Family Business Groups and Real Earnings Management——Analysis of Multivariate Linear Regression Model

Yingpei Zhang *, Wen Qu
yingpei2873@163.com, 961137998@qq.com

Xi'an Jiaotong University City College the Department of Management Xi'an, China

Abstract—Collecting samples of family business groups from 2011 to 2018, by constructing a multivariate linear regression analysis model empirically test the relationship between the structure of family business groups and the level of real earnings management of group-affiliated listed companies. The results of the study show that: With the increase of the size of the family business group, the degree of real earnings management of family group-affiliated listed companies declines firstly and then increases; The higher degree of the parent-subsidiary business-related, the lower degree of real earnings management of family group-affiliated Listed Companies.

Keywords—Family Business Groups; The Size of Business Group; The Parent-Subsidiary Business Related; Real Earnings Management

1 INTRODUCTION

In China, business groups are widespread. Different from foreign business groups, most business groups in China are not listed as a whole. Almost all business groups are forcibly divided into listed companies (high-quality assets) and non-listed companies (Non-quality assets), and the high-quality assets of business groups are put into listed companies for IPO. According to the number of listed companies in the business group, Chinese enterprise groups can be divided into two categories. One is a "non-family business group" that controls one listed company, and the other is a "family business group" that controls two or more. According to the statistics of the Shanghai Stock Exchange's research report, as of February 7, 2017, there were 178 family business groups in Shanghai and Shenzhen, including 1045 group-affiliated listed companies. Family business groups play an important role in China's economy and society.

The current research on family business groups in China mainly focuses on corporate performance (Zheng, Ling, and Tan 2017) [1], enterprise innovation (Lou, Zhang, and Chen 2020) [2], and other aspects. However, the Shanghai Stock Exchange's research report pointed out that the earnings management behaviors in family business groups are also common, where there are widespread problems of manipulating earnings and harming the interests of small and medium-sized investors. Earnings management has always been a hot topic for scholars, but the research on the impact of familized management on earnings management is very scarce. In view of this, this study is based on the degree of real earnings management, and an in-depth study of the influence of family management on the real earnings management of group-

ICEMME 2022, November 18-20, Nanjing, People's Republic of China

DOI 10.4108/eai.18-11-2022.2326862

affiliated listed companies will help to fully understand family business groups and enrich related research.

In order to test the relationship between family management and the real earnings management of group-affiliated listed companies, this study uses the 4157 group-affiliated listed companies of family business groups in Shanghai and Shenzhen A-shares from 2011 to 2018 as the research sample, build a multiple regression model to test. The study found that with the increase of the size of the family business group, the degree of real earnings management of group-affiliated listed companies declines firstly and then increases; The higher degree of the parent-subsidiary business-related, the lower degree of real earnings management of group-affiliated listed companies. The contribution of this research is mainly reflected in two aspects: First, it expands the research on the influencing factors of earnings management. Taking the form of corporate organization as an entry point, it studies the influence of family management on the earnings management level of group-affiliated listed companies and enriches the research on earnings management. Second, enrich the research on the economic consequences of familized management. From the perspective of earnings management, considering the size of the family business group, business relevance of parent and subsidiary, to verify the economic consequences of familized management, this is an important supplement to existing research.

2 THEORETICAL ANALYSIS AND HYPOTHESIS

2.1 The relationship between the scale of family business groups and the degree of real earnings management of group-affiliated listed companies

The size of the family business group is an important factor that determines the internal capital market and the agency conflict within the group. From the perspective of the function of the internal capital market, with the increase in the number of listed members in the business group, the scale of the family business group and the internal capital market has also expanded, and the financing advantages of the internal capital market have continued to increase. Xu, Ma, Ding, and Cai (2020) found that the greater the number of listed companies in the family enterprise group, the greater the breadth of the internal capital market, and the lower the debt financing costs of group-affiliated listed companies [3]. Therefore, for the group-affiliated listed companies, with the increase in the size of the family business group, the internal capital market can be better used to reduce financing costs and financing constraints, the opportunities for earnings management due to financing needs will be weakened. From the perspective of external supervision, the larger scale of the business group will receive larger external attention, and it will also be subject to more external stakeholders' supervision. Earnings management costs for groups and their affiliated listed companies are higher.

However, the size of the enterprise group is not larger, the lower the degree of earnings management. Taking into account the agency conflicts within the business group, the size of the business group is not the larger, the better the function of the internal capital market. Shao and Liu (2006) pointed out that the size of the business group is related to the size of agency costs. Exceeding a certain size will reduce the overall operational efficiency of the business group [4]. With the further increase in the number of group-affiliated members, the Information asymmetry and agency problems within business groups will intensify, and earnings management may increase. Based on the above analysis, hypothesis 1 is proposed.

Hypothesis 1: The degree of earnings management of group-affiliated listed companies has a U-shaped relationship with the size of the family business group.

2.2 The relationship between the business relevance of parent and subsidiary companies and the degree of earnings management

Under the parent-subsidiary framework of the group, business relevance affects the group's parent company's resource allocation to its subsidiaries and the severity of agency problems within the group, which in turn affects its earnings management.

First, the higher the parent-subsidiary business relevance, the more likely the subsidiary is the core enterprise of the entire business group. For the overall development needs, the parent company of the group will operate the resources of the parent company itself or other group-affiliated listed companies through the internal capital market to the group-affiliated listed companies with higher business relevance. Lou, Zhang, Chen, and Yu (2020) found that the higher the business relevance, the better the innovation performance of the group-affiliated listed companies [2].

Finally, consider the convenience of earnings management. The higher the business relevance, the lower the degree of information asymmetry between the parent and subsidiary companies, the more difficult it will be to carry out earnings management, which in turn inhibits the earnings management behavior of the parent company of the group and the earnings management behavior of the subsidiaries. Based on this, this paper proposes hypothesis 2.

Hypothesis 2: The higher degree of the parent-subsidiary business-related, the lower degree of real earnings management of listed companies.

3 RESEARCH DESIGN

3.1 Sample selection and data sources

Select the microdata of Shanghai and Shenzhen A-share listed companies from 2011 to 2018 as the sample. The data mainly comes from the WIND database and the CSMAR database. The sample classification procedure is as follows, (1) Learning from the research of Xin, Zheng, and Yang (2007) [5], when the actual controller or the largest shareholder of a listed company is a group company, this means that the listed company is under the control of the enterprise group, and the rest are independent listed companies. (2) For the listed company under the control of the enterprise group, inquire about their actual controllers. If the group-affiliated listed companies are controlled by the state-owned assets supervision, management committees, state-owned asset management companies, or other government agencies, according to the next level of controllers to make sure the real actual controllers. When two or more listed companies are controlled by the same actual controllers, they are regarded as listed companies controlled by a family enterprise group.

After excluding samples from the financial and insurance industry, ST category, and missing data in this study, the observed value of the family group-affiliated listed companies is 4,157. In order to reduce the influence of outliers, the continuous variables are reduced by 1% quantile in this study. In addition, this study will narrow down the real earnings management level by 1%

every year. All data processing and model checking is carried out in Stata13.0 software and Excel software.

3.2 Variable definition

3.2.1 The explained variable.

For the measurement of real earnings management, we first draw on the model of Roychowdhury (2006) [6] to calculate abnormal operating cash flow, abnormal production costs, and abnormal discretionary expenses.

3.2.1.1 Calculation of abnormal operating cash flow (R_CFO)

First, estimate the coefficients of the model (1) by industry and year.

$$CFO_{i,t}/A_{i,t-1} = \beta_0/A_{i,t-1} + \beta_1 Re\,v_{i,t}/A_{i,t-1} + \quad \beta_2 \Delta Re\,v_{i,t}/A_{i,t-1} + \epsilon_{i,t} \tag{1}$$

where $CFO_{i,t}$is the net cash flow from operating activities for firm i at period t; $A_{i,t-1}$ is the total assets for firm i at the end of year t-1; $Re\,v_{i,t}$is the revenue from the main business for firm i at period t.

Then, Substitute estimated coefficients into the model (2) to estimate the normal level of cash flows from operations

$$C\hat{F}O_{i,t}/A_{t-1} = \hat{\beta}_0/A_{i,t-1} + \hat{\beta}_1 Re\,v_{i,t}/A_{i,t-1} + \quad \hat{\beta}_2 \Delta Re\,v_{i,t}/A_{i,t-1} + \epsilon_{i,t} \tag{2}$$

Finally, calculate the abnormal level of cash flow from operation(R_CFO) according to model (3):

$$R\_CFO_{i,t} = CFO_{i,t}/A_{i,t-1} - C\hat{F}O_{i,t}/A_{i,t-1} \tag{3}$$

3.2.1.2 Calculation of abnormal production cost (R_PROD)

Same as the above method, first use model (4) to estimate the coefficients by industry and year, and then calculate the normal production cost ($PR\hat{O}D_{i,t}/A_{i,t-1}$), and compare it with the actual production cost ($PROD_{i,t}/A_{i,t-1}$), calculate the difference between the two, and get the abnormal level of production cost (R_PROD).

$$PROD_{i,t}/A_{i,t-1} = \gamma_0/A_{i,t-1} + \gamma_1 Re\,v_{i,t}/A_{i,t-1} + \quad \gamma_2 \Delta Re\,v_{i,t}/A_{t-1} + \gamma_3 \Delta Re\,v_{i,t-1}/A_{i,t-1} + \theta_{i,t} \tag{4}$$

Where $PROD_{i,t}$ is the sum of the cost of goods sold and change in inventories for firm i at period t.

3.2.1.3 Calculation of abnormal discretionary expenses (R_DISEXP)

Same as the above method, first use model (5) to estimate the coefficients by industry and year, and then calculate the normal discretionary cost ($DI\hat{S}X_{i,t}/A_{i,t-1}$), and compare it with the actual discretionary cost and calculate the difference between the two to obtain the abnormal discretionary expenses (R_DISEXP).

$$DISX_{i,t}/A_{i,t-1} = \rho_0/A_{i,t-1} + \rho_1 Re\,v_{i,t}/A_{i,t-1} + \pi_{i,t} \tag{5}$$

Where $DISX_{i,t}$ is the sum of sales expenses, management expenses, and R&D expenses for firm i at period t.

The second step is to draw on the research of Li, Dong, and Lian (2011) [7], and calculate the real earnings management according to model (6).

$$REM = R\_PROD - R\_CFO - R\_DISEXP \quad (6)$$

3.2.2 Explain variables.

The size of the family enterprise group ($Group_N$), drawing on the research of Shao and Liu (2006) [4], we select the number of group-affiliated listed companies as a measure of the size of the family enterprise group.

Parent-subsidiary business relevance (PSBR), when the group-affiliated listed company industry is related to the business scope of the enterprise group, the value is 1, and the rest is 0.

3.2.3 Control variables.

Previous earnings management studies have found that factors such as corporate financial characteristics and governance levels affect the level of earnings management. Therefore, this article controls the size of the enterprise (Size), measured with the natural logarithm of the company's total assets; the capital structure(Lev), measured with the total debt to total assets; return on total assets (Roa), measured with net profit to average total assets; the largest shareholder's shareholding ratio (Ownership); the audit opinion (Opinion), The unqualified audit opinion is 1, The rest is 0; the market index (Market) from the Marketization Index of China ’s Provinces report 2016. This study also controls the year (Year) and industry (Ind).

3.3 Regression model

In order to verify the U-shaped relationship between the size of the family enterprise group and the earnings management of group-affiliated listed companies, this study constructs a model (7).

$$\left|REM_{i,t}\right| = \alpha_0 + \alpha_1 Group_{N_{i,t}} + \alpha_2 Group^2_{N_{i,t}} + \quad \alpha_3 Control_{i,t} + Year + Ind + \varepsilon_{i,t} \quad (7)$$

In order to verify the relationship between the business relevance of parent-subsidiary companies and the earning management level of group-affiliated listed companies, this study constructs a model (8).

$$\left|REM_{i,t}\right| = \alpha_0 + \alpha_1 PSBR_{i,t} + \alpha_2 Control_{i,t} + Year + \quad Ind + \varepsilon_t \quad (8)$$

4 ANALYSIS OF EMPIRICAL RESULTS

4.1 Descriptive Statistics

Table 1 shows the descriptive statistical results of the main variables. It can be seen from Table 1 that for a total of 4157 observations of listed companies controlled by family enterprise groups, the mean value of the true earnings management level (|REM|) is 0.283, the standard deviation is 0.181, the minimum is 0.00003, and the maximum is 3.410. It shows that the degree of earnings management of the group-affiliated listed companies is quite different; for the size of

the family enterprise group ($Group_N$), the average value is 0.170, the standard deviation is 3.184, the minimum value is 2, and the maximum value reaches 20, indicating that there is a big difference in the size of Chinese enterprise groups; for the parent-subsidiary business relevance (PSBR), the average value is 0.628, indicating that 62.80% of Chinese family enterprise groups have business relevance to their parent-subsidiaries. The control variables are also close to the statistical results of other studies.

Table 1 The Descriptive Statistical Results

Variables	***Mean***	***SD***	***Minimum***	***Maximum***
|REM|	0.170	0.162	0.00004	0.951
$Group_N$	4.075	3.194	2	20
PSBR	0.628	0.483	0	1
Size	22.68	1.409	18.30	28.10
Lev	53.43	74.16	-19.47	4616
Roa	2.564	26.36	-1459	710.9
Ownership	37.56	15.14	5.161	89.09
Opinion	0.964	0.187	0	1
Market	8.015	1.940	1.075	11.11

4.2 Multiple regression analysis

Table 2 shows regression results of the relationship between the size of the family enterprise group and the degree of earnings management, and the relationship between the business relevance of the parent-subsidiary company and the degree of earnings management. It can be seen from the first column of Table 2 that the coefficient of the variable $Group_n^2$ is -0.0072, which is significant at the 1% level. The regression results show that the size of the family enterprise group is not as large as possible. The degree of real earnings management of listed companies affiliated to the family enterprise group has a U-shaped relationship with the size of the family enterprise group, that is, as the scale of the family enterprise group expands, the degree of earnings management of group-affiliated listed companies will first decline and then rise. Hypothesis 1 has been verified.

From the second column of Table 2, we can see that for the variable parent-subsidiary business correlation (PSBR) we focus on, the coefficient is -0.0186, which is significant at the 1% level. The regression results show that the degree of real earnings management of listed companies controlled by family enterprise groups is negatively correlated with business relevance, that is, the higher the business relevance between the parent and subsidiary companies, the lower the degree of earnings management of listed companies controlled by the family enterprise group. Hypothesis 2 has been verified.

Table 2 Regression results of family enterprise group size, parent-subsidiary business relevance, and earnings management

	(1)	**(2)**
	|REM|	**|REM|**
$Group_N$	-0.0072***	
	(-2.87)	

$Group_N^2$	0.0003**	
	(2.12)	
PSBR		-0.0186***
		(-3.45)
Size	-0.0098***	-0.0089***
	(-4.92)	(-4.46)
Lev	0.0004***	0.0004***
	(5.93)	(5.90)
Roa	0.0013***	0.0013***
	(6.83)	(6.76)
Ownership	0.0007***	0.0007***
	(3.93)	(4.18)
Opinion	-0.0117	-0.0106
	(-0.86)	(-0.78)
Market	0.0014	0.0015
	(0.96)	(1.02)
_cons	0.3778***	0.3449***
	(8.12)	(7.50)
Industry	*Control*	*Control*
Year	*Control*	*Control*
R^2	0.0653	0.0652
$Adj.R^2$	0.0582	0.0584
N	4157	4157

Note: t-values are in parentheses, and *, **, and * indicate significance levels of 1%, 5%, and 10%, respectively.**

5 RESEARCH CONCLUSIONS AND POLICY RECOMMENDATIONS

Collecting samples of group-affiliated listed companies from 2011 to 2018, empirically test the relationship between the structure of family business groups and the level of real earnings management of group-affiliated listed companies, and get the following conclusions:

First, with the increase in the scale of family enterprise groups, the degree of real earnings management of group-affiliated listed companies first declined and then increased. The increase in the size of enterprise groups will enhance the financing advantages of the internal capital market. However, as the scale continues to increase, the information asymmetry and agency problems within the enterprise groups will continue to intensify, which will increase the motivation of major shareholders to hollow out group-affiliated listed companies.

Second, the higher degree of the parent-subsidiary business-related, the lower degree of real earnings management of family group-affiliated. The higher degree of the parent-subsidiary business-related, the higher the degree of inclination the parent company of the group gives to its subsidiaries in terms of resource allocation for the overall development needs, the easier it will be for the subsidiary to obtain financial support from the group. At the same time, if the subsidiary receives more financial support, it will also reduce rent-seeking behavior towards the parent company.

Based on the above conclusions, this research puts forward the following suggestions:

First, enterprise groups should develop on a moderate scale. The results of this study show that the degree of earnings management of listed companies controlled by the family enterprise group presents a U-shaped relationship with the scale of the family enterprise group. When the listed companies controlled by the family enterprise group exceed a certain scale, the level of earnings management will be enhanced. This shows that enterprise groups should expand appropriately.

Second, the group-affiliated companies can maintain consistency with the industrial strategy of the family business group. The results of this study shows that if the subsidiary wants to make full use of the resources within the group and avoid the enterprise group's encroachment on the resources of the listed company, it can be achieved by maintaining consistency with the parent company's industrial strategy. On the one hand, by maintaining strategic consistency, the group-affiliated listed companies are more likely to be in the core position of the entire group and can receive more resource support from the enterprise group. On the other hand, maintaining strategic consistency will reduce the information asymmetry, making it easier to identify the opportunistic behavior of the business group and promote the development of the business group.

Acknowledgment. Supported by Special scientific research project of Shaanxi Education Department (Project Number: 21JK0218; Project Name: Research on the development momentum of Xi'an's equipment manufacturing industry from the perspective of military-civilian integration); Supported by university level research project of Xi'an Jiaotong University City College (Project Number: 2021X30; Project Name: Study on the effect of corporate group Management on earnings management); Supported by research project of Education Science of Shaanxi Province the 14th Five-Year Plan (Project Number: SGH21Y0410; Project Name: Research on the Improvement of Accounting Teachers' Ability under the background of interdisciplinary)

REFERENCES

[1] Zheng G.J., Ling D.J., Tan W.Q.(2016)“Xi Zu”Control Model Internal Group Structure and the Performance of China's Listed Companies. Accounting Research, (02): 36-43+95.

[2] Lou Z.K., Zhang L.P., Chen Y.Y., Yu X.Y.(2020)Familized Management and Enterprise Innovation: Empirical Evidence from Group-Affiliated Listed Companies. Journal of Systems & Management, 29 (01): 12-20.

[3] Xu Y., Ma X.B., Ding C.F., Cai G.L.,(2020) “Xi Zu” Group, Internal Group Structure and Bond Financing Cost. Securities Market Herald, (01): 62-70.

[4] Shao J., Liu Z.Y.(2006)The Optimal Scale Design of the Internal Capital Market of Enterprise Groups. Modern Finance And Economics-Fournal of Tianjin University of Finance And Economics ,(04): 32-36.

[5] Xin Q.Q., Zheng G.J., Yang D.M.(2007)Business group, government control and investment efficiency. Financial Research, (10): 123-142.

[6] Roychowdhury S. (2006)Earnings management through real activities manipulation. Journal of Accounting and Economics, 42 (3): 335-370.

[7] Li Z.F., Dong Z.Q., Lian Y.J.,(2011) Accrual Earnings Management or Real Activity Earnings Management?——Based on the Research of my country’s Income Tax Reform in 2007. (01): 121-134.