Research on the Impact of Earnings Management of Listed Companies in China on Inefficient Investment

Guangqiang Han[1], Chengyuan Huang[2,*]

2148500@qq.com[1], 1669712653@qq.com[2,*]

The College of Economics Bohai University, Jinzhou, Liaoning, China

Abstract: Appropriate investment is very important to expand the scale and increase the value of the enterprise, otherwise it will cause adverse effects on the enterprise. As one of the important information to evaluate the enterprise, the degree of earnings management will bring some information problems to the enterprise, which will lead the decision-makers to make inappropriate investment decisions. This paper analyzes the hypothesis from the principal-agent problem and the information asymmetry problem, and creates regression models between the degree of earnings management and inefficient investment, over investment, and under investment.The results show that: firstly, earnings management behavior of listed companies has a positive impact on inefficient investment; Secondly, through further grouping, we find that for the enterprises with over investment tendency, the earnings management has the forward influence on over investment; For the enterprises with the tendency of under investment, the earnings management also has the forward impact on under investment.

Keywords: Earnings management; Inefficient investment; Over investment; Under investment

1 Introduction

Whether the investment decision of an enterprise is correct or not is related to the future operating status and profitability of the enterprise, which is the key to the improvement of the enterprise value. Enterprises with sufficient cash flow in the market tend to expand the size of the enterprises, which leads to over investment of the enterprise. Enterprises also have the problem of too high external financing cost caused by information asymmetry, which makes some enterprises have to give up some investment projects in line with the principle of enterprise value maximization. From these cases, the information asymmetry path and the principal-agent path will cause the inefficient investment of enterprises. The earnings management behavior of managers brings information asymmetry and agency problems.

From the theoretical point of view, studying the effects of earnings management can supplement the economic consequences of surplus management, and also explore the causes of inefficient investment. From the perspective of practical significance, the study of the impact of earnings management on non-efficient investment can guide the managers to deal with the surplus correctly and make the right choice when making investment decisions. It can make creditors and other information disadvantage have a deeper understanding of the target enterprise and make a correct judgment. Shareholders can be urged to establish an appropriate

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management incentive mechanism and external supervisors to enhance their supervision efforts. Through the above aspects, to promote the stable and healthy development of the enterprise itself and the whole market.

2 Literature Review

Junying Ren(2021) found that accrued earnings management and real earnings management will promote inefficient investment, and high-quality internal control can inhibit this promotion effect.[1].Jiaqi Liu(2020) added executive incentive factors when studying the impact of accounting information quality on inefficient investment, and found that executive explicit incentive would restrain the positive impact of accounting information quality on inefficient investment[2]. Han Sun and Jinsong Zhang(2021) found that real earnings management reduces the investment efficiency of enterprises, while both executive compensation incentive and executive equity incentive can restrain the non-efficient investment caused by real earnings managemen[3].Bhutta S U et al. (2021)found that real earnings management leads to low investment efficiency, and that short-term debt can weaken this impact.[4]. Fengqi Zhang(2021) found that accounting information transparency has an intermediary role between high-quality external audit and non-efficient investment. The transparency of corporate accounting information through the four major audits will be improved, accrued earnings management will be reduced, and investment efficiency will be improved[5]. Nouha Khoufi(2020) found that improving the quality of accounting information can reduce information asymmetry, so high-quality accounting information can improve investors' decision-making ability[6].

It can be seen that the current research on earnings management and enterprise inefficient investment mainly focuses on the information asymmetry theory and principal-agent theory. For companies with different investment tendencies, over investment and insufficient investment, and the relationship between earnings management degree and investment behavior has not been in-depth. This paper will study and analyze this aspect.

3 Researching Method

3.1 Study hypothesis

The impact of earnings management on inefficient investment can be analyzed from two aspects.First, the information asymmetry aspect. Earnings management will cause the increase of internal and external information asymmetry, in the short term, will give investors create the illusion of a good business, thus at a lower cost for investment funds, expand enterprise investment, and in the long run, however, investors will find enterprise earnings management behavior, improve the cost of the project, it was forced to give up some profitable projects.Second, the principal-agency aspects. The low degree of earnings management reduces the principal-agent problem and reduces the resulting moral problems and the phenomenon of major shareholders squeezing minority shareholders, guiding the management to invest funds in high-quality projects and inhibiting over investment behavior. At the same

time, earnings management will also increase the agency cost, reduce the free cash flow of enterprises, resulting in insufficient investment. Therefore, we propose Hypothesis 1:

H1: The degree of earnings management has a positive impact on inefficient investment.

For enterprises with the tendency of over investment, their investment efficiency is low and the cost is high, their managers often pursue the expansion operation, and their earnings management is often reflected in the inflated profits, resulting in enterprises to further strengthen their Over investment in order to cooperate with their profits. Therefore, hypothesis 2 is proposed:

H2: For enterprises with a tendency of over investment, the degree of earnings management has a positive impact on Over investment.

For the enterprises with the tendency of insufficient investment, their managers often implement the shrinking business model, and they are often in the stage of slowing down the business development. The earnings management conceals this situation, making the managers have less incentive to make investment in order to pursue the business growth. Therefore propose hypothesis 3:

H3: For enterprises with a tendency of insufficient investment, the degree of earnings management has a positive impact on the under investment.

3.2 Variable selection

In this paper, China's Shanghai and Shenzhen A-share listed companies from 2008 to 2019 were collected as the initial samples, and further excluded financial and insurance companies, companies, ST companies and companies with missing or abnormal data, and finally obtained 10,973 valid samples.Data taken from CAMAR database, through Excel2016 Adjustment and statistical analysis using Stata16.The variables involved in the study and their definitions are listed in Table1.

For the explained variable, the Richardson model is chosen to measure the inefficiency investment behavior.The INV is used to indicate the absolute value of the residue, indicating the inefficient investment. OINV and UINV are used to indicate the absolute value of the positive and negative parts of the residual, to indicate over investment and under investment, respectively. For explanatory variable, the absolute value of the residual of the modified Jones model is used to represent the degree of earnings management and is expressed by absDAW.

Table 1. Variables and their definitions

class	name	variable	explain
explained variable	inefficient investment	INV	Absolute value of Richardson model
	Over investment	OINV	Richardson model with residual positive values
	under investment	UINV	Absolute values of the negative residues of the Richardson model

explanatory variable	Earnings management degree	absDAW	Revised absolute values of the Jones model residuals
controlled variable	return on assets	Roa	Net profit / average total assets
	asset-liability ratio	Lev	Total liabilities / total assets
	asset turnover	TAT	Main business income / average total assets
	increase rate of business revenue	Growth	Increase of main business income / main business income of last year
	Free cash flow	FCFO	Cash flows from operating activities / total assets at the beginning of the year
	scale	Size	Natural logarithm of the total assets
	Total compensation of the top three senior executives	Pay	Total compensation of the top three senior executives

The selection and reasons of the control variables are as follows: 1) Asset-liability ratio: it reflects the debt risk, which reflects the probability of generating financial difficulties. When the asset-liability ratio is high, companies tend to whitewash the statements to avoid some provisions on the debt constraints.2) Return on assets: it reflects the profitability, which shows the development potential of an enterprise, and whether the enterprise has a good development prospect. When some external investors invest, they first focus on the profitability of the enterprise. When the return on assets is low, creditors and shareholders will strengthen the supervision of the investment behavior of the enterprise in order to protect their own interests, so as to restrain inefficient investment.3) Growth rate of operating income: it reflects the growth of the enterprise. When the growth rate of the enterprise operating income is low, the enterprise adopts earnings management to whitewash the statement to avoid the withdrawal of external investors.4) Free cash flow: When the free cash flow is sufficient, agents tend to control more resources and gain greater prestige by using most of the free cash flow to expand the scale of the enterprise, leading to over investment. When the free cash flow is small, enterprises dare not invest easily, resulting in under investment.5) Enterprise size: The larger the enterprise is, the more inclined it is to disclose more information to obtain more investment, but at the same time, the motivation of earnings management is also more obvious.6) Asset turnover: Asset turnover reflects the utilization efficiency of assets and indirectly represents the loss caused by the invalid use of assets. The degree of enterprise agency problem can be reflected in this index, and low asset turnover is often accompanied by non-efficient investment.7) Total compensation of the top three executives: the compensation contract encourages the management to work hard for the sake of the enterprise, so that the agency cost is effectively reduced with the unification of benefits to people and the enterprise. But compensation contracts can also lead to earnings management practices.

3.3 Model construction

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

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

To verify the relationship between the degree of earnings management and over investment, the regression model 2 is constructed:

$$OINV = \beta_0 + \beta_1 absDAW + \beta_2 Roa + \beta_3 Lev + \beta_4 TAT + \beta_5 Growth + \beta_6 FCFO + \beta_7 Size + \beta_8 Pay + \beta_9 \sum Year \quad (2)$$

To verify the relationship between the degree of earnings management and insufficient investment, the regression model 3 is constructed:

$$UINV = \beta_0 + \beta_1 absDAW + \beta_2 Roa + \beta_3 Lev + \beta_4 TAT + \beta_5 Growth + \beta_6 FCFO + \beta_7 Size + \beta_8 Pay + \beta_9 \sum Year \quad (3)$$

4 Empirical test

This section provides descriptive statistics for all variables involved in the model in five aspects, namely, mean, median, standard deviation, minimum and maximum, and the results are shown in Table2, Tbale3 and Table4.

4.1 Descriptive statistics

1) Descriptive statistics of the degree of earnings management and inefficient investments

From Table2, the total effective samples were 10973. Inefficiency investment (INV) as the explained variable, its maximum value is 5.432 and the minimum value is 0, indicating that different enterprises have different levels of inefficiency investment and large differences. The average value was 0.0370, indicating that the scale of inefficiency investment is about 3.7% of the total assets of the enterprise at the beginning of the year. As the explanatory variable, the degree of earnings management (absDAW) has the maximum value of 0.582 and the minimum value of 0. There is a big difference between the maximum and minimum values, indicating that different enterprises have great differences in the degree of manipulating the surplus disclosed to the public. The average value was 0.0590, indicating that the average level of earnings management of the sample enterprises is about 5.9% of the total assets at the beginning of the year, and the median is 0.400. The maximum value of return on assets (Roa) is 0.964, and the minimum value is-1.859, indicating that the profitability of the sample enterprises varies greatly. The minimum value of operating revenue growth rate (Growth) is-1.309, and the maximum value is 355.6, indicating that the growth rate of operating revenue of different enterprises is quite different, and the investment opportunities faced are also quite different. The average asset-liability ratio (Lev) is 0.375 and the standard deviation is 0.201, indicating that the overall debt level of China's listed companies is reasonable. The maximum value of free cash flow (FCFO) is 6.409, and the minimum value is-1.481, indicating that the free cash flow of different enterprises is quite different. The maximum value of the enterprise size (Size) is 28.64, and the minimum value is 19.01, indicating that there are certain differences in the enterprise size of different enterprises.

Table 2. Descriptive statistical table of earnings management degree and inefficient investments

variable	N	mean	p50	sd	min	max
INV	10973	0.0370	0.0230	0.0790	0	5.432
absDAW	10973	0.0590	0.0400	0.0670	0	0.582
Roa	10973	0.0430	0.0440	0.0800	-1.859	0.964
Lev	10973	0.375	0.358	0.201	0.00800	4.596
Growth	10973	0.275	0.137	3.749	-1.309	355.6
FCFO	10973	0.0570	0.0530	0.117	-1.481	6.409
Size	10973	21.92	21.73	1.205	19.01	28.64
TAT	10973	0.639	0.539	0.509	-0.0480	12.37
Pay	10973	2.319e+06	1.800e+06	2.040e+06	0	3.069e+07

2) Descriptive statistics of earnings management , over investment and under investment

Table 3. Descriptive statistical table of earnings management degree and over investment

variable	N	mean	p50	sd	min	max
OINV	4555	0.0470	0.0250	0.110	0	5.432
absDAW	4555	0.0580	0.0400	0.0640	0	0.582
Roa	4555	0.0540	0.0510	0.0700	-1.859	0.598
Lev	4555	0.386	0.374	0.186	0.00800	0.980
Growth	4555	0.400	0.162	5.654	-0.720	355.6
FCFO	4555	0.0690	0.0630	0.152	-1.481	6.409
Size	4555	22.09	21.89	1.245	19.21	28.64
TAT	4555	0.670	0.569	0.486	0.0360	11.97
Pay	4555	2.510e+06	1.921e+06	2.224e+06	0	2.481e+07

Table 4. Descriptive statistical table of earnings management degree and under investment

variable	N	mean	p50	sd	min	max
UINV	6410	0.0300	0.0220	0.0430	0	1.249
absDAW	6410	0.0600	0.0390	0.0700	0	0.582
Roa	6410	0.0350	0.0390	0.0860	-1.579	0.964
Lev	6410	0.368	0.348	0.211	0.0110	4.596
Growth	6410	0.187	0.118	1.148	-1.309	82.70
FCFO	6410	0.0490	0.0470	0.0820	-0.524	1.011
Size	6410	21.80	21.63	1.162	19.01	28.50
TAT	6410	0.616	0.517	0.523	-0.0480	12.37
Pay	6410	2.184e+06	1.720e+06	1.889e+06	0	3.069e+07

From Table Table3, Table4 can see that among the 10973 samples of inefficient investment enterprises, there are 4555 samples of over investment enterprises, 6410 samples of enterprises with under investment, and the under investment enterprises in the sample are redundant with over-investment enterprises. The mean (median) of the over-investment (OINV) sample was 0.0470 (0.0250), and the mean (median) of the under-investment (UNNV) sample was 0.0300 (0.0220). This showed that although the sample was under-invested, the severity of over investment was higher than that of under investment. There is no significant difference between the overall data of earnings management (absDAW) in the under investment and over investment samples.

4.2 Correlation test

To ensure that there is no multicollinearity among the various variables in the model, to verify the effectiveness of the model construction, this section conducts a correlation analysis for all the variables involved in the model.

1) Test of the correlation between earnings management degree and inefficient investment

For the correlation analysis in model 1, the correlation coefficient between absDAW and INV was 0.139, significant at the level of 1%.This shows that it is feasible to study the influence of Earnings management degree on inefficient investment, and the hypothesis 1, Earnings management degree has a positive impact on inefficient investment. The other variables except for the company size are significantly correlated with inefficient investment, indicating that the overall selection of variables is more accurate and can enter the regression. The correlation coefficient between explanatory and control variables was small and there was no multicollinearity.

2) Test of the correlation between earnings management degree and over investment and under investment

Corcorrelation analysis was conducted for model 2 and Model 3 respectively, and the results show: the correlation coefficient of absDAW and OINV is 0.183, significant at 1%, and that of absDAW and OINV is 0.118, significant at 1%, that is, the degree of earnings management has a positive impact on excessive investment; for enterprises with under investment tendency, the degree of surplus management has a positive impact on under investment. Moreover, the relationship between over investment and Roa, Lev, Growth, FCFO, TAT, and Pay was significant, and the relationship between under investment and Roa, Size, Pay and other variables was significant.The correlation coefficient between the explanatory and control variables was small and there was no multicollinearity.

4.3 Regression analysis

Table 5. Table of the regression results

VARIABLES	(1)INV	(2)OINV	(3)UINV
AbsDAW	0.196***(16.08)	0.233***(8.83)	0.074***(8.89)
Roa	0.032***(2.58)	0.043(1.52)	0.035***(4.54)
Lev	0.007(0.96)	0.056***(3.14)	0.004(1.32)
Growth	-0.001***(-3.85)	-0.003***(-7.55)	0.000(0.13)
FCFO	0.370***(50.55)	0.480***(35.90)	-0.005(-0.74)
Size	0.014***(6.60)	0.017***(3.61)	-0.001**(-2.19)
TAT	-0.000(-0.06)	-0.003(-0.30)	-0.004***(-4.00)
Pay	-0.000***(-5.80)	-0.000***(-6.25)	0.000(0.96)
Constant	-0.221***(-4.84)	-0.341***(-3.41)	0.190***(14.31)

As can be seen from the regression results in Table5: when the explained variable is inefficient investment, the correlation coefficient of the degree of earnings management is 0.196, and the two are positively correlated at the level of 1%, which thus proves the validity of hypothesis 1. The return on assets is positively correlated with inefficient investment, indicating that the improvement of profitability will increase the inefficient investment behavior of enterprises, which may be caused by the reduced supervision of shareholders and creditors caused by the increase of profitability. Asset turnover rate and executive compensation non-reflect the agency cost of enterprises, and they are negatively correlated with inefficiency investment, indicating that improving the asset turnover rate and increasing the executive compensation is to restrain the inefficiency investment of enterprises by reducing the agency cost. The asset-liability ratio was positively correlated with inefficiency investments, but the correlation was not significant.The growth rate of operating income is negatively correlated with inefficient investment, which may be caused by the increase of operating income growth rate and the reduction of whitewash statements. Free cash flow, enterprise size are positively correlated with non-efficient investment, indicating that the increase of free cash flow and the size of enterprises will lead to inefficient investment, which may be caused by managers in order to build their own business empire.

The correlation coefficient of the degree of earnings management in the Over investment group is 0.233, which is positively correlated at the level of 1%, which proves the establishment of hypothesis 2, the correlation coefficient of the degree of Earnings management in the under investment group is 0.074, and the two are positively correlated at the level of 1% respectively, thus proving the establishment of hypothesis 3.

Comprehensive analysis of the regression results of the control variables in the three sample groups can be found that: Lev, Growth, FCFO, Pay are significantly associated with inefficiency investment and over investment, and the correlation direction is the same, which is not significantly associated with under investment. It means that these variables affect inefficient investment by affecting the level of over investment. Similarly, Roa and TAT affect inefficient investment by affecting the level of under investment. However, the control variable Size is significantly positively correlated with over investment, and significantly

negative with under investment, that is, the size of the company increases, intensifies the over investment, suppresses the under investment, and the force of aggravation is greater than the inhibition, leading to the intensification of inefficient investment. For the scale of the variable correlation coefficient of the explanation as follows: for over investment sample group, the larger the enterprise scale, the more tend to increase investment, the efficiency investment, for under investment sample group, the larger the enterprise, still the more tend to increase investment, to curb insufficient investment, so the correlation coefficient is negative.

4.4 Robustness test

In This paper, we split inefficient investment into two sample groups: over investment and under investment, and obtain a consistent conclusion, which is equivalent to the robustness test of hypothesis 1. At the same time, further reducing the sample year to 2012-2019, still obtained the same conclusion, and the results are robust.

5 Study conclusions and recommendations

5.1 Study conclusions

1)The number of samples with over investment tendency is relatively small compared with the samples with under investment tendency. However, according to the mean and median value of the data of over investment sample group and under investment sample group, it can be concluded that the severity of inefficient investment of the sample with over investment tendency is higher than that of the sample with under investment tendency.

2) The degree of earnings management will have an impact on inefficient investment, and there is a significant positive correlation between the two, which is in line with this hypothesis 1, that is, the degree of surplus management has a positive impact on inefficient investment. This phenomenon is caused by the information asymmetry of enterprises and the principal agent of enterprises.

3) This paper divides the total sample into under investment group and over investment group. It is found that the degree of earnings management has a positive impact on over investment for enterprises with over investment tendency, and the degree of earnings management degree has a positive impact on under investment. Moreover, the coefficient between the degree of earnings management and the over investment is significantly greater than that of the insufficient investment, indicating that the earnings management is more influential in the listed companies with the tendency of over investment.

4) Through the comparison of the control variables between different significance in the three sample groups, it can be found that the influence of Lev, Growth, FCFO and Pay on inefficiency investment is mainly reflected in the samples with the tendency to over investment, and these variables do not show a significant role in the samples with the tendency to under investment. On the contrary, the influence of Roa and TAT on inefficiency investment is mainly reflected in the sample with the tendency of under investment, while these variables do not show a significant effect in the sample with the over investment tendency. However, the control variable Size can affect the investment level both in the sample with over investment tendency and in the sample with under investment.

5.2 Study recommendations

1) Enterprises should pay special attention to the disclosure of surplus information when disclosing accounting information, so as to avoid the occurrence of financing difficulties and have an impact on investment behavior.

2) Shareholders shall supervise the behavior of the management, establish a reasonable performance evaluation method, and then restrain the behavior of the managers. According to the actual situation, moderately strengthen the incentive for managers, let managers unify the interests of the enterprise and their own interests.

3) External regulatory agencies such as CSRC should perform their duties, adjust the punishment for enterprises to disclose false information, and audit institutions should ensure that auditors have sufficient professional quality.

References

[1] Junying Ren. The relationship among internal control, earnings management and ineffici-ent investment——Based on the empirical data of A-share listed companies in Shanghai Stock Exchange[D].Dalian Maritime University,2021.DOI:10.26989/d.cnki.gdlhu.2021.000719.

[2] Jiaqi Liu.Research on the Impact of Accounting Information Quality on Investment Effi-ciency——From the Perspective of Executive Incentives [D].East China Jiaotong Univ-ersity ,2020.

[3] Han Sun,Jingsong Zhang.Study on the impact of real earnings management on investme-nt efficiency——Based on the adjustment effect of executive incentive[J]. Productivity Research,2021(12):108-112.DOI:10.19374/j.cnki.14-1145/f.2021.12.021.

[4] Bhutta S U,AlHares A,Shahab Y, et al. The jinx of real earnings management[J]. Jour-nal of Accounting in Emerging Economies,2021,12(2).

[5] Fengqi Zhang. Audit quality, accounting information transparency and inefficient invest-ment[D].Shandong University,2022.DOI:10.27272/d.cnki.gshdu.2021.004541.

[6] Nouha Khoufi. Accounting information quality and investment decisions in the emergingmarkets[J]. Frontiers in Management and Business,2020,1(1).