

Study of the Impact of ESG Performance on The Financial Performance of Mining Companies

Yiming Zhang*, Guoyu Mao

College of Management, Sichuan University of Science & Engineering, Yibin, 644000, China

* Corresponding author: Yiming Zhang (Email: 738977929@qq.com)

Abstract: As a comprehensive evaluation system focusing on corporate environmental responsibility, social responsibility and internal governance, ESG is of great significance for companies to realize sustainable and high-quality development. We select the listed companies in China's mining industry in 2018-2022 as the research sample, and empirically examine the impact of ESG performance on the financial performance of listed mining companies through a fixed-effects model. The results show that the ESG performance of mining enterprises is positively correlated with their financial performance, which is still valid through the robustness test; ESG investment has a heterogeneous impact on the financial performance of mining enterprises of different natures. In view of this, it is suggested that China's listed mining companies should strengthen their investment in ESG and emphasize on social responsibility and corporate governance; meanwhile, it is also suggested that regulators should look for regulatory clues based on the relationship between ESG performance and financial performance of mining companies.

Keywords: Mining companies; financial performance; ESG performance; sustainable development.

1. Introduction

Under the double impact of economic downturn and energy crisis, the wave of sustainable development is sweeping over all countries in the world, which also drives the continuous warming of the ESG (Environment, Social, Governance) concept that is deeply in line with it in the global scope, which adds the environmental and corporate governance related contents on the basis of corporate social responsibility (hereinafter referred to as CSR). The concept adds environmental and corporate governance-related contents to CSR, emphasizing the basic premise for enterprises to achieve sustainable development under the existing institutional environment.

Driven by China's dual-carbon target and the new development concept, enterprise ESG practice is a general trend, one of the purposes of which is to promote enterprises to adjust their internal factor structure in order to achieve the goal of maintaining a benign interaction among the environment, society and enterprises, and to promote the realization of sustainable development of enterprises.

In China, the concept of ESG is still in its infancy. In 2023, about 33.28% of listed companies in China independently published ESG reports, and although the disclosure rate of indicators in each dimension has improved, there are still problems of unbalanced and insufficient disclosure [1]. Among CSI 800 constituent listed companies, the disclosure rates of indicators in the three dimensions are corporate governance, environment and society in descending order, and the disclosure rates of most voluntary disclosure indicators are lower, with qualitative disclosure being better than quantitative disclosure. Nowadays, the capital market is paying more and more attention to the ESG performance of enterprises. Institutional investors have an ESG preference, as rated companies have higher stock returns than those without ESG ratings, and higher rated companies have higher stock returns among rated companies. However, the level of ESG management among listed companies varies, the quality of ESG disclosure is not high, the level of ESG disclosure varies

greatly among different industries, and the importance attached to ESG has not yet reached the strategic level it deserves.

Whether and how firms investing capital in ESG practices can realize improvements in corporate financial performance. It has become a topic explored by many scholars at home and abroad. According to the existing literature, scholars have not reached a unanimous conclusion on the relationship between corporate ESG performance and financial performance, with the following three main views: First, based on the stakeholder theory, some scholars believe that through ESG practices, corporations incorporate stakeholders into the process of value creation, alleviate the problem of information asymmetry, and enhance corporate credibility, and thus ESG performance is performance [2]; significantly positively correlated with financial second, based on neoclassical economics, some scholars believe that there are externalities in corporate ESG practices, and management may use them as a tool to pursue their own interests. Secondly, based on neoclassical economic theory, some scholars believe that there are externalities in the inputs of corporate ESG practices and management may use them as a tool to pursue their own interests, thus ESG performance is negatively correlated or irrelevant to financial performance [3][4]; thirdly, based on cost-benefit theory, some scholars believe that the impact of ESG performance on financial performance can be manifested in the form of a learning curve and synergistic effects, which show the "U" shape of ESG performance, and the "U" shape of ESG performance. "U"-shaped influence relationship [5].

Therefore, a review of the above literature suggests that the impact of ESG performance on the financial performance of firms in the mining industry is still unknown. Mining companies, due to their high pollution, high energy consumption and high emissions, are different from other companies and should take more environmental and social responsibilities in terms of ESG performance. Based on this, research on the effect of ESG performance on the financial performance of mining enterprises can provide empirical

evidence to support the green transformation of the industry to break through the "three highs" problem. This paper focuses on the link between the ESG performance of mining enterprises and their financial performance, and takes listed companies in China's mining industry as an example from 2018-2022 to explore the impact of ESG performance on corporate financial performance through empirical research in the mining industry. The results of the study will provide a theoretical basis for the sustainable development of coal enterprises under the ESG perspective, and provide a reference for the government to guide and incentivize enterprises to disclose ESG information, and promote the green and sustainable development of enterprises.

2. Literature Review

Currently, scholars' research on ESG mainly focuses on ESG evaluation system, ESG information disclosure and its economic consequences. It is still a controversial issue how ESG performance affects corporate financial performance and enhances corporate value. In addition to studying the impact of ESG performance on corporate financial performance from the three dimensions of ESG indicators, a large number of scholars have also studied the impact of corporate ESG performance on financial performance as a comprehensive indicator. Since there is no standardized index for measuring ESG performance, this issue has high research value in the academic world.

Relevant scholars believe that enterprises should take the ideal ESG investment as the long-term sustainable investment of the enterprise, which is because good ESG performance can improve the investment efficiency of the enterprise, reduce the risk of stock price collapse and lower the cost of financing [6]. Corporate financial performance is generally measured by two types of indicators, namely, the financial performance of corporate accounting information performance indicators and financial performance indicators based on capital market information. The literature suggests that ESG performance is generally associated with a higher level of financial performance based on the accounting and financial market information.

While financial performance indicators based on accounting information are positively correlated, the correlation between ESG performance and financial performance indicators based on capital market information has been analyzed with some studies supporting a positive correlation and others supporting a negative correlation.

In the existing studies on ESG performance and accounting-based corporate financial performance in the Chinese context, Yuan Yehu et al [7] ignored the impact of different dimensions of ESG performance on corporate financial performance. Although the results of Li Jinglin et al [8] support the positive relationship between overall ESG and its dimensions and corporate financial performance, the data used to measure the ESG dimensions come from different databases, and the systematicity and consistency of the data sources need to be considered. Jiang Tao et al [9] (2022) selected A-share listed companies in China's pharmaceutical manufacturing industry in 2015-2019 as the research object, and constructed a model with media attention as the mediating variable to study the relationship between ESG performance, media attention and corporate financial performance. The study shows that corporate ESG

performance has a significant positive impact on corporate financial performance, in which media attention plays a mediating role. Lin Zhang and Haitao Zhao [10] (2019) used a two-way fixed-effects model to analyze the impact of ESG performance on enterprise value, and at the same time explored the moderating effect of enterprise heterogeneity on the relationship between ESG and enterprise value. The results of regression analysis show that corporate ESG performance is positively related to firm value. The results of heterogeneity analysis show that the positive correlation between ESG performance and enterprise value is more significant for SMEs, non-state-owned enterprises and less polluted industries. Tong Fan and Wang Yujuan [11] (2022) found that the ESG performance of firms has a significant positive impact on the long-term value of firms, while the heterogeneity of the industry and the nature of the firms does not have a significant impact on the correlation between the two. Chen et al. [12] found that the ESG performance of 311 Chinese manufacturing firms listed in the global capital market during the period 2008-2019 is positively correlated with firm value in the short term. Chen et al. [12] analyzed 311 Chinese manufacturing firms listed in global capital markets during the period 2008-2019 and found that ESG performance is negatively related to firms' financial performance in the short term and this negative effect gradually weakens over time, while long-term ESG performance promotes firms' financial performance. However, there are differences in the institutional environments of different capital markets around the world, and different regulatory and compliance requirements for firms in different institutional environments may also lead to differences in firms' ESG performance.

Although global research on ESG disclosure and corporate financial performance is still in its infancy, it has yielded rich results. In most cases, there is a positive correlation between the two. Lokuwaduge [13] (2017) found that stakeholders are key in influencing the ESG performance of companies by examining ESG reports of listed companies in the metals and mining industry in Australia; Nollet et al. [14] (2016) argued that there is a U-shaped relationship between social performance and return on assets and return on capital and Velte [15] (2017), Barnett et al [16] (2006) argued that firms that fulfill their social responsibilities well usually have a higher level of financial performance. Wong [17] (2020) examined the impact of ESG certification on Malaysian firms. The analysis shows that ESG recognition The certificate reduces the firm's cost of capital, while Tobin's Q is significantly higher. These findings are consistent with the fact that in developed economies conducting the study yields consistent findings that suggest the value of social responsibility disclosure by firms in developing countries has increased. Yuan [18] (2022), after an empirical study in the context of financial irregularities in Chinese listed firms, conclude that ESG disclosure reduces the risk of financial irregularities in firms, and helps to mitigate information asymmetry. However, it was found that ESG disclosure does not bring all positive impacts to firms. Raimo [19] et al. (2020) analyzed a sample of 171 internationally listed companies in the restaurant industry headquartered in North America, Western Europe, and developed Asia-Pacific, and the regression analysis showed that there is a significant negative relationship between ESG disclosure and cost of equity capital.

3. Theoretical Foundations and Research Hypotheses

3.1. Analysis of the impact of ESG performance on the financial performance of mining companies

First of all, the active disclosure of ESG reports by mining enterprises indicates that the enterprises concerned pay great attention to the communication with external stakeholders and investors. At present, there are three main research results on the relationship between environmental performance and financial performance at home and abroad: positive correlation, negative correlation, and irrelevant. In recent years, as green development theories such as low-carbon economy, sustainable development and ecological civilization construction are more widely spread and recognized around the world, more and more enterprises realize that while pursuing profit maximization, optimizing resource allocation and focusing on environmental protection can achieve the healthy and long-term development goals of enterprises. Many scholars have proved through empirical research that environmental performance is positively correlated with financial performance, and that the business decisions of enterprises must meet the needs of more stakeholders rather than just focusing on financial performance. At the national level, for enterprises with good environmental performance, the government usually gives certain preferential and supportive policies, which bring benefits to the operation of the enterprise, and bring benefits to the operation of the enterprise, such as Zhu Qingxiang et al [20] (2020) and Jiang Yingbing et al [21] (2019) pointed out in their studies that good environmental performance significantly improves the enterprise's financial performance, and that rewarding government interventions can enhance the effect. At the social level, the media opinion platform in the era of big data is more perfect, and the good public image and environmental reputation of enterprises can help them further expand social resources. At the enterprise level, most enterprises in heavily polluted industries rely on natural resources, and increased investment in environmental protection equipment and green technology innovation can improve their productivity and form their unique competitive advantages.

Secondly, resource base theory recognizes the heterogeneity of resources owned by firms. Enterprises actively practicing ESG and taking the initiative to assume relevant responsibilities can be regarded as a special form of investment in intangible assets such as reputation and moral capital [22]. In the long run these unique resources and capabilities will become a source of competitive advantage for enterprises and guarantee the improvement of their financial performance [23]. In addition, companies that actively fulfill their ESG responsibilities pay more attention to the work of their employees. The company is committed to providing equal treatment, a favorable working environment, and attention to employee satisfaction and health and welfare. Employee training and development. As a result, the turnover rate of employees is usually lower, and it is more likely to retain high-quality employees, and it also helps to attract outstanding talents to join the enterprise and enhance its productivity.

Finally, in the process of enterprise operation, information asymmetry, opportunism, and management short-sightedness

between managers and enterprise shareholders can cause agency problems and agency costs to increase. ESG performance can effectively mitigate information asymmetry and agency problems [24] and reduce agency costs. On the one hand, ESG performance can improve the internal governance level of the enterprise and alleviate the principal-agent conflict through legal and compliant incentive and constraint mechanisms; on the other hand, the active disclosure of ESG information reduces the cost of external supervision, which helps to improve the enthusiasm of external supervision and force the management to strengthen its own awareness of sustainable development and reduce opportunistic motives and behaviors, so as to avoid all kinds of operational risks and ethical disputes. Based on the above analysis, the following hypothesis is proposed in the paper 1.

Hypothesis 1: ESG performance of mining companies is positively related to financial performance.

3.2. Heterogeneity analysis of ESG performance for mining firms of different nature

According to the different nature of mining enterprises, this paper classifies the sample mining enterprises into state-owned enterprises and private enterprises, and the ESG performance of these two kinds of mining enterprises may be different, which is mainly due to the different business objectives and characteristics of state-owned enterprises and private enterprises, and the private mining enterprises mainly aim at survival and development, and they adopt the business strategy of maximizing corporate interests in their daily business activities, which can increase shareholders' income and enhance corporate financial performance. In their daily business activities, they will adopt the business strategy of maximizing corporate interests, which can increase shareholders' income and improve corporate financial performance. However, due to their special equity nature and social status, SOEs have more social resources and also need to assume more social responsibility, which results in their efforts to address environmental and social issues are often overlooked by the public, and the improvement of their internal control system is highly regarded and expected, so it is difficult for SOEs to transform their ESG performance into actual economic benefits.

In summary, this paper proposes research hypothesis 2. Hypothesis 2: ESG performance has a heterogeneous impact on the financial performance of mining firms of different nature.

4. Research Design

4.1. Sample Selection and Data Sources

Since the ESG data selected in this paper comes from Wind Database, a domestic authoritative rating agency that has been conducting research on ESG standards and frameworks since 2018, the sample data of all A-share-listed mining enterprises in China in 2018- 2022 are selected for the study, and the original sample data are screened as follows: ① Delete the companies that are listed on ST, *ST and terminated during 2018-2022; ② Delete the companies with missing values of key variables; ③ Delete the companies with missing values of key variables; and the original sample data is screened as follows: ① Delete ST, *ST, and enterprises whose listing will be terminated during the period of 2018-

2022; ② Delete enterprises with missing values of key variables; and Lost samples. After the screening process, 368 samples were obtained. Data on corporate ESG performance from Wind Data on public ESG ratings from the database, and data on other companies from the Cathay Pacific database (CSMAR).

4.2. Definition of main variables

4.2.1. Explained Variables - Firm Financial Performance

In this paper, we refer to the research of Luo Jinghua and other scholars [2], to measure the financial performance of mining enterprises by ROA of total assets, and use ROE of net assets to conduct the robustness test. A higher ROA means a higher utilization efficiency of assets, which can better control the cost and risk and achieve a better operating efficiency. ROE reflects the return rate of enterprise's investment to shareholders, and enterprises with higher ROE can attract more attention and support from investors and the capital market.

4.2.2. Explanatory Variables - Corporate ESG Performance (ESG)

The explanatory variables are the ESG scores of mining companies obtained from the ESG scores published in the Wind database, and Wind has independently developed an ESG evaluation system based on the actual situation of China's A-share market. WindESG refers to the international mainstream ESG system structure and combines the development of China's capital market, regulatory policies and company ESG practices to form a localized indicator system, which is more scientifically applicable to Chinese companies.

4.2.3. Control variable

Referring to previous related studies [2][4], the following indicators are selected as control variables in this paper.

(1) Age of the enterprise. The age of an enterprise reflects the length of time it has been in existence, and its business operations continue to develop over time, resulting in richer capital and experience, which is conducive to performance improvement.

(2) Equity Concentration (Top1). Equity concentration is usually measured by the proportion of a firm's equity holders, i.e. shareholders, who hold a strategic position that contributes to the firm's financial performance.

(3) Growth capacity (Growth). The analysis of the growth capacity of the enterprise shows the long-term expansion ability of the enterprise and the strength of future production and operation.

(4) Gearing ratio (Lev). The gearing ratio reflects an enterprise's ability to raise debt to operate and is a key indicator of an enterprise's financial position.

(5) Proportion of Independent Directors (Indep). The proportion of independent directors reflects the objectivity, professionalism and independence of the board of directors to a certain extent, and has an impact on the financial performance of the enterprise by weakening the negative impacts caused by insider control.

(6) Enterprise size (Size). There is a close relationship between enterprise size and financial performance, and the impact of enterprise size on it is diverse.

Definitions and detailed descriptions of the main variables in the text are given in Table 1.

Table 1. List of variable definitions

Variable type	variable name	variable symbol	clarification
Explanatory Variable	Financial performance	ROA	Net profit/total assets
Explanatory Variable	ESG performance	ESG	ESG score based on Wind ESG rating system
Control variable	Age of business	Age	Years of business establishment
	shareholding concentration	Top1	Shareholding ratio of the largest shareholder
	growth capacity	Growth	(Current operating income - prior period's operating income)/prior period's operating income
	gearing	Lev	Total liabilities/total assets
	Proportion of Independent Directors	Indep	Number of independent directors/number of board members
	Enterprise size	size	Ln (total business assets)

4.3. Modeling

In order to test the research hypothesis, this paper constructs a regression model as:

$$ROA_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 X_{it} + u_i + \delta_t + \epsilon_{it} \quad (1)$$

Where ROA_{it} denotes firm i's return on total assets at time t, ESG_{it} denotes firm i's ESG performance at time t, and X_{it} denotes the main control variable. u_i denotes individual fixed effects where firm i does not vary over time, δ_t denotes time fixed effects, and ϵ_{it} denotes the randomized disturbance term.

5. Empirical Analysis

5.1. Descriptive statistics

The descriptive statistics of each variable are shown in Table 2, in which the mean value of ROA of the sample enterprises is 0.029, which is small, indicating that the financial performance of mining enterprises in China is at a lower level. The mean value of ESG performance of the sample enterprises is 5.796, with a rating between C and A. Initially, it indicates that the willingness of the mining industry to disclose ESG information on its own initiative is not high, and the overall importance of ESG is low.

Meanwhile, the standard deviation is 1.029, the minimum value is 0, and the maximum value is 9.250, which indicates that different mining enterprises attach different importance to and invest in ESG, so the ESG performance of the enterprises in the sample is not the same, according to the analysis of ESG score data in Wind database, the disclosure

of environmental, social and corporate governance information of the enterprises in China's mining industry as a whole is yet to be perfected. For the main control variables, except for Size, the maximum and minimum values of the other variables differ greatly, indicating that the development of mining enterprises in these five aspects is not balanced.

Table 2. Descriptive Statistics

variable name	obs	Mean	Std Dev.	Min	Max
ROA	368	0.029	0.138	-1.860	0.640
ESG	368	5.796	1.029	0.000	9.250
Lev	368	0.487	0.185	0.070	0.980
Age	368	20.826	4.809	9.000	34.000
Top1	368	41.737	18.010	6.390	80.870
Growth	368	0.242	0.694	-1.070	7.400
Indep	368	38.008	5.425	28.57	66.670
Size	368	23.547	1.719	19.29	28.640

5.2. Correlation test

The Pearson's correlation variables in the paper, and the results are shown in Table correlation coefficients between ESG performance and financial performance are positive and significant at the 5% level, which means that ESG performance can improve the financial performance of

mining companies, and the hypothesis is initially confirmed. From the Pearson correlation coefficient test results of the whole table, the coefficient between the variables is not high, indicating that the model is set up reasonably, so it is considered that there is no serious problem of multicollinearity between the relevant variables, and we can continue to carry out the next step of regression analysis.

Table 3. Correlation analysis

variable name	ROA	ESG	Lev	Top1	Growth	Indep	Size	Age
ROA	1.000							
ESG	0.124**	1.000						
lev	-0.279***	-0.050	1.000					
top1	0.203***	0.289***	-0.064	1.000				
growth	0.028	-0.015	0.021	-0.141***	1.000			
indep	0.065	0.206***	-0.173***	-0.010	0.189***	1.000		
size	0.244***	0.484***	0.136***	0.497***	-0.164***	0.044	1.000	
age	0.119**	-0.275***	0.008	-0.169***	0.022	-0.076	-0.047	1.000

Note: ***, **, * indicate significant at the 1%, 5%, and 10% levels, respectively, and the same below.

5.3. Analysis of regression results

The regression analysis of model (1) is shown in Table 4, from which it can be seen that the coefficient of the explanatory variable ESG is 0.028, which is significant at 5% level, i.e., the ESG performance of mining enterprises is positively correlated with their financial performance, which supports the hypothesis 1: the importance of ESG in mining enterprises is conducive to the achievement of better financial performance of the enterprises. As for the control variables, the coefficient of Growth is 0.036, which is significant at the 1% level, indicating that under other conditions, the ESG performance of mining enterprises is positively correlated with their financial performance, which supports the hypothesis 1: the importance of ESG in mining enterprises is conducive to the achievement of better financial performance of the enterprises. As for the control variables, the coefficient of Growth is 0.036, which is significant at the 1% level, indicating that under other conditions, the ESG performance of mining companies is positively related to their financial performance. The higher the growth performance of mining firms, the better their financial performance, holding constant the lev coefficient of -0.521, at significant at the 1% level.

This suggests that in recent years the cost of liabilities of mining companies has been rising and the quality of their assets has declined. Against the backdrop of the decline, maintaining a high gearing ratio reduce the profitability of enterprises.

Table 4. ESG and ROA regression analysis results

variable name	ROA	t-stat	p-value
ESG	0.028**	2.03	0.044
LEV	-0.521***	-4.82	0.000
Top1	0.003	1.30	0.196
Growth	0.036***	3.09	0.002
Indep	0.004*	1.79	0.075
Size	0.065	1.61	0.107
Age	0.015***	2.70	0.007
Enterprise fixed		Yes	
Year fixed		Yes	
_cons	-1.995**	-2.21	0.028
R ²		0.176	

Private firms have a different self-positioning and

development strategy than most state-owned firms, enabling them to obtain a higher rate of return from their R&D investments. Mining firms are divided into SOEs and private firms and regressed sequentially. The results of the heterogeneity analysis, as shown in Table 5:

Table 5. Results of heterogeneity analysis

Variable name	Explained variable: ROA	
	Private business	Nationalized business
ESG	0.025**	0.006
LEV	-0.481***	-0.524***
Top1	0.002	0.003
Growth	0.041***	0.038***
Indep	0.002	0.004*
Size	0.064	0.074*
Age	0.017***	0.018***
Enterprise fixed		Yes
Year fixed		Yes
_cons	-2.572**	-2.109**
R ²	0.178	0.189

From the test results in Table 5, it can be seen that the effect of ESG performance on financial performance in private enterprises is positive and significant, with a regression coefficient of 0.025, which is significant at the 5% level. In state-owned enterprises, the effect of ESG performance on financial performance is not significant. The reasons for this are: first, under the state regulatory system, state-owned enterprises will comply with state policies and implement relevant regulations to fulfill their social responsibilities, and the endogenous nature of their social responsibility mission weakens the relationship between ESG performance and financial performance; second, state-owned enterprises are in an advantageous position in obtaining government resources, and it is easier for them to raise funds, and therefore they will not rely on the way of improving ESG performance to improve their financial performance. In summary, the relationship between ESG performance and financial performance is more significant for private mining companies than for state-owned companies, which supports Hypothesis 2: ESG performance has a heterogeneous effect on the financial performance of mining companies of different natures.

5.4. Robustness test-variable substitution

In order to test the reliability of the research results as well as the stability of the model, this paper selects new variables to replace financial performance. Referring to the existing literature [2], we further replace the explanatory variable ROA with return on equity (ROE, ROE=enterprise net profit/average net assets), and carry robustness test. The regression results of ESG and ROE Table 6. It can be seen in Table 6 that the correlation coefficient of ESG performance and ROE, an indicator of financial performance, is 0.392, which is positively correlated, and it is significantly significant at the 5% level. The robustness test finds that the sign and significance of the coefficients of the main variables have not changed, and the conclusion is robust, and the hypothesis of this paper can be supported.

Table 6. ESG and Firm ROE Regression Analysis Results

variable name	ROE	t-stat	p-value
ESG	0.392**	2.21	0.028
LEV	-5.102***	-3.61	0.000
Top1	0.025	0.96	0.337
Growth	0.511***	3.36	0.001
Indep	0.039*	1.39	0.166
Size	-0.803	-1.52	0.129
Age	0.015***	2.90	0.004
Enterprise fixed		Yes	
Year fixed		Yes	
_cons	0.216***	1.01	0.313
R ²		0.117	

6. Conclusions and Recommendations

6.1. Reach a verdict

"The 14th Five-Year Plan clearly points out that economic and social development should be based on the theme of promoting high-quality development, and enterprises should pay more attention to environmental, social and governance performance to realize long-term sustainable development, and ESG is one of the powerful tools to implement the new development concept and build a new development pattern. Based on the ESG score data of Wind database, this paper selects the listed companies in China's mining industry from 2018-2022 as the research sample to explore the relationship between ESG performance and financial performance of listed companies in China's mining industry. The conclusions support the academic view that ESG performance is positively correlated with corporate financial performance, and the specific conclusions are as follows:

Overall, the ESG performance of mining companies is positively correlated with their financial performance, i.e., mining companies can positively affect their financial performance by increasing their awareness of ESG concepts and investing in ESG practices.

In terms of the nature of ownership, the relationship between ESG performance and financial performance is more significant for private companies in the mining sector than for state-owned companies, suggesting that private companies in this sector are better able to capitalize on their market advantages by improving their ESG performance.

Of course, this study still has some limitations, such as only selected listed companies in China's mining industry as the research object. In future studies, the sample range will be expanded to verify the generalizability of the findings. Meanwhile, it is found in this study that since the performance of corporate ESG is also affected by many other

factors, other factors of the relationship between corporate ESG performance and financial performance will be further investigated in future studies.

6.2. Suggestions

(1) The government and relevant departments should strengthen the ESG information disclosure requirements for enterprises in the mining industry, improve the ESG-related institutional development.

According to the descriptive statistics, there is a big difference in ESG disclosure among mining enterprises, and enterprises still mainly disclose ESG information voluntarily. Therefore, relevant government regulators should continuously improve the regulatory mechanism to reduce the

short-sighted behavior of enterprises, establish ESG information disclosure norms, improve the evaluation index system, attract more enterprises to take the initiative to make ESG-related investments, and create a market atmosphere of active ESG disclosure, so as to realize a benign industry loop.

At the same time, relevant organizations should incorporate ESG disclosure into relevant laws and regulations, improve the ESG disclosure system, and establish a unified ESG disclosure standard and framework. Increase the supervision of ESG disclosure, and provide incentives and penalties according to the ESG performance of enterprises to improve their ESG performance. At the same time, give full play to the market mechanism to raise the importance of commercial banks and other financial and investment institutions on ESG responsible investment, and encourage and guide them to increase their ESG investment in the mining industry, so as to help mining enterprises realize sustainable development. The relevant government regulatory agencies can provide subsidies or other preferential policies to enterprises that actively fulfill and disclose environmental information, so as to promote enterprises to increase the enthusiasm of ESG disclosure. Provide support to enterprises that actively disclose ESG information, such as lowering the cost of corporate finance, tax breaks and other incentives, to advocate the sustainable green development of the industry.

(2) Mining companies should improve ESG information disclosure and integrate ESG concepts into their production and operation.

As enjoyers of social resources, enterprises should assume social responsibility on a wider scale. Consciously fulfilling ESG responsibilities can not only improve the financial performance of enterprises, but also increase the non-economic benefits for stakeholders. Mining enterprises, as entities that consume natural resources and emit pollution, can only respond to the development of society and gain new vitality by reshaping their concept of sustainable development and increasing their investment in ESG practices.

ESG disclosure can reflect the future development prospects of an enterprise, and active fulfillment of ESG responsibility is the right choice for long-term development of an enterprise. Based on the cost-benefit theory, the fulfillment of ESG responsibility requires a large amount of direct capital investment, which increases the cost of the enterprise to a certain extent, and may cause the enterprise to fall into a situation of high uncertainty. Therefore, mining enterprises should improve the corporate governance system, clarify the responsibility of ESG strategy deployment of the board of directors, and incorporate it into the performance appraisal of executives. In addition, through the linkage of incentives and constraints, internal principal-agent conflicts can be mitigated, so that the management of the enterprise can prioritize the fulfillment of ESG responsibilities in decision-making and contribute to the sustainable development of the enterprise.

(3) Private companies in the mining sector should actively participate in ESG practices

Compared with private enterprises, SOEs are affected by more factors and bear more social responsibilities, which makes their ESG performance better than private enterprises. Therefore, according to the theory of diminishing marginal utility, the ESG performance of private enterprises has a more significant effect on financial performance. The active participation of private mining companies in ESG practices can convey to external stakeholders that their internal

operations are in good shape, effectively express their adherence to the concept of sustainable development, and gain support and recognition from the government and the public. For state-controlled mining companies, the government and regulators have not been able to improve their financial performance due to the lack of obvious effects of ESG performance on financial performance. It should play a guiding role and put appropriate external pressure on state-owned enterprises to actively participate in ESG practices. Trample.

References

- [1] Business Road Rong Green. Report on ESG Rating Analysis of A-share Listed Companies (2023)[R]. 2023
- [2] Luo, Jinghua, Zhao, Boya. ESG performance and firms' short-term financial performance: moderating effects based on institutional environment Test[J]. Wuhan Finance, 2022(7):20-28.
- [3] ATANR, ALAMMM, SAIDJ, et al. The Impact s of Environmental, Social, and Governance Fact or son Fi r m Performance: Panel Study of Malaysi an Companies [J]. Management of Environmental Quality :An International Journal. 2018, 29 (2): 1 82- 1 94.
- [4] DUQUE- GRISALES E, AGUILERA- CARACUEL J. Environmental, Social and Governance (ESG) Scor es and Financial Performance of Multilatinas: Moder at Effects of Geographic International Diversification and Financial Slack [J]. Journal of Busi ness Et hi cs, 2021 , 1 68(2): 31 5- 334.
- [5] Wang Shuangjin, Tian Yuan, Dang Lili. ESG Responsibility Fulfillment, Competitive Strategy and Financial Performance of Industrial Enterprises[J]. Accounting Research, 2022(3):77-92.
- [6] Qiu Muyuan, Yin Hong. Corporate ESG performance and financing cost in the context of ecological civilization construction[J]. Research on Quantitative Economics and Technical Economics, 2019(3):108-123.
- [7] YUAN Yehu, XIONG Xiaohan. Research on the relationship between ESG performance and corporate performance of listed companies: Based on the moderating role of media attention[J]. Jiangxi Social Science, 2021(10): 68-77.
- [8] LI Jinglin, YANG Zhen, CHEN Jin, et al. Research on the mechanism of ESG promoting corporate performance: a perspective based on corporate innovation[J]. Science and Technology Management, 2021(9): 71-89.
- [9] Li Jiangtao, Pan Yijiang. Research on the Impact of ESG Performance on Corporate Financial Performance-Based on Media Attention Perspective [J]. Land Resources Science and Technology Management, 2022, 39(01):96- 104.
- [10] Zhang L, Zhao H. Does Corporate Environmental, Social and Corporate Governance (ESG) Performance Affect Corporate Value? --an empirical study based on A-share listed companies[J]. Wuhan Finance, 2019(10):36-43.
- [11] Tong Fan, Wang Yujuan. Can ESG Performance Enhance Corporate Value? --Based on China's A-share Listed Companies. A study of evidence[J]. Business Accounting, 2022 (21): 48-53.
- [12] CHEN L, YUAN T, CEBULA R J, et al. Fulfillment of ESG Responsibilities and Firm Performance : A Zero- Sum Game or Mutually Beneficial[J]. sustainability, 2021, 13(19):1-17.
- [13] LOKUWADUGE C S D S , HEENETIGALA K. Integrating Environmental, Social and Governance (ESG) Disclosure for a Sustainable Development: an Australian Study[J]. Business Strategy and the Environment, 2017, 26(4):438- 450.

- [14] NOLLET J, FILIS G, MITROKOSTAS E. Corporate Social Responsibility and Financial Performance: a Non-linear and Disaggregated Approach[J]. Modelling, 2016, 52(B):400-407.
- [15] VELTE P. Does ESG Performance Have an Impact on Financial Performance? Evidence from Germany[J]. Journal of Global Responsibility, 2017, 8(2):169- 178.
- [16] BRAMMER S, BROOKS C, PAVELIN S. Corporate Social Performance and Stock Returns : UK Evidence from Disaggregate Measures[J]. , 35(3):97-116.
- [17] Wong W C, Batten J A, Ahmad A H, et al. Does ESG certification add firm value?[J]. Finance Research Letters, 2020, 39(2): 101593.
- [18] Xueying Y, Zhongfei L, Jinhua X, et al. ESG disclosure and corporate financial irregularities - Evidence from Chinese listed firms[J]. Journal of Cleaner Production, 2022, 332(02): 129992.
- [19] Raimo N, de Nuccio E, Giakoumelou A, et al. Non-financial information and cost of equity capital: an empirical analysis in the food and beverage industry [J]. British Food Journal, 2020, 23(4): 49-65.
- [20] ZHU Qingxiang, ZOU Tao, CUI Xiaomin, et al. Research on the impact of corporate environmental performance on financial performance: based on different types of Analysis of the regulatory role of government intervention[J]. Economy and Management, 2020(4):72-81.
- [21] JIANG Yingbing, CUI Guanghui. The impact of environmental protection industrial policy on corporate environmental protection investment: based on heavily polluted listed companies the empirical evidence [J]. Reform, 2019(2):87-101.
- [22] Wang Linlin, Lian Yonghui, Dong Jie. Research on the Influence Mechanism of ESG Performance on Corporate Value [J]. Securities Market Herald, 2022(05):23-34.
- [23] Hu Quying. Research on the correlation between environmental performance and financial performance of listed companies [J]. China Population-Resources and Environment, 2012, 22(06):2332.
- [24] ZHOU Bing, LU Jiangjiang, LU Pei. Research on technological innovation promotion effect of enterprise ESG performance improvement [J]. Western Forum, 2023, 33(06):81-95.