



Research on the influence of chain shareholders on auditor behavior-An empirical study based on Logistic and Ols regression analysis

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Abstract. Based on the real situation of China's capital market, this paper takes non-financial listed companies in Shanghai and Shenzhen from 2007 to 2021 as samples to explore the impact of chain shareholders from the perspective of auditor behavior. Using Stata16 software for data processing, Logistic and Ols regression results show that chain shareholders achieve portfolio value maximization through the "collusion effect", which would intensify the manipulation of real earnings management of enterprises, Risk premium would lead auditors to demand higher fees, and they are motivated to issue non-standard audit opinion reports in order to maintain their own reputation and reduce potential litigation risk. This study has not only enriched the research literature in the field of audit behavior influencing factors and economic consequences of chain shareholders, but also provided a new perspective for auditors to pay attention to the potential audit risks of chain shareholders in the process of implementing audit procedures.

Keywords: chain shareholders, audit behavior, audit expenses, audit opinions, real earnings management, regression analysis, Stata16

1 Introduction

Investors who hold a large number of shares in several enterprises in the same industry (hereinafter referred to as "chain shareholders"), as an informal system, are common in the capital market. The academic circles have formed two different views: collusion and fraud and governance coordination. The former believes that the existence of chain shareholders intensifies bad competition in the market (Pan Yue et al.,2020;Azar et al,2018)^{[2][5]};The latter believes that in terms of corporate governance, the existence of chain shareholders facilitates access to information(He et al,2019;Kang et al,2018).^{[8][10]}In general, the existing studies have not reached a consistent conclusion on the impact of chain shareholders on enterprises.

Auditor behavior has been a topic of long-term concern in the practical and academic circles. At present, there are few literatures on the relationship between chain shareholders and auditor behavior and decision-making with auditor behavior as

the focus. Whether and how the chain shareholders affect auditor behavior, and if so, what are the channels? These are the issues to be focused on .

The research contributions of this paper are mainly made in the following three aspects: First, it is a supplement to the existing literature on auditor behavior; Second, this conclusion provides new evidence support and theoretical reference for the fraud collusion effect of chain shareholders. Thirdly, which helps to prevent audit failures and improve audit quality. It also provides important policy and practical value for how to promote the development of chain shareholders.

2 Theoretical analysis and research hypothesis

2.1 The influence of chain shareholders on auditor behavior

2.1.1 Synergies of chain shareholder governance

Firstly, driven by preventing greater benefits from being hollowing out, chain shareholders have the motivation to play the role of corporate supervisors, reduce financial fraud, and improve the quality of internal control (Brooks et al., 2018; Chen et al., 2018).^[6] Secondly, the experience of chain shareholders in acquiring and processing information in one enterprise will be transferred to other enterprises in the same industry jointly held by them, which can reduce the supervision cost of chain shareholders on the fraudulent motives and manipulations of enterprises in the same industry (Ramalingegowda et al., 2020)^[4]. Therefore, in this case, auditors are more inclined to issue standard audit opinions. In the audit process, we can also appropriately reduce the implementation of substantive procedures, reduce audit input and the fee of the company. hence, hypothesis 1 is suggested:

H1a: Chain shareholders will reduce audit fees.

H2a: Chain shareholders have a positive impact on auditor opinion issuance.

2.1.2 The competitive collusion effect of chain shareholders

Firstly, the chain shareholders have the incentive to encourage the companies in the portfolio to conspire to increase the earnings management activities among the companies. Secondly, the investment of chain shareholders in multiple enterprises will distract their attention, which increases the motivation of management to cheat and manipulate, and thus increases the audit risk and audit cost of auditors, resulting in higher audit fees. Auditors are more inclined to issue non-standard audit opinions to reduce potential litigation risks. Therefore, hypothesis 2 is suggested:

H1b: Chain shareholders will increase audit fees.

H2b: Chain shareholders have a negative impact on auditor opinion issuance.

2.2 The mediating role of real earnings management in the relationship between chain shareholder and auditor behavior

With the improvement of China's accounting standards, there is less and less room for executives to manipulate accrual earnings management, and then they turn more to

real earnings management. The previous hypothesis mentioned that there are two hypotheses. The first holds that chain shareholders can restrain the possible earnings management behaviors of top executives. At this time, auditors are more inclined to issue standard audit opinions and reduce fee.

The second is that they have strong motivation to hide the real accounting information by pushing the portfolio enterprises to carry out earnings management. At the same time, the investment of chain shareholders in multiple enterprises will distract their attention, and then may increase the motivation of the management to manipulate earnings. Risk premium will lead auditors to demand higher fees. They are also motivated to issue non-standard audit opinion reports. Therefore, this paper proposes the following hypothesis:

H3: Real earnings management has a mediating effect on the behavior transmission path of chain shareholders and auditors.

3 Research design

3.1 Sample selection and data sources

This paper selects A-share listed companies in Shanghai and Shenzhen from 2007 to 2021. Chain shareholder indicators are collected at the quarterly level according to the CSMAR database, and others are derived from the CSMAR database. Select principles: ① Delete the sample of listed companies in the financial industry; ② Remove ST, *ST and PT companies; ③ Delete the samples with missing data. In order to eliminate the influence of extreme values, 1% and 99% indentation are applied to continuous variables.

3.2 Variable definition and model design

When verifying the impact of chain shareholders on audit costs and opinion, this paper adopts the following model:

$$\ln Fee_{it} = \beta_0 + \beta_1 Cross_Dum(Cross)_{it} + \gamma CVs_{it} + \delta_j Indu_j + \delta_t year_t + \varepsilon_{it} \quad (1)$$

$$\ln \left(\frac{prob(Opin_{it})}{1 - prob(Opin_{it})} \right) = \gamma_0 + \gamma_1 Cross_Dum(Cross)_{it} + \gamma CVs_{it} + \delta_j Indu_j + \delta_t year_t + \varepsilon_{it} \quad (2)$$

Based on the possible influence path of chain shareholders on auditor behavior, this paper constructs the following regression model through stepwise regression method and conducts tests:

$$REM_abs_{it} = \alpha_0 + \alpha_1 Cross_Dum(Cross)_{it} + \gamma_1 CVs_{it} + \delta_j Indu_j + \delta_t year_t + \varepsilon_{it} \quad (3)$$

$$\ln Fee_{it} = \varphi_0 + \varphi_1 Cross_Dum(Cross)_{it} + \varphi_2 REM_abs_{it} + \varphi CVs_{it} + \delta_j Indu_j + \delta_t year_t + \varepsilon_{it} \quad (4)$$

$$\ln \left(\frac{\text{prob}(\text{Opin}_{it})}{1 - \text{prob}(\text{Opin}_{it})} \right) = \omega_0 + \omega_1 \text{Cross}_{\text{Dum}(\text{Cross})_{it}} + \omega_2 \text{REM}_{\text{abs}_{it}} + \omega_3 \text{CVS}_{it} + \beta_j \text{Indu}_j + \beta_t \text{year}_t + \varepsilon_{it} \quad (5)$$

3.2.1 Explanatory variable

This paper refers to existing literatures (He and Huang, 2017; Chen et al., 2018) defined chain shareholders as shareholders holding shares in multiple enterprises in the same industry with a shareholding ratio of not less than 5%.^[3]This paper reflect the chain shareholders of from two dimensions: (1) At the quarterly level, shareholders with a shareholding ratio of not less than 5% are found, it can indicate that the company has a chain shareholder (Cross_Dum), the value is 1, otherwise the value is 0; (2) Number of chain shareholders (Cross), on a quarterly basis, calculate how many chain shareholders each listed company has, and then find the annual average of this data, and add 1 to take the natural logarithm.

3.2.2 Explained variable

Audit fee (Lnfee), which is expressed by the audit cost disclosed in the annual report of listed companies and takes the natural logarithm. Audit Opinion (Opin), the value of the non-standard audit opinion issued by the listed company in the current year is 1, otherwise the value is 0.

3.2.3 Intermediate variable

This paper used real earnings management (Rem), and then took the absolute value of this indicator (Rem_abs) as a proxy variable for the level of real earnings management.

3.2.4 Control variable

Referring to the relevant studies of Simunic (1980), this paper selects indicators: Size、 Lev、 dum_profit、 Inv、 Rec、 Growth、 Board、 Id、 Soe、 Top1、 Big4 and Change.

4 Empirical results and analysis

4.1 Descriptive statistics and analysis

Table 1 shows explained variables that the average values of LnFee and Opin are 13.7603 and 0.0171, the minimum values are 12.4292 and 0.000, and the maximum values are 16.2535 and 1.0000 respectively. It indicates that there are certain differences in fees and audit opinions which are basically consistent with the statistical results of Li Zhe et al. (2020)^[9]. In terms of independent variables and other control variables, they are basically consistent with the existing literature.

Table 1. Descriptive statistics

| VarName | Obs | Mean | P5 | SD | Min | Max |
|-----------|-------|---------|---------|--------|---------|---------|
| LnFee | 32878 | 13.7603 | 12.7657 | 0.7143 | 12.4292 | 16.2535 |
| Opin | 32878 | 0.0171 | 0.0000 | 0.1297 | 0.0000 | 1.0000 |
| Cross_Dum | 32878 | 0.1107 | 0.0000 | 0.3137 | 0.0000 | 1.0000 |
| Cross | 32878 | 0.0824 | 0.0000 | 0.2380 | 0.0000 | 1.0986 |

4.2 Correlation analysis

The person correlation coefficient of the variables not listed preliminarily verified the hypothesis H1b and H2b, and passed the variance inflation factor test. It shows that there is no multicollinearity problem between variables.

4.3 Baseline regression analysis

Table 2 shows the regression coefficients of Cross_Dum and Cross with audit fees are 0.0698 and 0.1147, and those with audit opinions are 0.9240 and 1.1605, both of which are significant at the 1% level. The above regression results show that chain shareholders will increase audit fees, and chain shareholders will have a negative impact on opinions, which verifies the hypothesis H1b and H2b.

Table 2. Reference regression

| | (1) LnFee | (2) LnFee | (3) Opin | (4) Opin |
|-------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Cross_Dum | 0.0698*** (7.5713) | | 0.9240*** (5.8022) | |
| Cross | | 0.1147*** (8.9274) | | 1.1605*** (5.3481) |
| Year fe | Yes | Yes | Yes | Yes |
| Industry fe | Yes | Yes | Yes | Yes |
| N | 32878 | 32878 | 32878 | 32878 |
| R2 | 0.7041 | 0.7045 | | |
| Adj. R2 | 0.7009 | 0.7013 | | |

4.4 Regression analysis of intermediary mechanism

Table 3 shows that there is an intermediary effect between real earnings management and chain shareholders.

Table 3. The mediating role of real earnings management

| | (1) REM abs | (2) LnFee | (3) Opin | (4) REM abs | (3) LnFee | (4) Opin |
|-----------|----------------|--------------|-------------|----------------|--------------|-------------|
| Cross_Dum | 0.0129*** | 0.0618*** | 0.4151*** | | | |

| | | | | | | |
|-------------|----------|-----------|-----------|-----------|----------|----------|
| | (4.0070) | (6.4619) | (5.1974) | | | |
| Cross | | | | 0.0164*** | 0.1031* | 0.4974* |
| | | | | | ** | ** |
| | | | | (3.9073) | (7.7844) | (4.5973) |
| REM_abs | | 0.0475*** | 0.6087*** | | 0.0469* | 0.6149* |
| | | | | | ** | ** |
| | | (3.0806) | (4.0173) | | (3.0427) | (4.0651) |
| Year fe | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fe | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 29291 | 29291 | 29291 | 29291 | 29291 | 29291 |
| R2 | 0.1914 | 0.7053 | | 0.1914 | 0.7056 | |
| Adj. R2 | 0.1820 | 0.7018 | | 0.1820 | 0.7022 | |

4.5 Robustness test

Referring to the study of Du Yong et al. (2021), the definition threshold of chain shareholders is changed to holding 10% or more shares, and the regression analysis is conducted again. The conclusion of this paper is still valid.^[1]

With reference to the research of Pan Yue (2020), the sum of the shareholding ratio of the chain shareholders was used to replace Cross_Dum and Cross.^[2] Specific calculation method: Calculate the sum of the shareholding ratio of all chain shareholders at the quarterly level, and take the annual average. The regression results show that the conclusion is still valid.

5 Conclusion and suggestion

5.1 Research conclusion

This paper takes non-financial listed companies in Shanghai and Shenzhen stock markets from 2007 to 2021 as samples to explore the impact of chain shareholders from the perspective of auditor behavior. Using Stata16 software for data processing, Logistic and Ols regression results show that chain shareholders achieve portfolio value maximization through "collusion effect", which has increased audit fees, and had a negative impact on auditor issuing opinions.

5.2 Suggestion

Firstly, for enterprises, it is necessary to create a harmonious industry competition environment, and truly achieve a win-win situation of competitors in the industry.

Secondly, for the regulatory, they should speed up the formulation of corresponding laws and regulations, and realize the normal operation and healthy development of the capital market.

Finally, for auditors, they should fully understand the economic principle and purpose behind the chain shareholders, reduce audit risks and improve quality.

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