The Impact of Earnings Management of Listed Companies in China on Their Investment Efficiency —— Based on The Adjustment Effect of The Supervision of Independent Directors

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Abstract: In the current market environment, China's listed companies unreasonable resource allocation, low investment efficiency and other problems are increasingly prominent. The earnings management of listed companies for various purposes will cause low investment efficiency, and the supervision of independent directors will alleviate this impact to some extent. In order to investigate how the earnings management of listed companies acts on the investment efficiency and the adjustment effect of the supervision of independent directors (the number of independent directors) in the relationship, the listed companies that meet the requirements of Shanghai-Shenzhen A-shares from 2008 to 2019 are taken as samples, and the multiple regression analysis method is used for empirical analysis. The results show that earnings management has a negative effect on investment efficiency; the supervision of independent directors can weaken the negative impact of earnings management on investment efficiency.

Key words: earnings management; independent director;investment efficiency; internal supervision

1 Introduction

With the gradual improvement of China's market economic system, the capital market has entered a new stage of development, but at the same time, the problems such as unreasonable resource allocation and low investment efficiency of listed companies have become increasingly prominent. Accounting information is an important basis for a company to make decisions, and its quality is very important. However, some companies in order to achieve the purpose of inflated income, reasonable tax avoidance, data manipulation, the implementation of earnings management behavior, lead to the company's lost authenticity of accounting information, accounting information quality, low quality of accounting information will make the public agent conflict problem, information asymmetry degree, leading to low investment efficiency. The supervision of independent directors can alleviate the two types of agency costs, improve information transparency and improve the quality of internal control, which is an important measure to improve corporate governance.

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Theoretical significance, the past scholars mostly choose from the company earnings management or independent director supervise a specific dimension to study the relationship with the investment efficiency, this paper in order to more in-depth research enterprise independent director supervision, earnings management and the influence of investment efficiency, combine them, enrich the theoretical basis and related literature, provides a new perspective for similar research. In terms of practical significance, through the supervision of independent directors, earnings management and investment efficiency, the earnings management behavior of senior executives can be standardized, and the inefficient investment activities caused by surplus behavior can be reduced. At the same time, the independent director system should be improved to improve the authenticity of the information disclosure of the accounting statements of listed companies in China, so that the company executives can choose the investment projects that maximize the long-term interests of the enterprise, and lay a foundation for the high-quality development of the company.

2 Literature review

Jing Huang(2023) found that the earnings management behavior of company managers was positively correlated with the investment efficiency. When the company purchased the executive liability insurance of directors, the positive correlation between the earnings management behavior of company managers and the investment efficiency weakened[1]. Weifeng Xie, Shenghong Chen(2021) found that under the interaction between corporate social responsibility and earnings management, the investment efficiency will decrease[1]. Yicheng Wang, Jinwei Zuo(2020) introducing the independent director system is an important measure to improve corporate governance, and the supervisory role of corporate information disclosure has gradually become the key content of independent directors[2].

Sana Mardessi (2021) The study found that there is a statistically significant relationship between the corporate governance mechanism, mainly based on the size of independent directors, financial experts and audit committees, and the real earnings management[4]. Bilel Bzeouich et al. (2019) found that the behavior motivation of enterprise earnings management is related to the problem of high management opportunistic behavior and information asymmetry, which reduces the investment efficiency[5]. Rui Xiang , Wenyan Zhu(2023) found that academic independent directors have a significant inhibitory effect on fraud activities[6].

It can be seen that the current academic circle mainly studies the relationship between earnings management and enterprise investment efficiency from two paths: information asymmetry theory and principal-agent theory. At the same time, the supervision of independent directors plays a significant role in improving internal control and preventing fraud. However, the academic circle has not deeply studied the influence of independent director supervision on earnings management and investment efficiency, so this paper will study and analyze this aspect.

3 Research methods

3.1 Study hypothesis

Surplus management affects the investment efficiency through the medium of accounting information quality. On the one hand, low quality accounting information will increase the information asymmetry, increase the agency cost and supervision cost of the company, and eventually cause the investment efficiency behavior of the company; on the other hand, low quality accounting information will cause the "adverse selection" of creditors and the "moral hazard" of the management, further cause the financing constraints of the company, increase the financing cost of the company, and finally cause the investment efficiency behavior of the company. Therefore, we propose Hypothesis 1:

H1: earnings management has a negative impact on investment efficiency.

The supervision of independent directors can be reflected by the number of independent directors. The increase in the number of independent directors can not only strengthen the voice and influence of independent directors in their listed companies, but also improve the autonomy of the board of directors in the supervision of financial information quality. The larger the number of independent directors, the stronger their independence, supervision and decision-making influence will be. It can effectively alleviate the principal-agent problem,and then help to improve the internal governance of the company and improve the quality of internal control. Therefore, this paper holds that independent directors can restrain the negative impact of earnings management on investment efficiency by alleviating the principal-agent problem, improving information transparency and improving the quality of internal control, thus putting forward hypothesis two:

H2: Supervision by independent directors can weaken the negative impact of earnings management on investment efficiency.

3.2 Variable selection

This paper selects 2008-2019 China and Shenzhen a-share listed companies for the research samples, data from the Tai'an database, excluding all financial listed companies, ST companies and data missing samples, and the variables at 1% and 99% level Winsorize processing, finally get 10735 sample data, using Excel 2021, Stata18, etc.

The variables involved in the present study and their definitions are shown in Table1.

Table 1. Variables and their definitions

class	name	variable	explain
explained variable	efficiency of investment	IE	Absolute values of the Richardson model
explanatory variable	control of earnings	EM	Revised absolute values of the Jones model residuals

regulated variable	Independent director supervision	IDN	Number of independent directors
controlled variable	return on assets	Roa	Net profit / average total assets
	total remuneration of the top three senior executives	Pay	Total remuneration of the top three senior executives
	asset turnover	TAT	Main business income / average total assets
	scale	Size	Natural logarithm of the total assets
	Free cash flow	FCFO	Cash flows from operating activities / beginning of year total assets
	increase rate of business revenue	Growth	Increase of the income from main business / main business income of last year
	asset-liability ratio	Lev	Total liabilities / total assets

1) explained variable.In this paper, the investment efficiency uses the negative absolute value of the Richardson model, expressed by IE.

2) explanatory variable.In this paper, the absolute value of the modified Jones model, expressed by EM.

3) regulated variable.This paper uses the number of independent directors to express the degree of supervision of independent directors, using IDN, the information of independent directors is taken from the National Tai'an database.

4) controlled variable.Return on assets: Enterprises with high return on assets have less financing constraints, have more investment opportunities, and can provide sufficient capital flow for investment behavior;Total remuneration of the top three senior executives: The higher the total salary of the top three executives, the stronger the motivation to make the right investment behavior for the company's goals; Asset turnover: The higher the asset turnover rate, the lower the degree of resource allocation and waste, and the higher the investment efficiency is; Enterprise scale: The larger the company is, The greater the space for surplus management, the more difficult it is to supervise the management behavior; Free cash flow: Lower cash flow may mean large investment, There is a possibility of over investment, Higher cash flow may indicate that companies do not have enough money for investment, The probability of the low investment situation is high; Revenue growth rate: Management with self-interest motives are likely to sacrifice long-term interests, so more growing companies can lead to more asymmetric information; Asset-liability ratio: The higher the asset-liability ratio of listed companies, the more likely it is to fall into the debt crisis, The more likely the company is to risk violations.

3.3 Model construction

To verify the relationship between earnings management and investment efficiency, a regression model 1 is constructed:

$$IE = \beta_0 + \beta_1 EM + \beta_2 Roa + \beta_3 Lev + \beta_4 TAT + \beta_5 Growth + \beta_6 FCFO + \beta_7 Size + \beta_8 Pay + \beta_9 \sum Year \quad (1)$$

To verify the regulatory effect of independent director supervision on the relationship between earnings management and investment efficiency, the regression model is constructed:

$$IE = \beta_0 + \beta_1 EM + \beta_2 \mathrm{IDN} + \beta_3 EM \times IDN + \beta_4 Roa + \beta_5 Lev + \beta_6 TAT + \beta_7 Growth + \beta_8 FCFO + \beta_9 Size + \beta_{10} Pay + \beta_{11} \sum Year \quad (2)$$

4 Empirical test

4.1 Descriptive statistics

Table 2. Descriptive statistics table

Variable	N	Mean	p50	SD	Min	Max
IE	10735	-0.0370	-0.0230	0.0790	-5.432	0
EM	10735	0.0580	0.0390	0.0670	0	0.582
IDN	10735	3.121	3	0.524	0	8
Roa	10735	0.0440	0.0440	0.0780	-1.579	0.964
Lev	10735	0.374	0.357	0.201	0.00800	4.596
Growth	10735	0.267	0.137	3.702	-1.309	355.6
FCFO	10735	0.0580	0.0540	0.117	-1.481	6.409
Size	10735	21.92	21.73	1.207	19.02	28.64
TAT	10735	0.640	0.541	0.508	-0.0480	12.37
Pay	10735	2.333e+06	1.807e+06	2.054e+06	0	3.069e+07

As can be seen from the results in Table2, during the sample period, the maximum value of the investment efficiency (IE) is 0, the minimum value is-5.432,indicating that there is a large difference in the investment efficiency level of different listed companies, with the average value being-0.0370 and the median being-0.0230. The maximum and minimum values of the degree of earnings management (EM) are quite different, with 0.582 and 0 respectively, indicating that the degree of surplus of different listed companies is quite different, with the average of 0.0580 and the median of 0.039. The maximum value of the number of independent directors (IDN) is 8 and the minimum value is 0, indicating that the number of independent directors of different listed companies varies greatly.

4.2 Correlation test

In the correlation analysis of variables, the results show that,without considering other control variables, the correlation coefficient of earnings management (EM) and investment efficiency (IE) is-0.139, which is significant at 1%. The hypothesis is that earnings management has a negative impact on investment efficiency, which proves that it is feasible to study the impact of earnings management on investment efficiency. The correlation coefficient for the number of independent directors (IDN) and investment efficiency (IE) is-0.008, but it is not significant. Except for the size of the company, other control variables are significantly correlated with the investment efficiency, indicating that the control variables are relatively accurate and can enter the regression . To detect multicollinearity, the variance inflation factor between variables is calculated with a maximum value of 1.71, strictly less than 5.

4.3 Regression analysis

Table 3. Table of the regression results

VARIABLES	(1)IE	(2)IE
EM	-0.192***(-15.42)	0.695***(9.82)
IDN		0.017***(5.84)
EM xIDN		-0.286***(-12.73)
Roa	-0.024*(-1.84)	-0.009(-0.73)
Lev	-0.005(-0.72)	-0.007(-0.94)
Growth	0.001***(4.35)	0.001***(4.13)
FCFO	-0.379***(-50.61)	-0.371***(-49.92)
Size	-0.015***(-6.56)	-0.014***(-6.53)
TAT	0.002(0.47)	0.001(0.33)
Pay	0.000***(5.69)	0.000***(5.62)

The regression results of the models (1) and (2) are shown in Table3. From 2008 to 2019, the degree of earnings management (EM) of listed companies was significantly negatively correlated with the investment efficiency (IE) of listed companies at the level of 1%, with a coefficient of-0.192, indicating that the investment efficiency of listed companies with a relatively high degree of earnings management was relatively low. In terms of the regulation effect of independent directors supervision, the earnings management and the number of independent directors (EMxIDN) and office on the investment efficiency at 1%, the coefficient of 0.286, that the higher degree of earnings management on the company, the more the number of independent directors, the higher the investment efficiency of listed companies, namely the independent directors supervision can weaken the negative impact of earnings management on the investment efficiency of listed companies. The regression results of Table3 prove the hypothesis of H1 and H2 in this paper.

In terms of control variables, return on assets (Roa), free cash flow (FCFO), enterprise size (Size) were significantly negatively correlated with investment efficiency, while the increase rate of revenue income (Growth) and the top three executives (Pay) were significantly positively correlated with investment efficiency. The data results show that the higher the return on assets, the more free cash flow, the larger the enterprise scale, the lower the investment efficiency of the listed company; the higher the total remuneration of the top three executives, the higher the investment efficiency.

4.4 Robustness test

In this paper, the sample year was further shortened to 2013-2019 based on the original data sample, and the same conclusion was obtained. At the same time, this paper selects the proportion of independent directors as another way to measure the supervision of independent directors, and still obtains the same conclusion. The two robustness test results show that the results are robust.

5 Conclusions

5.1 Study conclusion

1) Based on the principal-agent theory and the information asymmetry theory, this paper tests the influence of earnings management on investment efficiency. The research shows that earnings management will have an impact on investment efficiency, and there is a significant negative correlation between them, which complies with hypothesis 1, that is, the degree of earnings management has a negative impact on investment efficiency.

2) higher degree of earnings management of listed companies relative to lower earnings management degree of listed companies, its investment efficiency is lower, and the independent director supervision can improve the quality of internal control of listed companies, alleviate the principal-agent problems, improve the quality of information, to alleviate the negative impact of earnings management for investment efficiency.

5.2 Study recommendations

1) Listed companies should reduce earnings management behavior and strengthen corporate governance. Because the surplus management will cause the low efficiency of the company's investment, so in order to make the company develop better and make better use of the company's resources, appropriate control measures can be taken to prevent excessive surplus manipulation.

2) Pay attention to the number of board of directors meetings and strengthen the disclosure of real information within listed companies. The important factor for the independent directors to play their supervision function lies in the information. In the case of information asymmetry, the effective play of the supervision function cannot be fully guaranteed.

3) In areas with poor legal environment and marketization process, listed companies should guarantee the effectiveness of information obtained by independent directors, so as to better exercise the supervision function. The improvement of the investment efficiency of listed companies not only depends on the exercise of the supervision function of independent directors, but also requires the internal managers of listed companies to effectively "law in mind" in daily operations and major decisions. Only under the joint action of both internal and external companies can the inefficient investment behavior of listed companies be reduced.

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