Exploration of Volatility and Market Risk of Stock Return Rate in Listed Financial Enterprises Based on Fair Value Measurement

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Abstract—The measurement attribute of fair value has been proved to improve the transparency of financial statement information. However, there are few guidelines on fair value measurement in accounting standards, so it is difficult to meet the need of fair value measurement in practical application. Taking the listed companies from 2009 to 2015 as samples, Richardson model is adopted as the tool to calculate the investment efficiency, from the perspective of fair value hierarchy, whether the stratified measurement of fair value can improve the investment level in the Chinese market environment is investigated theoretically and tested empirically. The study shows that the net asset information measured at the first level of fair value is reliable, which is beneficial to improve the quality of accounting information, reduce the information asymmetry and agency cost between contracting parties, and improve the investment efficiency of the company; the net asset information measured at the second level of fair value has a promoting effect on the investment efficiency, indicating that even though the net asset information content measured at this level is lower than that measured at the first level, many reliable and relevant information is still disclosed; due to the lack of accurate and fixed valuation technology, net asset information measured at the third layer of fair value is susceptible to manipulation and triggers opportunistic behavior. However, the number of items measured at this level is small, resulting in less information disclosed, and the overall effect on investment behavior is small.

Keywords—fair value; fluctuations of stock price; investment efficiency

I. INTRODUCTION

Today, the subprime crisis originated in the United States has evolved into a global financial crisis, and people are constantly reflecting on its causes in the face of the ever-expanding financial crisis. However, some financial practitioners in Europe and the United States believe that fair value measurement was to blame for the financial crisis, sparking a huge debate over fair value accounting standards. Its wide range and high level of influence are unprecedented in nearly 50 years since American accounting circles put forward the concept of fair value and gradually implemented fair value accounting standards. Fair value, once called "the direction of future accounting measurement", becomes the target of public criticism. They believe that fair value is the generator of financial bubbles when the economy is booming; in a recession, fair value is a booster to financial risk. In the financial crisis, fair value makes the company's financial statements too "ugly", affecting the company's performance and investors' confidence. The financial crisis hits investors' confidence, in the case of market crash and the absence of the function of market fixed price, the sharp decline in the fair value of financial assets leads to financial institutions' excessive provision for the impairment of assets at market price, resulting in the loss of financial institutions and the decline in capital adequacy ratio, thus prompting financial institutions to increase their selling of assets. It further ensnares the market in the vicious circle of "transaction price decline, asset reduction, capital fund reduction, panic selling, further price decline, must continue to increase calculation and withdrawal of reserve and continue to reduce equities", which plays a role in aggravating the financial crisis. In view of the fierce debate on fair value measurement in global financial circle and accounting circle, the connotation, characteristics, development and existing defects of fair value are first explained. Based on the latest theory of fair value pro-cyclical effect and financial contagion effect, the regressive empirical model of the effect of fair value change on stock price change is established. The following research is carried out by combining normative research and empirical test, and it is expected to play a role in the study of fair value accounting in China.

II. LITERATURE REVIEW

Domestic and foreign scholars have done a lot of research on the economic consequences of fair value measurement. Most scholars believe that fair value measurement will increase the decision-making freedom of the management, increase the risk of the company, and then affect the earnings quality and audit quality of the company.

Mcgee et al. believed that three different measurement levels of fair value have different impacts on the information risk formed by the combination of assets and liabilities, and that higher level of fair value will bring higher information risk. The information risk of assets can be reduced due to the perfect corporate governance system, but the information risk of liabilities is not affected by the quality of corporate governance [1].

When Shen studied the impact of fair value on audit fees and audit quality, it was found that fair value measurement would increase auditing costs of accounting firms. Therefore, the "Big 4" accounting firms require higher "reputation premium", which leads to the increase of audit fees. However, the improvement of "reputation premium" doesn't mean the improvement of audit quality. The higher the profit and loss of changes in the fair value per share of listed companies, the lower the audit quality [2].

Bratten studied management's performance adjustment ways through the disposal of financial assets available for sale. It was found that management's opportunistic behavior is catalyzed by fair value measurement. The disposal time of financial assets available for sale and the convenience of adjustment make the management use the financial assets available for sale to achieve the adjustment performance and realize the optimal remuneration [3].

Biondi found that, as an alternative variable of measurement degree of fair value, there is no correlation between profit and loss from fair value changes and executive compensation. The profit from fair value changes in private enterprises is positively correlated with the executive compensation, but this correlation is not shown in central enterprises and local state-owned enterprises. Although there are differences in the effects of the company's profit and loss from fair value changes under different nature of property right on the executive compensation, the sensitivity between the two is weak in general [4].

Jozef studied the influence of fair-value accounting on the acquisition of bank loans and found that the attribute of fair-value measurement was not useful from the perspective of the bank's loan object; however, after reducing the maturity of bank loans, it was found that the profit from fair value changes can positively affect the scale of short-term bank loans. The study also found that banks are cautious about fair value information [5].

Ma studied listed companies holding securities assets. The study found that holding financial assets can bring about an increase in net profit and comprehensive income, and disposal of financial assets can manage earnings and adjust profits. Therefore, compared with the overconfidence of the management layer, the fair value measurement model can lead to the increase of the financial asset holdings of listed companies, leading to the increased financial risks [6].

Starting from whether fair value measurement will increase the volatility of balance sheet, Barker simulated and compared the impact of different economic environments and different measurement attributes on the volatility of balance sheet. It was found that under the fair value measurement, the fluctuation of balance sheet is affected by the market environment and economic subjects and doesn't necessarily have pro-cyclical characteristics, and the fair value measurement can't lead to pro-cyclical effect [7].

Shafii demonstrated the correlation of fair value measurement from the perspective of multiple measurement attributes. The study found that fair value measurement has a pro-cyclical effect, and stock market risk has a great influence on the sensitivity between variable profit and loss of fair value and stock price. Before adjusting the risk, the variable profit and loss of fair value is very sensitive to the stock price, and after adjusting the risk, this sensitive reaction decreases. This is reflected in the financial crisis, the synchronization between fair value measurement and stock price after the financial crisis is lower than that before the financial crisis [8].

III. STUDY DESIGN

A. Sample Selection and Hypothesis Presentation

The Shanghai-Shenzhen A-share listed company in 2009-2015 is selected as the sample. Among them, the hierarchical data of fair value comes from the notes of the financial statements of the enterprise in the current year. To improve the reliability and operability of the sample, the data missing samples are deleted. In particular, when studying the relationship between the hierarchical measurement of fair value and the investment efficiency, China's financial report in 2016 has not been released, so the real investment level in this year can't be measured. At the same time, the Richardson (2006) model is used in predicting and evaluating the investment efficiency of enterprises. The prediction condition of this model is that the data of delayed period is required, so the investment efficiency of listed companies in 2016 can't be measured. Taking 2009-2015 as the time window for exploring the relationship between hierarchical measurement of fair value and investment efficiency, a total of 1909 valid observation samples are collected. The data is processed with STATA analysis software, and the continuous variables are treated with Winsorize of 1%.

B. Variable Definition

It aims to examine the impact of hierarchical measurement of fair value on investment efficiency and the investment efficiency models and regression models that need to be involved. The investment efficiency model mainly refers to the Richardson model and takes the residual as the substitution variable of the investment efficiency. In model (2), (3), (4), (5) and (6), the residual in model (1) is used as the substitution variable of explained variable investment efficiency. Considering the free cash flow and the influence of corporate governance mechanism on investment decisions, the net amount of each asset (Nes), asset-liability ratio (Lev), enterprise scale (Size), listed years (Age), Tobin's q (Q), ownership concentration (Owc), free cash flow (Cash), and the shares held by the major shareholder (Orecta) are used as control variable. The specific variables and their explanations are shown in "Table I":

TABLE I.   VARIABLE DEFINITION

Variable symbol	Variable name	Variable declaration
Fva1	Net assets information measured at the first level of fair value	The ratio of net assets measured at the first level of fair value to total assets to eliminate the impact of enterprise scale
Fva2	Net assets information measured at the second level of fair value	The ratio of net assets measured at the second level of fair value to total assets to eliminate the impact of enterprise scale
Fva3	Net assets information measured at the third level of fair value	The ratio of net assets measured at the third level of fair value to total assets to eliminate the impact of enterprise scale
Nes	Net amount of each asset	The sum of net amount of fixed assets and intangible assets/total assets
Lev	Asset-liability ratio	Liabilities/assets
Size	Enterprise scale	The natural log of total assets (LNSIZE)
Age	Listed years	Time for companies to go public
Q	Tobin's q	Investment opportunity
Owc	Ownership concentration	The proportion of shares held by the largest shareholder
Cash	Free cash flow	Net cash flow from operating activities /total assets
Orecta	Orecta	Other receivables/total assets

C. Model Establishment

Richardson (2006) model is adopted to measure the investment efficiency of enterprises. Specifically, the ideal investment scale of listed companies is predicted according to Richardson model, and then the residual term of model (1) is used as the substitution variable of investment efficiency. The specific meaning of the residual term is the deviation between the actual investment amount of the listed company and the estimated ideal investment amount. As an alternative variable of the investment efficiency index, if the value of the residual term is greater than zero, it indicates the phenomenon of over-investment in listed company; conversely, if the value of the residual term is less than zero, it indicates the phenomenon of under-investment in listed company. The closer the value of the residual term is to zero, the higher the investment efficiency of the enterprise. Model 1 is as follows:

$$Invest_{i,t} = \beta_0 + \beta_1 Nest_{i,t-1} + \beta_2 Lev_{i,t-1} + \beta_3 Size_{i,t-1} + \beta_4 Age_{i,t-1} + \beta_5 Q_{i,t-1} + \beta_6 Invest_{i,t-1}$$
$$+ \sum Industry_{i,t-1} + \sum Year_{i,t-1} + \varepsilon \tag{1}$$

The investment efficiency indicator measured by the model (1), that is, the value of the residual term, is recorded as INV. The INV actually indicates the deviation between the amount of the listed company's investment in actual operation and the estimated ideal investment amount, also called the abnormal investment amount. Its absolute value is recorded as INVA. INV>0 means over-investment and recorded as Over_INV. And INV<0 means the under-investment of the enterprise and recorded as Under_INV. The larger the absolute value of INV (INVA), the lower the investment efficiency; the closer the value of INVA is to zero, the closer the actual investment level of the listed company is to the ideal level.

IV.   EMPIRICAL ANALYSIS

A. Descriptive Statistical Analysis

"Table II" is a descriptive statistical analysis of related variables in the regression model, including the indicators of minimum value, maximum value, mean value and standard deviation. Based on this, the characteristics of each variable are analyzed, which will bring a certain factual basis for the study of the application of fair value in China.

TABLE II.   DESCRIPTIVE STATISTICAL ANALYSIS OF THE FULL SAMPLE

Variable	Number of samples	Mean	Standard deviation	Minimum	Maximum
Fva1	1910	0.009	0.143	-0.015	5.991
Fva2	1910	0.026	0.155	-0.196	2.561
Fva3	1910	0.002	0.017	-0.265	0.308
Nes	1910	0.271	0.203	0.002	0.909
Lev	1910	0.527	0.225	0.025	1.095
Size	1910	23.227	2.005	18.475	30.572
Age	1910	12.338	6.376	1.000	25.001
Q	1910	1.496	1.776	0.0457	27.428
Owc	1910	0.373	0.163	0.037	0.891
Cash	1910	0.141	0.118	-0.426	0.778
Orecta	1910	0.017	0.031	0.000	0.439

From "Table II", it can be concluded that in the mean value of the ratio between net assets and total assets measured by levels of fair value between 2009 and 2015, the net assets measured by fair value at the first level is 0.009, the net assets measured by fair value at the second level are 0.026, and the net assets measured by fair value at the third

level are 0.002. It can be concluded that, on the whole, the amount of accounting elements measured by the fair value hierarchy accounts for a small proportion of the total assets, mainly because of the late application of the layered measurement model of fair value. Although many enterprises are actively adopting this measurement model, the overall application is not extensive. In addition, among the net assets measured at the three levels of fair value, the net assets share measured at the first and second levels occupies the majority of the total amount, which is significantly higher than the third level measurement amount. The third level measurement project of fair value is far less than the first two levels, which may be significantly related to the difference in the determination conditions of input parameters at each level. The reason why the ratio of net assets to total assets measured at the first level of fair value is smaller than that at the second level is as follows: the requirements for the confirmation of the first-level measurement information of fair value are strict, and the price of the same accounting element item under active market conditions is required as the input parameter.

Therefore, for some enterprises, the determination of the input value is difficult. In addition, the process of confirming the third-level measurement information of fair value is to estimate the input value in the inactive market and with reference to other information. Because of this, the input value under such measurement condition has low credibility and is difficult to be recognized by investors, so the relevant information disclosed by it will not receive too much attention. In addition, the average investment efficiency of enterprises in 2009-2015 is 0.032, and there is a large difference between the maximum value of 0.331 and the minimum value of 0, indicating that there is a certain degree of difference in investment efficiency between listed companies that disclose information in accordance with fair value hierarchy.

B. Measurement and Calculation of Enterprise Investment Efficiency

Model (1) is adopted to measure the investment efficiency of enterprise, and the measurement results are shown in "Table III".

TABLE III.   ESTIMATION RESULTS OF INVESTMENT EFFICIENCY MEASUREMENT MODEL

Variable	A	B	C	D	E	F
Cons	0.009	0.005	0.035***	-0.072**	-0.040	-0.066**
$Invest_{t-1}$	0.042***	0.040***	0.040***	0.038***	0.036***	0.039***
Net		0.076***	0.083***	0.079***	0.085***	0.087***
Lev			-0.038***	-0.055***	-0.042***	-0.038***
Size				0.005***	0.004***	0.005***
Age					-0.002***	-0.002***
Q						0.001**
N	1910	1910	1910	1910	1910	1910
Adj.R^2	0.242	0.273	0.283	0.289	0.315	0.317
F	50.22	54.55	53.15	51.16	54.28	51.49
Prob>F	0.000	0.000	0.000	0.000	0.000	0.000

"Table III" shows the regression results of Richardson (2006) investment efficiency prediction model with the method of adding variables step by step. According to the regression results of Richardson (2006) in table 3, with the introduction of control variables one by one, the adjusted R2 is basically in the trend of slow growth, increasing slowly from the initial 0.242 to 0.317. From the perspective of the change degree of the whole model, the delayed introduction of investment has a great effect on the improvement of model fitting degree, which also indicates that investment is often very sticky. Because the Richardson model predicts the ideal investment level based on factors that affect the investment of the enterprise, in theory, the related variables of the model should be significantly correlated with the investment behavior, so that the model has a suitable estimation effect on the ideal investment status.

From the regression results of model F in table 3, it can be concluded that the regression coefficient of the previous phase investment (Invest t-1) is 0.039, which has a significant impact on the investment at the 1% level, indicating that the investment viscosity of the enterprise is large; the sum of net amounts of each asset (Nes) and investment behavior of enterprises is significant at the level of 1%, and the regression coefficient is 0.087, which has a greater impact on

the investment of enterprises. The more the net amounts of each asset, the greater the promotion effect on investment, which is consistent with the existing theory; the relevant coefficient of asset-liability ratio (Lev) is -0.038, which has a significant impact on the investment behavior at the 1% level, indicating that the capital structure is closely related to the investment behavior of listed companies, and the higher the asset-liability ratio is, the more restrained the investment behavior of listed companies will be; the factor of enterprise Size (Size) has a significant impact on enterprise investment at the level of 1%, with a coefficient of 0.005, showing a trend that the larger the enterprise is, the more the investment amount will be, this is in line with expectations; the Towbin q (q) variable is considered as an important indicator of investment opportunities. Although some scholars have questioned the accuracy of this statement, it is still widely used as an important reference for investment. Its correlation coefficient is 0.003, which has a significant positive correlation with investment at the level of 5%; the correlation coefficient of listed years (Age) is -0.002, which is negatively correlated with investment at the 1% level, indicating that the company may have experienced its rapid development period and its investment gradually decreased. Based on the above analysis, it can be concluded that the

investment amount of the first period of the listed company, the sum of the net amounts of each asset, the company size and Tobin q can promote the investment of the listed company. Among them, by observing the correlation coefficient of each variable, it is found that the investment amount in the previous period and the sum of net amounts of each asset have a greater influence on the investment of the enterprise, which indicates that the investment status of the enterprise is closely related to the previous investment and the net assets of the company; the listed time and asset-liability ratio of listed enterprises have negative effects on

the investment level of enterprises, which is consistent with the theory and reality. After analysis, the factors affecting the investment level of the enterprises are all significant and the direction of influence is the same as the expectation, and the adjusted R^2 is 0.317, which indicates that the model has a relatively high degree of fit and can effectively play the role of predictive estimation.

C. The Regression Analysis of the Model of the Relationship Between Fair Value and Investment Efficiency

TABLE IV.   THE FAIR VALUE HIERARCHY AND INVESTMENT EFFICIENCY

Variable	A (full sample)	B (under-investment)	C (over-investment)
Cons	13.45	8.98	9.33
Fva1	-4.25	-2.08	-3.68
Fva2	-2.15	-0.39	-1.93
Fva3	0.24	0.28	-0.79
Cash	-1.33	-0.23	-1.41
Orecta	4.44	4.77	2.04
Age	-1.72	-1.23	-1.69
Qwc	-1.72	-1.66	-0.58
N	1909	983	926
Adj.R2	0.024	0.025	0.027
F	7.84	4.72	4.78
Prob>F	0.000	0.000	0.000

In "Table IV", A shows the regression results of model (1) in terms of the sample of listed companies as a whole: the net assets disclosed in the first level of fair value are significantly correlated with the investment efficiency, and the Fva1 correlation coefficient is -0.015, which is significant at the 1% level. That is, the more net assets disclosed in the first level of fair value, the smaller the investment difference between the enterprise and the ideal investment, the higher the investment efficiency. It shows that the net assets disclosed at the first level of fair value have higher reliability, accurately and effectively disclose the relevant information of the enterprise, and improve the quality and transparency of financial information, which is conducive to the management to have an accurate understanding of the company and effectively improve the decision-making level. At the same time, it can reduce the level of information asymmetry between information users, avoid the moral risk and adverse selection caused by information asymmetry, and significantly reduce the degree of underinvestment or over-investment of enterprises. The conclusion effectively proves hypothesis H1. The correlation coefficient of Fva2 is -0.012, showing a significant correlation with the investment efficiency at the level of 5%. That is, the more the net assets disclosed at the second level of fair value, the smaller the deviation between the actual investment and ideal investment of listed companies, the higher the investment efficiency. This shows that the financial information disclosed by the listed company at the second level of fair value can effectively convey the true value of the enterprise and has the characteristics of reliability. It is similar to the net asset regression coefficient of the first level of fair value measurement and can increase the content of disclosure information. It can also reduce a series of problems caused by information asymmetry by

increasing the content of disclosed information, thus avoiding underinvestment or over-investment. This is consistent with the expected effect of the standard-making institution and related regulators on the reform of accounting standards. The conclusion strongly supports hypothesis H2. However, the estimated coefficient of Fva3 is not significant, which is inconsistent with the hypothesis H3. It can be concluded from the results that there is no significant correlation between the net asset of the fair value measurement at the third level and the investment efficiency, that is, the investment efficiency is not significantly affected by the measurement information at this level. Considering the fact that the net asset information measured at the third level occupies a relatively small proportion in the net asset information measured at the whole fair value, it is believed that the net asset information measured at this level is less reliable and accounts for a small proportion of information. The information user usually doesn't deliberately pay attention to this level of information based on the principle of cost-effectiveness, even if the proportion of relevant information disclosed by this level fluctuates to different degrees in financial statements. Due to its low verifiable degree, it will not attract too much attention from information users, and information users will naturally not have different predictions on the overall situation of accounting information disclosure. Therefore, information disclosed at this level is difficult to be utilized by information users, which will affect the investment efficiency.

In "Table IV", B shows the regression results of model (3) in terms of the underinvestment samples: the coefficient of Fva1 is -0.010, which is significantly negatively correlated with the underinvestment at the level of 5%, indicating that the enterprise's net assets measured at the first level of fair

value increase, the underinvestment phenomenon of the enterprise is lower. As the information disclosed at the first level of fair value keeps increasing, it provides information users with more reliable financial information to understand the actual operation of the enterprise. On the one hand, it helps to reduce financing constraints and helps management layer make investment decisions based on effective information. On the other hand, it is beneficial for stakeholders to learn more financial information to improve contracts and strengthen supervision to reduce opportunistic behaviors, and it is also beneficial for investors to make rational decisions in line with actual conditions. The conclusion supports hypothesis H1a. However, both Fva2 and Fva3 coefficients are not significant, indicating that the application of fair value information at the second and third levels has no impact on the under-investment of enterprises, and the conclusion don't support hypothesis H2a and hypothesis H3a. Although analysts can effectively improve the content of the second and third levels of accounting information, the generation of rent-seeking behavior and the artificial participation of the second and third levels of fair value measurement mode make the information users still hold a cautious attitude towards the accounting information at these two levels, and make them attach little importance and trust to the third level of measurement information. Therefore, in the layering information of fair value, only the first level of fair value information can significantly reduce the underinvestment phenomenon of enterprises, while the second and third levels of fair value information have no significant impact on the underinvestment.

In "Table IV", C shows the regression results of the model (5) in terms of the over-investment samples: the estimated coefficients of Fva1 and Fva2 are negative and significant at the level of 1% and 10% respectively, which indicates that the net asset information measured at level 1 and level 2 has a negative correlation with the over-investment of listed companies. That is, as the disclose information of these two levels increases, the over-investment phenomenon decreases accordingly. This result indicates that the net asset information measured at the first level of fair value has reliability characteristics, which is helpful for transmitting more accurate, rich and effective information to information users, and helps information users to reasonably estimate the real value of the enterprise and the actual situation of the project and make reasonable decisions. At the same time, it also shows that the second level of fair value measurement information can effectively disclose relevant information and has two effects due to the cautious attitude of information users: on the one hand, it draws the attention of stakeholders to the management behavior to reduce the moral risk; on the other hand, due to more attention, the management is more cautious in using this level of accounting information, which is helpful for managers to rationally understand the current situation of enterprises and projects and ensure reasonable investment. In general, the fair value measurement information at level 1 and level 2 plays a greater role in effectively preventing over-investment, which is consistent with the hypothesis H1b and H2b. In addition, from the perspective of the correlation coefficient and significance of Fva1 and Fva2,

the absolute value of the coefficient of Fva1 is higher than the absolute value of the coefficient of Fva2, and in the significance aspect, Fva1 is more significant, indicating that there is more obvious negative correlation between the fair value measurement information at the first level and overinvestment, the first level of fair value measurement information can provide more reliable information, and information users have higher trust in the first level of fair value information. However, Fva3 coefficient is not significant, which is inconsistent with the hypothesis H3b. The empirical results show that when the relevant information measured at the third level of fair value increases, it will not have a significant impact on the over-investment phenomenon of enterprises. It is believed that because the quantity of information measured at the third level of fair value is small and the reliability is low, it has not received the attention of information users and has little impact on the investment decision of enterprises.

TABLE V.   FAIR VALUE MEASUREMENT AND INVESTMENT EFFICIENCY

Variable	Coefficient	Standard error	T value	P
Constant	0.047***	0.004	13.28	0.000
Net	-0.015***	0.003	-5.27	0.000
Cash	-0.010	0.008	-1.29	0.202
Orecta	0.129***	0.029	4.58	0.000
Age	-0.00003	0.0002	-2.17	0.032
Qwc	-0.006	0.006	-1.59	0.115
N	1910		Adj.R^2	0.026
F	10.88		Prob>F	0.000

At the same time, the regression results of model (5) on 1910 samples are showed in "Table V". The empirical results show that the estimated coefficient of Net is -0.015, showing a significant positive correlation with the investment efficiency of listed companies at the 1% level. That is, the more net asset information disclosed by fair value, the higher the investment efficiency level of the enterprise, which is consistent with hypothesis H4. This shows that from the overall perspective of the information disclosed by the fair value measurement model, the first and second level of information disclosed by China's listed companies at different levels of fair value has a greater impact on the investment efficiency, while the third level has a smaller impact on the investment efficiency. This also shows that the net assets measured by fair value are sufficiently reliable to effectively disclose relevant financial information to enhance the transparency of financial statements, thereby improving the investment efficiency of enterprise. This conclusion is also consistent with the conclusion that the measurement information at the third level of fair value has no significant influence on the investment efficiency. In addition, the F values of the models are all significant at the 1% level, indicating that the model design is reasonable. In conclusion, the conclusion of study strongly supports the hypothesis H4, that is, on the whole, the net assets measured by fair value can help mitigate the information asymmetry and agency problems among all parties of the listed companies in China, so that fair value measurement information can have a positive impact on the investment efficiency of listed companies.

TABLE VI.   FAIR VALUE MEASUREMENT, MANAGEMENT SHAREHOLDING AND INVESTMENT EFFICIENCY

Variable	Coefficient	Standard error	T value	P
Constant	0.041***	0.004	10.43	0.000
Net	-0.013***	0.003	-4.22	0.000
Dir*Net	-15.051**	6.758	-2.24	0.027
Cash	-0.012	0.008	-1.63	0.107
Orecta	0.127***	0.028	4.54	0.000
Age	-0.00006	0.0002	-0.35	0.733
Dir	0.038***	0.009	3.97	0.000
Qwc	-0.006	0.006	-1.12	0.268
N	1910		Adj.R2	0.034
F	10.39		Prob>F	0.000

The regression results of model (6) on 1910 samples are presented in "Table VI". The empirical results show that the estimated coefficients of net assets of fair value measurement and the cross term of net assets of management shareholding and fair value measurement are -0.012 and -15.050 respectively, which are significant at the level of 1% and 5%. That is, management shareholding has a positive adjustment effect on the relationship between fair value measurement and investment efficiency, and the assumption that H5 is proved. This indicates that when the shares held by the management layer are increasing, the interests of the management layer and the maximization of corporate interests tend to be the same. On the one hand, managers will make more accurate and effective decisions based on the accounting information disclosed by fair value; on the other hand, information disclosed by fair value enables external stakeholders to correctly understand the investment behavior of enterprises and management layer and reduce the degree of information asymmetry. To a certain extent, it contributes to the injection of funds and accurate, rapid and centralized decision-making of management layer, and helps management grasp business opportunities to improve investment efficiency, which is consistent with relevant statements of Jensen and Mecking (1976). At the same time, the F value of this model is 10.38, which is significant at the 1% level, indicating that the model (6) can effectively express the relationship between related variables.

D. Robustness Test

To reduce the prediction bias of the investment efficiency prediction model, the robustness test is conducted on the model of the impact of the overall situation of fair value measurement on the investment efficiency. The absolute value of the difference between the actual investment amount and the ideal investment amount is divided into three groups, and the intermediate group samples are subjected to regression detection. After that, the test results of the samples are compared with the test results of model, and the results show that the conclusion remains unchanged. Specific test results are shown in "Table VII":

TABLE VII.   FAIR VALUE MEASUREMENT, MANAGEMENT SHAREHOLDING AND INVESTMENT EFFICIENCY

Variable	Coefficient	Standard error	T value	P
Constant	0.089	0.008	12.34	0.000
Net	-0.018	0.007	-2.52	0.013
Cash	-0.031	0.017	-1.91	0.060
Orecta	0.182	0.050	3.66	0.000
Age	-0.0007	0.0003	-2.28	0.024
Qwc	-0.007	0.011	-0.58	0.572
N	637		Adj.R2	0.035
F	5.15		Prob>F	0.000

"Table VII" presents the results of the robustness test, and the conclusion remains unchanged through the comparative analysis with the empirical results of the model.

V.   CONCLUSION

Combined with the empirical results of the above models, the first and second level measurement of fair value can help to improve the quality of accounting information, mitigate the information asymmetry among the contracting parties and agency problems, and further improve the investment efficiency, which is consistent with the previous theoretical analysis and empirical evidence of Biddle, etc. In addition, from the perspective of control variables, capital held by major shareholders (Orecta) is negatively correlated with the over-investment and underinvestment of the company. This means that when the majority shareholder has more funds, the compensation contract based on its own interests lacks sufficient compensation effect and incentive effect for the management and give of the management layer, which easily leads to the opportunistic behavior of the operator, leading to unreasonable investment in enterprises, especially the management's excessive investment; in model (2) and (3), the estimated coefficient of Ownership Concentration (Qwc) is negative, which is significant at 10% level. When the degree of equity concentration increases, the interests of major shareholders and the maximization of the enterprise value gradually converge, which is beneficial to improve the investment efficiency of the enterprise to some extent; the estimation coefficient of the listed years (Age) of the enterprise is relatively small. As the listed years of enterprise increase, information users are more aware of the overall operation of the company, so they are less affected by information asymmetry. In general, enterprises that have been listed for a long time have already passed the high-speed development period. To ensure the normal and stable development of enterprises, all stakeholders will pay more attention to the investment situation of enterprises to ensure the efficiency of enterprise investment.

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