

A Study of the Impact of ESG Performance on Enterprise Value—Taking Ming Yang Smart as an Example

Yantao Wang^{1,a}, Wenyu Guan^{2,b,*}

¹Business School, Qingdao University of Technology, Qingdao, 266520, China

²Business School, Qingdao University of Technology, Qingdao, 266520, China

^awangyantaoking@163.com, ^b2442117591@qq.com

*Corresponding author

Abstract: With the steady progress of the “double carbon” goal, the concept of ESG sustainable development has been gradually popularized in the capital market, which plays an important role in promoting the enhancement of enterprise value and gradually becomes an important information basis for enterprise managers and market investors to make decisions. New energy wind power enterprise Ming Yang Smart actively responds to the call of the state, is committed to ESG construction, based on the constructed ESG evaluation system, this paper adopts the entropy method to comprehensively score the ESG performance of Ming Yang Smart in the past five years, and uses the gray correlation method to measure the degree of correlation between its ESG performance and enterprise value. From the analysis results, Ming Yang Smart's ESG performance scores improve year by year, and there is a strong correlation between all three dimensions of ESG as well as overall performance and enterprise value, among which the correlation between social responsibility and enterprise value is the highest, so it can be seen that good ESG performance has a positive impact on improving enterprise value, and active fulfillment of social responsibility is conducive to the enhancement of enterprise value. The research in this paper helps to enhance Ming Yang Smart's attention to ESG and provides reference for peers.

Keywords: ESG; Ming Yang Smart; Enterprise value; Entropy method; Gray correlation analysis

1. Introduction

At present, global ecological and environmental governance is facing serious challenges, and the outbreak of the new Crown Pneumonia epidemic has pushed the issue of sustainable economic development to the forefront. General Secretary Xi Jinping pointed out that sustainable development is “an inevitable product of the development of social productive forces and scientific and technological progress” and “the golden key to solving current global problems”. In this context, all walks of life and the capital market are increasingly concerned about whether enterprises have the ability of sustainable and healthy development. ESG is an investment concept and enterprise evaluation standard, which means that enterprises fully consider the environment, society and corporate governance and other factors in their operation and management, and make behaviors conducive to the sustainable development of the enterprise^[1]. As the implementation body of ESG concept, enterprises should actively fulfill their environmental, social and governance responsibilities, carry out ESG practices, and improve the efficiency of resource allocation through production and operation activities and investment activities, so as to realize the unity of economic, social and environmental benefits. The performance of enterprises in the three dimensions of environment, social responsibility and corporate governance is closely related to enterprise value, and good ESG performance can attract more investment, improve the level of innovation, convey a good reputation, and enhance the value of enterprises. The new energy wind power industry where Ming Yang Smart is located belongs to China's strategic emerging industries, and is an important force in promoting low-carbon economy and realizing green sustainable development. Exploring the impact of its ESG performance on its enterprise value is of great significance in promoting the sustainable development of the new energy wind power industry, and it can also provide a reference and inspiration for other enterprises that carry out ESG practices.

2. Literature review

2.1. Study of the impact of ESG performance on enterprise value

Most scholars believe that good ESG performance has a positive impact on enterprise value^[2], and that improving ESG performance is an important way for companies to hedge their risks and preserve their value, obtain favorable resources and win competitive advantages, which is conducive to the improvement of corporate financial performance and market value^[3]. Good ESG disclosure can lead to higher stock returns^[4], and the better the ESG performance, the higher the market value. Of course, there are some scholars who hold the opposite view, they believe that the most fundamental business purpose of enterprises is to create benefits for shareholders, and if they invest too much in ESG, it will increase the extra expenses of enterprises, harm the interests of shareholders, and then reduce the value of the enterprise^[5]. Rehman R U (2016)^[6] argues that the degree of asymmetry of the information related to the ESG event is higher, and in the process of transmission bias easily in the process of transmission, which tends to adversely affect the financial performance and market valuation of enterprises.

2.2. Research on the path of ESG performance on enterprise value

Firstly, the investment effect. Good ESG performance can alleviate financing constraints and enhance the availability of capital, thus helping to increase enterprise value^[7]. Enterprises with good ESG performance tend to have higher risk management capabilities, and are better able to focus on their own long-term development and reduce the damage brought about by short-sighted behavior^[8], which can also send positive development signals to the outside world, enhance market acceptance, increase investor confidence in obtaining the expected returns^[9], and obtain investor preference, in which the institutional investor can use its professional ability to regulate the behavior of the managers, so as to reduce the cost of the principal-agent, and to enhance the value of the enterprise. Secondly, innovation effect. Technological innovation has a mediating transmission effect in the mechanism of ESG performance enhancing market value, and strengthens the role of ESG performance in enhancing market value^[10]. Enterprises with good ESG performance, the management tends to pay more attention to the long-term goal, and will be more willing to increase the innovation investment^[11], and then increase the innovation output, in addition, it can also optimize the innovation structure and improve the efficiency of innovation, which in turn can enhance the value of the enterprise^[12]. Thirdly, reputation effect. As a special intangible asset, corporate reputation will help enterprises obtain more lasting economic benefits by influencing the evaluation of stakeholders, so that the long-term value of the enterprise will continue to increase. Good ESG performance can signal to market participants that the enterprise is taking the initiative to assume social responsibility, support environmental protection and improve corporate governance, thereby establishing a positive image and gaining a good reputation^[13], and also attracts the attention of new consumers, helping to expand the consumer market, thus contributing to the improvement of its own competitiveness and enterprise value^[14].

2.3. Literature Review

In general, most scholars believe that ESG performance has a positive impact on enterprise value, and mainly through the path of improving investment efficiency, enhancing the level of innovation and improving the external reputation of the enterprise value, the research method is based on empirical evidence, and there are relatively few case studies. This paper takes Ming Yang Smart as the research object, and combines the entropy value method and gray correlation degree method, and analyzes the impact of ESG performance on enterprise value as the direction of the content, which can enrich the relevant case studies.

3. Introduction to Ming Yang Smart

This paper takes Ming Yang Smart as the research object (see Table 1), mainly based on the following three points: Firstly, it is representative, Ming Yang Smart has a certain degree of strength in the new energy wind power industry, and it has been developing rapidly over the years, and has a model role compared with other companies in the same industry. ahead, and has a demonstration role compared with other enterprises in the same industry; Secondly, the data are easily accessible, with regular annual public disclosure of financial reports, ESG reports, etc; Thirdly, Ming Yang Smart actively practiced the ESG green development concept, published social responsibility reports continuously since 2018, disclosed in

detail its practice in the field of environment, society and governance, ranked among the top 500 Chinese enterprises and the top 500 global new energy enterprises, and was awarded “Forbes China Sustainable Industrial Enterprises” in 2023, it has certain research feasibility.

Table 1: Ming Yang Smart Company Profile.

Company name	Ming Yang Smart Energy Group Limited
Date of Establishment	Established in 2006 and listed on the Shanghai Stock Exchange in 2019 (601615).
Main Businesses	(1) Research & development, production and sales of wind turbines and their core components; (2) power generation business of new energy power plants; (3) sales business of new energy power plant products.

4. Analysis of the correlation between ESG performance and enterprise value of Ming Yang Smart

4.1. Evaluation System Construction

Table 2: Ming Yang Smart ESG Performance Evaluation System.

grade A	grade 2	attributes	instructions	code
Environmental	Electricity Energy Consumption Intensity (million kWh/ 100 million yuan)	Negative	Total electricity consumption/revenue	A1
	Water Consumption Intensity (cubic meters/ 100 million yuan)	Negative	Total water consumption/revenue	A2
	Domestic wastewater discharge density (cubic meters/ 100 million yuan)	Negative	Domestic wastewater discharge/business revenue	A3
	Greenhouse gas emission intensity (tCO ₂ e/ Ten thousand yuan)	Negative	Total greenhouse gas emissions/operating income	A4
	Hazardous waste emission intensity (tons/ million yuan)	Negative	Total hazardous waste/revenue	A5
Social	Proportion of R&D staff (%)	positive	Number of R&D staff/total	A6
	R&D investment as a percentage (%)	positive	R&D investment/revenue	A7
	Earnings per share (Yuan)	positive	Net profit/total number of ordinary shares at the end of the year	A8
	Training hours per capita	positive	Total training hours/number of trainees	A9
	Investment in production safety (Ten thousand yuan)	positive		A10
	Equal employment	positive	Female employees/total employees	A11
	Staff Composition	positive	Number of employees with bachelor's degree or above/total number of employees	A12
	Customer Satisfaction	positive		A13
	Total tax payments (million yuan)	positive		A14
Total public welfare donations (million yuan)	positive		A15	
Governance	Shareholding checks and balances	positive	Proportion of shares held by the second to fifth largest shareholder/first largest shareholder	A16
	Proportion of independent directors	positive	Number of independent directors/all directors	A17
	Number of Board meetings	positive		A18
	Quality of disclosure	positive	Number of information disclosure announcements	A19
	Expenditure on fines(Ten thousand yuan)	Negative		A20

Based on the principles of comprehensiveness, operability and comparability, this paper has formulated the following ESG evaluation system (see Table 2), which is mainly based on the following: firstly, with reference to the HKEX's framework guidelines for ESG disclosure and the division of indicators categorized by major international rating agencies; and secondly, combining with the enterprise's own situation, the ESG report disclosed by Ming Yang Smart every year lists important topics and key indicators on environmental, social and governance in two dimensions, namely, the significance to the stakeholders and the significance to the enterprise. In addition, regarding enterprise value, this paper chooses Tobin's Q value as the evaluation index, which was proposed by James Tobin in 1969, and

is the ratio of the market value of an enterprise to the replacement cost of its assets. Because this index is not easy to be manipulated by the enterprise and can reflect the growth ability of the enterprise, it has been widely used in the research related to enterprise value.

4.2. Evaluation of ESG performance based on entropy method

Entropy method is an objective assignment algorithm, which can overcome problems such as the arbitrariness of subjective methods. In this paper, the entropy method is chosen to score the performance of Ming Yang Smart in terms of ESG. The specific steps are as follows:

Firstly, data standardization, due to the different units of different indicators, it is not possible to directly compare the calculation, so it is necessary to implement the dimensionless processing of various indicators to reduce the impact caused by the differences in the quantitative scale, so that the data are comparable. For positive and negative indicators, they are processed according to the following formulas:

$$X_{ij} = \frac{x_{ij}-min_j}{max_j-min_j} (Positive\ indicators); X_{ij} = \frac{max_j-x_{ij}}{max_j-min_j} (Negative\ indicators) \tag{1}$$

Secondly, calculate the weight P_{ij} for the period i data under the j th indicator, with formula:

$$P_{ij} = \frac{x_{ij}}{\sum_{i=1}^n x_{ij}} \tag{2}$$

Thirdly, calculate the entropy value e_j for the j th indicator, with formula:

$$e_j = \frac{-1}{Ln(n)} \times \sum_i^n P_{ij} ln(P_{ij}), 0 \leq e_{ij} \leq 1 \tag{3}$$

Fourth, calculate the coefficient of variation g_i for the j th indicator, with formula:

$$g_i = 1 - e_j \tag{4}$$

Fifth, calculate the weight W_j for the j th indicator, with formula:

$$W_j = \frac{g_j}{\sum_{j=1}^m g_j} \tag{5}$$

Sixth, calculate the composite score S_i for each period, with formula:

$$S_i = \sum_{j=1}^m w_j P_{ij} \tag{6}$$

Following the above steps, the composite scores of Ming Yang Smart's E, S, and G dimensions for each year were calculated and multiplied by the corresponding weights and totaled to obtain the overall ESG composite scores for each year. As can be seen in Table 3, the composite scores have been on an upward trend as a whole, this indicates an overall trend of good corporate performance in terms of ESG practices. Specifically, social responsibility has been performing well; environmental scores declined more severely year-on-year in 2023, which, when combined with the ESG report, was found to be mainly due to poor performance on environmental indicators such as electricity energy and water consumption intensity; and governance scores declined in 2022 but showed improvement in the most recent year.

Table 3: Entropy method score of Ming Yang Smart's ESG performance.

	2019	2020	2021	2022	2023
E	0.0159	0.0517	0.0488	0.0658	0.0174
S	0.0605	0.0416	0.1123	0.1595	0.1746
G	0.0171	0.0549	0.0808	0.0433	0.0558
T	0.0407	0.0470	0.0917	0.1115	0.1133

Data source: EXCEL calculations

4.3. Correlation analysis of ESG performance and enterprise value based on gray correlation method

Gray correlation method is a research method for evaluating the degree of influence of multiple factors in the system on the target variable, which is applicable to the research of single-case problems with a small amount of data, and the basic principle is to judge whether the connection is close or not based on the similarity of the trend of the sequence curves, and the closer the curves are, the greater the correlation between the corresponding sequences, and vice versa, the smaller the correlation is. Therefore, this chapter will use gray correlation to analyze the degree of correlation between Ming Yang Smart ESG and enterprise value, and the specific analysis steps are as follows:

Firstly, determine the reference sequence and comparison sequence, and dimensionless them. The reference sequence is the indicator or item to be concerned with, and the comparison sequence is the other factors to be compared with the reference sequence. In this section, Tobin's Q value is used as the reference sequence, and the ESG score calculated using the entropy method is used as the comparison sequence. Since the entropy method score data is already in the interval of (0,1), there is no need for further dimensionless processing, in order to avoid the appearance of a 0 value, the Tobin's Q value will be dimensionless using homogenization to compress the value of the data to the vicinity of 1. The calculation is done by dividing the individual samples of each sequence by the sample mean.

Secondly, calculate the correlation coefficient, let the reference sequence be X_0 and the comparison sequence be X_i ($i = 1, 2, 3$), first find out the maximum difference b and the minimum difference a between the comparison sequence X_i and the reference sequence X_0 , and then calculate the gray correlation coefficient $\gamma_{0,i}(k)$, where ρ is the resolution factor, located between $[0, 1]$, which is generally taken to be 0.5 in order to minimize the effect of extreme values on the calculation. the specific formula is as follows:

$$a = \min|X_0(k) - X_i(k)|; b = \max|X_0(k) - X_i(k)| \tag{7}$$

$$\gamma_{0,i} = \frac{a + \rho b}{\gamma_{0,i}(k) + \rho b} \tag{8}$$

Thirdly, the composite gray correlation r_i is calculated by averaging the gray correlation coefficients of each point on the sequence, where each sequence calculated in this section has 4 values, so n is taken to be 4 and the formula is as follows:

$$r_i = \frac{1}{n} \sum_{k=1}^n \gamma_{0,i} \tag{9}$$

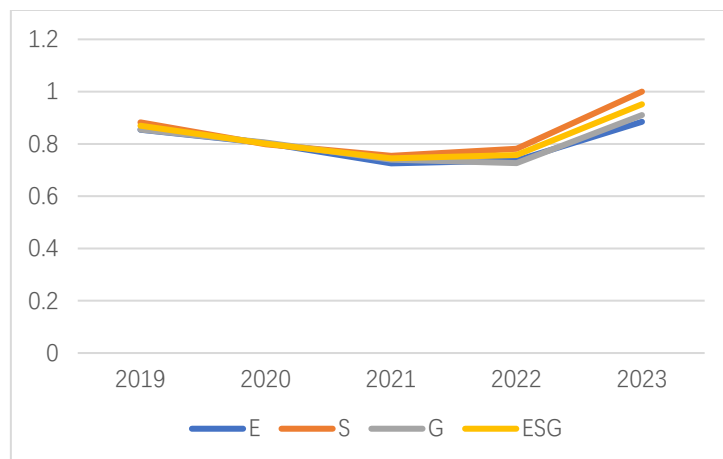


Figure 1: Trend of gray correlation coefficient.

Table 4: Calculation results of gray correlation coefficient and composite gray correlation degree.

	E	S	G	ESG
2019	0.8544	0.8823	0.8551	0.8697
2020	0.8036	0.7982	0.8053	0.8011
2021	0.7255	0.7544	0.7398	0.7448
2022	0.7365	0.7812	0.7265	0.7577
2023	0.8846	1.0000	0.9103	0.9516
Comprehensive Gray Correlation	0.8009	0.8432	0.8074	0.8250

Data source: EXCEL calculation

Generally speaking, the gray correlation coefficient of 0.5 to 0.7 is the more important factor, and higher than 0.7 is the important factor. The closer the correlation coefficient is to 1, the stronger the correlation between the two sequences. As can be seen in Figure 1 and Table 4, the change trend of the correlation coefficient between comprehensive ESG performance and each dimension is basically the same, the gray correlation coefficients and composite gray correlations for all years are above 0.8, in which the highest degree of correlation exists between social responsibility (S) and enterprise value, followed by comprehensive ESG performance, which means that there is a strong correlation between the ESG performance of Ming Yang Smart and its corporate value, in which the investment in social responsibility plays a more significant role in the enhancement of corporate value, and there is a lot of

room for improvement in environmental performance (E), especially in 2023, Ming Yang Smart performs poorly in terms of environmental governance, so the company should take more environmental protection actions to enhance its own sustainable development ability and create longer-term value.

5. Ming Yang Smart Enterprise Value Analysis

5.1. Value Analysis Based on Financial Indicators

Shareholder wealth maximization is an important goal of enterprise operation, and the selection of ROE and decomposed indicators for analysis can be a good way to evaluate enterprise value from the perspective of financial health. As can be seen from Table 5, the ROE is roughly on an upward trend, in which the real economy as a whole under the impact of the epidemic in 2020 is still in a relatively sluggish state, but the ROE of Ming Yang Smart can maintain the growth trend, which indicates that the enterprise has a certain degree of financial resilience, and is able to quickly adjust its status and restore profitability in case of operational setbacks. ROE showed a downward trend after 2022, partly due to a smaller year-on-year increase in net profit but a larger increase in net assets in that year, as seen in the disclosed financial statements, but the overall decline was smaller and much higher than the industry average, so it performed reasonably well. 2023 ROE declined sharply and for the first time was lower than the industry average, combined with the annual report and found that in that year, Ming Yang Smart's net profit fell from 34.447 million yuan in 2022 to 3.725 million yuan, the cost and expense ratio increased from 80% in 2022 to 98%, the company's sales profitability and cost and expense management ability declined, the net sales margin declined by -87.88% year-on-year, the total asset turnover ratio also declined substantially year-on-year, and the utilization efficiency of the assets became lower, so in the case of a better performance of the ESG, the decline in the net sales margin and the total asset turnover ratio is the cause of its important reason for the significant drop in ROE, and it can be said that Ming Yang Smart's enterprise value in 2023 is underperforming from the perspective of financial health.

Table 5: Ming Yang Smart ROE and Breakdown Metrics vs. Industry 2019-2023.

		2019	2020	2021	2022	2023
Ming Yang Smart	ROE	0.1205	0.1571	0.1840	0.1457	0.0133
	Net sales margin	0.0630	0.0581	0.1090	0.1122	0.0136
	Total asset turnover rate	0.37	0.52	0.48	0.47	0.36
	Equity multiplier	5.17	5.20	3.52	2.76	2.72
Industry average	ROE	0.0665	0.1264	0.1354	0.0812	0.0441
	Net sales margin	0.0449	0.0736	0.0836	0.0613	0.0403
	Total asset turnover	0.46	0.57	0.55	0.45	0.42
	Equity multiplier	3.22	3.01	2.94	2.94	2.61

Data source: Choice Financial Terminal, Straight flush Database

5.2. Value analysis based on Tobin's Q value

Table 6: Ming Yang Smart Tobin's Q 2019-2023.

	2019	2020	2021	2022	2023
Tobin's Q	1.056935	1.208262	1.400216	1.390831	1.000392

Data source: CSMAR database

Tobin's Q reflects investors' expectations for the future of the enterprise, and generally speaking, the higher the Tobin's Q value is, the more confident investors are in the enterprise's development prospects, and the stronger the willingness to invest. As can be seen in Table 6, the Tobin's Q value increase significantly from 2019 to 2022. During this period, Ming Yang Smart's ESG strategy, from its inception to its gradual improvement, has always adhered to the five development concepts of innovation, coordination, greening and sharing, and has become more and more comprehensive in ESG management and invested more and more, which sends positive signals to the market that Ming Yang Smart has a higher high level of operation and management, and has sufficient capital reserves for ESG practice management, which strengthens investors' confidence and gains market value. In 2020, under the impact of the epidemic, Tobin's Q value did not fall but rose, which indicates that Ming Yang Smart's ESG practices during the epidemic were indeed. In 2023, the Tobin's Q value decreased significantly, generally speaking, profitability is a key factor affecting the Tobin's Q value, the profitability level of the enterprise has a direct impact on the future development potential and the ability to return to the market, because investors are more inclined to choose to invest in the company that can get a high return, so highly

profitable companies usually have a higher Tobin's Q value. Companies usually have higher Tobin's Q. Combined with the analysis of the financial indicators above, it can be seen that the significant decline in the profitability level is an important reason affecting the decline of Tobin's Q value.

5.3. Value analysis based on innovation outputs

Innovation is an important factor affecting the value of an enterprise, and the innovation output can reflect the value creation level of an enterprise. As can be seen in Table 7, the cumulative number of patent applications of Ming Yang Smart has been increasing year by year, and the level of innovation has been continuously improved, in which the proportion of R&D personnel and the proportion of R&D investment in operating income have been maintained at about 17% and 40% respectively, and even if affected by the epidemic, there has not been any reduction in the R&D expenditure. It is precisely because Ming Yang Smart actively practices the innovative development concept of ESG and continues to deeply plough into the research and development of innovative technologies in the field of new energy that the company is able to maintain a certain amount of innovative output continuously.

Table 7: Cumulative Patent Applications of Ming Yang Smart, 2019-2023.

	2019	2020	2021	2022	2023
Cumulative number of patent applications	614	900	1316	1732	1935

Data source: Ming Yang Smart Environmental, Social and Governance Report

6. Conclusion

This paper takes Ming Yang Smart as the research object, from the perspective of quantitative analysis, uses the entropy method to evaluate the ESG performance of the enterprise in the past five years, and uses the gray correlation method to test the correlation between the ESG performance and the enterprise value, and the results show that Ming Yang Smart's ESG performance scores in the past five years have risen year by year, and there is a strong correlation between the overall as well as the dimensions of the ESG performance and enterprise value. It can be said that when an enterprise performs well in ESG, its reputation as well as the trust and goodwill of external stakeholders towards the enterprise will increase, and investors will be more willing to invest and pay higher valuation, which will also be conducive to improving the level of internal innovation, thus positively affecting the enhancement of enterprise value. Therefore, Ming Yang Smart should continue its commitment to ESG, enhance the impact of ESG performance, and lay a solid foundation for the long-term development of the enterprise. In addition, judging from Tobin's Q value and financial performance, sales profitability in 2023 was poor, which was partly responsible for the decline in Tobin's Q value in that year. The profitability level of an enterprise has a direct impact on its future development potential and market return ability, therefore, Ming Yang Smart also has to pay attention to its sales ability, cost control ability and asset utilization efficiency, improve its development potential and market return ability, so as to obtain a higher enterprise value.

Acknowledgements

This paper was supported by the Key Project of Shandong Province Key R&D Program (Soft Science) (2023RZB01003), the Humanities and Social Sciences Project (Key Think Tank) of Shandong Province Social Science Federation (2023-zkzd-050), and the Second Batch of Philosophy and Social Science Talent Team Project of Shandong Province.

References

- [1] Zhang Xinyuan, Shi Guifen, Xue Jiabin. ESG Performance and Corporate Investment and Financing under Economic Policy Uncertainty Shocks[J]. *Taxation and Economy*, 2023(03):75-83.
- [2] Liu Zhuocong, Ye Chengang, Xie Zemin et al. A study on the impact of ESG ratings of listed companies on enterprise value[J]. *The Chinese Certified Public Accountant*, 2023(03):24-30.
- [3] Aureli S, Gigli S, Medei R, et al. The value relevance of environmental, social, and governance disclosure: Evidence from Dow Jones Sustainability World Index listed companies[J]. *Corporate Social Responsibility and Environmental Management*, 2020, 27(1):43-52.
- [4] Xu Guanghua, Zhuo Yaoyao, Zhang Yimeng et al. Does ESG disclosure increase enterprise value?[J]. *Communication of Finance and Accounting*, 2022(04):33-37.

- [5] Garcia A S, Orsato R J. *Testing the institutional difference hypothesis: A study about environmental, social, governance, and financial performance*[J]. *Business Strategy and the Environment*, 2020(1).
- [6] Rehman R U, Zhang J, Uppal J, et al. *Are environmental social governance equity indices a better choice for investors? An Asian perspective*[J]. *Business Ethics: A European Review*, 2016(4):25.
- [7] Wang Linlin, Lian Yonghui, Dong Jie. *Study on the Impact Mechanism of ESG performance on corporate value*[J]. *Securities Market Herald*, 2022(05):23-34.
- [8] Zhu Qingxiang, Guo Huan, LI Xiaoqing. *Research on the Influence Mechanism of Social Responsibility Performance on Firm Value: The Mediation Role of Accounting Conservatism*[J]. *Frontiers of Science and Technology of Engineering Management*, 2019, 38(03):52-57.
- [9] Xue Tianhang, Guo Qin, Xiao Wen. *An Empirical Study on the ESG Impact Mechanism on Enterprise value under the Context of Carbon Peak and Neutrality Target*[J]. *Social Science Front*, 2022(11):89-99+281.
- [10] Chen, Weili. *ESG performance, technological innovation and market value of distribution companies* [J]. *Journal of Commercial Economics*, 2024(02):170-173.
- [11] Lin Binghong, Li Bingxiang. *The impact of ESG Responsibility Performance on Enterprise R&D investment: From the Perspective of resource Acquisition and Resource Allocation* [J]. *Soft Science*, 2024, 38(01):61-66.
- [12] Liu Xiaohui, Chen Yan. *ESG performance and corporate innovation - A moderating role based on green finance reform*[J]. *Statistics & Decision*, 2024, 40(07):183-188.
- [13] Liu Yanbo, Geng Xulin. *Research on the relationship between marketing investment, corporate social responsibility and corporate reputation under uncertainty environment* [J]. *Management Review*, 2021, 33(10):159-170.
- [14] Fatemi A, Fooladi I, Tehranian H. *Valuation effects of corporate social responsibility*[J]. *Journal of banking & finance*, 2015(59-Oct.).