

# Research on Investors' Value Discovery Ability -- From the Perspective of Improving Comprehensive Income Disclosure

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**Abstract**—This paper use data of A-share listed companies in Shanghai stock exchange for the value finding ability of investors from the comprehensive income disclosure improvement perspective. Through empirical test, investors can find corresponding decision according to the part of the comprehensive income, but the value of ability exist defects. After the improvement of the comprehensive income disclosure, the ability of investors to value discovery has been improved, but the degree of improvement is limited. As the regulatory authorities, they should strengthen investment education and take measures in supporting the disclosure of reform in the process of information disclosure reform.

**Keywords**—value discovery ability; comprehensive income; improvement

## 1 INTRODUCTION

The value discovery ability of investors is reflected in the capital market. The release of enterprise information can cause the capital market to respond quickly. For each enterprise, the performance is the change of enterprise stock price[1].The research on investors' value discovery ability comes from the efficient market hypothesis, that is, the stock price in the open market is a dynamic measure of enterprise value, which reflects all public and useful information. Investors in the market are rational investors. They collect a large amount of information in various ways, screen and summarize these information according to the purpose of decision-making, and finally make appropriate economic decisions. If the capital market reflects quickly and accurately after a certain information is published or some data are disclosed, it indicates that investors have strong ability to find value; On the contrary, it shows that the value discovery ability of investors is weak. The improvement of performance report is the focus of the change of enterprise information disclosure in recent years. This paper mainly studies the value discovery ability of investors from the perspective of the improvement of comprehensive income disclosure.

The term "comprehensive income" appeared in 1980 and was proposed by FASB in concept Announcement No. 3 "elements of enterprise financial statements". Since then, ASB, FASB and

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IASB implemented comprehensive income performance reporting reforms in 1992, 1997, 2002 and 2011 respectively. Up to now, the concept of comprehensive income has been relatively mature in foreign countries. In order to achieve international convergence, China issued the interpretation of accounting standards for Business Enterprises No. 3 in June 2009, which defines the connotation of other comprehensive income and comprehensive income, and requires enterprises to disclose comprehensive income in the income statement and notes to the statements. In January 2014, the Ministry of Finance issued the revised accounting standards for Business Enterprises No. 30 - presentation of financial statements, which improved the presentation content and method of comprehensive income. On the basis of the existing disclosure requirements, it is proposed to disclose other comprehensive income in the balance sheet and list the composition of other comprehensive income in detail in two categories in the income statement[2]. Subsequently, the Ministry of Finance supplemented and improved the use of "other comprehensive income" for many times, including the application guidelines of accounting standards for Business Enterprises No. 2 - long term equity investment and accounting standards for Business Enterprises No. 9 - employee compensation in 2014, accounting standards for Business Enterprises No. 22 - recognition and measurement of financial instruments and accounting standards for Business Enterprises No. 24 - hedge accounting in 2018.

It can be seen that after many revisions and improvements, the determination of comprehensive income is more clear, the performance report prepared by the enterprise is more reasonable, and the presentation of comprehensive income is more accurate and sufficient, which is more conducive to investors' correct and comprehensive performance evaluation of the enterprise. What is the response of investors? Can investors effectively find the enterprise value information and make full use of the information in the performance report for decision-making, so as to achieve the expected effect of standard setters? This paper selects A-share listed companies in Shanghai stock market from 2019 to 2020 to make an empirical study on the value discovery ability of investors from the perspective of improving comprehensive income disclosure.

## **2 RESEARCH DESIGN**

### **2.1 Research sample**

2019-2020 is selected as the time window for comparative study. This paper selects A-share listed companies in Shanghai stock market from CSMAR database as the research sample. According to the research purpose, the samples are screened: ST listed companies are excluded; excluding financial listed companies; excluding the sample companies with other comprehensive income of 0 (the improvement of comprehensive income disclosure is mainly reflected in the presentation of other comprehensive income. If other comprehensive income is 0, comprehensive income is equal to net profit, which is inconsistent with the purpose of empirical research); excluding enterprises whose shares were suspended on April 30. After screening, 475 valid data were obtained in 2019 and 450 in 2020. In addition, the closing prices of stocks from April 30, 2019 to 2020 were collected, and stata16 was used for data statistical analysis. In order to eliminate the influence of extreme values, this paper winsorize the main continuous variables by up and down 1%.

## 2.2 Research hypothesis

Comprehensive income extracts the gains and losses included in the balance sheet of the enterprise, which is the compensation and improvement of the traditional net profit information, discloses the most real performance of the enterprise, and can more fully reflect the overall value of the enterprise[3]. According to the efficient market hypothesis, investors should evaluate the future value of the company according to the comprehensive income information in the statement and make corresponding decisions. Reflected in the capital market is the fluctuation of stock price. Therefore, hypothesis 1 is proposed.

Hypothesis 1: comprehensive income information is helpful to investors' decision-making, that is, comprehensive income has value relevance.

Comprehensive income consists of net profit and other comprehensive income. Net profit is equal to operating profit plus non operating profit minus income tax expenses. Among them, operating profit reflects the income from daily activities of the enterprise and is the most important part of the income of the enterprise; Non operating profit refers to the gains and losses included in the current profit and loss, and other comprehensive income refers to the gains and losses not included in the current profit and loss. Therefore, the enterprise income can be divided into three parts: operating profit, non operating profit included in profit and loss (hereinafter referred to as non operating profit), non operating profit not included in profit and loss, that is, other comprehensive income. Operating profit reflects the main profitability and sustainable profitability of the enterprise; non operating profit and other comprehensive income reflect the current or recent incidental income, which is difficult to sustain. Investors should understand the above relationship and make corresponding decisions according to the components of comprehensive income and different characteristics. Therefore, hypothesis 2 is proposed.

Hypothesis 2: investors can make corresponding decisions according to different components of comprehensive income.

After the improvement of the disclosure method of comprehensive income, the balance sheet, income statement and statement of changes in owner's equity all disclose the comprehensive income, and there is a cross checking relationship between the statements. At the same time, the income statement classifies and lists other comprehensive income in detail, which is more conducive for investors to find useful information for decision-making than the previous disclosure in the notes[4]. Therefore, hypothesis 3 is proposed.

Hypothesis 3: after the performance report is improved, the value discovery ability of investors is improved

## 2.3 Model design

According to the research experience of scholars at home and abroad, the price model is used for empirical test. The price model tests the relationship between accounting income, book value of net assets and stock value. The construction model 1 and 2 are as follows:

$$P_{i,t} = \alpha_0 + \alpha_1 CIPS_{i,t} + \alpha_2 BVPS_{i,t} + \alpha_3 SIZE + \varepsilon_{i,t} \quad (1)$$

$$P_{i,t} = \alpha_0 + \alpha_1 OPPS_{i,t} + \alpha_2 NOPPS_{i,t} + \alpha_3 OCIPS_{i,t} + \alpha_4 BVPS_{i,t} + \alpha_5 SIZE + \varepsilon_{i,t} \quad (2)$$

**Table1** Variable description

Variable type	Variable name	Variable symbol	Value taking method of variable
Explained variable	Stock price	P	P <sub>i,t</sub> Select the closing price on April 30 of year t + 1
Explanatory variable	Comprehensive income per share	CIPS	Comprehensive income/Total share capital
	Operating profit per share	OPPS	Operating profit/Total share capital
	Non operating profit per share	NOOPS	Non operating profit /Total share capital
	Other comprehensive income per share	OCIPS	Other comprehensive income/Total share capital
control variable	net asset value per share	BVPS	Net assets/Total share capital
	company size	SIZE	Natural logarithm of total book assets at the end of the period

Among them,  $\alpha_0$  is a constant term,  $\alpha_i$  is the independent variable coefficient,  $\varepsilon_{i,t}$  is the random error variable. Use model 1 to test hypothesis 1, that is, the decision usefulness of comprehensive income, if  $\alpha_i \neq 0$ , then the comprehensive income information is helpful to investors' decision-making. In model 2, the comprehensive income per share is divided into three parts: operating profit per share, non operating profit per share and other comprehensive income per share. The model is used to test hypothesis 2, that is, investors can make corresponding decisions according to different components of comprehensive income. If investors can correctly understand the components and characteristics of comprehensive income, it can be expected that operating profit has the strongest explanatory power for stock price. Based on the above, the sub samples of model 1 and model 2 are tested to verify hypothesis 3, that is, after the performance report is improved, the value discovery ability of investors is improved.

#### 2.4 Variable description

The explanatory variable is the closing price of the stock on April 30, which lags one year. In order to eliminate the influence of incomparable factors such as capital stock scale and capital stock change, the explanatory variables are comprehensive income per share, operating profit per share, non operating profit per share and other comprehensive income per share. Considering other factors affecting the stock price of listed companies, in order to ensure the reliability of the conclusion, according to the research results of domestic and foreign scholars, two control variables, net assets and asset scale, are introduced to improve the model [5]. For the control variable net assets, select the net assets per share index; Chen Xinyuan and other researchers confirmed that the higher the index, the stronger the strength of the company, the greater the income realization space and the higher the stock price. For the control variable asset scale, the logarithm of total assets is selected to narrow the gap between the company's asset scale and reduce the adverse impact of too large data range on the regression results. Meng Yan and other researchers confirmed that there is a value correlation between the size of the company and the income of the enterprise. The larger the size of the company, the easier it is to obtain the funds needed for development, the stronger the ability to resist risks, and the higher the content of financial report information. See Table 1 for specific description of variables.

### 3 DESCRIPTIVE ANALYSIS

#### 3.1 Overall descriptive statistics

In order to reduce the impact of extreme values on the statistical results, the main variables in the total sample from 2019 to 2020 are winsorized by up and down 1%. The descriptive statistical results are shown in Table 2.

**Table 2** Overall descriptive statistics

variable	mean	sd	min	max	p50	cv
P	15.367081	11.825575	2.120000	66.190002	12.030000	0.769539
CIPS	0.437792	0.774999	-3.809994	13.439488	0.300702	1.770244
OPPS	0.447914	0.849072	-3.521428	18.259092	0.310791	1.895614
NOOPS	0.064320	0.129404	-0.292135	2.002073	0.028389	2.011878
OCIPS	0.034601	0.365812	-3.966089	5.196044	-0.000022	10.572296
BVPS	4.534235	2.739946	0.084396	14.195018	4.041852	0.604280
SIZE	10.005718	0.646756	8.354833	12.381183	9.928314	0.064639

In Table 2, the minimum value of stock price (P) is 2.12, the maximum value is 66.19 and the average value is 12.03, indicating that there are differences in different stock prices. However, there is little difference between the median and mean, indicating that the stock price is evenly distributed. CIPS, OPPS, NOOPS and OCIPS are 0.437792, 0.447914, 0.064320 and 0.034601. It can be seen that in the contribution to the comprehensive income of enterprises, operating profit occupies the most important position, followed by non operating profit and other comprehensive income. During the sample observation period, non operating profit and other comprehensive income are positive, indicating that non operating profit and other comprehensive income enhance the overall performance of the company and are the enhancement items of performance.

In addition, the coefficients of variation of CIPS, OPPS, NOOPS and OCIPS are 1.770244, 1.895614, 2.011878 and 10.572296. The variation coefficient of comprehensive income per share is less than operating profit per share and non operating profit per share, indicating that the value fluctuation of comprehensive income becomes smaller after considering other comprehensive income. The average value of net assets per share (BVPS) is 4.534235 and the median is 4.041852, indicating that the economic strength of the sample companies is basically the same. After logarithmic processing, the average value of the company's scale is 10.005718, the minimum value is 8.354833, the maximum value is 12.381183, and the median value is 9.928314, indicating that the company's scale is close.

### 3.2 Descriptive statistics of sub samples by year

**Table3** Descriptive statistics of sub samples

variable	time	mean	sd	min	max	p50	cv
P	2019	9.980000	8.697706	1.520000	77.489998	7.355000	0.871513
	2020	21.386505	18.291811	4.530000	252.229996	16.620001	0.855297
CIPS	2019	0.365986	0.565636	-3.809994	2.699811	0.286182	1.545513
	2020	0.505819	0.926409	-2.287766	13.439488	0.321201	1.831503
OPPS	2019	0.419695	0.607511	-3.521428	3.170953	0.301480	1.447506
	2020	0.474648	1.026776	-2.282566	18.259092	0.314937	2.163237
NOOPS	2019	0.066892	0.151189	-0.292135	2.002073	0.028613	2.260196
	2020	0.061883	0.104776	-0.182261	0.963558	0.028054	1.693131
OCIPS	2019	-0.016773	0.260500	-3.966089	2.647244	-0.000368	-15.530913
	2020	0.083271	0.437837	-1.152346	5.196044	0.000090	5.257977
BVPS	2019	4.470894	3.535513	-2.114425	43.086952	3.925624	0.790784
	2020	4.745187	3.756540	-15.819944	45.692436	4.188674	0.791653
SIZE	2019	9.987170	0.647898	8.477008	12.369588	9.908660	0.064873
	2020	10.023289	0.645862	8.354833	12.381183	9.943093	0.064436

In Table 3, the average stock price in 2020 is 21.386505, much higher than 9.98 in 2019. The fluctuation of stock price is closely related to the sharp rise of stock market in the first half of 2020. However, the substantial increase of the company's comprehensive income is also an important factor driving the rise of share price. In 2019, the average comprehensive income per share of the company was 0.365986, rising to 0.505819 in 2020. The increase was 38%. In terms of the composition of comprehensive income, the contribution of operating profit is prominent; non operating profit performance was stable. Other comprehensive income changed significantly, from -0.0167732 per share in 2019 to 0.083271 per share in 2020, with a significant increase. It can be seen that half of the improvement of the company's comprehensive income is due to the growth of other comprehensive income. In terms of net assets per share and company size, the sample companies have the same strength and scale. The net assets per share and company size in 2020 are better than those in 2019, which is consistent with the overall improvement of the company's performance.

### 3.3 Correlation test

**Table 4** Correlation test — Pearson correlation coefficient

	P	CIPS	OPPS	NOOPS	OCIPS	BVPS	SIZE
P	1.0000						
CIPS	0.4239***	1.0000					
OPPS	0.4058***	0.7753***	1.0000				
NOOPS	0.0600**	-0.0240	-0.1461***	1.0000			
OCIPS	0.1069***	0.5121***	0.0708**	-0.0704**	1.0000		
BVPS	0.3402***	0.5145***	0.4973***	0.2153***	0.1392***	1.0000	
SIZE	-0.1540***	0.1549***	0.2102***	-0.0202	-0.0367	0.3062***	1.0000

Note: \*\*\* means 1% level is significant, \*\* means 5% level is significant, \* means 10% level is significant, the same below.

In Table 4, through Pearson correlation test, it is found that the stock price is significantly positively correlated with comprehensive income per share, operating profit per share, other comprehensive income per share and net assets per share at the level of 1%, positively correlated with non operating profit per share at the level of 5%, and negatively correlated with the size of the company at the level of 1%. The correlation coefficient between stock price and comprehensive income per share is the highest, 0.4239, and the correlation coefficient with non operating profit per share is the lowest, 0.06.

## 4 EMPIRICAL TEST RESULTS

In the regression analysis, this paper tests the multicollinearity of the above model, and it is not found that there is multicollinearity between variables.

### 4.1 Decision usefulness of comprehensive income

**Table 5** Regression results of model 1

	Total sample	2019	2020
CIPS	5.149*** [10.298]	7.291*** [12.218]	10.533*** [10.199]
BVPS	1.094*** [7.456]	0.651*** [6.653]	0.780*** [3.002]
SIZE	-5.190*** [-9.618]	-4.887*** [-9.189]	-6.638*** [-6.565]
CONS (constant term)	60.085*** [11.417]	53.212*** [10.227]	78.893*** [7.912]
N	925	450	475
R <sup>2</sup>	0.273	0.363	0.437
R <sup>2</sup> <sub>a</sub>	0.271	0.359	0.434
F	115.267	84.87	122.1
Prob	Prob>F=0	Prob>F=0	Prob>F=0

The overall regression analysis of model 1 is shown in Table5. When its F value is equal to 115.267, the p value is equal to 0, which passes the overall significance test of the regression model. The CIPS regression coefficient is 5.149, which is significant at the level of 1% (t = 10.298), indicating that there is a significant positive correlation between comprehensive income and stock price, that is, the higher the stock price of the company with high comprehensive income. This shows that comprehensive income is useful for decision-making, and hypothesis 1 is tested. The regression coefficient of BVPs is 1.094, which is significant at the level of 1% (t = 7.456), which is significantly positively correlated with the stock price. The size regression coefficient is -5.19, which is significant at the 1% level (t value = -9.618), which is significantly negatively correlated with the stock price, indicating that the net assets per share and the size of the company are also important factors affecting the stock price.

#### 4.2 Value discovery ability of investors

The overall regression analysis of model 2 is carried out to test the value discovery ability of investors, as shown in Table6. Its F value is significant at the level of P = 0, which has passed the overall significance test of the regression model.

The regression results show that the regression coefficient of operating profit per share is 4.971 which is significant at the level of 1%, the regression coefficient of non operating profit per share is 5.332 which is significant at the level of 5%, the regression coefficient of other comprehensive income per share is 1.356 which is significant at the level of 10%. It shows that there is a significant positive correlation between operating profit, non operating profit and other comprehensive income and stock price, that is, investors have a certain value discovery ability for the components of comprehensive income. However, the value discovery ability of investors is not balanced, in which the operating profit is the strongest, followed by non operating profit, and finally other non comprehensive income. It is also the gains and losses of enterprises in non daily activities, and investors pay much less attention to other comprehensive income than non operating profit. On the one hand, it is due to the particularity and strong professionalism of other comprehensive income projects, and most investors are not familiar with other comprehensive income projects; on the other hand, it comes from investors' high attention to net profit. According to a large number of empirical studies, net profit is the most important basis for investors' decision-making. However, other comprehensive income is not a part of net profit. To sum up, investors can make corresponding decisions according to different components of comprehensive income, and hypothesis 2 is tested to a certain extent.

**Table6** Regression results of model 2

	Total sample	2019	2020
OPPS	4.971*** [10.535]	8.563*** [13.607]	12.449*** [14.449]
NOPPS	5.332** [1.923]	9.019** [3.066]	24.286** [4.176]
OCIPS	1.356* [1.467]	-0.787 [-0.576]	0.0330 [0.022]



BVPS	1.017*** [6.567]	0.206 [1.748]	0.287 [1.131]
SIZE	-5.457*** [-10.045]	-5.331*** [-10.240]	-7.301*** [-7.911]
Cons (constant term)	62.736*** [11.831]	58.226*** [11.397]	85.786*** [9.421]
N	925	450	475
R <sup>2</sup>	0.279	0.409	0.537
R <sup>2</sup> _a	0.275	0.402	0.532
F	71.11	61.40	108.8
P	Prob>F=0	Prob>F=0	Prob>F=0

It is noteworthy that at the significance level of 5%, the regression coefficient of non operating profit per share is higher than operating profit per share, indicating that the impact of non operating profit on stock price may be higher than operating profit. However, in the composition of enterprise performance, operating profit represents the main business of the enterprise and reflects the main profitability and profitability sustainability of the enterprise, non operating profit represents non daily business and its income is sporadic and difficult to sustain. If investors have strong value discovery ability, operating profit should have a strong influence on the stock price, and the explanatory power and relevance of non operating profit to the stock price should be weaker than that of operating profit. However, the empirical results show the opposite situation, which shows that investors mainly focus on the amount of corporate profits when making investment decisions, lack of in-depth analysis of the sources and characteristics of profits, and the value discovery ability of investors needs to be improved.

#### **4.3 Improvement of performance report and improvement of investors' value discovery ability**

The annual regression of model 1 is shown in Table 5. Both years passed the F test. Through regression, it is found that the R<sup>2</sup> value of the sample in 2019 is 0.363 and that in 2020 is 0.437. This shows that the fitting degree of the regression model is improved, and the regression model will have more explanatory power in 2020. The regression coefficient of comprehensive income per share in 2019 is 7.291, and the significance level is 1%; 10.533 in 2020, with a significance level of 1%. This shows that in the two sub samples, comprehensive income has significant explanatory power on stock price. In comparison, the comprehensive income in 2020 can affect the stock price more than that in 2019. That is, after the 2020 performance report is improved, the comprehensive income disclosure is more sufficient, and investors can find the enterprise incremental value information, thus affecting the investment decision. Hypothesis 3 is verified.

The annual regression of model 2 is shown in Table 6 to further verify hypothesis 3. The annual model regression in 2019 and 2020 passed the F test. It is found that the R<sup>2</sup> value of the sample in 2019 is 0.409 and that in 2020 is 0.537, indicating that the fitting degree of the regression

model is improved in 2020 and the regression model is more explanatory in 2020. In addition, the regression coefficient of major explanatory variables such as operating profit per share in 2020 is better than that in 2019. This shows that after the performance report reform, the correlation between the stock price and the company's performance has improved, investors pay more attention to the company's performance, and investors' value discovery ability has been improved to a certain extent. However, the situation of blind decision-making still exists.

## 5 RESEARCH CONCLUSIONS

Through the empirical test, this paper draws the following conclusions. First, comprehensive income is the most comprehensive measure of enterprise performance, including both net profit as current profit and loss and other comprehensive income not included in current profit and loss. This index has value relevance. Second, investors can make decisions according to the components of comprehensive income, but there are defects in the ability of value discovery. Investors are not sensitive to the value of other comprehensive income. Investors lack of analysis on the composition of comprehensive income, and the decision-making based on comprehensive income is not accurate, which is mainly reflected in the strong explanation of non operating profit for stock price. This shows that investors are mainly concerned about the total profit of enterprises when making investment decisions, and lack of analysis on the source of income. Therefore, the value discovery ability of investors needs to be further improved. Third, after the improvement of comprehensive income disclosure, the components of enterprise performance are clearer and more fully disclosed, which improves the information content of comprehensive income, is conducive to the discovery of investors' value information, and the ability of investors' value discovery is improved.

To sum up, the improvement of comprehensive income disclosure is conducive to the provision of useful information for decision-making and the value discovery of investors, which is a necessary measure of accounting reform. However, the improvement of investors' value discovery ability is limited, the information disclosed by accounting can not be fully identified and effectively used, and there is a heavy color of speculation. Therefore, while improving the information disclosure, we should strengthen the investment education for investors, help investors establish a correct investment view, and improve investors' understanding and application of the disclosed information.

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