The Relationship Between Three-Level Review System and Audit Quality: Empirical Evidence from China*

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Abstract

To improve audit quality, certain Chinese auditing firms have added a third-level review by an additional signing auditor to the general evaluation by a signing auditor team consisting of an engagement auditor and a partner. Nonetheless, our research-based on 36,033 firm-year observations from 2004 to 2019 reveals that compared to the general review system, auditor teams under the three-level review system are less likely to issue modified audit opinions when abnormal financial conditions arise. This finding suggests that, while larger auditor teams' knowledge, experience, and information advantages can theoretically sharpen their judgment, their performance is more susceptible to interference from divergent opinions, the diffusion of responsibility, and lower energy invested by individual auditors, ultimately impairing their judgment regarding the audited enterprises' abnormal financial conditions. That is, the three-level review system, which aims to improve audit quality, actually worsens audit quality. This conclusion remains valid after the problems of heteroscedasticity and endogeneity are addressed by using firm-level cluster robust standard errors and two-stage regression. We hope that our research will draw the attention of auditing firms, prompting them to reconsider the rationality of the three-level review system.

Keywords: Three-level Review System, General Review System, Modified Audit Opinions, Audit Quality

JEL Classification Code: D79, L29, M42

1. Introduction

In 1980, the audit industry was restored in China. Before 2001, the government did not define the minimum number of auditors who would sign an audit report or the qualifications (whether they were certified public accountants (CPAs)) and eligibility (whether they

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participated in the project concerned) of signing auditors. To enhance audit quality and clarify the responsibilities shared by auditors and auditing firms, in July 2001, the Ministry of Finance implemented a mandatory provision according to which audit reports must be jointly reviewed and signed by an engagement auditor and at least one partner (refer to Document No. 1035, issued in 2001 by the Ministry of Finance: The Notice on Issues Related to CPA Signing & Sealing Audit Reports).

Moreover, after the restoration of the industry, seeking to further enhance audit quality, some audit firms (or their subsidiaries) took the initiative to add an extra review process for all audit projects executed by them, hence forming the three-level review system under which an audit report should be jointly reviewed and signed by a partner, CPA 1 (the engagement auditor) and CPA 2 (usually the department manager) (Li, 2002; Peng & Liu, 1998; Sheng & Liu, 2000; Tao, 2004). That is, under the three-level review system, a single audit report should be jointly reviewed and signed by the partner, CPA 1 and CPA 2.

Therefore, after the audit review and signing system were standardized by the government, the mandatory two-level review system (review and signature by the engagement

auditor and the partner) and the voluntary three-level review system aimed to further improve audit quality (review and signature by the partner, CPA 1 and CPA 2) began to coexist in the Chinese audit market.

In this study, we raise a critical issue that, to date, has not received any research attention: does the implementation of the three-level review system lead to better audit quality?

Some previous studies hold that larger teams, which benefit from broader perspectives and richer information resources, tend to outperform smaller teams (Carnevale & Probst, 1998; Hambrick & D'Aveni, 1992; Williams & O'Reilly, 1998). Based on this point, the advantages in knowledge, experience, and information resources of larger teams should allow them to make more informed judgments on corporate financial conditions, which leads to the hypothesis that the implementation of the three-level review system leads to better audit quality.

In contrast, Steiner (1972) argued that the resource advantages due to the increase in team size would ultimately be offset by process losses, mainly including the loss of coordination and motivation (here, motivation loss is a phenomenon of social loafing). Previous research holds that a large team will inevitably encounter more difficulties in coordinating communication, information sharing, member relationships, and opinions (Steiner, 1972), which will hinder the team from investing all its perspectives and information resources in its production (Van Knippenberg et al., 2004). Moreover, as team size scales up, the effect of social loafing is thought to reduce the sense of responsibility and commitment of individual members and even result in the "free rider" problem, further undermining the increased productivity resulting from the resource advantage (Chidambaram & Tung, 2005; Steiner, 1972). Steiner (1972) and Van Knippenberg et al. (2004) contend that the increase in process losses will ultimately prevail over the increase in productivity, causing large teams to have lower performance levels. Therefore, although, theoretically, large auditor teams can make more informed judgments by leveraging their advantages in knowledge, experience, and information resources, their performance level is more susceptible to interference from divergent opinions, the diffusion of responsibility, and less energy invested by individual auditors, ultimately impairing their judgment on abnormal financial conditions. Thus, the implementation of the three-level review system is likely to be counterproductive.

We involve an empirical study on the relationship between the implemented three-level review system and audit quality based on 36,033 firm-year observations between 2004 and 2019. Following previous studies, we measure audit quality based on whether modified audit opinions are issued—assuming that auditors will draw on their professional judgment to issue modified audit opinions for enterprises believed to have abnormal financial conditions (Chen et al., 2010; DeFond et al., 2002; Firth et al., 2012; Francis & Yu, 2009; Hardies et al., 2016; Knechel & Vanstraelen, 2007; Lim & Tan, 2008; Robinson, 2008). The empirical results show that affected by process losses, auditor teams under the three-level review system are less likely to issue modified audit opinions when abnormal financial conditions arise. In other words, implementing the three-level review system worsens audit quality. Our conclusion remains valid after the problems of heteroscedasticity and endogeneity are addressed.

We further explore how internal supervision and external attention affect the negative correlation between the implemented three-level review system and audit quality. The results show that the level of the busyness of the signing partner influences supervision intensity; the busier the signing partner is, the greater the loss of motivation among other team members. Therefore, when the signing auditor is busy, the negative correlation between the three-level review system and audit quality will be intensified. Moreover, in China, state-owned enterprises receive more attention from the public and media (Lau et al., 2016; Meng et al., 2013), and the presence of external attention prompts signing auditors to invest more energy or reduce the loss of motivation. Therefore, when the audited enterprise is a state-owned enterprise, the negative correlation between the three-level review system and audit quality will be weakened.

We hope that our research and conclusions can draw the attention of auditing firms and prompt them to reconsider the rationality of the three-level review system. Furthermore, under the existing signing system, the results of our additional analysis indicate that 1) policy measures should be enacted to control the maximum business volume of partners, and 2) increasing external attention is an effective method that will help improve audit quality.

The rest of this study is organized as follows. Section 2 explains the background and establishes the hypotheses. Section 3 provides information about the model and samples. Section 4 offers the empirical results of the main hypotheses. Section 5 presents an additional analysis. Section 6 describes the conclusions and limitations of this study.

2. Literature Review and Hypothesis Development

2.1. Team Size and Team Performance

Some previous studies hold that their broader perspectives and richer information resources allow large teams to develop more solutions and reach more informed judgments and decisions (Haleblian & Finkelstein, 1993; Van Knippenberg et al., 2004), leading to better performance compared to smaller teams (Carnevale & Probst, 1998; Hambrick & D'Aveni, 1992; Williams & O'Reilly, 1998).

In contrast, in the early 20th century, Ringelmann (1913) noticed that as team size scales up, the performance level decreases. The negative correlation between team size and team performance has been confirmed by a large number of

subsequent studies in the fields of psychology, economics, and management science (Holmstrom, 1982; Malone & Crowston, 1994; Steiner, 1972). Steiner (1972) attributes this phenomenon to process losses, which, according to him, are caused by the loss of coordination and motivation.

Above all, as team size scales up, the need for coordination grows exponentially, and it becomes significantly more difficult to coordinate the communication, information sharing, relationships, and opinions among members (Steiner, 1972). For instance, in a larger team, the tasks of members interact more and interfere more with each other, hindering members from performing their best or making their efforts balance out. The coordination loss will ultimately prevent the team from investing all its perspectives and information resources in its production (Van Knippenberg et al., 2004).

On the other hand, research on social loafing also provides further suggestions (Karau & Williams, 1993; Latané et al., 1979). Here, social loafing is explained as the inclination of individuals to make less effort in group work than in individual work (Karau & Williams, 1993). Specifically, as team size scales up, it is increasingly difficult for an individual member to determine his or her contribution to the group's results. In other words, for the entire team, the contribution of individuals becomes less evident, which often leads to the effect of social loafing. A direct consequence of social loafing is that group members are less responsible and less devoted and even become "free riders" (Chidambaram & Tung, 2005; Steiner, 1972).

Given the above, despite their advantages in perspectives, information, and resources, which might increase their productivity, larger teams suffer from significant process losses that diminish productivity. As argued by Steiner (1972) and Van Knippenberg et al. (2004), an increase in process losses will ultimately prevail over an increase in productivity, causing large teams to have a lower performance level.

2.2. Implementation of the Three-Level Review System and Audit Quality

In the audit process, as a larger team of signing auditors possesses more knowledge, experience, and information resources when the three-level review system is implemented, theoretically, it will enable more informed judgments on abnormal financial conditions, thus improving audit quality.

Nonetheless, the frequently varying opinions of auditors will force each auditor to spend more time and energy evaluating and filtering information. Redundant and distracting information might even mislead their thinking and judgment. Based on this point, the better decision brought by the resource advantages of large teams will be offset by the serious coordination loss.

Additionally, from the perspective of social loafing, in actual audit practice, in large teams of signing auditors, individuals are less responsible and less devoted than those in smaller teams. Thus, the sharpened judgment of large teams of signing auditors owing to the resources held by more individuals will be further undermined by the decreased sense of individual responsibility and reduced commitment.

In summary, although larger teams of signing auditors possess more knowledge, experience, and information resources, their performance level is more affected by divergent opinion, the diffusion of responsibility, and less energy invested by individual auditors, impairing their judgment on the abnormal financial conditions of audited enterprises. Thus, the implementation of the three-level review system might worsen audit quality. Therefore, we propose the main hypothesis in the form of a null hypothesis:

H1: The implementation of the three-level system has nothing to do with audit quality.

3. Research Methods

3.1. Measurement

3.1.1. Audit Quality

Following previous research, we measure audit quality (MAO) based on whether modified audit opinions are issued. If enterprise *i* receives modified audit opinions in year *t*, then the value of MAO is 1; otherwise, it is 0 (Chen et al., 2010; DeFond et al., 2002; Firth et al., 2012; Francis & Yu, 2009; Hardies et al., 2016; Knechel & Vanstraelen, 2007; Lim & Tan, 2008; Robinson, 2008). The measurement assumes that auditors will draw on their professional judgment to issue modified audit opinions for enterprises believed to have abnormal financial conditions. In this study, when abnormal financial conditions arise, a higher probability of giving modified audit opinions represents higher audit quality.

3.1.2. The Implementation of the Three-Level System

If the three-level review system (with 3 signing auditors) is applied to enterprise *i* in year *t*, then the value of THREE is 1; otherwise (2 signing auditors), it is 0.

3.2. Empirical Model

To test our hypothesis, the following model was constructed:

$$
\begin{aligned}
MA0_{i,t} = {} & \alpha_0 + \alpha_1 THREE_{i,t} + \alpha_2 ARTA_{i,t} + \alpha_3 BIG4_{i,t} \\
& + \alpha_4 LEV_{i,t} + \alpha_5 LNSIZE_{i,t} + \alpha_7 LOSSi_{,t} \\
& + \alpha_8 ROA_{i,t} + OCF_{i,t} + \text{Industry Dummies} \\
& + \text{Year Dummies} + \varepsilon_{i,t}
\end{aligned}
$$

Table 1 gives the definitions of the variables of the model.

Table 1: Variable Definitions

Variables	Definition
MAO	Audit quality (modified audit opinion). If enterprise *i* receives a modified audit opinion in year *t*, then the value of MAO is 1; otherwise, it is 0.
THREE	A dummy variable. If the three-level review system (with 3 signing auditors) is applied to enterprise *i* in year *t*, then the value of THREE is 1; otherwise, it is 0.
ARTA	Accounts receivable divided by total assets.
BIG4	A dummy variable is equal to one if a firm is audited by a Big 4 auditor and zero otherwise.
LEV	Total liabilities divided by total assets.
LNSIZE	The natural log of total assets.
LOSS	A dummy variable that takes the value of 1 if a company experienced losses.
ROA	Net income divided by total assets.
OCF	Operating cash flows are divided by total assets.
Industry Dummies	Industry dummy variables.
Year Dummies	Year dummy variables.
ε	Error term.

According to previous research, ARTA, BIG4, LEV, LNSIZE, LOSS, ROA, and OCF can affect audit quality (Alawaqleh et al., 2021; Chen et al., 2010; Firth et al., 2012; Hardies et al., 2016; Omer et al., 2020; Robinson, 2008; Tahir et al., 2020).

3.3. Samples

This research focuses on Chinese A-share listed companies, with all data being sourced from the China Stock Market and Accounting Research (CSMAR) database.

China did not define the number of auditors who signed the audit report or their qualifications (CPAs or not) and eligibility (whether they participated in the concerned project) until 2001. In addition, to address the problem of endogeneity, LagTHREE2 and LagTHREE3 are used as instrumental variables of THREE (the definitions of LagTHREE2 and LagTHREE3 are offered in "Endogeneity"). To ensure the validity of the results, we focused on publicly listed Chinese firms between 2004 and 2019 and cleaned the data based on the following methods:

(1) All financial service company samples were deleted; and
(2) All samples with missing values were deleted.

Finally, we obtained 36,033 firm-year observations between 2004 and 2019. To mitigate the influence of outliers, we winsorized all of the continuous variables at the 1% and 99% levels.

4. Empirical Results

4.1. Descriptive Statistics

Table 2 lists the descriptive statistical results of all the variables. According to the results, the average value of MAO is 0.054. Statistical results based on subsamples show that the sample sets implementing the three-level review system obtain an average MAO of 0.025 and that those implementing the general review system obtain an average MAO of 0.055 (testing results for sample differences: chi^2 value = 18.7026, *P*-value = 0.000), indicating that under the three-level review system, modified audit opinions are less likely to be issued.

4.2. Regression Results

Table 3 presents the hypothesis testing probit regression results, showing that MAO is negatively correlated with THREE at the 1%. This result suggests that process losses hamper the judgment of signing auditors in larger teams regarding audited companies' abnormal financial conditions, making them less likely to issue modified audit opinions when abnormal economic conditions arise. In other words, the three-level review system, which aims to improve audit quality, actually tends to worsen audit quality. Moreover, Column 2 in Table 3 displays the probit regression results using firm-level cluster-robust standard errors, demonstrating that our conclusion remains valid after the problem of heteroscedasticity is addressed.

Table 2: Descriptive Statistics

Variables	Obs.	Mean	S.D.	Min	P25	P50	P75	Max
MAO	36,033	0.054	0.226	0.000	0.000	0.000	0.000	1.000
MAO (THREE = 1)	1,159	0.025	0.158	0.000	0.000	0.000	0.000	1.000
MAO (THREE = 0)	34,874	0.055	0.228	0.000	0.000	0.000	0.000	1.000
THREE	36,033	0.032	0.176	0.000	0.000	0.000	0.000	1.000
ARTA	36,033	0.116	0.103	0.000	0.032	0.092	0.171	0.473
BIG4	36,033	0.055	0.229	0.000	0.000	0.000	0.000	1.000
LEV	36,033	0.450	0.224	0.051	0.276	0.442	0.607	1.158
LNSIZE	36,033	21.885	1.309	19.070	20.954	21.736	22.637	25.884
LOSS	36,033	0.107	0.310	0.000	0.000	0.000	0.000	1.000
ROA	36,033	0.033	0.074	−0.369	0.012	0.036	0.066	0.206
OCF	36,033	0.044	0.075	−0.199	0.004	0.044	0.088	0.259

Table 3: Implementation of the Three-level Review System and Audit Quality

Variables	MAO		MAO	
	Coeff.	z-statistics	Coeff.	z-statistics
THREE	−0.252***	−2.641	−0.252**	−2.220
ARTA	−0.689***	−5.061	−0.689***	−3.173
BIG4	0.139*	1.749	0.139	1.333
LEV	2.096***	33.028	2.096***	18.430
LNSIZE	−0.337***	−26.430	−0.337***	−14.773
LOSS	0.522***	11.913	0.522***	11.243
ROA	−2.646***	−13.227	−2.646***	−11.191
OCF	−1.028***	−5.848	−1.028***	−4.649
Constant	4.694***	16.503	4.694***	9.292
Industry dummies	Yes		Yes	
Year dummies	Yes		Yes	
Clustered by firm	No		Yes	
LR chi^2/Wald chi^2	5,489***		2,771***	
Pseudo R^2	0.361			
No. of Obs.	36,033			

Note: The z-statistics are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels or better, respectively.

4.3. Endogeneity

We adopted two-stage regression to handle the potential problem of endogeneity, which can affect the results.

LagTHREE2 and LagTHREE3 were selected as the instrumental variables of THREE. If the three-level review system was applied by an auditing firm to enterprise i in year $t-2$, then LagTHREE2 is equal to 1; otherwise, it is equal to 0. If the three-level review system was applied by an auditing firm to enterprise i in year $t-3$, then LagTHREE3 is equal to 1; otherwise, it is equal to 0 (The method of using lagged variables as instrumental variables has been quite common in some research fields, such as accounting and political economy (Gerber, 1998; Kang & Sivaramakrishnan, 1995). We also adopted the suggestion of Kang and Sivaramakrishnan (1995) and selected LagTHREE2 and LagTHREE3, rather than LagTHREE1 (if the three-level review system was applied by the auditing firm to enterprise

i in year $t-1$, then LagTHREE2 is equal to 1; otherwise, it is equal to 0), as the instrumental variables of THREE to weaken the influence of autocorrelation on the results). In China, publicly listed firms have the incentive and habit of employing acquiescent auditing firms (Aharony et al., 2000; Chen & Yuan, 2004; Wang et al., 2008) to decide on the audit review system. Therefore, there should be a positive correlation between THREE and LagTHREE2 and LagTHREE3. However, there will be no correlation between the audit review system implemented in years $t-2$ and $t-3$ and the audit quality in year t.

In the first-stage regression, a linear probability model was employed to estimate the fitting value of MAO, namely, Pre-MAO (THREE being a dummy variable, although the fitting results of the linear probability model are still valid and consistent (Wooldridge, 2013). Pre-MAO was used as a concern variable for probit regression in the second-stage regression.

The results of the two-stage regression are presented in Table 4. Column 1 of Table 4 shows that THREE is positively correlated with LagTHREE2 and LagTHREE3, while Column 2 of Table 4 shows a negative correlation between MAO and the predicted value of THREE (Pre-THREE). In addition, according to the weak instrument variable testing, LagTHREE2 and LagTHREE3 is not weak; the corresponding P-value of the Amemiya-Lee-Newey minimum chi^2 is 0.9931 ($P > 0.1$), demonstrating that the instrument variables selected are appropriate. Furthermore, although the Wald test of exogeneity indicates that the results listed in Table 3 show interference from the problem of endogeneity, the two-stage regression results still support our conclusion.

5. Further Analysis

Our main results show that under the three-level review system, auditor teams, affected by the loss of coordination and motivation, are less likely to issue modified audit opinions. Thus, the implementation of the three-level review system will worsen audit quality. Based on the main hypothesis, we go further and explore how internal supervision and external attention affect the negative correlation between the implemented three-level review system and audit quality.

Table 4: Endogeneity: Two-stage Regression

Variables	THREE		MAO	
	Coeff.	*t*-statistics	Coeff.	*z*-statistics
LagTHREE2	0.339***	50.392		
LagTHREE3	0.181***	26.475		
Pre-THREE			−0.765***	−3.126
ARTA	0.020**	1.984	−0.623***	−4.217
BIG4	−0.020***	−4.787	0.123	1.423
LEV	−0.004	−0.829	1.973***	29.639
LNSIZE	0.001	1.596	−0.345***	−25.720
LOSS	−0.003	−0.985	0.524***	11.749
ROA	0.018	1.051	−2.148***	−11.100
OCF	0.022	1.636	−0.994***	−5.316
Constant	−0.029	−1.430	4.944***	16.437
Industry dummies	Yes		Yes	
Year dummies	Yes		Yes	
F-value/Wald chi^2	172***		3,235***	
AR/Wald chi^2 (Weak instrument test)	9.79 (P-value = 0.0075)/9.78 (P-value = 0.0018)			
Amemiya-Lee-Newey minimum chi^2 (Test of overidentifying restrictions)	0.000 (P-value = 0.9843)			
Wald test of exogeneity	chi^2(1) = 5.42 (P-value = 0.0199)			
No. of Obs.	27,656			

Note: The z/t-statistics are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels or better, respectively.

5.1. The Level of the Busyness of Auditing Partners

In China, the senior partner or head of the accounting firm is primarily responsible for controlling engagement quality and planning audit tasks (Chen et al., 2020).

Moreover, whether a signing auditor is a partner leads to different legal responsibilities. In China, partners are accountable for the residual control rights and the income of the auditing firm, thereby assuming greater legal responsibilities than non-partners (Yan & Xie, 2016). Specifically, when an audit fails, other signing auditors take their share of the liabilities, while the unlimited joint and several liabilities belong to the signing partners. Gul et al. (2013) discovered that compared to non-partners signing CPAs, signing CPAs who are partners is more prudent with report signing and tends to produce higher-quality reports.

Given the above, we hold that signing partners have a greater sense of responsibility toward audit projects than non-partner signing auditors. Thus, social loafing is more likely to occur with non partner signing auditors. Nonetheless, an extremely busy signing partner tends to loosen his or her supervision over team members, which leads to a further loss of motivation in the non-partner signing auditors. Therefore, we propose the following additional hypothesis:

Additional Hypothesis 1: Under the premise that the signing partner is busy, the negative correlation between the three-level review system and audit quality will be intensified.

Following previous research, we use the natural logarithm of the total audit fees paid by enterprises audited by the signing partner in the year i (PtrWL_fee) to measure the level of the busyness of the signing partner (Choi et al., 2020; Gul et al., 2017).

$$
\begin{aligned}
MA0_{i,t} = {} & \beta_0 + \beta_1 THREE_{i,t} + \beta_2 THREE * PtrWL\_fee_{i,t} \\
& + \beta_3 PtrWL\_fee_{i,t} + \beta_4 ARTA_{i,t} + \beta_5 BIG4_{i,t} \\
& + \beta_6 LEV_{i,t} + \beta_7 LNSIZE_{i,t} + \beta_8 LOSS_{i,t} \\
& + \beta_9 ROA_{i,t} + \beta_{10} OCF_{i,t} + \text{Industry Dummies} \\
& + \text{Year Dummies} + \varepsilon_{i,t}
\end{aligned}
$$

We excluded circumstances where one audit team had several signing partners and retained samples with only one signing partner. Finally, 19,400 firm-year observations were obtained. To reduce the problems of multicollinearity between the interaction term and the other variable, the independent variables were mean-centered for the regressions (Robinson & Schumacker, 2009).

The analysis results of Additional Hypothesis 1 are presented in Table 5, which reveal a significant negative

Table 5: Three-level Review System, Busy Auditing Partners, and Audit Quality

Variables	MAO			
	Coeff.	z-statistics	Coeff.	z-statistics
THREE	−0.346**	−2.154	−0.346*	−1.742
THREE * PtrWL_fee	−0.317*	−1.922	−0.317**	−2.546
PtrWL_fee	−0.056**	−2.316	−0.056*	−1.936
ARTA	−0.841***	−4.438	−0.841***	−3.019
BIG4	0.110	1.000	0.110	0.766
LEV	2.120***	23.190	2.120***	14.026
LNSIZE	−0.321***	−17.659	−0.321***	−10.951
LOSS	0.509***	8.514	0.509***	7.932
ROA	−2.670***	−9.997	−2.670***	−8.997
OCF	−0.861***	−3.417	−0.861***	−2.938
Constant	4.992***	10.729	4.992***	7.108
Industry dummies	Yes		Yes	
Year dummies	Yes		Yes	
Clustered by firm	No		Yes	
LR chi²/Wald chi²	2,720***		1,545***	
Pseudo R^2	0.346			
No. of Obs.	19,400			

Note: The z-statistics are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels or better, respectively.

correlation between THREE and MAO and between THREE * PtrWL_fee and MAO. These results indicate that when the signing partner is busy, a greater loss of motivation will occur with other members of the team. That is, the negative impact of the three-level review system on audit quality increases with the level of the busyness of the signing partner.

5.2. External Attention to Audited Enterprises

Chinese state-owned enterprises receive more external attention from the public and media (Lau et al., 2016; Meng et al., 2013). Under external pressure, the signing auditor might handle audit projects more rigorously (Zhang et al., 2016). In other words, increased external pressure might lead to a higher sense of responsibility and commitment. Hence, we propose the following additional hypothesis:

Additional Hypothesis 2: When an audited enterprise is a state-owned enterprise, the negative correlation between the three-level review system and audit quality will be weakened.

$$MA0_{i,t} = \gamma_0 + \gamma_1 THREE_{i,t} + \gamma_2 THREE * SOE_{i,t} + \gamma_3 SOE_{i,t} + \gamma_4 ARTA_{i,t} + \gamma_5 BIG4_{i,t} + \gamma_6 LEV_{i,t} + \gamma_7 LNSIZE_{i,t}$$

$$+ \gamma_8 LOSS_{i,t} + \gamma_9 ROA_{i,t} + \gamma_{10} OCF_{i,t} + \text{Industry Dummies} + \text{Year Dummies} + \varepsilon_{i,t}$$

Here, SOE represents the dummy variable for whether enterprise i is a state-owned enterprise in year t. The corporate ownership structure data come from the CSMAR database.

Table 6 lists the analysis results of Additional Hypothesis 2, showing a significant negative correlation between THREE and MAO but a significant positive correlation between THREE * SOE and MAO. These results suggest that external attention to the audited firm increases auditors' responsibility and commitment, which mitigates the negative impact of the motivation loss in large teams of signing auditors on audit quality.

6. Conclusion and Limitations

To improve audit quality, some auditing firms have set up a three-level review system by adding a review by a signing auditor to the mandatory general review system consisting of an engagement auditor and a partner. Nonetheless, our research-based on 36,033 firm-year observations between 2004 and 2019 reveals that auditor teams under the three-level review system are even less

Table 6: Three-level Review System, Ownership, and Audit Quality

Variables	MAO			
	Coeff.	z-statistics	Coeff.	z-statistics
THREE	−0.242**	−2.369	−0.242**	−2.014
THREE * SOE	0.464**	2.324	0.464**	2.080
SOE	−0.188***	−5.794	−0.188***	−3.566
ARTA	−0.873***	−5.999	−0.873***	−3.759
BIG4	0.115	1.317	0.115	1.030
LEV	2.098***	31.273	2.098***	17.342
LNSIZE	−0.332***	−23.615	−0.332***	−13.453
LOSS	0.503***	10.714	0.503***	9.922
ROA	−2.882***	−12.775	−2.882***	−10.629
OCF	−0.959***	−5.237	−0.959***	−4.121
Constant	−1.839***	−15.546	−1.839***	−8.809
Industry dummies	Yes		Yes	
Year dummies	Yes		Yes	
Clustered by firm	No		Yes	
LR chi²/Wald chi²	5,006***		2,478***	
Pseudo R^2	0.364			
No. of Obs.	34,269			

Note: The *z*-statistics are in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels or better, respectively.

likely to issue modified audit opinions when abnormal financial conditions arise.

This result indicates that despite the knowledge, experience, and information advantages possessed by larger teams that might sharpen their judgment, their performance level is more susceptible to interference from divergent opinions and the diffusion of responsibility and lower energy invested by individual auditors, which impairs their judgment on the abnormal financial conditions of audited enterprises. Therefore, the three-level review system implemented to improve audit quality will be counterproductive in reality.

The contributions made by our study are given below.

First, our results inspire auditing firms: rather unexpectedly, the three-level review system worsens audit quality. Therefore, they need to reconsider the rationality of the practice.

Second, although the general review system leads to better audit quality than the three-level review system, a two-member auditing team will also necessarily be affected by process losses. The results of our additional analyses suggest that the absence of internal supervision (increased external attention) will intensify (weaken) the influence of process losses. Thus, under the existing system, which requires the joint review and signing of at least the engagement auditor and a partner, our research offers further suggestions to the government and auditing firms: 1) policy measures should be enacted to control the maximum business volume of partners; and 2) external attention can be increased to help improve audit quality.

Third, previous research studying management teams, sports teams, and information technology (IT) teams concludes that due to process losses, team size is negatively correlated with team performance (Aubé et al., 2011; Sharma & Ghosh, 2007; Widmeyer et al., 1990). Our research focusing on the team of signing auditors provides further support for the results of previous research.

Unavoidably, our limitations are as follows.

First, to improve audit quality, the central government mandated that an audit report should be signed by at least two auditors. However, we did not study whether the review performed by the two signing auditors (the general review system) leads to better audit quality than that performed by one auditor. The reasons are as follows: First, the mandatory provision aims not only to improve audit quality by increasing the number of auditors but also to urge auditing firms and engage auditors to share accountability for the audit results because if either party has sole accountability, then this situation might lead to a significant decline in audit quality. Second, as stated above, the Chinese government did not define the number of signing auditors or their qualifications (whether they are CPAs) and eligibility (whether they participated in the project concerned) until 2001. Thus, we are unable to obtain valid data to verify how the implementation of

the general review system influences audit quality. However, there is more space for us to conduct further explorations. This research will be continued in the future.

In addition to audit opinions, some of the previous research measures audit quality with the level of post-audit earnings management. The basic assumption of the method is that after receiving high-quality audits, enterprises will have a low level of earnings management; however, this assumption has been accused of having logical flaws (Gu, 2010; Hua, 2019; Wang & Duan, 2009). For instance, if Company A does not carry out any form of earnings management, its level of earnings management will remain 0 before and after the audit. In this case, the ultralow level of earnings management is irrelevant to high-quality audits; it occurs simply because the audited enterprise performs little earnings management. Gu (2010), Hua (2019), and Wang and Duan (2009) argued that when using the level of earnings management to measure audit quality, the correct method is to observe the change in the level of earnings management before and after the audit. The research conducted by Zhao and Zhang (2017) based on the data of publicly listed firms in China also indicated that in China's case, modified audit opinions can serve as a proper criterion for assessing audit quality, while the level of earnings management after the audit is irrelevant to audit quality. Given the current unavailability of pre-audit data, in the future, we expect to gain access to necessary data that can support our further research on how the implemented three-level review system influences the change in the level of earnings management before and after audits.

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