The Effectiveness of ESG in Risk Control: Review and Research Prospects

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Abstract. As companies pay more attention to ESG (environment, society, and corporate governance), they also pay more attention to controlling risks and improving corporate performance through ESG practices. This article comprehensively reviews the impact of ESG on performance through risk control mechanisms, mainly from the aspects of environmental risks and business risks. It is found that effective ESG practices can reduce corporate risks to a certain extent and improve the market competitiveness of the enterprises. However, there are still differences in research methods and conclusions in existing research. Based on the previous research, this article proposes future research directions, emphasizes the differences and regulatory effects of ESG in different industries, and shows that its mechanism of action significantly affects corporate financial performance.

1 Introduction

In this case, the concept of ESG (environment, society and governance) has gradually become one of the key criteria for judging the long-term development capabilities of enterprises. Especially in resource-intensive industries, ESG performance is regarded as closely related to the risk control and financial stability of enterprises.

Existing studies have shown that ESG practices have a certain degree of positive impact on corporate financial performance, but the effects of this impact vary in different industries. For example, the manufacturing industry consumes more energy, produces more environmental pollution, and has higher risks, so ESG practices will directly affect its operational-related violation risks and corporate image [1,2]. Relevant studies have pointed out that if the manufacturing industry makes compliance investments in environmental aspects such as energy conservation and emission reduction and water pollution control, it can not only reduce the probability of being fined by regulators, but can also obtain green certification, enjoy tax incentives and more favorable financing conditions [2]. In terms of corporate social responsibility, ensuring the safety and well-being of employees is also seen as a means to ensure production stability [1,3]. However, asset-light industries such as finance and services have lower environmental risks, and the impact of ESG is more reflected in the company's governance efficiency, employee relationships, and public reputation [3,4].

This article focuses on how ESG affects corporate financial performance through risk control, and mainly takes the manufacturing industry as the core research object. In addition

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to summarizing existing achievements, it also sorts out the relevant mechanisms of how ESG can reduce corporate operating risks, strengthen corporate financing capabilities, and improve corporate stability, and shows the regulatory effect that ESG can play from the perspective of risk control. The research in this article has three aspects of marginal contribution: First, it clearly defines "risk control" as the intermediary mechanism for ESG to affect financial performance, which makes up for the shortcomings in mechanism identification in existing research; second, it highlights the importance of industry heterogeneity and emphasizes the differences and adaptability of ESG risk control mechanisms in high-risk industries such as manufacturing; third, it provides a more targeted reference path for manufacturing companies to practice ESG management, and provides ideas for policymakers to identify the focus of ESG supervision in high-risk industries.

2 The role of ESG risk control mechanisms in improving corporate performance

2.1 Environmental risk control

The environmental dimension is one of the ESG challenges faced by manufacturing companies. High energy consumption and high emissions have caused manufacturing companies to bear huge social responsibility pressure and compliance risks in environmental governance. Studies have shown that the higher the ESG rating of a manufacturing company, the more its operational risk and compliance risk show a clear downward trend, and its financial stability and external financing capabilities are more prominent [2]. This means that the company's proactive behavior in environmental protection facility investment, pollution control, energy conservation and emission reduction has not only reduced policy risks, but also enhanced its own market competitiveness.

Moreover, good responses to environmental risks will encourage manufacturing companies to receive green financial support, thereby reducing financing costs. Nguyen et al. showed that in Vietnam’s manufacturing industry, companies with higher ESG environmental dimension scores are more likely to receive government green subsidies and environmental policy resources, and the net profit fluctuations of such companies are far less than the average of the same industry [2]. These mechanisms improve the virtuous cycle of environmental improvement and financial performance.

2.2 Social and Governance Risk Control

Social risk control mainly focuses on employee safety, labor disputes, and customer privacy, which is also an integral part of enterprise risk prevention and control. In the manufacturing industry, the high-intensity work process with many people and high-intensity work scenes can easily lead to various safety accidents. Therefore, enterprises should build a complete occupational health system and do a good job in production control. Researchers have proposed that if enterprises invest in safety in terms of safety system, humanities, and training, they can not only avoid the suspension of the enterprise due to safety issues, but also improve employees' sense of belonging and work efficiency [1].

In terms of governance, the board structure, the ratio of independent directors, and the company's internal control system are related to the disclosure of ESG data. In 2023, the governance compliance rating in the environmental, social and governance report released by Tencent has improved compared with the past, and the audit committee structure has been optimized. This has made external financial investment institutions more confident in Tencent's risk control capabilities [4]. Research has found that a good governance structure

can help companies achieve lower equity capital cost rates and obtain higher market value valuations in the capital market [4].

3 Research on the mechanism of ESG risk control affecting financial performance

3.1 ESG drives efficiency and cost improvement

In resource-intensive industries such as manufacturing that require cost control and efficiency improvement, the implementation of ESG requires large expenditures from the outset, but its impact is far-reaching and can improve efficiency and change cost structures in the future [2]. For the natural environment, if enterprises save energy and reduce emissions, and make rational use of wastewater treatment systems and energy recycling systems, environmental violations and risks will be reduced, and pollution treatment costs will also be reduced [2]. If manufacturing companies actively invest in environmental protection projects, they can improve profitability on a large scale in the medium term [2]. From a social perspective, improving labor-management relations, improving employee welfare, and stabilizing supply chain management systems are all ways to enhance efficiency. For example, China Minsheng Bank mentioned in its report that after screening and continuously assessing suppliers, supply defaults were reduced by 35%, and the risk of production interruptions and reputational losses were significantly reduced. This institutional arrangement can avoid financial fluctuations caused by coordination errors, thereby indirectly optimizing corporate financial performance [5]. SF Holding showed in its 2024 ESG report that after the deployment of its new energy fleet and the investment in the AI intelligent dispatching system, transportation operating costs were reduced by 4.5%. This structural cost reduction approach is a direct reflection of the efficiency improvement of ESG practices [6].

3.2 Investor confidence and capital acquisition

The boost that ESG practices bring to the confidence of the capital market is also an important way to influence corporate financial performance. On the one hand, companies with high ESG ratings are considered to have stronger risk resistance and stable performance, with less stock price volatility and lower market risk premiums [3]. Studies have found that better ESG performance can reduce information asymmetry, improve analyst coverage, and thus increase investors' predictions of the company's future cash flow and growth [1]. At the same time, the improvement of ESG information transparency will also affect the availability of corporate financing. Against the backdrop of the rapid development of green finance, financial institutions and investors are increasingly inclined to use ESG ratings as one of the basis for pricing. As shown in the report of Minsheng Bank， the financing interest rate of customers with "excellent green ratings" is 28 basis points lower than that of ordinary customers on average, reflecting the positive incentive effect of the capital market on high ESG performance companies [5]. The value of ESG in the financial market is mainly reflected in the advantages of non-financial information, which enables companies to establish a trust relationship with external capital and can play a substantial supporting role in corporate financial performance by reducing corporate financing costs and optimizing corporate financing structures [7].

4 The moderating effect of industry characteristics on the relationship between ESG risk control and financial performance

4.1 ESG Practices in the Manufacturing Industry: A Typical Case of Transformation in a High-risk Industry

As a pillar industry of the economic system, manufacturing is also a resource-consuming industry and an important subject of ESG research. Compared with asset-light and information-intensive industries, manufacturing is under the pressure of "three highs" - high emissions, high energy consumption, and high labor intensity, and is highly sensitive to policy regulation. Therefore, manufacturing is a key area for ESG risk control which also means that whether the manufacturing industry can effectively promote ESG practices is often regarded as a "barometer" for the green transformation of the entire industry structure [2].

Nguyen et al. found that under systemic shocks such as public health emergencies and sharp fluctuations in energy prices, the stock price declines of manufacturing companies with high ESG scores were significantly lower than the industry average, proving that they have strong risk resistance and capital resilience, and recover faster during the recovery cycle. This situation shows that in addition to prior warning, ESG can also provide assistance in post-event repair.

Domestic research has also further shown that manufacturing companies must work hard on both the "green process chain" and the "responsible supply chain" to achieve full-process ESG control. According to the standard interpretation given by the China Enterprise Reform and Development Research Association in 2024, if the manufacturing industry can successfully integrate ESG goals into the design, procurement, production, and logistics links, it will not only improve the system's risk identification capabilities, but also generate internal synergy effects, prompting companies to transform from external pressure-driven to endogenous development-oriented [8].

From a research perspective, the manufacturing industry not only has many ESG issues and complex risk control mechanisms, but also has significant feedback on financial performance. It is the most representative and practical sample industry.

4.2 Differential impacts of industry characteristics on ESG performance

Different industrial sectors have great differences in resource dependence, external supervision and the severity of risk exposure. The focus of ESG work and the path of financial benefits have changed accordingly. As far as the service industry is concerned, the environmental burden is small. In this case, the impact of ESG on enterprises is mainly reflected in social responsibility and corporate governance. In detail, it is related to customer relationship management, and it is related to employee satisfaction and transparent governance structure. It is the key for enterprises to maintain their dominant market position. Ding et al. believe that companies with higher transparency in the ESG governance of service-oriented enterprises have financing levels that are significantly better than the industry average, and their customer retention is also stronger than other companies [3].

For environmentally sensitive industries such as energy, chemicals, and mining, the environmental dimension of ESG has become a core challenge. Emission accidents, waste of resources, or environmental violations will result in huge penalties and trigger a serious crisis of public trust, which in turn will affect their capital market performance and the stability of government relations. Therefore, companies in these industries pay more attention to environmental compliance investment and the construction of risk emergency plans, which forms a unique strategy for heavy asset industries on the "risk control" path of ESG.

There are differences in industry characteristics, which not only affects the ESG dimensions that companies focus on, but also indicates that future research should use "industry risk exposure" as a mediating variable to explore the performance feedback of ESG

practices. Such an industry-based perspective will help to identify the marginal value and improvements of ESG practices in detail.

5 Research methods and future directions

Most existing studies have used panel regression, two-way fixed effects, event studies and other methods to explore the relationship between ESG and financial performance. However, the risk control mechanism has not been fully visualized. ESG scores and financial indicators are only regressed as two variables, which cannot show the impact of variables such as the number of accidents, the number of violations, and reputation changes in the mechanism. "Existing studies mostly stay at verifying the correlation between ESG and financial performance, but rarely reveal how risk control, such as environmental accidents, are transmitted as cost savings. This black box mechanism leads to a lack of policy targeting [9]. In terms of industry heterogeneity, the impact of environmental disclosure (E) in the energy industry on Tobin's Q value is 2.3 times that of the service industry [10]. However, existing models generally ignore such differences between industries, resulting in the risk of extrapolating conclusions.

In the future, we can add variables such as accident rate and employee turnover rate, and construct multiple mediation models to discover the impact path of ESG. People can cluster industry samples and set cross-terms to examine whether industry characteristics have a moderating effect. Individuals can divide ESG into sub-dimensions to examine the different marginal impacts on different financial indicators. We can also use high-frequency event research or text analysis to dynamically evaluate the relationship between ESG events and market reactions [7].

6 Conclusion

This article explores how ESG affects corporate performance, and comprehensively sorts out the specific manifestations of risk control mechanisms in the three aspects of environment, society, and governance in manufacturing enterprises. Through research, researchers know that good ESG performance can reduce operating risks in environmental compliance, labor-management relations and corporate governance, enhance the company's financing capabilities and capital market performance, and thus improve financial performance.

In terms of mechanism, risk control is an important intermediary between ESG and financial performance, especially in the high-risk manufacturing industry. ESG can reduce policy penalties, accident frequency, reputation loss, and improve transparency and governance efficiency, which can enhance investor confidence.

However, existing research needs to subdivide sub-dimensions and consider the moderating effects of industries when designing mediating variables. Future research needs to build multiple mediating models, refine industries, and introduce high-frequency data to more accurately reflect the dynamic impact of ESG risk control mechanisms on performance.

Overall, ESG is not only a strategic component of corporate development, but also an important way to enhance risk response and sustainable performance value-added. It also summarizes ESG-related theories, provides practical suggestions for corporate decision-makers and related policy makers, and improves the relevant theoretical research on ESG.

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