is non-discretionary accruals in year t.

The discretionary accruals will represent the dependent variable (earnings management) to do the regression analysis in the following study.

Measuring audit quality:

DeAngelo (1981) thinks the larger auditing firms provide high audit quality service. Defond et al. (2000) find more strong evidence that larger Chinese auditors prefer to release revised reports than smaller auditors. In the following study, AUD is a measurement of audit quality for a firm i in year t using auditing firm's size. Audit quality is measured by using a dummy variable that equal one if the auditing firm is one of the Big 4, and equal zero otherwise. Big 4 include PWC, DTT, KPMG, EY. AUD as 0 or 1 will represent the audit quality to do the following regression analysis.

Measuring control variables:

The first control variable, cash flow from operating activities is included in the regression result. Because the result of cash flow from operating activities is very large, the result divide total assets to represent this variable. Dechow (1994) finds negative relationship between cash flow from operating activities and discretionary accruals. Thus, in the final result, the study expects there is a negative coefficient on cash flow from operating activities.

The second control variable, the natural logarithm of total assets is included in the regression result. Teoch and Wong (1993) get a result that a positive relationship between the natural logarithm of total assets and discretionary accruals. In the final result, the study expects there is a positive coefficient on the natural logarithm of total assets.

The third control variable, the absolute value of total accruals is included in the regression result. Similar to cash flow from operating activities, the result also needs to divide total assets

to represent this variable. According to Francis et. al. (1999), companies with larger absolute total accruals may show higher discretionary accruals (Jeong and Rho 2004). Therefore, in order to control a company with a large absolute value of total accrual, it may also have a large discretionary accrual. The study expects the coefficient of this variable to be positive.

The fourth variable, in previous researches, the ratio of market value to book value of equity is included in the regression result. It could reflect the company's growth opportunities (Zhou and Elder 2001).

The fifth control variable, a dummy variable indicating whether a firm is among the highest decile of leverage is included in the regression result. The result of total liability divides total assets represent this variable. High leveraged companies are easily trapping into financial troubles (Beneish and Press 1995). The study expects there is a negative coefficient on the dummy variable.

V. EMPIRICAL RESULTS

The topic is the effects of audit quality on earnings management, especially in Chinese listed firms. First of all, finding the model to represent the relationship between audit quality and earnings management is important. The dependent variable is earnings management, the independent variable is audit quality. Second, search the models of the two variables. In the two models, there are many variables to be calculated and solved. Besides, the data source is important to use. Our school has subscribed to a lot of data. The CSMAR database is useful and rich, choose the company stock in CSRC Industry Classification 2012 Edition and select

all stock code. All my data can be searched and downloaded. In the model of audit quality, the audit research data is from 2012 to 2017, to measure it, the period of auditing and auditing firms from 2014 to 2016. In the model of earnings management, cash flow from operating activities, total assets and net income from 2014 to 2016. In the main model, control variable market value and book value of equity, a dummy variable indicating whether a firm is among the highest decile of leverage in 2016. Because the model of earnings management includes the three periods. And the data from 2017 is incomplete (just until March). The data would be collected from 2014 to 2016 in the CSMAR database. There are 2838 observations to meet all of the above needs.

After making sure the auditing firms, to define Big 4 (PwC, DTT, KPMG, EY) as 1 and define other auditing firms as 0. Table 1 analyzes the sample relationship between audit quality and earnings management without other control variables.

Through table 1, it analyzes the audit quality influence positive or negative discretionary accruals. For audit quality is 1, it means Big 4 auditing firms, positive discretionary accruals have 46%, negative discretionary accruals have 54%. For audit quality is 0, it means other auditing firms, positive discretionary accruals have 54%, negative discretionary accruals have 46%. The results of the two datasets are almost the same. Therefore, there is a weak negative relationship between audit quality and earnings management.

Table 1: Description of the sample observations

	AUD=1	AUD=0
	n=123	n=2715
Positive DA (%)	56(46)	1478(54)
Negative DA (%)	67(54)	1237(46)

Note: AUD=Audit quality; DA= Discretionary accruals.

In table 2, without control variables, it uses the original data of discretionary accruals. From panel A, about all discretionary accruals, with Big 4, the mean of discretionary accruals is positive, with not Big 4, the mean of discretionary accruals is negative. Therefore, companies with high audit quality have more earnings management than companies with low audit quality. From panel B, about negative discretionary accruals, with Big 4 and not Big 4, the mean of discretionary accruals is negative, but companies with low audit quality have more earnings management than companies with high audit quality. From panel C, about positive discretionary accruals, with Big 4 and not Big 4, the mean of discretionary accruals is positive, but companies with high audit quality have more earnings management than low audit quality.

In addition, from these data, companies rarely hire high-quality auditors for earnings management. In all discretionary accruals, only 123 companies hire Big 4 auditing firms to do the earnings management. Therefore, in general, high audit quality would not bring high earnings management.

Table 2: Comparison the means of DA for firms with Big 4 and not Big 4

The audit quality	Number	Mean DA
Panel A: all DA	2838	-3831573.19
Big 4(1)	123	159364285.80
Not Big 4(0)	2715	-11224976.75
Panel B: Negative DA	1304	-924914483.50
Big 4(1)	67	-2515266795.00
Not Big 4(0)	1237	-838775756.80
Panel C: Positive DA	1534	779148945.10
Big 4(1)	56	3359369329.00
Not Big 4(0)	1478	681386873.70

DA: discretionary accruals, Big 4: (PwC, DTT, KPMG, EY)

In table 3, 2838 Chinese listed firms can be divided into six industries. There are 71 finance companies, 482 utility companies, 177 property companies, 86 conglomerates companies, 1864 industry companies, 158 commerce companies. On the whole, the most are industry companies. For these companies, the audit quality is more important than other companies because the management is complex and hard to control. In this study, the industry as a fixed effect to influence other variables.

Table 3: Descriptive of industry code

Industry code	Freq.	Percent	Cum.
0001	71	2.50	2.50
0002	482	16.98	19.49
0003	177	6.24	25.72
0004	86	3.03	28.75
0005	1864	65.68	94.43
0006	158	5.57	100.00
Total	2838	100.00	

Note: 0001= Finance, 0002= Utilities, 0003= Properties, 0004= Conglomerates, 0005= Industry, 0006= Commerce

The above results are calculated without control variables. Through the main model, the control variables have cash flow from operating activities, the natural logarithm of total assets, the absolute value of total accruals, the ratio of market value to book value of equity, a dummy variable indicating whether a firm is among the highest decile of leverage. Then through Stata, to get the details and regression results (Table 4, Table 5).

From Table 4, there are 2838 observations, 1 dependent variable, 1 independent variable, 4 control variables. The descriptive statistics show the details of all useful data, including their mean, standard deviation, minimum and maximum. From the table, about discretionary accruals, the mean is 0.004, the standard deviation is 0.074, the range is from -0.682 to 1.67. About audit quality, the mean is 0.043, the standard deviation is 0.204, the range is from 0 to 1. Regarding cash flow from operating activities, the mean is -0.004, the standard deviation is 0.074, the range is from -1.67 to 0.682. About the natural logarithm of total assets, the mean is 21.856, the standard deviation is 1.387, the range is from 15.479 to 30.703. About the absolute value of total accruals, the mean is 0.036, the standard deviation is 0.064, the range is from 0 to 1.67. Regarding the ratio of market value to book value of equity, the mean is 1.972, the standard deviation is 23.199, the range is from 0 to 1128.28. About a dummy variable indicating whether a firm is among the highest decile of leverage, the mean is 19.75, the standard deviation is 370.48, the range is from 0 to 12989.341.

Table 4: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
dat	2838	.004	.074	-.682	1.67
audt	2838	.043	.204	0	1
cfot	2838	-.004	.074	-1.67	.682
sizelogat	2838	21.856	1.387	15.479	30.703
abs_acct	2838	.036	.064	0	1.67
mkbkt	2838	1.972	23.199	0	1128.28
hilevt	2838	19.75	370.48	0	12989.341

Note: dat= discretionary accruals/total assets; audt=audit quality; cfot=cash flow from operating activities/total assets; sizelogat= natural logarithm of total assets; abs_acct= the absolute value of total accruals/total assets; mkbkt= the ratio of market value to book value of equity; HiLev= total liabilities/total assets;

The correlation matrix (Table 5) provides a quick overview of these relationships. Given a set of variables, it can provide a correlation coefficient for the relationship between each pair of variables. For discretionary accruals and audit quality, the value 0.007 represents a little weak positive relationship between them. For control variables, the coefficient of cash flow from operating activities is -0.999 and a dummy variable indicating whether a firm is among the highest decile of leverage is -0.005, they mean to have a negative effect on discretionary accruals. The coefficient of the absolute value of total accruals is 0.317, the ratio of market value to book value of equity is 0.012, and the natural logarithm of total assets is 0.038, they mean to have a positive effect on discretionary accruals.

Table 5: The correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) dat	1.000						
(2) audt	0.007	1.000					
(3) cfot	-0.999	-0.007	1.000				
(4) sizelogat	0.038	0.150	-0.034	1.000			
(5) abs_acct	0.317	0.004	-0.317	-0.151	1.000		
(6) mkbkt	0.012	-0.005	-0.012	0.012	0.014	1.000	
(7) hilevt	-0.005	-0.005	0.005	-0.039	-0.015	0.016	1.000

Note: dat= discretionary accruals/total assets; audt=audit quality; cfot=cash flow from operating activities/total assets; sizelogat= natural logarithm of total assets; abs_acct= the absolute value of total accruals/total assets; mkbkt= the ratio of market value to book value of equity; HiLev= total liabilities/total assets;

In Table 6, R-squared is 0.999, it means the amount of variance of the dependent variable explained by the independent variable. In this result, the model explains 99.9% of the variance in discretionary accruals. In terms of correlation coefficients, the coefficient of audit quality is -0.000* (-0.0003693) and p-value is smaller than 0.1, the independent variable has a significant negative effect on discretionary accruals, and it has 90% confidence interval to explain discretionary accruals. The coefficient of cash flow from operating activities is -0.999***, it has a significant negative effect on discretionary accruals and p-value is smaller than 0.01, it has 99% confidence interval to explain discretionary accruals. The coefficient of natural logarithm of total assets is 0.000*** and p-value is smaller than 0.01, it has a significant positive effect on discretionary accruals, and it has 99% confidence interval to explain discretionary accruals. The coefficient of the absolute value of total accruals is 0.002** and the

p-value is smaller than 0.05, it has a significant positive effect on discretionary accruals, and it has 95% confidence interval to explain discretionary accruals. The coefficient of the ratio of market value to book value of equity is -0.000, it has an insignificant negative effect on discretionary accruals. The coefficient of dummy variable indicating whether a firm is among the highest decile of leverage is -0.000* and p-value is smaller than 0.1, it has a significant negative effect on discretionary accruals, and it has 90% confidence interval to explain discretionary accruals.

Compared with Alpaslan's research (2013), the coefficient of the (independent variable) audit quality is -0.000155 on (dependent variable) discretionary accruals, it can reflect the relationship between audit quality and earnings management is a significant negative. The result is similar to the study (-0.0003693). Therefore, the study's regression result can be confirmed. Regarding other control variables, for cash flow from operating activities, in Alpaslan's research, the coefficient is -0.548, it is similar to the study (-0.998699). For the natural logarithm of total assets, in Alpaslan's research, the coefficient is 0.013 and positive, it is similar to the positive value 0.0002164. The natural logarithm of total assets has a positive effect on discretionary accruals. For the absolute value of total accruals, in Alpaslan's research, the coefficient is 0.021, it is similar to the study value (0.0016957). It shows the absolute value of total accruals has a positive effect on discretionary accruals. For the ratio of market value to book value of equity, in Alpaslan's research, the coefficient is 0.021, it is similar with the study value (0.000), there is a positive effect on them. For a dummy variable indicating whether a

firm is among the highest decile of leverage, in Alpaslan’s research, the coefficient is -0.047, it is similar to the negative value (-0.000) in this study. There is a negative effect on them.

Table 6: Regression results of discretionary accruals on audit quality and control variables

VARIABLES	(1) dat
audt	-0.000* (-1.733)
cfot	-0.999*** (-1,122.480)
sizeogat	0.000*** (3.861)
abs_acct	0.002** (2.529)
mkbkt	-0.000 (-0.404)
hilevt	-0.000* (-1.704)
Constant	-0.001 (-0.556)
Observations	2,838
R-squared	0.999
Year FE	YES
Industry FE	YES
Adj. R-sq	0.999

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: dat= discretionary accruals/total assets; audt=audit quality; cfot=cash flow from operating activities/total assets; sizeogat= natural logarithm of total assets; abs_acct= the absolute value of total accruals/total assets; mkbkt= the ratio of market value to book value of equity; HiLev= total liabilities/total assets;

VI. CONCLUSION AND LIMITATIONS

Conclusion

This study examines the relationship between audit quality and earnings management. In China, the improvement of audit quality is limited. Compared with other developed countries, the effective supervision mechanism is not enough in China. In this situation, the auditing firm would not provide a strong restraint ability on earnings management. However, in China, Big 4 auditing firms have more restraint ability on earnings management than not Big 4 auditing firms.

In conclusion, in this study, in terms of regression result, the coefficient of audit quality is -0.000^* (-0.0003693) and p-value is smaller than 0.1, the independent variable has a significant negative effect on discretionary accruals, and it has 90% confidence interval to explain discretionary accruals. Therefore, the hypothesis mentioned above: “the improvement of audit quality will have a negative impact on earnings management in Chinese listed firms” has also been confirmed. Audit quality will have a significant negative effect on earnings management in Chinese listed firms.

Limitations

Like any research, the limitation of the study is that this research uses a small sample of Chinese listed firms. This sample size may small, because the study chooses the more active 2838 Chinese listed firms, and thus may not be representative of all populations of Chinese listed firms, consequently. Thus, it had better study Chinese listed firms from a wider range.

Another limitation is that because the study focuses on Chinese listed firms. The equation includes control variables: cash flow from operating activities, the natural logarithm of total assets, the absolute value of total accruals, the ratio of market value to book value of equity, dummy variable indicating whether a firm is among the highest decile of leverage. They might not apply to other countries. If other authors want to study other countries, they need to find a different method or model to do the study.

APPENDIX

Variable definitions

Explanatory variable	Expected sign	How to measure
Earnings management	?	Discretionary accruals
Audit quality	0/1	Big 4 (1) or not Big 4 (0)
Cfot (cash flow from operating activities)	?	cash flow from operating activities/total assets
Sizeogat (natural logarithm of total assets)	+	natural logarithm of total assets
Abs_acct (the absolute value of total accruals/total assets)	+	the absolute value of total accruals/total assets
Mkbkt (the ratio of market value to book value of equity)	+	the ratio of market value to book value of equity
HiLev (a dummy variable indicating whether a firm is among the highest decile of leverage)	+	total liabilities/total assets

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