Research of Reform of Registration System and Earnings Management of R&D Activities in IPO

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ABSTRACT
China's registration reform took place in 2013, and a full registration system will be implemented in 2022. The registration system takes the quality of information disclosure as the core and requires IPO enterprises to disclose true, accurate and complete information. However, it is a common phenomenon for IPO companies to conduct EARNINGS management of R&D activities in the reporting period before listing, which is mainly aimed at beautifying financial statements and raising the valuation of listing. Taking IPO companies listed on the main board and gem from 2019 to 2021 as samples, this paper finds that the registration system inhibits the earnings management degree of their R&D activities compared with the approval system.

Keywords: *Registration System, Earnings Management, R&D, IPO.*

1. INTRODUCTION

Since 2013, China has begun the process of reform of the registration system for listing verification, which was put on the agenda for the first time at the third plenary session of the eighteen TH Central Committee of the Communist Party of China. In November 2018, the Central Committee of the Communist Party of China decided to set up the science and Technology Innovation Board on the Shanghai Stock Exchange and set up a pilot registration system. The Science and Technology Innovation Board became the first board in China to implement the registration system. In 2020, the Central Committee of the Communist Party of China decided to pilot the gem registration system on the Shenzhen Stock Exchange, and GEM became the second board to implement the registration system. The first batch of registered listed companies went on the market on August 24,2020. In 2022, the registration system will be extended to the whole market.

In China, the prospectus of an IPO company needs to disclose the operating results of the three years prior to the benchmark date. The better the operating results, the higher the valuation at the time of listing. Therefore, the management of IPO Enterprises often choose to use earnings management to beautify the short-term operating performance before listing, in order to achieve the effect of raising the valuation. The Ritter (1991)[1] study found that the long-term performance of IPO firms was lower than the forecast based on pre-IPO filing period data. The management earnings manipulation will harm the interests of investors in the long run, which violates the requirement of the registration system that the quality of information disclosure is the core. Therefore, this paper studies the data of IPO Enterprises before and after the reform of the registration system to explore whether the registration system audit restrains the behavior of earnings management before listing.

2. THEORETICAL BASIS AND LITERATURE REVIEW

2.1. Principal-Agent Theory

The principal agent theory, which was developed in the late 1960s by Roth, Andrew Johnson, Meckling and other economists, is a game theory based on the Information asymmetry phenomenon. Jensen and Meckling (1976)[2] argue that because agents are directly involved in the production and operation of a company, they can obtain relevant information more directly and have a competitive advantage over their clients in terms of information. Therefore, the agent can take advantage of this advantage to get a higher income, which often results in the loss of the principal.

The principal-agent theory is based on the following assumptions:

a. Information asymmetry. In the principal-agent model, it is assumed that an agent has more private information than the principal, which can not be obtained without payment, and this information may be the basis for choosing the agent's behavior.

b. The work of an agent is not welcome. In the principal-agent model, the agent's work is based on the assumption of rational economic man, and in the course of his work there will be certain costs, that is to say, the agent's work will bring negative effects, so the work of an agent is repugnant.

c. Uncertainty Assumption. The result of an agent's work is influenced not only by the effort of the agent, but also by many factors beyond the agent's control.

d. The assumption that the goals of both sides are not aligned. When an agent needs to make a choice, he will consciously calculate his own costs and benefits according to the assumption of rational economic man, so as to minimize the risks he bears and obtain the maximum expected benefits, and thereby detract from the client's objective function. The principal is risk-neutral and the agent is risk-averse.

Based on the principal-agent theory, the management of IPO enterprises have the motivation to conduct earnings management under the background of the Information asymmetry.

2.2. IPO R&D Earnings Management

The behavior of earnings management of IPO companies has always been the focus of academic attention. Aharony et al. (2000) [3] were the first scholars to study earnings management of early ipos in China and found evidence of earnings manipulation by management prior to ipos. Research by Darrough and Rangan (2005)[4] has found that managers are more likely to use R&D activities for earnings management purposes by cutting R&D spending. Aharony et al. (2010)[5] further research shows that IPO firms still perform earnings management at the approval stage. Zhang Zheng et al. (2014)[6] found that the degree of earnings management of IPO enterprises will be restrained with the improvement of IPO auditing system. Under the background of registration system reform in China, this paper will verify whether the registration system reform restrains the degree of earnings management of IPO Enterprises.

3. RESEARCH ASSUMPTION

Compared with the past approval system, the registration system has eliminated the substantial audit. The registration system focuses on the quality of information disclosure of IPO enterprises and requires that there should be no false records and misleading statements in public disclosure. An IPO enterprise shall ensure the authenticity, accuracy and completeness of the disclosure of public information. Regulators put forward higher requirements for issuers listed in the IPO of the registered system board and the intermediary agencies such as sponsors, accounting firms and law firms. Regulators require IPO sponsors to assume the role of "gatekeeper" and take responsibility for enhancing the operation and financial standardization of IPO companies.

Therefore, compared with the approval system of listing audit mechanism, the tendency of earnings manipulation by the management of IPO companies that choose to declare in the registration system will be weakened. Sponsors will also be more diligent and responsible, based on the principle of prudence to ensure the standardization of corporate information disclosure. They will further restrain the earnings manipulation of the management when implementing the sponsorship work. Currently, China's IPO filing period is three years. Generally speaking, the last year of IPO filing period (i.e. the year before listing) tends to have higher performance growth than the previous two years. This provides a more convenient space for the management to carry out earnings management of R&D activities. Therefore, this paper proposes the following hypotheses:

H1: All other things being equal, the manipulation of the R&D surplus by the management of the listed companies in the registered companies will be restrained compared with those of the listed companies in the approved companies.

4. RESEARCH DESIGN

4.1. Sample Selection and Data Sources

In this paper, the data of IPO application period of listed companies on the main board and GEM from January 1, 2019 to December 31, 2021 are selected as the research sample, and the financial enterprises and the enterprises with missing main data are excluded. The variables obtained are reduced by 1%, and the observed values of 636 IPO enterprises are finally obtained. The data sources of this paper are the prospectuses, audit reports and other information publicly disclosed by WIND financial terminal and IPO enterprises on the websites of Shanghai Stock Exchange, Shenzhen Stock Exchange and China Securities Regulatory Commission. The industry of IPO enterprises is classified according to the CSRC.

4.2. Model Design

4.2.1. Measurement of R&D Earnings Management

For the measurement of the degree of earnings management, it is a common practice to use Jones model to estimate accruals earnings management, and the

researchers have modified it to modified Jones model, Basu model, C model, etc. , to measure the degree of earnings management, companies such as Du and Li (2018)[7] used a modified Jones model to find that firms with higher R&D spending were more likely to manage their earnings. Roychowdhury et al. (2006)[8] set up the following model to measure the degree of real activity earnings management:

$$DISEXP_t / A_{t-1} = \alpha_0 + \alpha_1(1/A_{t-1}) + \beta(S_{t-1}/A_{t-1}) + \varepsilon$$

Among them, $DISEXP_t$ represents the discretionary costs of disclosure, A_{t-1} represents the total assets of year t-1, and S_{t-1} represents the operating income of year t-1, measure the level of real activity earnings management by reducing discretionary costs.

With the help of the above model, the following model(1)is set up to estimate the manipulative R&D expenditure:

$$\frac{RD_{i,t}}{A_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{A_{i,t-1}} + \alpha_2 \frac{S_{i,t-1}}{A_{i,t-1}} + \varepsilon_{i,t} \quad (1)$$

Among them, $RD_{i,t}$ is the R&D expenditure disclosed by an IPO company in the last year of its filing period (i.e. one year before listing). $A_{i,t-1}$ represents the total assets of an IPO company in the second year of the filing period (i.e. two years before listing). $S_{i,t-1}$ Represents the operating income of the second year of the reporting period.

The residual of the model ARD_i was obtained by OLS regression according to the above models. Taking the absolute value of residual is the earnings management level of R&D activities $MARD_i$ in the last year of the reporting period defined in this paper. In model (1), the smaller the absolute value of residuals, the higher the degree of earnings management of the IPO company.

4.2.2. Model Building

The cross-sectional DID model (2) is established in this paper:

$$MARD_i = \alpha_0 + \alpha_1 TIME_i + \alpha_2 GEM_i + \alpha_3 TIME_i * GEM_i + \alpha_4 CONTROL_i + \sum YEAR + \sum INDUSTRY + \varepsilon_i \quad (2)$$

$TIME_i$ is the dummy variable of TIME. After the gem listing review system changes from approval system to registration system on August 24, 2020, the value is 1, otherwise it is 0. GEM_i is a dummy variable, set 1 for enterprises listed on GEM and 0 for those listed on main board; $CONTROL_i$ is the CONTROL variable, and the specific variable definition is shown in the Table 1:

Table 1. Definitions of main variables

Variable type	Variable name	Variable definition
Explanatory variable	MARD	Degree of earnings management in R&D activities
Explanatory variable	TIME*GEM	The interaction item examines the impact of the registration reform
Control variable	GROWTH	Growth rate of operating income (%) in the last year of the filing period
	INDEP	Percentage of independent directors in the board of Directors in the last year of the reporting period (%)
	BIG4	The virtual variable is taken as 1 by the Big Four, otherwise 0
	LEV	Ratio of assets and liabilities in the last year of the reporting period (%)

By regression of the above models, the coefficient α_3 of interaction term can be obtained, and then the degree of earnings management of R&D activities of IPO enterprises in the last year of filing period can be judged by the reform of registration system.

5. ANALYSIS OF EMPIRICAL RESULTS

5.1. Descriptive Statistical Analysis of Major Variables

According to the descriptive statistical results of the main variables, from 2019 to now, all IPO enterprises have different degrees of earnings management behavior. The median of residual term ARD_i of model (1) is -0.477, indicating that some IPO enterprises have reduced their R&D expenditure in order to carry out negative EARNINGS management of R&D activities in the last year of the reporting period. According to the average value of variables $TIME_i$ and GEM_i, it can be concluded that 66% of enterprises were listed on August 24, 2020 or after, and 52.7% of enterprises were listed on GEM. In addition, only 5.7% of companies chose to hire a Big Four accounting firm to audit their IPO.

5.2. Analysis of Regression Results

In this paper, the cross-sectional DID model is used to test whether the registration reform has a restraining effect on the R&D earnings management degree of IPO enterprises in the last year of the filing period. The regression results are shown in Table 2:

Table 2. Regression results

Dependent Variable MARD	
Independent variable	Coefficient
TIME	-0.0064*
	(0.073)
GEM	-0.0093**
	(0.012)
TIME*GEM	0.0072*
	(0.068)
GROWTH	0.0002***
	(0.002)
INDEP	-0.0002
	(0.309)
BIG4	-0.0031
	(0.279)
LEV	-0.0002***
	(0.000)
YEAR	Control
INDUSTRY	Control
N	636
R^2	17.67%

Note: ***, ** and * are significant at 1%,5% and 10% levels respectively

According to the regression results, the goodness of fit of model (2) is 17.67%, and the coefficient of interaction term $TIME_i * GEM_i$ is significantly positive (0.0072*), indicating that the reform of listing audit system from approval system to registration system has a restraining effect on the earnings management degree of R&D activities of IPO enterprises in the last year of filing period, and the original hypothesis is valid. The regression results show that the registration system audit mechanism, which focuses on the quality of information disclosure, requires the authenticity, accuracy and integrity of information disclosure of IPO companies, which restricts the management from manipulating earnings by cutting R&D expenditure.

5.3. Robustness Test

In this paper, the robustness test is carried out by changing the form of explained variable $MARD_i$. The specific operation method is to take the logarithm of the absolute value of residual error of the original model (1), and then substitute it into model (2) for regression test. The results of robustness test regression are shown in the table below. The coefficient of interaction term $TIME_i * GEM_i$ is significantly positive (0.4067**), indicating that the regression results in this paper are robust.

6. RESEARCH CONCLUSIONS AND SUGGESTIONS

6.1. Research Conclusions

Earnings management has always been the focus of academic research and is an important factor affecting the quality of information disclosure of IPO companies. The management of IPO companies have manipulated earnings by cutting r&d expenditure in order to beautify the operating performance of the last year of the reporting period. After China's listing audit system changed from approval system to registration system, it emphasized the quality of information disclosure as the core. Based on the data of IPO companies in the main board and GEM from 2019 to 2021 in the last year of filing period, this paper studies the relationship between the earnings

management degree of IPO companies' R&D activities and the registration system reform. The research finds that the registration listing audit system has a restraining effect on the earnings management degree of R&D activities of IPO companies in the last year of the filing period, indicating that China's registration system plays a supervisory role with information disclosure as the core, effectively strengthens the information disclosure responsibility of IPO companies and improves the transparency of the market. It plays a promoting role in solving the information asymmetry between enterprise management and investors.

6.2. Shortage of Research

There are still some deficiencies and limitations in this study. The registration system has only been implemented in China for a short time, and it has only been more than one year since the approval system was changed to the registration system in GEM. Therefore, the sample size used in this study is relatively limited. After the registration system is fully implemented in China in 2022, we will have the opportunity to obtain a richer sample. In addition, the companies listed in 2021 have yet to disclose their annual reports for 2021. For the time being, this paper cannot obtain sufficient samples to study earnings management of registered listed companies after listing. After a period of operation with a more complete registration system, there will be an opportunity for further exploration.

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REFERENCES

[1] Ritter J R, The Long-Run Performance of Initial Public Offerings, Journal of Finance, 1991, 46(1):3-27. DOI: https://doi.org/10.2307/2328687

[2] Jensen, M. C., and W. H. Meckling , Theory of the firm: Managerial behavior, agency costs and ownership structure, Journal of Financial Economics 3.4, 1976, pp:305-360. DOI: https://doi.org/10.1007/978-94-009-9257-3_8

[3] Aharony, Joseph, Lee, et al, Financial Packaging of IPO Firms in China, Journal of Accounting Research, 2000. DOI: https://doi.org/10.1111/j.1475-679x.2004.00161.x

[4] Darrough M N, Rangan S , Do Insiders Manipulate Earnings When They Sell Their Shares in an Initial Public Offering?, Social Science Electronic Publishing. DOI: https://doi.org/10.1111/j.1475-679x.2004.00161.x

[5] Aharony J , Wang J , Yuan H , Tunneling as an incentive for earnings management during the IPO process in China, Journal of Accounting & Public Policy, 2010, 29(1):1-26. DOI: https://doi.org/10.1016/j.jaccpubpol.2009.10.003

[6] Zhang Zheng, Cui Yi, An empirical test on earnings management of ipos in a stock market: a study based on IPO system reform and plate divergence, Journal of Finance and Accounting, 2014(10) : 5. DOI: https://doi.org/10.19641/j.cnki.42-1290/f.2014.20.003

[7] Du Rui , Li Yanxi, Corporate R&D and earnings management-the adaptive behavior of micro-enterprises to macro-industrial policies. Management of scientific research, 2018(03) . DOI: https://doi.org/10.19571/j.cnki.1000-2995.2018.03.013

[8] Roychowdhury S , Earnings management through real activities manipulation. Journal of Accounting & Economics, 2006, 42(3):335-370. DOI: https://doi.org/10.2139/ssrn.477941