

Mitigating Financial Statement Information Deficiency: The Role of Supplementary ESG Information in Improving the Value Relevance of Accounting Earnings

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Abstract

Financial statements focus on historical monetary information, which inevitably suffers from information incompleteness, timeliness lag, and insufficient reflection of corporate sustainable development potential, leading to reduced value relevance of traditional accounting earnings. As important non-financial supplementary information, ESG disclosure can effectively compensate for the inherent defects of financial information and transmit incremental corporate characteristic information to capital market investors. Based on the information asymmetry theory and signal transmission theory, this study selects the panel data of Chinese A-share listed companies from 2018 to 2023 as the research sample, adopts the modified Ohlson price model to empirically test the impact of ESG supplementary information disclosure on financial statement information deficiency and accounting earnings value relevance. The results show that ESG supplementary information disclosure significantly improves the value relevance of accounting earnings; further mechanism tests confirm that high-quality ESG disclosure mitigates information asymmetry caused by insufficient financial information, reduces investor information judgment bias, and thus strengthens the correlation between accounting earnings and stock market value. Heterogeneity analysis indicates that the value enhancement effect of ESG information is more significant in non-state-owned enterprises and firms with low financial information transparency. This study verifies the incremental information value of ESG disclosure, provides empirical evidence for improving corporate information disclosure quality, and offers references for investors' decision-making and capital market information optimization.

Keywords

ESG supplementary information, financial statement deficiency, earnings value relevance, information asymmetry, listed companies.

1. Introduction

Traditional financial reporting system is based on accrual basis and historical cost measurement, which can systematically reflect the past operating performance and financial status of enterprises. However, with the development of the digital economy and sustainable development concept, the single financial information system can no longer fully meet the information needs of capital market stakeholders[1,2]. Financial statements mainly reflect tangible asset value and short-term operating benefits, while ignoring intangible resources such as corporate environmental governance, social responsibility performance and internal governance level, resulting in obvious information deficiency problems[3]. The limitation of financial information leads to the decline of earnings value relevance, that is, the ability of accounting earnings to explain stock market value is weakened, which increases the difficulty of investors' value judgment and aggravates capital market information asymmetry[4].

In recent years, ESG (Environmental, Social, Governance) information disclosure has become an important supplement to traditional financial reporting, and has been widely valued by regulatory authorities, enterprises and investors worldwide[5]. Different from financial information that focuses on historical operating results, ESG information focuses on corporate sustainable development capacity, long-term value creation potential and risk control level, which can provide incremental non-financial information for market participants[6]. Existing studies have confirmed that standardized ESG disclosure can restrain corporate earnings manipulation, improve corporate information transparency, and reduce capital market financing costs. However, there are still controversies in academic circles about whether ESG supplementary information can effectively make up for the defects of financial statements and improve the value relevance of core accounting earnings indicators[7]. Some scholars believe that excessive ESG disclosure may bring information redundancy and increase investor information processing costs, while others hold that high-quality ESG information can optimize corporate information disclosure system and enhance the decision-making usefulness of accounting information[8].

Under the background of China's vigorous promotion of sustainable development and standardized ESG disclosure system construction, this study takes Chinese A-share listed companies as the research object to explore the mitigation effect of ESG supplementary information on financial statement information deficiency and its impact mechanism on earnings value relevance[9]. The research contributions are mainly reflected in two aspects: first, it clarifies the incremental value of ESG information from the perspective of financial information defect compensation, enriches the research framework of earnings value relevance influencing factors; second, it verifies the heterogeneous effect of ESG information in different corporate governance and information transparency environments, providing targeted empirical support for improving differentiated ESG disclosure supervision and optimizing capital market information efficiency.

2. Theoretical Analysis and Research Hypotheses

2.1. Financial Statement Information Deficiency and Earnings Value Relevance Decline

The inherent defects of traditional financial statements are the fundamental reason for the decline of earnings value relevance[10]. First, financial statements adopt historical cost measurement, which can only reflect past operating performance and cannot fully predict the future development potential of enterprises, resulting in timeliness deficiency of information. Second, financial reporting focuses on monetary quantitative information, while ignoring non-monetary information such as environmental protection investment, social welfare undertakings and internal governance efficiency[11], leading to incomplete information content. Third, the accrual basis provides operating space for enterprise earnings management, which reduces the authenticity and reliability of accounting earnings. The above information deficiencies make traditional accounting earnings unable to fully reflect the intrinsic value of enterprises, thus weakening the correlation between earnings indicators and stock market value, and reducing the value relevance of accounting information[12].

2.2. ESG Supplementary Information and Compensation of Financial Information Deficiency

Based on information asymmetry theory and signal transmission theory, ESG supplementary information can effectively make up for the deficiencies of financial statements and improve earnings value relevance. On the one hand, ESG disclosure covers environmental governance, social responsibility and corporate governance dimensions, which supplements the non-

financial information missing in financial statements, realizes the full coverage of corporate value information, and helps investors comprehensively judge corporate operating quality and sustainable development capacity. On the other hand, high-quality ESG disclosure is a positive signal of corporate standardized operation and sound internal control. It can restrain management's opportunistic behavior of earnings manipulation, improve the authenticity of accounting earnings, and enhance the credibility of financial information.

In addition, ESG information can reduce the information gap between enterprises and investors. For enterprises with insufficient financial information disclosure, ESG supplementary information can provide incremental decision-making information, correct investors' value judgment deviation caused by single financial information, and strengthen the ability of accounting earnings to explain stock price changes. Based on the above theoretical analysis, this study proposes the core research hypothesis:

H1: ESG supplementary information disclosure can significantly improve the value relevance of corporate accounting earnings.

H2: ESG supplementary information improves earnings value relevance by mitigating financial statement information deficiency and reducing information asymmetry.

3. Research Design

3.1. Sample Selection and Data Sources

This study selects all Chinese A-share listed companies from 2018 to 2023 as the initial research samples, and filters the samples according to the following standards: (1) exclude financial and insurance industry samples, due to the special accounting system and operating mode of the industry; (2) exclude ST, *ST and delisted companies to avoid the interference of abnormal operating conditions; (3) exclude samples with serious missing financial data and ESG data. Finally, 18,642 firm-year observation samples are obtained.

The ESG disclosure score data of listed companies comes from Wind ESG rating database, which adopts a mature evaluation system including 26 primary indicators and 85 secondary indicators, with high data credibility and industry recognition. Financial statement data, stock market transaction data and corporate governance characteristic data all come from CSMAR database. In order to eliminate the interference of extreme values, all continuous variables are winsorized at the 1% and 99% quantiles. Data processing and empirical analysis are completed by Stata 17.0 software.

3.2. Variable Definition

3.2.1. Dependent Variable: Earnings Value Relevance

Referring to the classic Ohlson price model and the improvement of domestic and foreign literatures, this study takes stock price (P) as the dependent variable to reflect corporate market value, and uses the regression coefficient of basic earnings per share (EPS) to measure earnings value relevance. The larger the coefficient and the higher the significance, the stronger the value relevance of accounting earnings.

3.2.2. Independent Variable: ESG Supplementary Information Disclosure (ESG)

This study adopts the total score of Wind ESG rating as the proxy variable of ESG supplementary information disclosure level. The ESG score ranges from 0 to 100. The higher the score, the higher the quality of corporate ESG information disclosure, the more sufficient the supplementary non-financial information. In the heterogeneity analysis, ESG is divided into high, medium and low groups according to industry annual median.

3.2.3. Control Variables

Referring to existing research, this study selects enterprise size (Size), asset-liability ratio (Lev), total asset turnover (Turn), enterprise growth (Growth), board size (Board), independent director ratio (Indep), institutional shareholding ratio (Inst) as control variables, and controls the fixed effects of year and industry.

3.3. Empirical Model Construction

In order to test the impact of ESG supplementary information on earnings value relevance, this study constructs the following multiple regression model based on the modified Ohlson model:

$$P_{i,t} = \beta_0 + \beta_1 EPS_{i,t} + \beta_2 ESG_{i,t} + \beta_3 EPS_{i,t} \times ESG_{i,t} + \sum Control_{i,t} + Year + Industry + \varepsilon_{i,t}$$

Where $P_{i,t}$ represents the closing stock price of firm i in year t ; $EPS_{i,t}$ is basic earnings per share; $ESG_{i,t}$ is ESG disclosure score; $EPS \times ESG$ is the interaction term of earnings and ESG information, and the coefficient β_3 is the core focus of this study. If β_3 is significantly positive, it indicates that ESG supplementary information significantly improves the value relevance of accounting earnings; *Control* represents all control variables; Year and Industry represent year and industry fixed effects respectively; ε is the random error term.

4. Empirical Results and Analysis

4.1. Descriptive Statistics

Table 1 reports the descriptive statistical results of the main variables. The mean value of stock price (P) is 15.682, the standard deviation is 12.354, indicating that there is a large difference in market value among sample enterprises. The mean value of earnings per share (EPS) is 0.426, the minimum value is -1.218, and the maximum value is 2.895, which shows that the profitability of listed companies is differentiated. The mean value of ESG disclosure score is 62.357, the standard deviation is 8.642, indicating that the overall ESG disclosure level of Chinese A-share listed companies is medium, and the disclosure quality among enterprises is significantly different. The descriptive statistical results of control variables are within the reasonable range of existing studies, and the sample data is stable and effective.

Table 1. Descriptive Statistics of Main Variables

Variable	Obs	Mean	Std.Dev	Min	Max
P	18642	15.682	12.354	2.105	68.924
EPS	18642	0.426	0.583	-1.218	2.895
ESG	18642	62.357	8.642	45.216	85.739
Size	18642	22.864	1.325	20.125	26.783
Lev	18642	0.438	0.206	0.052	0.896
Growth	18642	0.152	0.287	-0.326	1.589

4.2. Correlation Analysis

Pearson correlation test results show that EPS is significantly positively correlated with stock price P at the 1% level, which verifies the basic value relevance of accounting earnings. ESG score is significantly positively correlated with P and EPS respectively, indicating that high-quality ESG disclosure is accompanied by higher corporate market value and better profitability. The correlation coefficients among all variables are less than 0.7, which eliminates the serious multicollinearity problem among variables and ensures the reliability of subsequent regression results.

4.3. Baseline Regression Results

Table 2 reports the baseline regression results of the impact of ESG supplementary information on earnings value relevance. Column (1) is the regression result without adding ESG variables, which verifies the basic value relevance of EPS. The coefficient of EPS is 8.264 and significantly positive at the 1% level, indicating that accounting earnings can effectively explain corporate market value. Column (2) adds ESG variable and interaction term EPS×ESG. The results show that the coefficient of the core interaction term EPS×ESG is 0.083 and significantly positive at the 1% level, which indicates that with the improvement of ESG supplementary information disclosure quality, the explanatory ability of accounting earnings on stock price is significantly enhanced. That is, ESG supplementary information effectively makes up for the deficiency of traditional financial statement information and significantly improves the value relevance of accounting earnings. The research hypothesis H1 is verified.

In terms of economic significance, every 1-unit increase in ESG disclosure score will increase the value relevance coefficient of earnings per share by 0.083 units, which confirms the significant incremental information value of ESG supplementary disclosure. After controlling enterprise characteristic variables and fixed effects of year and industry, the regression results are still robust.

Table 2. Baseline Regression Results, *** $p < 0.01$, t-values in parentheses

Variables	(1) P	(2) P
EPS	8.264*** (36.89)	7.125*** (28.64)
ESG	-	0.126*** (15.32)
EPS×ESG	-	0.083*** (9.68)
Controls	YES	YES
Year/Industry FE	YES	YES
Adj-R ²	0.352	0.418
N	18642	18642

4.4. Mechanism Test

In order to verify the mechanism that ESG supplementary information improves earnings value relevance by mitigating financial information deficiency and reducing information asymmetry, this study adopts the mediation effect test method, and takes information asymmetry level (measured by analyst forecast divergence) as the mediation variable. The regression results show that ESG disclosure significantly reduces corporate information asymmetry, and after controlling information asymmetry, the positive effect of ESG on earnings value relevance is still significant, and the coefficient decreases. It confirms that ESG supplementary information can compensate for the deficiency of financial statements, reduce the information gap between enterprises and investors, correct the information bias of investors' judgment on corporate earnings quality, and then improve the value relevance of accounting earnings. The research hypothesis H2 is established.

4.5. Heterogeneity Analysis

4.5.1. Heterogeneity of Enterprise Property Rights

Grouping regression according to enterprise property rights shows that the interaction term EPS×ESG coefficient of non-state-owned enterprises is 0.102 and significant at the 1% level, while the coefficient of state-owned enterprises is 0.046 and only significant at the 5% level. The reason is that state-owned enterprises have higher information transparency and stronger supervision, and their financial statement information deficiency is relatively weak; while non-state-owned enterprises have more prominent information asymmetry problems, and ESG

supplementary information has a more obvious marginal compensation effect on financial information defects, so the improvement effect on earnings value relevance is stronger.

4.5.2. Heterogeneity of Financial Information Transparency

Taking the annual industry median of earnings management level as the standard to divide high and low financial transparency groups, the results show that in the low financial transparency group (serious financial information deficiency), the $EPS \times ESG$ coefficient is 0.091 and highly significant; in the high transparency group, the coefficient is not significant. It further verifies that ESG supplementary information plays a stronger complementary role in enterprises with insufficient financial statement information, which fully reflects the defect compensation function of ESG non-financial information.

4.6. Robustness Test

In order to ensure the reliability of the research conclusions, this study carries out multiple robustness tests: first, replace the dependent variable with annual stock return to re-regress; second, lag the ESG variable by one period to alleviate endogenous problems; third, adopt fixed effect model and remove extreme samples. The results of all robustness tests are consistent with the baseline regression conclusions, which proves that the research conclusions of this study are stable and reliable.

5. Research Conclusion and Implications

5.1. Research Conclusion

Based on the panel data of Chinese A-share listed companies from 2018 to 2023, this study empirically tests the mitigation effect of ESG supplementary information on financial statement information deficiency and its impact on accounting earnings value relevance. The main conclusions are as follows: First, ESG supplementary information disclosure significantly improves the value relevance of corporate accounting earnings, and high-quality ESG disclosure can effectively enhance the decision-making usefulness of traditional financial accounting information. Second, the mechanism test shows that ESG information compensates for the inherent deficiency of financial statements by reducing corporate capital market information asymmetry, optimizes the corporate information disclosure system, and then strengthens the correlation between accounting earnings and enterprise market value. Third, the improvement effect of ESG supplementary information is heterogeneous, which is more significant in non-state-owned enterprises and enterprises with low financial information transparency and serious financial information deficiency.

5.2. Theoretical and Practical Implications

In theory, this study expands the research boundary of earnings value relevance influencing factors, clarifies the defect compensation mechanism of non-financial information on financial information, and provides new empirical evidence for the information decision-making usefulness of ESG disclosure. In practice, for enterprises, they should actively improve the quality of ESG information disclosure, make full use of ESG supplementary information to make up for the shortcomings of financial reporting, and improve corporate information transparency. For regulatory authorities, they should further standardize the ESG disclosure system, promote the standardized and unified construction of ESG information disclosure, and give full play to the incremental value of non-financial information. For investors, they should integrate financial indicators and ESG non-financial information to comprehensively judge corporate value, reduce investment judgment bias caused by single financial information, and improve investment decision-making efficiency.

5.3. Research Limitations and Prospects

This study still has some limitations. This study focuses on the overall disclosure level of ESG, and does not further distinguish the differential impact of environmental, social and governance single-dimensional information on earnings value relevance. Future research can subdivide ESG dimensional indicators to explore the heterogeneous compensation effect of different types of non-financial information on financial statement defects. In addition, future research can further explore the moderating role of external supervision and market environment on the relationship between ESG disclosure and earnings value relevance.

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