The Relation between ESG Performance and Financial Performance: Evidence from Healthcare Firms

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Abstract. Today, ESG, as a critical investment consideration, is receiving more and more attention from investors and entrepreneurs. They seek to improve their investment decisions by understanding the relationship between ESG and business performance. Many investors are looking to optimize their investment strategies, and entrepreneurs are trying to attract more investors by improving their companies' environmental, social and governance performance to increase profitability. This study aims to help investors make more effective investment decisions and give managers more valuable, profitable growth solutions. Based on the two-stage least squares analysis and curve fitting analysis of the data of 48 sample companies, the conclusions are as follows: (1) The direct impact of ESG performance and its different forms on the financial results of enterprises is relatively limited, and this impact is often not significant in statistical data. (2) Changes in corporate finance are not only affected by ESG performance but may also be affected by other factors that have not been fully considered. (3) The relationship between ESG performance and corporate financial performance may not be linear but involves more complex nonlinear variable relationships. Future studies should also try to use another nonlinear model to reveal more deeply the complex interactions between variables. Finally, given the small sample size (N=46), increasing the sample size is also an important direction for future research.

Keywords: ESG performance, financial performance, healthcare firms, regression analysis.

1. Introduction

In recent years, global environmental problems have become increasingly severe, and many countries have taken measures to alleviate them. Positive progress has been made. Medical institutions are committed to saving energy and resources in the medical industry, such as intelligent medical management systems, using biodegradable medical materials, and strict treatment of medical waste. At present, the medical industry is also one of the industries that the investment community is optimistic about, and ESG factors are also included in the investment decision-making framework in the investment process, aiming to help investors make better investment decisions and, at the same time, bring specific positive impacts to the society. However, sustainable economic development remains an issue, and to address this, companies should take the lead in improving their environmental, social and governance performance and actively fulfilling their ESG responsibilities. Compared with other industries, the pharmaceutical sector naturally shoulders greater social responsibilities because it is a strategic industry related to the national economy and people's livelihood, economic development and national security, and essential support for building a healthy China and ensuring people's well-being [1]. The concept of ESG was first put forward in 2004 by the United Nations Global Compact. It refers to environmental, social, and corporate governance. It systematically investigates the investment ideas and evaluation criteria of enterprises from the three dimensions of environment, social responsibility, and governance elements. And ESG investment has gradually become a mainstream investment concept. According to relevant research, ESG investment originated in Europe, prospered in the United States and Japan, and began to receive widespread attention in China in recent years.

ESG investing considers a business's environmental, social and governance factors to maximize the combined economic, environmental and social value. This investment philosophy can help direct capital to more sustainable, environmentally friendly and responsible companies, contributing to the

sustainable development of the global economy. This paper explores the relationship between ESG performance and healthcare firm performance. In this study, 48 companies were included in the sample, including their financial statements, ESG score and ESG disclosure score. This experiment used SPSS for regression analysis, which involved correlation analysis, two-stage least square analysis and curve fitting. This paper aims to help investors choose better healthcare companies and help their managers improve their governance ability to attract more investors to invest in their companies to a certain extent. The remainder of the document is organized as follows: Section 2 will examine the prior Literature, Section 3 will describe the research methodology, Section 4 will give the analysis's findings, and Section 5 will provide the research's conclusion.

2. Literature Review

2.1. The Relationship between ESG Performance and Other Characteristics

There has been much literature on the impact of ESG on enterprise performance, which has clarified the research results of researchers, including two results: ESG performance has a positive effect on enterprise performance and a non-positive impact. First of all, the research of S&P 500 listed companies in the United States found that ESG disclosure has a positive effect on the operation (ROA), finance (ROE) and market performance (Tobin's Q) of enterprises [2]. Studies have also shown that ESG factors positively impact enterprises' profitability, especially for large enterprises [3]. Studies of Chinese A-share listed companies show that good ESG performance directly promotes corporate performance [4]. At the same time, there is a significant positive correlation between ESG performance and enterprise value, and good ESG performance plays a positive role in promoting enterprise value [5]. However, other studies have pointed out that ESG performance also has a negative impact on corporate performance. A study of listed companies in Saudi Arabia found that ESG disclosure significantly reduced market performance, but the correlation with ROE was insignificant [6]. Research on China's A-share listed company's shows that the implementation of ESG is not conducive to the growth of enterprises, especially when compulsory and voluntary ESG are distinguished. The enterprises forced to implement ESG have a more significant negative impact on their growth ability than those that implement it voluntarily [7]. In addition, ESG disclosure increases enterprise operating costs and reduces profit margins to some extent on enterprise costs and profits [2, 6]. Then, the impact of ESG disclosure on corporate reputation and market performance increases the risk of facing controversial events [8]. Regarding corporate sustainability, ESG disclosure may inhibit corporate growth [7].

2.2. The Characteristics of the Firms with Better Financial Performance

There is also much research on the characteristics of companies with better financial performance. The quality of an enterprise's financial position is also a key factor in determining its financial performance. Asset quality, capital structure quality, profit quality, and cash flow quality are important indicators that can be used to evaluate the financial status of enterprises [9]. In addition, there is a significant positive correlation between corporate profitability and financing efficiency [10]. The earnings quality evaluation indicators of listed companies, such as the ratio of net operating cash flow to operating profit, can provide investors with useful references for investment decisions [11]. Some studies have also shown that corporate reputation is crucial for maintaining long-term excellent financial performance, and companies with a good reputation can better maintain their above-average profit results [12].

2.3. ESG and Corporate Performance in Healthcare Industry

From the financial performance perspective, there is a positive relationship between ESG performance and corporate financial performance. Studies have found that the ESG performance of listed companies in the pharmaceutical industry positively impacts stock returns [13]. From the perspective of social responsibility and environmental protection, by improving ESG performance,

medical enterprises can achieve enterprise value creation by relieving corporate financing pressure, gaining competitive advantages, expanding domestic and foreign markets, and enhancing the ability to prevent and cope with risks [14]. However, the impact of ESG activities on firm performance is not positive in all cases. One study found that the relationship between ESG activities and firm performance in developing countries may be negative or insignificant [15].

2.4. Theoretical Analysis and Research Hypothesis

Based on the above literature review, it can be understood that ESG impacts enterprise performance, including positive and non-positive impacts. At the same time, the characteristics of enterprises with good financial performance include financial factors such as the financial status and profitability of enterprises and the company's reputation, but no ESG-related factors are mentioned. However, ESG can affect a company's reputation and, in turn, its financial performance. One of the reasons for choosing the healthcare industry for this study is that the reputation of the healthcare industry is generally good. In implementing the ESG strategy, healthcare enterprises can improve their financial performance, market value, social responsibility, and environmental protection awareness to a certain extent. This way, the research results can be avoided due to corporate reputation factors. From this, we propose the following hypothesis:

H1: the firm with better ESG performance will have a better financial performance.

3. Methodology

3.1. Sample and Data

This study selected the top 50 healthcare companies listed on the NASDAQ by 2024 and their 2022 data and the 60 A-share listed companies by 2024 and their 2022 data. To ensure the scientificity of the research, it is necessary to process the obtained data. (1) Eliminate companies with missing data, (2) eliminate companies with ST, and (3) eliminate companies that do not publicly disclose ESG data. A total of 188 data from 48 companies were included in the sample. Among them, we obtained their financial statements from Wind Terminal and Oriental Fortune and received their return on equity (ROE) by dividing the net interest rate by the owner's equity. In addition, we found their ESG score and ESG disclosure score from Bloomberg.

3.2. Method

Regression analysis is a statistical method used to study the relationship between one or more independent variables (explanatory variables) and dependent variables. It can help to predict and understand the interactions between variables. Regression analysis is widely used in many fields, such as economics, medicine, and engineering. In empirical research in economics, linear causality modelling is one of the most commonly used methods [16]. This experiment uses correlation analysis, two-stage least squares analysis and curve fitting to explore the relationship between ESG performance and the financial performance of healthcare enterprises.

3.3. Variables

3.3.1. Dependent Variable

Corporate financial performance. The return on equity was chosen to represent the firm's performance, the more excellent the value, the better the firm's financial performance. (Equation 1)

$$ROE = \frac{Net\ Profit}{Total\ Owners'Equity} \quad (1)$$

3.3.2. Independent Variable

ESG performance. According to the received ESG score and ESG disclosure score data, ESG performance is set to be expressed by the quotient of the two. The larger the value is, the better the enterprise's ESG performance is. (Equation 2)

$$ESG_P = \frac{ESG\ score}{ESG\ disclosure\ score} \tag{2}$$

3.3.3. Control Variable

Size of enterprise. Corporate net assets refer to the net value of assets minus liabilities owned by an enterprise in a certain period, which mainly reflects the enterprise's capital structure and financial stability [17]. There is a specific correlation between the size of an enterprise and its financial performance [18]. The size of net assets can be used as a reference indicator to measure the size of the enterprise because higher net assets usually mean that the enterprise has more resources to support its operation and development. Here, the logarithm of the base e of the net assets of enterprises is taken as the control variable of this experiment. (Equation 3)

$$SCALE = \ln(Net\ Assets) \tag{3}$$

3.3.4. Model Assumptions

Taking the enterprise's financial performance as the explained variable and the enterprise's ESG performance as the explanatory variable, Equation (4) is established by regressing the enterprise's ESG performance and the enterprise's financial performance.

$$ROE = \beta_0 + \beta_1 ESG_P + \beta_2 SCALE + \varepsilon \tag{4}$$

Where ROE represents the financial performance of the enterprise, ESG_P represents the ESG performance of the enterprise. The rest are control variables, $\varepsilon$is the random error, and β_0 is the constant term. If β_1 is regular, then H1 is supported.

4. Analysis and Discussion

4.1. Descriptive Analysis

As shown in Table 1, the mean value of ESG performance is 0.07325, and the standard deviation is 0.0245, indicating that the ESG performance of the sample enterprises is above medium. The maximum value of ESG performance is 0.1480, and the minimum is 0.0440. The significant difference between the two indicates a large difference in ESG performance among different enterprises. ROE's maximum and minimum values are 0.4672 and − 0.4127, respectively, which also shows that the financial performance of different enterprises is different.

Table 1. Variable description analysis.

	Max	Min	Average	Standard deviation
ESG_P	0.1480	0.0440	0.0732	0.0245
ROE	0.4672	-0.4127	0.1263	0.1513
$SCALE$	25.0645	-21.7709	21.8091	6.5666

Before the regression, the variables were subjected to Pearson correlation analysis. Pearson correlation analysis is a statistical method that measures the strength and direction of a linear relationship between two continuous variables. By calculating the correlation coefficient, it is possible to determine whether there is a positive or negative correlation between the variables and the strength of this relationship. In this study, the correlations between firm financial performance and ESG performance and between ESG performance and firm size are − 0.075 and 0.224, respectively. However, these correlations are not statistically significant (p values are 0.618 and 0.134,

respectively), indicating a weak linear relationship between these variables. Still, the control and dependent variables are significantly correlated.

4.2. Regression Analysis

Two-stage, most minor squares analysis was used to construct multiple regression models to further explore the impact of ESG performance on corporate financial performance and consider the possible mediating or moderating effect of firm size. In the first model, Yun sets corporate financial performance as the dependent variable and ESG performance as the predictor variable. The results show that the explanatory power of ESG performance on corporate financial performance is low (r-square is 0.007), and the adjusted R-square is − 0.016, indicating that the model's predictive power is limited. In the second model, the logarithmic form of ESG performance is included as a predictor variable, and the model's explanatory power is found to be slightly improved (r-square is 0.009), but it is still low. Similarly, the inverse form of ESG performance was tried in the third model, but the results were not significantly improved (r-square 0.013). These results suggest that ESG performance and its transformed form have weak explanatory power for firm financial performance.

Quadratic and cubic regression models are further constructed to explore whether the relationship between ESG performance and corporate financial performance may show nonlinear characteristics. In the quadratic model, the squared term of ESG performance is incorporated into the model. While in the cubic model, the cubic term of ESG performance is also considered. The results show that even with the introduction of nonlinear terms, the explanatory power (r-squared = 0.012 and 0.048, respectively) and predictive power (adjusted R-squared = − 0.032 and − 0.017, respectively) of these models are still low, and all the regression coefficients are statistically insignificant (p values greater than 0.05). This indicates that ESG performance and its nonlinear form do not significantly impact firm financial performance.

4.3. Discussion

Based on the above analysis, the following conclusions can be drawn: In this study, ESG performance and its transformed form have a limited direct impact on the financial performance of enterprises, and this impact is not statistically significant. This may mean that changes in corporate financial performance are not solely determined by ESG performance but may also be affected by other unconsidered variables. In addition, the relationship between ESG performance and firm financial performance may not be simply linear but more complex and nonlinear, but this relationship is not captured in these models. Therefore, future research may need to consider more variables and complex models to understand the relationship between firm financial performance and ESG performance more accurately.

5. Conclusion

As ESG becomes increasingly important as an investment metric, many investors want to know the relationship between ESG and corporate performance to help them invest. In addition, many corporate managers also want to improve corporate ESG to increase corporate profits and attract more investors. This study also aims to help investors invest better and help managers make better decisions to increase profits. The following conclusions are obtained through the regression of the data of 48 sample companies: (1) the direct impact of ESG performance and its transformation form on the financial performance of enterprises is limited, and this impact is not statistically significant. (2) Changes in corporate financial performance are not solely determined by ESG performance but may also be affected by other unconsidered variables. (3) The relationship between ESG performance and corporate financial performance may not be a simple linear relationship but a more complex nonlinear relationship.

In addition, although enterprise size is correlated with corporate financial and ESG performance in the correlation analysis, we do not take it as a predictor or mediator variable for in-depth discussion

in the regression model. Future research could consider the potential role of firm size, such that it may act as a moderating variable affecting the impact of ESG performance on firm financial performance. At the same time, other types of nonlinear models, such as polynomial regression or generalized additive models, can be tried to capture the complex relationships among the variables better. In addition, given the small sample size, N=46, it may limit the ability of the model to find significant effects, so increasing the sample size may also be a direction for future research.

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