ISSN 2616-5902 Vol. 3, Issue 5: 95-106, DOI: 10.25236/AJBM.2021.030516

Fair Value Measurement Model for Investment Real Estate and Rationality of Management Compensation

Fei Xie[1, *]

[1]School of Management, Shanghai University, Shanghai, China
**Corresponding author*

Abstract: *In this paper, I mainly investigate the relationship between the fair value measurement model for investment real estate and the rationality of management compensation, and further examine the correlation between the overall education background of a company's management and the tend of them to introduce the fair value measurement model for investment real estate. I have conducted empirical studies using data from China's A-share listed companies in Shanghai and Shenzhen stock markets that owned investment real estates from 2013 to 2018. Consistent with my hypotheses, I find that: (1) using fair value to measure investment real estate will reduce the rationality of management compensation; (2) the better the overall education background of a company's management is, the less inclined they are to use fair value to measure investment real estate.*

Keywords: *fair value measurement model, investment real estate, management compensation*

1. Introduction

1.1. Research Background

As the trend of pursuing the convergence of accounting standards became more and more popular, China formally added fair value measurement model to the "Accounting Standards for Enterprises" in 2006. This decision was of great reform significance. It indicated that Chinese accounting standards were getting in line with international ones, and it also marked that China's financial reporting system had shifted from the past emphasis on information reliability and profit to weighing accounting information reliability and relevance, meanwhile emphasizing the development of asset-liability view. Among them, the "Accounting Standards for Enterprises No.3 – Investment Real Estates" accounted for investment real estate as an independent asset item for the first time, and proposed that investment real estate had two follow-up measurement models: cost model and fair value model.

Due to the increasing maturity of China's market-oriented economy, the real value of an enterprise is expected to be accurately and timely reflected. It is no longer enough appropriate to use cost model to measure enterprise-related assets. Especially in the rapid development of China's real estate industry and frequent real estate price fluctuations, under which circumstances the cost model measurement has become even more contrary to the market dynamic. On the other hand, the land area occupied by real estates are scarce resources, thus the value of real estates should gradually increase over time. Therefore, the measurement of investment real estate according to historical cost model cannot meet the needs of enterprises and the market well, so the fair value model has been placed high hopes on since its birth. In addition, due to the particularity of investment real estates (which have value preservation and appreciation as well as investment risks), their value will inevitably respond to market fluctuations, resulting in the historical cost model not being able to feed back its value changes in time, nor can it satisfy the complexity of value requirements. If the fair value model is used for measurement, it can reflect the current value of investment real estates in a timely and fair manner, thus reflecting the advantages of the dynamic measurement attribute of fair value: it can effectively improve the relevance and decision-making usefulness of financial information. Due to the relatively late start of the real estate market in China, and the fact that there are relatively unbalanced developments in different regions and imperfect market systems, the fair value measurement model's application to investment real estates presents many difficulties: complicated accounting treatments, difficulties in valuation, constraints of traditional concepts, etc. As a result, many Chinese enterprises still doubt the possibility of introducing such a specific fair value model. Although the theoretical researches on the fair value measurement model for investment real estate have made some progress in recent years, empirical researches related to it are

ISSN 2616-5902 Vol. 3, Issue 5: 95-106, DOI: 10.25236/AJBM.2021.030516

relatively scarce.

In addition, the mismatch between the increase of management compensation and the growth of the company's performance, and the incoordination between the increase of management compensation and the growth of normal employees' wages have become hot topics of discussion in all walks of life recently. In the modern company system, to solve the agency problem caused by the separation of ownership and control, lessen the moral hazard of management, reduce agency costs, and protect the rights and interests of shareholders, one effective way is to link company performance with management compensation. Investment real estates are relatively important and frequently changing assets, thus the change in their measurement method will inevitably lead to changes in the business status of the company to a certain extent, thereby affecting the management's performance evaluation and compensation. As a result, the relevant analysis of the rationality of management compensation when companies adopt different measurement models for investment real estates is a topic worthy of research.

1.2. Research Significance

1.2.1. Theoretical Significance

Accounting has always been self-improving and reforming along with the development of the economy, so the generation of fair value has also confirmed the inevitable development of economy. At the same time, fair value can measure the economic prosperity of society to a certain extent. Although China was also affected by the global financial crisis in 2008, the data released by the Data Center of the National Bureau of Statistics showed that although China's GDP growth rate declined compared with the previous years, the overall rate remained at a high level of 9.63%. After the outbreak of the financial crisis, China underwent a process of adopting, discarding, and finally re-adopting the fair value model for the follow-up measurement of investment real estates, which was of course inseparable from the changes in the economic environment at that time.

Now fair value has finally been recognized worldwide. Although the change of accounting theory cannot completely reverse the economic crisis, perfecting accounting standards and reforming accounting will undoubtedly continuously promote orderly development of the market economy. With the vigorous development of the real estate market in today's China, it is urgent for us to seize the opportunity to improve and deepen the relevant theoretical researches on the fair value measurement of investment real estates, so as to make the reported ending value of investment real estates more capable of providing report users with useful information and make the fair value measurement model more smoothly implemented in China, thus ensuring that the model can show a relatively true and fair view of the assets' value. At the same time, the use of fair value measurement for investment real estates will greatly affect the company's performance, thereby increasing the company's attention to the rationality of management compensation. The research in this paper will provide specific analyses and relevant evidences for the relationship between the fair value measurement model for investment real estate and the rationality of management compensation.

1.2.2. Practical Significance

The research results of this paper will provide powerful reference evidences for enterprises. This paper will mainly use empirical research methods to analyze in detail the relationship between the fair value measurement model for investment real estate and the rationality of management compensation. Companies can draw considerations related to the rationality of management compensation from the conclusions of this paper, and generate a deeper understanding of the trend of companies gradually accepting the fair value measurement model. At the same time, this paper will also provide useful reference opinions on how to examine the rationality of management compensation for relevant financial information users and give suggestions for people from various fields.

1.3. Research Contents and Framework

This paper mainly focuses on the research on the relationship between the fair value measurement model for investment real estate and the rationality of management compensation. On the basis of theoretical exposition, the method of Wu et al. (2010) will be used for reference to establish a management compensation decision model. The relative difference between the reported management compensation and the one obtained by calculating through the management compensation decision model mentioned before reflects the degree of management compensation irrationality. Subsequently, this paper puts the relevant variables of the rationality of management compensation and the fair value

ISSN 2616-5902 Vol. 3, Issue 5: 95-106, DOI: 10.25236/AJBM.2021.030516

measurement model for investment real estate into the model, and adds the control variables to obtain the influence of the enterprise's use of fair value to measure investment real estates on the rationality of management compensation. Then, empirical analyses were carried out to verify the hypotheses put forward in this paper, so as to draw expected conclusions and put forward corresponding suggestions.

The paper is organized as follows. Section 1 mainly summarizes the research background and significance, and states the research contents and framework of this paper. Section 2 sorts out and reviews relevant literature at home and abroad, and proposes research hypotheses. Section 3 describes samples, data resources and variables and establishes related models. Section 4 includes empirical analyses such as descriptive statistical analyses, correlation analyses and regression testing, and specific analyses and discussions of the empirical results. Finally, Section 5 concludes and gives suggestions.

2. Literature Review and Hypotheses

2.1. Foreign Literature Review

2.1.1. Choice of Measurement Models for Investment Real Estate

The choice of measurement models for investment real estate is essentially a matter of choosing accounting policy. Researches on the relevant factors that affect this choice have been carried out abroad since the last century.

Dietrich et al. (2000) studied the reliability of the mandatory use of fair value measurement model for investment real estate in the UK. The results showed that the fair value measurement model using estimated value was conservative to the actual sales price. What's more, it could measure investment real estate more unbiasedly and accurately than historical cost to a large extent.

Francesco (2004) studied seven European companies owning investment real estates and found that under the fair value measurement model, the income changed with the market prices and showed a characteristic of instability. Meanwhile, because historical cost measurement model continued to use the initially recorded cost, which was more conducive to even corporate income, it could effectively prevent large fluctuations in income. Therefore, in order to make their business performance more stable, the companies' management mainly chose the historical cost model for the follow-up measurement of investment real estate.

Muller et al. (2008) studied the reasons and results of the European real estate industry's decision to disclose the fair value of investment real estate before the IFRS made it mandatory to disclose such information. They found that companies with higher information transparency would be more inclined to choose the fair value measurement model, but failed to prove that the universal adoption of fair value accounting mandatory by IFRS would make information more symmetrical.

Christensen and Nikolaev (2009) conducted a study on 1539 companies in the UK and Germany, discovering that real estate companies at that time mainly used historical costs to measure investment real estate because this measurement model had more contractual validity than the fair value one. The ability to borrow money was an important factor in the choice of measurement mode. The study also found that most companies that choose to measure investment real estates by fair value were those whose main business was investment real estate.

Quagli and Avallone (2010) selected the real estate companies of Finland, France, Germany, Greece, Italy, Spain and Sweden, the first seven countries which introduced IFRS, as their research samples, using a multiple logistic model, and finally found that information asymmetry, contract efficiency and management opportunism would cause companies to choose fair value to measure investment real estate.

2.1.2. Consequences of Choosing the Fair Value Measurement Model for Investment Real Estate

Herrmann, Saudagaran and Thomas (2002) used real estates, factories and equipments as research objects and analyzed the impact of choosing fair value measurement model for these assets on the reliability and relevance of accounting information. The research results showed that the adoption of the fair value measurement model provided a guarantee for the reliability and relevance of accounting information.

Lourenço and Curto (2008) conducted empirical tests on real estate companies in France, Sweden, and the UK, and found that investors in the market could clearly distinguish among the confirmed cost and fair value of investment real estates and the disclosed fair value of them, but they couldn't distinguish

ISSN 2616-5902 Vol. 3, Issue 5: 95-106, DOI: 10.25236/AJBM.2021.030516

the meaning of the confirmed fair value of investment real estates.

Muller, Riedl, and Sellhorn (2011) examined whether companies that were forced to adopt a fair value model to measure investment real estate could reduce the information asymmetry in the market. The results showed that the mandatory use of fair value measurement models could help reduce this situation, thereby effectively improving the investment environment of market participants. The research also compared the companies that voluntarily adopted the fair value measurement model with those that are forced to adopt it, and found that the information asymmetry of those that voluntarily adopted the model could be reduced to a greater extent. At the same time, the research also concluded that companies that voluntarily provided fair value information of investment real estate were more willing to hire large accounting firms to audit the company, so the complexity of their asset portfolio was relatively low.

2.1.3. Impact of Corporate Performance on Management Compensation

Taussins and Baker (1925) were the first to study the relationship between management compensation and corporate performance. They found that the correlation between corporate managers' compensation and corporate performance was very little.

Subsequently, Mcguire, Chiu and Elbing (1962), Rosen (1982), Clinch (1991) studied the impact of corporate performance on management compensation from the perspectives of the sensitivity and performance response coefficients of salary based on data in different periods. They found that accounting performance had a greater impact on management compensation than market performance. This was because accounting performance was relatively less affected by market uncertainties, so it could reflect the management's performance more accurately.

2.2. Domestic Literature Review

2.2.1. Choice of Measurement Models for Investment Real Estate

Luo et al. (2009) conducted a statistical analysis of 617 companies with investment real estate projects and found that 600 (97.24%) of them used the cost model to measure investment real estate, while only 17 (2.76%) chose fair value model. They believed that the main reason was that there were still certain defects in the domestic investment market, resulting in its insufficiency to ensure that objective and accurate fair value information could be obtained. As market conditions gradually becomes mature, China is introducing the fair value measurement model little by little.

Wu (2012) believed that companies should select investment real estate measurement models based on their development strategies. For companies in the expansion stage, the adoption of fair value measurement model could help companies allow investors to see their development, thereby obtaining more investment funds and maintaining investors' confidence. For companies in a stable period, the use of cost model could ensure their steady profitability and absorption of investment, and could protect the rights and interests of shareholders to a larger extent.

Hou, Li and Guo (2013) found that the higher the degree of a company's marketization was, the less likely it was to choose fair value model to measure investment real estate. When a company's financial leverage was higher, it would be more willing to choose fair value model. The development of the fair value measurement model in China was affected by the asymmetry of market information and loan contracts. The paper recommended to reform the financial market to make investment real estate develop more healthily.

Zhu (2013) conducted a research on the selection of investment real estate measurement models for state-owned companies. The author believed that state-owned enterprises had obvious advantages over ordinary ones in choosing fair value measurement model. This was because state-owned enterprises were more stable and easier to attract talents, so they were more capable of overcoming the difficulties of obtaining fair value.

Xu (2015) believed that the fair value measurement model was more in line with the trend of the accounting industry, but the cost model still had areas difficult to be replaced. The cost model could perfectly fit the principle of prudence, smooth the profits of listed companies, and comply with China's relevant policies on real estate regulation. In contrary, the flaw of fair value measurement model was very obvious: the reliability of assessed value was low. Therefore, the cost model would still remain the mainstream of the real estate enterprises' application model in China.

Shen (2018) believed that there were two main reasons for the difficulty in obtaining fair value. Firstly, the development of China's real estate market was not comprehensive enough. Secondly, the real estate

ISSN 2616-5902 Vol. 3, Issue 5: 95-106, DOI: 10.25236/AJBM.2021.030516

valuation technology was not perfect. The author made several suggestions for the application of fair value measurement model: different valuation methods could be used for various types of real estate; different valuation methods could be selected according to enterprises' levels in the market; the same investment real estate should be valuated by using two or more valuation methods at the same time to ensure the accuracy of valuation.

2.2.2. Consequences of Choosing the Fair Value Measurement Model for Investment Real Estate

Pan and Qu (2007) believed that there were three aspects of impact of using investment real estate fair value measurement model on a company. First, the use of this measurement model would improve the financing capacity of real estate companies, which would ease their condition of capital shortage. Second, the use of this measurement model would enable companies to achieve profit growth without causing excessive profit fluctuations. Third, the usage of fair value measurement would not increase the substantial taxation of the enterprise, thus not increasing tax burden.

Zhang (2010) believed that ST and *ST companies had greater incentives to use fair value measurement models, because when the profit on the changes in fair value was huge, these companies could turn losses into profits in terms of accounting figures. These companies could use new earnings management methods to create book profits in order to avoid delisting through taking advantage of the option of accounting measurement attributes.

Zhang, Zhang and Dai (2011) took Beijing North Star Company Limited as their research object and found that during the period of rising housing prices, adopting fair value measurement model would greatly increase the book value of investment real estate and aggravate the fluctuation of the company's current net profit. The authors had the following revelation: companies should weigh the information disclosure cost and regulatory cost of fair value measurement model. Meanwhile, in the process of advancing and implementing the investment real estate fair value model, the supervisory authority should evaluate the costs of implementing fair value measurement and the costs and gains of information disclosure.

Zou, Wang and Wu (2013) conducted research on Jinbin Development and companies in the same industry and region. They found that Jinbin Development beautified its main financial indicators to a certain extent through using fair value model to measure investment real estate, thus improving its external financing capabilities.

Li (2015) believed that when a company's investment real estate accounted for a large proportion of its total assets, the management's choice of accounting policies would have relatively larger economic consequences. The fair value measurement model would cause the instability of profits in the long run, but in the short run it could quickly increase the profits of the company's statements, thus playing the role of dressing up performance. The short-term accounting consequences caused by the selection of the fair value measurement model were likely to be internalized into personal interests, which would cause adverse economic consequences for the enterprise. On the contrary, the reason why most Chinese enterprises evaded the fair value measurement model was to take into account the negative economic consequences of this model for the long-term development.

2.2.3. Impact of Corporate Performance on Management Compensation

In the early research, the domestic literatures didn't reach a consistent research conclusion on the impact of corporate performance on management compensation. Wei (2000) and Li (2003) failed to find a significant correlation between the management compensation and corporate performance of China's listed companies. However, Liu et al. (2003) found that the sensitivity of management compensation of China's listed companies to corporate performance was gradually increasing. The inconsistency of research results was because the management compensation data at that time was not compulsorily required to be disclosed in China, which made it difficult to accurately measure the actual compensation level of management in the research, thus further leading to different conclusions among scholars.

The China Securities Regulatory Commission issued a new "Corporate Financial Reporting Disclosure Standards" in 2005, which clearly requires listed companies to "disclose the total compensation (including basic salaries, various bonuses, benefits, subsidies, housing allowances and other allowances, etc.)". Since then, the necessary data for research on management compensation have been fully improved.

Tan and Zheng (2013) used a second-order factor analysis model to study the impact of the management compensation, profitability, operating ability, debt solvency, and growth ability of listed agricultural companies on their performance. The results showed that listed agricultural companies'

ISSN 2616-5902 Vol. 3, Issue 5: 95-106, DOI: 10.25236/AJBM.2021.030516

management compensation was related to performance.

Li (2014) used A-share listed companies' data from 2006 to 2011 to conduct an empirical analysis. The results showed that corporate managers' compensation levels were positively correlated with ROA, cash flow-to-asset ratio, and asset scale, while negatively correlated with asset-liability ratio and cash flow-debt ratio. Under different asset scales, the relationship between the salary level of a company's managers and the rate of return on total assets and asset-liability ratio was different.

Fu (2017) studied A-share companies listed in Shanghai and Shenzhen stock markets that had fair value changes from 2011 to 2015. The results showed that the fair value changes of state-owned enterprises had no significant impact on management compensation, while those of none state-owned enterprises had a positively significant impact.

Wang and Yang (2019) believed that China's listed companies generally had the phenomenon of decoupling management compensation from performance and insufficient performance sensitivity of management compensation. The capital market regulators should strengthen supervision and timely introduce relevant policies to guide listed companies to establish appropriate management compensation system to improve its governance capability.

2.2.4. Total Research Review

In summary, foreign real estate markets are more mature than China's, and the use of fair value for follow-up measurement of investment real estate has become the mainstream there. However, the application of fair value in the measurement of investment real estate is still in the exploratory stage in China, where most companies still tend to adopt cost measurement model. Although Chinese scholars have achieved significant results in the researches on the fair value measurement model for investment real estate in the past ten years, most studies focused more on theoretical research, and the research methods were basically limited to case analyses. There were only a few scholars who exercised empirical research.

In addition, due to the late implementation of mandatory disclosure of management compensation in China, the accuracy of China's management compensation related research has been significantly improved after 2005. There are many domestic and foreign researches on the impact of corporate performance on management compensation, but there are few literatures that combine the gains and losses of changes in fair value with management compensation for empirical analysis, and there is no literature on the impact of the use of the fair value model for investment real estate on management compensation rationality.

2.2.5. Hypotheses

When a company uses fair value to measure investment real estate, it will cause a significant change in its accounting performance. As accounting performance has a significant impact on management compensation, the fair value measurement model will affect management compensation to a certain extent. However, the qualitative impact of the conversion of this measurement model on the rationality of management compensation is uncertain. Based on the above analysis, this paper proposes hypothesis 1:

H1: The use of fair value to measure investment real estate will affect the performance evaluation of managers, thereby affecting the rationality of management compensation.

Whether a company uses fair value to measure investment real estate is mainly determined by its management, and each company's management's overall education background is different. Highly educated management may be more cautious of the impact of accepting the new measurement model and fully consider its shortcomings and advantages in both long run and short run so that the company can remain stable. Therefore, this paper proposes hypothesis 2:

H2: There is a negative correlation between the company's management's overall education background and their willingness to introduce fair value to measure investment real estate.

3. Research Design

3.1. Data

The samples of this paper are China's A-share listed companies in Shanghai and Shenzhen stock markets that owned investment real estates from 2013 to 2018. In order to ensure the reliability of the

ISSN 2616-5902 Vol. 3, Issue 5: 95-106, DOI: 10.25236/AJBM.2021.030516

data, I have filtrated the samples according to the following criteria:

(1) Exclude ST and *ST companies to avoid extreme values in the research variables that will affect the statistical results. ST and *ST companies may have a series of problems in operation and management. Faced with pressure from all walks of life, it will increase their motivation to whitewash their financial statements. The lack of reliability of their financial data is likely to reduce the explanatory capability of the research models.

(2) Exclude the samples of listed companies in the financial industry and real estate industry.

(3) Exclude the samples of listed companies with incomplete management-related data and financial indicator data, as well as the samples that were listed in the exact sample year.

The samples' data mainly come from the CSMAR database and the Wind database. The data processing software for empirical analyses is Stata 15.0. In order to avoid the results from being affected by abnormal values, this paper performs Winsorize up and down 1% processing on continuous variables.

3.2. Variable Design and Models

The rationality of management compensation is not only related to the actual salary amount in the current period, but also related to the theoretical compensation level. This paper uses the management compensation decision model of Core, Holthausen and Larcker (1999) for reference and makes appropriate modifications, thus adopting the following model:

$$Ln(MC1)_{i,t} = \alpha_0 + \alpha_1 SIZE_{i,t} + \alpha_2 LEV_{i,t} + \alpha_3 SPR_{i,t} + \alpha_4 GROW_{i,t} + \alpha_5 CENTR_{i,t} + \alpha_6 WEST_{i,t} + \alpha_7 CBD_{i,t} + \alpha_8 BDS_{i,t} + \alpha_9 CON_{i,t} + \varepsilon_{i,t} \quad (1)$$

After linear regression of model (1), the obtained parameter values and relevant actual data of each company are substituted into the right side of model (1) to obtain the theoretical annual management compensation Ln(MC2).

With Ln(MC1) and Ln(MC2), we can get:

$$RMC_{i,t} = | Ln(MC2)_{i,t} - Ln(MC1)_{i,t} | \quad (2)$$

To discover the relationship between the fair value measurement model for investment real estate and the rationality of management compensation, other variables must be controlled at the same time. In order to test H1, the following model is run using Ordinary Least Squares (OLS):

$$RMC_{i,t} = \beta_0 + \beta_1 FV_{i,t} + \beta_2 IPA_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 LEV_{i,t} + \beta_5 SPR_{i,t} + \beta_6 GROW_{i,t} + \beta_7 CENTR_{i,t} + \beta_8 WEST_{i,t} + \beta_9 CBD_{i,t} + \beta_{10} BDS_{i,t} + \beta_{11} CON_{i,t} + \Sigma YEAR_{i,t} + \Sigma INDUSTRY_{i,t} + \varepsilon_{i,t} \quad (3)$$

Aiming at the correlation test between the education background of the company's management and its use of fair value to measure investment real estate, this paper uses OLS to run the following model:

$$YEARS_{i,t} = \delta_0 + \delta_1 EB_{i,t} + \delta_2 IPA_{i,t} + \delta_3 SIZE_{i,t} + \delta_4 CENTR_{i,t} + \delta_5 WEST_{i,t} + \delta_6 LEV_{i,t} + \delta_7 MTB_{i,t} + \delta_8 STATE_{i,t} + \delta_9 ROA_{i,t} + \delta_{10} IPO_{i,t} + \delta_{11} RMC_{i,t} + \Sigma YEAR_{i,t} + \Sigma INDUSTRY_{i,t} + \varepsilon_{i,t} \quad (4)$$

For the description of all variables, see in Table 1 below.

Table 1: Variable definitions

Variables	Variable Concept	Variable Measurement
Ln(MC1)	Actual management compensation	The natural logarithm of management compensation in the final financial report
Ln(MC2)	Theoretical management compensation	Calculated by model (5)
RMC	Degree of management compensation's irrationality	The absolute value of Ln(MC2) minus Ln(MC1)
FV	Fair value measurement model	Dummy variable: equals 1 when the gains and losses from changes in fair value include investment real estate as a secondary subject, 0 otherwise
IPA	Scale of investment real estate	The amount of investment real estate as a percentage of total assets
SIZE	Enterprise scale	The natural logarithm of total assets
LEV	Financial leverage	Liabilities divided by total assets
SPR	Sales margin	Net profit divided by sales revenue
GROW	The growth rate of sales	The difference between the current period and the previous period's sales revenue divided by the previous period's sales revenue
CENTR	Central region	Dummy variable: equals 1 when the company was registered in central China, 0 otherwise

ISSN 2616-5902 Vol. 3, Issue 5: 95-106, DOI: 10.25236/AJBM.2021.030516

WEST	Western region	Dummy variable: equals 1 when the company was registered in western China, 0 otherwise
CBD	Combination of CEO and Chairman	Dummy variable: equals 1 if the CEO and chairman of the company are the same person, 0 otherwise
BDS	Size of the Board	Total number of board members
CON	Management shareholding ratio	The proportion of management holdings to the total number of shares
YEARS	The number of years using fair value to measure investment real estate	Report year minus the year in which the company began to measure investment real estate by fair value
EB	Education background of the management	Proportion of management staff with a master's degree or above
MTB	Market-to-book ratio	The total market value of owners' equity divided by the book value of it at the end of the period
STATE	Nature of property rights	Dummy variable: equals 1 when the listed company is a state-owned property right or state-owned holding company, 0 otherwise
ROA	Return on assets	Net profit after tax divided by total assets
IPO	Listed days	Report date minus IPO date
YEAR	Report year	Dummy variable of report year
INDUSTRY	Industry which belongs to	Dummy variable of industry

The statistical analysis methods used in this paper include: descriptive statistics, hypotheses testing, correlation analyses and regression analyses.

4. Empirical Analyses

4.1. Data Processing

By processing and regressing the relevant variables of model (1), this paper draws the following management compensation decision model for obtaining Ln(MC2):

$$\begin{aligned} Ln(MC2)_{i,t} = {} & 8.253863 + 0.3068719\ SIZE_{i,t} - 0.2924694\ LEV_{i,t} - 0.0012951\ SPR_{i,t} \\ & + 0.0002841\ GROW_{i,t} - 0.157566\ CENTR_{i,t} - 0.1281875\ WEST_{i,t} \\ & - 0.0099809\ CBD_{i,t} + 0.0375503\ BDS_{i,t} + 0.230532\ CON_{i,t} \end{aligned} \quad (5)$$

After using model (5) to obtain Ln(MC2), I get RMC required in the subsequent analyses by substituting Ln(MC1) and Ln(MC2) into model (2).

4.2. Descriptive Statistics

Table 2 lists the descriptive statistical results of the main variables. The mean (median) value of RMC is 0.456 (0.379), while its minimum (maximum) value is 0.007(1.623). There is a huge difference between the extreme values, indicating that different companies have obvious differences in the rationality of management compensation. The average (median) value of FV is 0.040 (0), indicating that Chinese companies don't tend to use fair value to measure investment real estate. The values of other variables are within a reasonable range.

Table 2: Descriptive Statistics

Variable	Mean	Median	Std.Dev.	Min	Max
RMC	0.456	0.379	0.343	0.007	1.623
FV	0.040	0	0.195	0	1
IPA	0.022	0.006	0.040	0.000	0.306
SIZE	22.683	22.483	1.288	20.120	26.657
LEV	0.466	0.470	0.192	0.061	0.896
SPR	0.076	0.056	0.107	-0.536	0.633
GROW	0.137	0.085	0.308	-0.510	2.446
CENTR	0.130	0	0.336	0	1
WEST	0.122	0	0.328	0	1
CBD	0.206	0	0.405	0	1
BDS	8.875	9	1.728	5	15
CON	0.059	0.000	0.126	0	0.572
YEARS	0.217	0	1.163	0	11
EB	0.440	0.467	0.268	0	1
MTB	3.063	2.393	2.457	0	36.605
STATE	0.550	1	0.498	0	1
ROA	0.040	0.034	0.049	-0.555	0.43
IPO	5158.726	5514	2376.142	0	10248

ISSN 2616-5902 Vol. 3, Issue 5: 95-106, DOI: 10.25236/AJBM.2021.030516

4.3. Correlation Analyses

Through the analysis of Pearson correlation in Table 3 below, this paper discovers that the correlation coefficient between FV and RMC is 0.041, which is significant at the 5% level, indicating that the management compensation of companies that use fair value to measure investment real estate is more likely to be irrational. The correlation coefficient between Years and EB is significant at the 10% level, showing that there is a correlation between the two variables. The absolute values of other variables' correlation coefficients are under 0.5 on the whole with only three exceptions, indicating that there is no serious multicollinearity among the variables.

4.4. Regression Testing

Table 4: Rationality of management compensation and fair value measurement model

RMC	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
FV	0.050	0.029	1.76	0.078	-0.006	0.106
IPA	-0.048	0.143	-0.34	0.735	-0.348	0.231
SIZE	0.029	0.005	5.48	0.000	0.019	0.040
LEV	0.092	0.035	2.60	0.009	0.023	0.161
SPR	0.298	0.055	5.46	0.000	0.191	0.405
GROW	-0.025	0.018	-1.44	0.149	-0.060	0.009
CENTR	-0.007	0.016	-0.42	0.672	-0.038	0.025
WEST	-0.011	0.017	-0.63	0.526	-0.043	0.022
CBD	0.026	0.014	1.92	0.054	-0.001	0.053
BDS	-0.003	0.003	-0.77	0.440	-0.009	0.004
CON	-0.157	0.046	-3.44	0.001	-0.247	-0.068
_cons	-0.240	0.112	-2.14	0.032	-0.460	-0.021
R-squared	0.035					
Adj R-squared	0.032					

Table 4 shows the regression results of model (3), where the regression coefficient of FV is 0.050, which is significant at the 10% level, indicating that the fair value measurement of companies' investment real estate has a significantly positive correlation with the irrationality degree of management compensation. It shows that the fair value measurement method for investment real estate is likely to affect the management's performance evaluation, thereby reducing the rationality of its compensation evaluation. This result verifies H1 proposed in this paper. The direction and significance of the coefficients of the control variables involved in model (3) are basically consistent with the results of existing studies.

Table 5: Years of using fair value measurement model and management's education background

YEARS	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
EB	-1.478	0.888	-1.66	0.098	-3.235	0.279
IPA	1.742	3.429	0.51	0.612	-5.043	8.526
SIZE	-0.348	0.224	-1.55	0.122	-0.790	-0.095
CENTR	-0.446	1.126	-0.40	0.693	-2.674	1.782
WEST	-0.452	0.625	-0.72	0.471	-1.689	0.785
LEV	1.762	1.453	1.21	0.227	-1.112	4.637
MTB	-0.071	0.106	-0.68	0.501	-0.281	0.138
STATE	0.882	0.443	1.99	0.049	0.005	1.759
ROA	2.286	7.899	0.29	0.773	-13.344	17.915
IPO	0.000	0.000	3.47	0.001	0.000	0.001
RMC	-0.338	0.542	-0.62	0.534	-1.410	0.735
_cons	9.376	5.203	1.80	0.074	-0.920	19.671
R-squared	0.402					
Adj R-squared	0.257					

Table 5 shows the regression results of model (4), where the regression coefficient of EB is -1.478, which is significant at the 10% level, indicating that the years of using fair value measurement for investment real estate have a significantly negative correlation with the overall education background of a company's management. It shows that the management with better education background tend to be

ISSN 2616-5902 Vol. 3, Issue 5: 95-106, DOI: 10.25236/AJBM.2021.030516

more cautious about using the fair value measurement method for investment real estate. This result verifies H2 proposed in this paper. The direction and significance of the coefficients of the control variables involved in model (4) are basically consistent with the existing studies' results.

To sum up, the regression testing above verifies the two proposed hypotheses of this paper.

5. Conclusions and Suggestions

This paper selects China's A-share listed companies in Shanghai and Shenzhen stock markets that owned investment real estates from 2013 to 2018 as samples, and have mainly drawn the following two conclusions: (1) using fair value to measure investment real estate will reduce the rationality of management compensation; (2) the better the overall education background of a company's management is, the less inclined it is to use fair value for the measurement of investment real estate. After conducting the above researches, this paper puts forward the following suggestions:

Firstly, enterprises should optimize the salary contract structure and formulate a reasonable salary incentive system. A main reason of compensation irrationality is that Chinese companies' salary structure is relatively simple at present, and short-term incentives are generally adopted. A diversified compensation incentive mechanism can largely avoid the short-sighted behaviors of executives, therefore weaken the impact of changing the follow-up measurement model of investment real estate on management compensation.

Secondly, market regulators should strengthen corporate supervision and prevent senior executives from abusing their powers. Nowadays, there are more and more matters in the corporate accounting standards that require relevant staff to make professional judgments, in which situation the management have more opportunities to pursue the maximum of their personal interests by misusing accounting policies. At this time, setting strict regulatory system is particularly necessary.

Last but not least, enterprises themselves should strengthen the cultivation of their staff's professional ethics. To comply with the trend of introducing fair value model to measure investment real estate, the staff are required to accordingly improve their professional judgement ability and ethics in order to response to the problems hidden in the increased freedom and subjectivity at work.

References

[1] Christensen, H.B., Nikolaev, V.V. (2009) Who Uses Fair-Value Accounting for Non-Financial Assets Following IFRS Adoption?. Social Science Electronic Publishing, 120(35), 39-53.
[2] Clinch, G. (1991) Employee Compensation and Firms' Research and Development Activity. Journal of Accounting Research, 29(1), 59-78.
[3] Core, J.E., Holthausen, R.W., Larcker, D.F. (1999) Corporate Governance, Chief Executive Officer Compensation and Firm Performance. Journal of Financial Economics, 51(2), 141-152.
[4] Dietrich, J.R., Harris, M.S., Muller, K.A. (2000) The Reliability of Investment Property Fair Value Estimates. Journal of Accounting & Economics, 30(2), 125-158.
[5] Francisco (2004) Another Step towards Full Fair Value Accounting for Financial Instruments. Accounting Forum, 28(2), 167-179.
[6] Fu, Y.Y. (2017) An Empirical Study on the Nature of Property Rights, the Gains and Losses from Changes in Fair Value and Executive Salary. Lanzhou University of Finance and Economics.
[7] Herrmann, Saudagaran, Thomas (2002) The Quality of Fair Value Measures for Property, Plant and Equipment. Accounting Forum, 30(1), 43-59.
[8] Hou, X.H., Li, G., Guo, Y. (2013) Marketization Degree, Loan Contract and Fair Value Measurement Choice——An Empirical Study Based on the Application of Fair Value Measurement in Investment Real Estate. Contemporary Accounting Review, 1, 78-88.
[9] Jin, W.H. (2018) Research on the Value Correlation of the Hierarchical Measurement of the Fair Value of Investment Real Estate——Based on the Empirical Data of A-Share Listed Companies. Shanghai Jiao Tong University.
[10] Li, B.F. (2014) Research on the Relationship among Capital Structure, Enterprise Performance and Management Compensation. Times Finance, 3, 217-218.
[11] Li, Q. (2003) Analyses of Influencing Factors of Senior Manager Salary in Listed Companies. Economic Science, 6, 113-127.
[12] Li, Y.J. (2015) Research on the Economic Consequences of the Follow-up Measurement Model of Investment Real Estate's Fair Value. Contemporary Accounting, 5, 3-4.

ISSN 2616-5902 Vol. 3, Issue 5: 95-106, DOI: 10.25236/AJBM.2021.030516

[13] Liu, B., Liu, X., Li, S.X., He, S.W. (2003) An Empirical Test of the Interactive Effect between CEO Salary and Enterprise Performance. Accounting Research, 3, 35-39+65.

[14] Lourenço, Isabel, Curto, J.D. (2008) The Value Relevance of Investment Property Fair Values. Social Science Electronic Publishing.

[15] Luo, J.W., Luo, Y.Q., Liu, X., Liu, Y.S. (2009) Selection of Follow-up Measurement Models for Investment Real Estate. Finance and Accounting Monthly, 18, 33-36.

[16] Mcguire, J.W., Chiu, J.S.Y., Elbing, A.O. (1962) Executive Incomes, Sales and Profits. American Economic Review, 52(4), 753-761.

[17] Muller, K.A., Riedl, E.J., Sellhorn, T. (2008) Consequences of Voluntary and Mandatory Fair Value Accounting: Evidence Surrounding IFRS Adoption in the EU Real Estate Industry. Harvard Business School Working Papers.

[18] Pan, L.X., Qu, X.L. (2007) Talking about the Fair Value Measurement of Investment Real Estate. Communication of Finance and Accounting, 12, 59-60.

[19] Quagli, A., Avallone, F. (2010) Fair Value or Cost Model? Drivers of Choice for IAS 40 in the Real Estate Industry. European Accounting Review, 19(3), 461-493.

[20] Rosen, S. (1982) Authority, Control, and the Distribution of Earnings. The Bell Journal of Economics, 13(2), 311-323.

[21] Shen, J. (2018) Comparative Analysis of the Fair Value Evaluation Methods of Investment Real Estate. Marketing Research, 2, 34-35.

[22] Tan, C., Zheng, S.F. (2013) Research on the Relationship between Listed Company's Executive Salary and Company Performance——A Research on Listed Agricultural Companies Based on Structural Equation Model. Communication of Finance and Accounting, 3, 37-40.

[23] Taussig, F.W., Barker, W.S. (1925) American Corporations and Their Executives: A Statistical Inquiry. Quarterly Journal of Economics, 40(1), 1-51.

[24] Wang, L.F., Yang, X.Z. (2019) Quantile Regression Research on Management Compensation's Performance Sensitivity. Friends of Accounting, 22, 25-30.

[25] Wei, G. (2000) Senior Management Incentives and Operating Performance of Listed Companies. Economic Research Journal, 3, 32-39+64-80.

[26] Wu, D. (2012) Research on the Financial Strategy of Listed Companies' Spin-off and Listing. Sci-Tech and Development of Enterprise, 12, 139-142.

[27] Xu, J.M. (2015) Application of Fair Value Measurement Model in Investment Real Estate. Times Finance, 5, 346.

[28] Zhang, M. (2010) Research on the Influence of the Choice of Fair Value Measurement Model in Investment Real Estate. Accounting Learning, 2, 19-22.

[29] Zhang, Q.F., Zhang, M., Dai, J.J. (2011) Financial Influence and Determinants of Fair Value Measurement of Investment Real Estate: Taking Beijing North Star Company Limited as an Example. Accounting Research, 8, 22-29+95.

[30] Zhu, Z.M. (2013) Research on the Factors of Accounting Policy Choice of Listed Companies' Investment Real Estate. South Western University of Finance and Economics.

[31] Zou, Y., Wang, X., Wu, X.Y. (2013) Research on the Application of Fair Value Measurement in Investment Real Estate——Taking Jinbin Development and Companies in the Same Industry and Region as Examples. Accounting Research, 9, 22-28+96.

ISSN 2616-5902 Vol. 3, Issue 5: 95-106, DOI: 10.25236/AJBM.2021.030516

Table 3: Pearson correlation

Variables	RMC	FV	IPA	SIZE	LEV	SPR	GROW	CENTR	WEST	CBD	BDS	CON	YEARS	EB	MTB	STATE	ROA
FV	0.039**																
IPA	-0.023	0.258***															
SIZE	0.150***	0.067***	-0.225***														
LEV	0.092***	0.080***	-0.049***	0.503***													
SPR	0.084***	-0.000	-0.038**	0.067***	-0.312***												
GROW	-0.012	0.005	-0.054***	0.041***	0.012	0.122***											
CENTR	0.002	-0.037**	-0.070***	0.060***	0.088***	-0.020	-0.005										
WEST	0.001	-0.002	-0.055***	-0.001	0.051***	0.026	-0.039**	-0.144***									
CBD	0.003	0.075***	0.048***	-0.147***	-0.080***	0.037**	0.079***	-0.043***	-0.044***								
BDS	0.030*	-0.027*	-0.156***	0.275***	0.111***	0.075***	-0.019	0.055***	0.077***	-0.174***							
CON	-0.087***	-0.001	-0.038**	-0.259***	-0.262***	0.068***	0.144***	-0.014	-0.106***	0.221***	-0.106***						
YEARS	0.037**	0.826***	0.227***	0.059***	0.073***	-0.003	-0.007	-0.032**	-0.002	0.052***	-0.030*	-0.028*					
EB	0.040**	0.030*	0.007	0.181***	0.064***	0.031*	0.008	-0.024	0.052***	-0.015	0.130***	-0.066***	0.027*				
MTB	0.009	0.020	0.091***	-0.446***	-0.123***	0.051***	0.069***	-0.066***	-0.021	0.165***	-0.125***	0.145***	0.004	-0.046***			
STATE	-0.009	-0.069***	-0.032**	0.330***	0.200***	-0.042***	-0.105***	0.123***	0.053***	-0.287***	0.209***	-0.485***	-0.049***	0.107***	-0.255***		
ROA	0.079***	-0.060***	-0.070***	-0.005	-0.353***	0.698***	0.178***	-0.038**	-0.020	0.054***	0.023	0.091***	-0.075***	-0.022	0.146***	-0.085***	
IPO	-0.051***	-0.001	-0.153***	-0.100***	-0.242***	0.119***	0.112***	-0.015	-0.057***	0.155***	-0.011	0.527***	-0.033**	-0.008	0.047***	-0.358***	0.114***