

# *The Impact of ESG Performance in the Pharmaceutical Industry on Corporate Value under the Background of "Double Carbon"—Take Yunnan Baiyao as an Example*

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**Abstract:** With growing global focus on ESG issues and the "double carbon" goal, ESG performance in various industries, exemplified by Yunnan Baiyao in the pharmaceutical industry, has become an important factor for measuring enterprise sustainable development and comprehensive value. By sorting theories, analyzing ESG practices, and constructing an evaluation model, it reveals ESG's impact on corporate financial and non-financial value, and provides targeted suggestions for improving ESG performance and value in the "double carbon" era.

## 1. Introduction

Global climate change is a major challenge. China's "double carbon" goal requires industries to change in energy, production and resource management. ESG's core values align with China's strategic goals. The pharmaceutical industry, directly related to health and safety, is distinctive. The pharmaceutical industry may impact the environment and society in production, R&D, and marketing. Under "double carbon", it must ensure drug quality and supply and also focus on ESG performance. So far, China hasn't established a complete ESG system. Early studies on the ESG-performance and corporate-value relationship were mostly from a theoretical perspective or by building models for a certain industry or A-share companies. This study takes Yunnan Baiyao as the research object, and adopts the formula of case analysis. Formula, deeply discusses the impact of ESG on corporate value, aiming to encourage companies to pay more attention to ESG performance, thereby providing a strong reference for the sustainable development of companies.

## 2. Literature review

### 2.1 Impact of Environmental Performance on Enterprise Value

When exploring the relationship between enterprise value and environmental responsibility, most scholars think that enterprises can effectively improve their value by fulfilling environmental responsibility. Pan Fei et al. found that those companies that take the initiative to assume environmental responsibility are likely to occupy a favorable position in the market<sup>[1]</sup>. Those

companies that actively take responsibility for the environment can usually establish a positive brand image in the minds of consumers, thus improving brand praise, attracting more customers and expanding market share. Relatively speaking, those enterprises that are unwilling to take environmental responsibility may pay more for environmental problems, thus causing damage to economic benefits. Furthermore, the damage may be somewhat delayed and not immediately apparent, but at some point in the future, it may deliver an unexpected and significant blow to the business. Tang Yongjun and his team made a detailed discussion on the relationship between enterprise environmental performance and enterprise value, and they proposed that there is a U-shaped relationship pattern between enterprise environmental performance and enterprise value<sup>[2]</sup>. This shows that when an enterprise begins to assume environmental responsibility, there may be a certain cost input, and the value of the enterprise may not increase immediately in a short period of time, or even decrease. However, as time goes by, when an enterprises environmental performance reaches a certain standard. On time, which will have a positive boost to its value. This U-shaped relationship further emphasizes that enterprises need to go through a long journey when assuming environmental responsibility, which requires enterprises to show great patience and firm determination. Only by continuously investing various resources and continuously optimizing environmental performance can the value of the enterprise be truly increased.

## 2.2 Impact of Social Responsibility Performance on Corporate Value

Through the comprehensive analysis of domestic and foreign literature, we can observe that the impact of social responsibility on enterprise value is mainly concentrated in several key areas. First of all, social responsibility establish a solid relationship with stakeholders. Zhu Qingxiang and his team found that enterprises can strengthen information exchange with stakeholders through ESG, so as to better grasp the dynamic changes of market demand and the direction of policy adjustment, so as to timely Adjust your own business strategy<sup>[3]</sup>. Actively practicing social responsibility can motivate groups with high corporate social responsibility (CSR) awareness and encourage them to invest more resources in the company. These resources can improve the companys efficiency in various forms, such as bringing more financial support to the enterprise, providing better human resources, and expanding broader market channels. Secondly, it can strengthen the resistance of enterprises to risks. He Xianjie and his team believe that there is a negative correlation between the financing cost of enterprises and the quality of social responsibility information disclosure reports<sup>[4]</sup>. This means when enterprises fulfill social responsibilities and improve disclosure reports, financing costs reduce. With more funds, they can better handle risks, mitigate adverse impacts. Active social responsibility boosts risk resistance, lessens market value loss in adverse events. It also enhances internal cohesion by improving public image and employees' sense of belonging, motivating them to promote enterprise growth.

## 2.3 Impact of Corporate Governance Performance on Corporate Value

Current research shows that corporate governance has a positive effect on enterprise value and is significant among the core elements of ESG. First, good internal control reduces information asymmetry. Enterprises with strong management capabilities improve cash flow efficiency through internal and external cooperation. After improvement, it reduces financing costs and increases value. For example, efficient internal management during cooperation creates favorable financing conditions and opportunities. Second, corporate governance alleviates interest conflicts between management and shareholders, reducing inefficient investment. Establishing supervision and incentive mechanisms reduces management opportunism and makes the management team focus on long-term development and value creation. For example, equity incentives prompt management to

make prudent investment decisions. Finally, corporate governance reduces the cost of equity capital. In Chinese listed companies, board governance is prominent in reducing equity financing costs. Different independent mechanisms can complement or substitute each other. Through cooperation and synergy, the overall financing cost is reduced. For example, a sound information disclosure system and an efficient risk management strategy respectively increase trust and reduce operational risks, thereby reducing equity financing costs.

### 3. Yunnan Baiyao ESG status

According to public information, Yunnan baiyao's MSCI-ESG rating in 2021 is A, and has maintained this rating for three consecutive years. In 2023, Yunnan Baiyao was selected into the "2023 ESG Best Practice Cases of Listed Companies" of the China Association of Listed Companies and the "2023 ESG Practice Cases Traditional Chinese Medicine Poverty Alleviation and People Practice" of the ESG and Sustainable Development Forum; With its excellent social responsibility (ESG) performance, the company was successfully selected into the "State-owned Enterprise Social Responsibility · Pioneer 100 Index (2023)" list of the State-owned Assets Supervision and Administration Commission of the State Council and ranked 6th.

Figure 1 shows the changes in MSCI's ESG rating of Yunnan Baiyao.

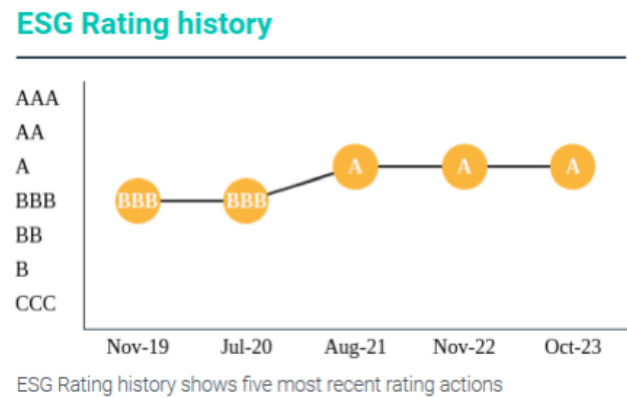


Figure 1: Yunnan baiyao's ESG rating change data from 2019 to 2023 comes from the MSCI official website

### 4. Impact of ESG Performance on Corporate Financial Performance

This study selects Yunnan baiyao's financial report data from the past two years to conduct an in-depth analysis of Yunnan baiyao's financial situation by calculating three financial performance indicators of profitability, operating capabilities and growth capabilities, and comparing them with the industry average financial performance indicators. This process aims to explore how Yunnan Baiyao's ESG performance affects its financial performance and, in turn, corporate value.

#### 4.1 Profitability Analysis

Table 1 shows that from 2019 to 2022, Yunnan baiyao's ROA and ROE showed a downward trend and remained at a relatively stable and high level in the same industry. Comparative analysis: 2019: Yunnan baiyao's ROA (8.43%) and ROE (12.19%) are both higher than the average levels of ROA (9%) and ROE in the same industry (about 10%). 2020: Yunnan Baiyao's ROA (9.99%) and ROE (14.38%) are significantly higher than the average level of the same industry, showing that the companys profitability was strong during the year. 2021 and 2022: Yunnan Baiyao's ROA (5.2%

and 5.4%) and ROE (7.4% and 7.8%) have declined, and they are still within the average range of ROA in the same industry, with ROE close to or slightly lower than the average of good companies in the same industry.

Table 1: Profitability indicators of Yunnan Baiyao and pharmaceutical manufacturing industry

Index	Annual Report 2019	Annual Report 2020	Annual Report 2021	Annual Report 2022	2023
Yunnan Baiyao ROE/%	12.19	14.38	7.40%	7.80%	
Yunnan Baiyao ROA/%	8.43	9.99	5.20%	5.40%	
Pharmaceutical Manufacturing Industry ROE/%	9.00%	8.90%	13.00%	10.00%	
Pharmaceutical Manufacturing Industry ROA/%	7.00%	7.00%	6.00%	5.00%	

Note: The data comes from Guotaian database and Yunnan Baiyao annual report

Yunnan Baiyao's ESG rating has improved from 2019 to 2022. The decline in ROA and ROE is due to various factors such as the market environment, industry competition, and rising costs. The positive impact of ESG on profitability is reflected in the long term, including improving operational efficiency, reducing risks, and enhancing brand value. In the short term, these positive effects are overshadowed by other factors, resulting in a decline in ROA and ROE. In the long run, good ESG practices will help the company stabilize its growth and enhance its competitiveness.

Despite the big impact on the market, Yunnan Baiyao was still able to maintain its profitability potential, which confirms that excellent ESG performance also helps to reduce risks in operations to some extent.

## 4.2 Analysis of Operational Capabilities

Table 2: Growth capability indicators of Yunnan Baiyao and pharmaceutical manufacturing industry

Index	Annual Report 2019	Annual Report 2020	Annual Report 2021	Annual Report 2022	2023
Yunnan Baiyao inventory turnover rate	1.86	2.31	2.74	3.28	3.98
Yunnan Baiyao Total Asset Turnover Rate	1.16	0.62	0.68	0.69	0.73
Inventory turnover rate of pharmaceutical manufacturing industry	3.00	1.50	2.00	2.00	3.00
Total asset turnover rate of pharmaceutical manufacturing industry	1.00	0.60	0.40	0.45	0.50

Note: The data comes from Guotaian database and Yunnan Baiyao annual report

We can analyze Yunnan Baiyao's inventory and total asset turnover rates from 2019 to 2023, combined with the pharmaceutical industry average, to explore ESG's impact on its operating capabilities.

Table 2 shows that Yunnan Baiyao's inventory turnover rate in 2019 was 1.86, below the pharmaceutical manufacturing industry average of 3 times. In 2020, industry inventory turnover rate dropped, while Yunnan Baiyao's increased and grew steadily, along with ESG rating improvement. Suspected connection. If Yunnan Baiyao does well in ESG (e.g., improving supply chain, inventory

management, using eco-friendly packaging), inventory turnover rate should theoretically increase. In 2019, Yunnan Baiyao's total asset turnover rate was 1.16 times, higher than the industry average of 1 time. Later, the industry declined due to market influence. Yunnan Baiyao also declined but then rose and stabilized, possibly related to ESG rating improvement. Good ESG is associated with efficient resource allocation and asset utilization. If Yunnan Baiyao does well in ESG, its total asset turnover rate should increase. Decline may indicate ESG deficiency. Overall, ESG has a large impact and promoting effect on Yunnan Baiyao's operating capabilities. Problems include low current asset use efficiency and obvious inventory fluctuations. Overall, it keeps improving with asset operating efficiency higher than the industry average. For Yunnan Baiyao to improve inventory and total asset turnover rates, it needs to focus on ESG, especially in supply chain management, environmental protection, social responsibility and corporate governance.

### 4.3 Analysis of Growth Ability

The growth ability of an enterprise refers to its ability to expand scale and strengthen, including income increase and financing expansion. As shown in Table 3, Yunnan Baiyao's growth potential is evaluated by observing changes in two key indicators: operating income growth rate and net profit growth rate.

Table 3: Yunnan Baiyao and pharmaceutical manufacturing industry growth capability indicators

Index	Annual Report 2019	Annual Report 2022	Annual Report 2021	Annual Report 2022	2023
Yunnan Baiyao operating income growth rate	9.80	10.38	11.09	0.31	7.19
Yunnan Baiyao net profit growth rate	7.4	31.85	-49.17	7.03	36.41
Operating income growth rate of pharmaceutical manufacturing industry	16.2	4.5	20.1	1.6	4.9
Net profit growth rate of pharmaceutical manufacturing industry	5.9	12.8	77.9	31.8	1.1

Note: The data comes from Guotaian database and Yunnan Baiyao annual report.

Data shows Yunnan Baiyao's operating income growth rate peaked at 11.09% in 2021, dropped sharply to 0.31% in 2022 and rebounded to 7.19% in 2023, fluctuating greatly, especially a significant slowdown in 2022. The same industry's operating income growth rate also fluctuated but was overall higher, reaching 20.1% in 2021, far exceeding Yunnan Baiyao's 11.09%, related to its stock investment loss of 2.2 billion. The net profit growth rate of the same industry was 77.9% in 2021 but declined in 2022 and 2023. In 2022, the pharmaceutical manufacturing industry's revenue and profit declined due to high 2021 base and demand decline, with volume procurement and insurance negotiations compressing margins. Yunnan Baiyao's net profit growth changed more drastically, with -49.17% in 2021, but increased to 36.41% from 2022 to 2023, related to ESG rating upgrade. It has growth rate gaps compared to the industry. Improving ESG may enhance its competitiveness and growth ability.

## 5. Impact of ESG Performance on Corporate Market Value

This study uses the event research method to analyze the impact of ESG performance on the market. It explores if ESG ratings affect company value and the industry. It sets September 2, 2021 as the key time point (event day) for ESG rating upgrade to minimize other disruption factors, though the actual rating adjustment date isn't detailed. To fully assess the impact of the event, we

define the event window period, that is, the 10 trading days before and after the event date, denoted as  $[-10, 10]$ . In addition, in order to accurately estimate the normal earnings before the event, we selected an estimation period covering the 125 trading days before the event window period to the 6th trading day, that is,  $[-78, -17]$ , and eliminated special dates that may have a significant impact on the stock market in the process to ensure the purity of data analysis. During the analysis process, we used  $R_{i,t}$  to represent the actual rate of return of Yunnan Baiyao on day  $t$ , while  $R_{m,t}$  to represent the rate of return of the industry market on the same day. Based on the return formula (1), which is not expanded in this paragraph, but usually involves calculating the difference between the actual rate of return and the expected rate of return to evaluate the abnormal impact of the event on the stock price, we can quantitatively analyze the impact of the ESG rating upgrade event on Yunnan Baiyao. The immediate and subsequent impact on the stock price and market performance, provides empirical basis for understanding the impact of ESG ratings on the value of the company and the industry.

$$R_{i,t} = \alpha + \beta R_{m,t} + \varepsilon_t \quad (1)$$

Where:  $\alpha, \beta$ --regression coefficient;  $\varepsilon_t$ --error residual term.

Through linear regression analysis of Yunnan baiyao's real market returns and industry market returns during the expected period  $[-78, -17]$ , we identified the regression coefficients  $\alpha$  and  $\beta$ , as well as the error residual term  $\varepsilon_t$ , and plotted their scattered points accordingly diagram. The corresponding function expression is (2):  $R_{i,t} = 0.0394 R_{m,t} - 0.0008$

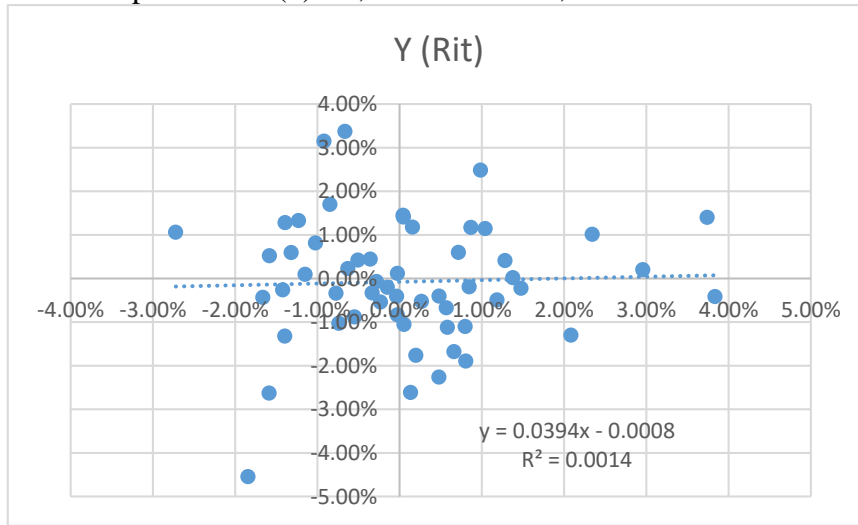


Figure 2: Yunnan Baiyao event day function fitting results

Using the regression function described in Figure 2 and 3 in the window period, we can estimate that the expected daily rate of return of Yunnan Baiyao in that window period is  $R_{i,t}$ . According to the first and second formulas, we have the ability to derive the abnormal earnings of the enterprise and the abnormal income accumulated in a specific window period.

According to the data in Figure 3, after the event, we can observe that the period when the companys abnormal returns are positive returns has increased significantly, and this stability is also more significant than before the event. This shows that after the ESG rating has been improved, investors have shown strong investment intention in Yunnan Baiyao, and the emergence of this attitude in the stock market has further increased the companys value. In addition, since investors conducted detailed and timely research on Yunnan baiyao's previous continuity reports after the ESG rating was made public, the effect of the investment produced immediate feedback, so significant economic benefits could be obtained on the day of the incident.



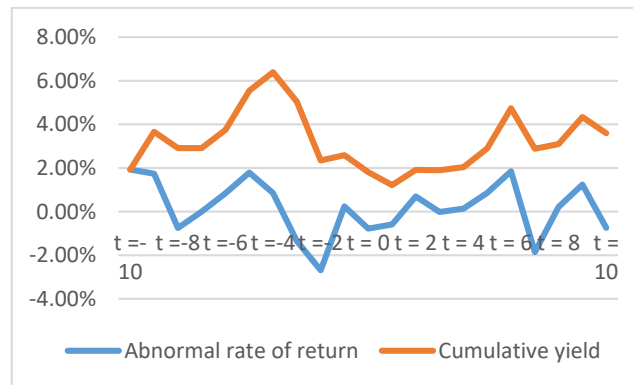


Figure 3: Yunnan Baiyao abnormal rate of return and cumulative abnormal rate of return change trend chart

## 6. Conclusions

Good ESG performance positively impacts corporate value. For Yunnan Baiyao, in the environmental dimension, it promotes green production to reduce energy losses and emissions, meeting the "double carbon" goal and enhancing its image and consumer trust. Socially, it actively engages in public welfare, winning acclaim. In governance, it optimizes the structure for stable development. These ESG actions enhance brand value, competitiveness and profitability, promoting enterprise value growth. The "double carbon" goal brings opportunities and challenges to the pharmaceutical industry. Companies can achieve sustainable development by increasing environmental investment and innovation, but it also sets higher standards. Currently, there are ESG problems in the industry, like some enterprises' insufficient attention and lack of an effective system, and insufficient environmental information disclosure.

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