Greenwashing or Genuine Impact? Investigating the Link Between ESG Ratings and Financial Performance in the Automobile Industry

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Abstract. As environmental, social, and governance (ESG) investing gains global momentum, ESG ratings have become a key tool for evaluating corporate sustainability. However, growing concerns over "greenwashing", where firms strategically enhance disclosures to achieve higher ESG scores without substantive improvements, raise doubts about the credibility and economic relevance of these ratings. This study focuses on the automotive industry, known for its high carbon emissions and intense pressure to transition toward sustainability. It systematically examines the relationship between ESG ratings and corporate financial performance, with a particular emphasis on how greenwashing behavior may distort this relationship. By analyzing the interference mechanisms through which symbolic ESG actions affect rating outcomes and market perception, the paper aims to reveal the extent to which ESG ratings reflect actual sustainability efforts versus strategic signaling. The findings contribute to a deeper understanding of ESG rating reliability and offer insights for investors, regulators, and stakeholders seeking to align financial performance with genuine environmental and social progress.

Keywords: ESG Ratings, Greenwashing, Automobile Industry.

1 Introduction

1.1 Research background

In recent years, Environmental, Social and Governance (ESG) investment has grown rapidly and has become a key engine driving sustainable financial development. According to Grand View Research's forecast, the global ESG investment market is expected to reach approximately $25.1 trillion by 2023 and is projected to grow at an average annual rate of 18.8% by 2030, surpassing $79.7 trillion. Since the concept of ESG was proposed by the United Nations in 2004, this framework has gradually evolved into one of the mainstream investment strategies, attracting a large number of institutional investors and asset managers' attention [1].

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Under this trend, the automotive industry, as a major emitter of carbon, is facing unprecedented pressure for sustainable transformation. Transportation accounts for approximately 23% of global energy related carbon emissions, with road transportation contributing about 69% of transportation emissions [2]. Therefore, the EU Euro 7 emission standards and the proposed mandatory climate information disclosure policy by the US SEC are continuously driving car companies to upgrade towards electrification, green production, and other directions.

However, in the process of transformation, "greenwashing" behaviour also frequently occurs. A typical example is the Volkswagen incident, where exhaust emissions were manipulated during testing, resulting in actual emissions exceeding standards by more than 40 times, ultimately leading to fines of over $30 billion and a serious crisis of trust [3]. Moreover, according to RepRisk's research, about 25% of ESG or climate commitments disclosed by global companies have the risk of substantive action gaps, posing a "greenwashing" hazard. This highlights the significant challenges faced by the current ESG rating system in terms of verifiability and transparency [4].

Therefore, the automotive industry is facing both external pressure from low-carbon transformation and a trust crisis caused by distorted internal ESG evaluations. On the one hand, investors increasingly rely on ESG ratings to determine whether a company has sustainable competitiveness; On the other hand, if the rating deviates from the real performance, it will seriously weaken its resource allocation function and may cause ESG foam risk. In this context, conducting empirical tests on the "authenticity" of ESG ratings and focusing on micro behavioural mechanisms in the automotive industry has urgent academic and practical significance.

1.2 Research motivation and problem statement

As ESG investment becomes increasingly mainstream, the ESG scores provided by rating agencies have become the core basis for investors to identify non-financial risks and sustainability of companies. However, multiple studies have shown that companies may enhance ratings through exaggerated advertising or selective information disclosure, rather than truly improving governance or environmental practices. This strategic behaviour is known as 'greenwashing', which poses a systematic challenge to ESG credibility [5].

The core issue facing is whether the existing ESG rating system can truly reflect the sustainability level of enterprises? At present, there are significant differences in methodology among mainstream rating agencies, such as MSCI, Sustainalytics, and LSEG, which are inconsistent in indicator weights, disclosure dependencies, and data source usage, resulting in highly inconsistent rating results [6]. This standard divergence further raises questions: in the context of inconsistent ratings and even widespread greenwashing, does a company's high ESG score still represent its true performance?

From a market perspective, if ESG ratings are manipulated or deviate from facts, it not only misleads capital allocation, but may also weaken the effectiveness of ESG investments and damage investors' trust in sustainable finance. Therefore, the systematic evaluation of whether ESG ratings have authenticity and financial explanatory power has become an important topic in current financial and policy research.

2 Literature Review

2.1 Definition and Heterogeneity of ESG Ratings

ESG rating is a core tool for measuring a company's performance in the three dimensions of environmental, social, and governance, aimed at helping investors identify potential non-financial risks and sustainable opportunities for the company [7]. Among them, the environmental dimension focuses on the impact of enterprises on carbon emissions, resource utilization, and pollution control; The social dimension covers issues such as employee rights, product safety, and community relations; The governance dimension focuses on corporate governance structure, business ethics, and protection of shareholder rights [8]. As a key component of responsible investment, ESG ratings not only provide a basis for investment decisions, but also shape corporate behaviour standards to a certain extent.

However, there are significant differences in indicator design, weight allocation, and data processing methods among mainstream ESG rating agencies, resulting in significant deviations in ESG scores of the same enterprise among different agencies, leading to the problem of "rating heterogeneity". Taking the MSCI ESG rating system as an example, its rating logic is industry based and focuses on evaluating a company's risk management capabilities on major ESG issues within its industry. Its rating system consists of seven levels ranging from CCC to AAA, with AAA representing the company with the strongest ESG management capabilities, usually associated with environmentally friendly products or services [9]. In contrast, Sustainalytics' ESG risk rating is based on the "unmanaged risk" model, which mainly measures a company's risk exposure and governance effectiveness on major ESG issues. Based on this, a risk score ranging from 0 to 100 is calculated, with higher values indicating greater risk [10]. The LSEG ESG score adopts a data-driven model based on the environmental and social responsibility data publicly disclosed by the company, and has two indicators: data disclosure rate and substantive performance, emphasizing information transparency [11].

This heterogeneity in ratings not only reflects differences in methodological choices, but also brings decision-making difficulties in practice. Berg et al. analyzed the consistency of ratings among six mainstream ESG rating agencies, including MSCI, Sustainability, and LSEG, and found that the median correlation between their ratings was only 0.46, significantly lower than the level of consistency among credit rating agencies [12]. In addition, different rating agencies have subjectivity in selecting key indicators under the same ESG dimension. For example, MSCI emphasizes the fundamental role of governance dimension in ESG evaluation, while Sustainability focuses on environmental risk control and identification of unmanaged risks. This inconsistency in ratings may lead to misjudgements by investors in asset allocation, corporate comparison, and risk assessment, and also weaken the credibility of ESG ratings as a standardized tool.

Therefore, understanding the definition framework and institutional heterogeneity of ESG ratings is not only a prerequisite for empirical identification and mechanism decomposition in this study, but also provides a methodological basis for exploring whether rating results reflect true sustainable performance in the future. Especially in

the high emission and highly controversial field of the automotive industry, clarifying rating heterogeneity is particularly important for identifying the intrinsic relationship between "greenwashing" behaviour and evaluating financial performance.

2.2 Research on ESG and Financial Performance

There has always been a divergence between academia and the investment community regarding whether ESG performance can lead to better financial returns. Overall, most studies support a positive relationship between ESG performance and Corporate Financial Performance (CFP), but some studies suggest that the results are highly context dependent.

Some researches conducted a meta-analysis of over 2200 literature and found that more than 90% of the research results showed a non negative relationship between ESG and CFP, with the majority showing a positive correlation [13]. This indicates that good ESG performance not only does not harm profitability, but may also bring return advantages through reducing capital costs, enhancing brand value, and attracting long-term investment. This positive correlation is particularly significant in emerging markets and bond markets.

ESG is also considered an effective risk management mechanism. It pointed out that companies with high ESG ratings exhibit stronger resilience to extreme market shocks, driven by investors' ESG preferences and reflecting the resilience of good governance and environmental management [14]. Another study further suggests that companies with higher ESG scores have lower stock beta coefficients, indicating lower sensitivity to systemic risks such as industry volatility and policy shocks, and more robust stock price performance. Other empirical studies also support this conclusion, indicating that high ESG performing companies have relatively small stock price fluctuations during market turbulence, demonstrating a strong risk buffering effect [15].

However, some scholars have warned against the risk of "green foam", that is, enterprises may be overestimated due to the overheated theme of ESG. In this situation, the company may exaggerate its sustainable performance, leading to asset prices deviating from fundamentals. It stressed that the difference in ESG ratings has exacerbated the green innovation foam of enterprises, because enterprises tend to pursue too many green patents rather than quality to convey the image of being responsible for the environment, thus misleading investors [16].

Overall, the relationship between ESG and financial performance is positively correlated, but presents a complex and diverse picture across different industries, regions, and research methods. To deepen the understanding of this relationship, further refinement is needed in terms of rating reliability, dimensional differentiation, and behavioural mechanisms.

2.3 Lack of ESG Research

Although the relationship between ESG and financial performance has been extensively studied and explored, there are still significant limitations in the selection of research subjects, variable settings, and mechanism explanations. Especially in high polluting industries such as the automotive industry, systematic in-depth research is still relatively scarce. As one of the important sources of global carbon emissions, the sustainable transformation of the automotive industry is not only a key touchstone for ESG

investment evaluation mechanisms, but also has a profound impact on relevant policy formulation and capital market pricing.

Firstly, empirical research on ESG in the automotive industry is relatively lagging behind. Most existing literature focuses on industries with clear ESG impact pathways, such as finance, energy, and real estate, while insufficient attention is paid to the automotive industry, which combines high pollution characteristics and technological transformation needs. For example, although Arhinful examined the governance structure and ESG performance of automotive listed companies on the Tokyo Stock Exchange, they did not further explore the dynamic linkage mechanism between ESG performance and financial performance, making it difficult to provide concrete empirical support [17].

Secondly, the heterogeneous impact of the three dimensions of ESG on corporate financial performance has not been systematically identified. Previous studies have often regarded ESG as a single comprehensive indicator, ignoring the differences in importance of environmental (E), social (S), and governance (G) dimensions in different industry contexts. Digakwar pointed out in their study on the sustainability of the Indian automotive industry that environmental management practices significantly improve energy efficiency, while governance dimensions have a more direct impact on capital structure and investment elasticity [18]. The uneven effect within this dimension is particularly evident in the automotive industry, especially in the "environment" dimension, which is more sensitive to the impact on production costs, policy compliance, and brand reputation. Therefore, relying solely on ESG overall rating indicators may mask micro mechanism differences and limit the accuracy of relevant policies and management recommendations.

Thirdly, in high polluting industries such as automobiles, there is a structural tension between ESG ratings and actual corporate performance. The reason for such differences is often that companies respond to regulatory and reputational pressures through symbolic disclosures rather than substantive operational changes. As pointed out in the case of Japanese automotive companies, the gaps in ESG governance systems and inconsistent reporting standards have led to the risk of "greenwashing", thereby weakening the credibility of ESG assessments and their effectiveness in capital allocation [19]. Especially in the automotive industry, due to inconsistent ESG rating methods and unclear standards, greenwashing is more likely to occur. Future research can start with longitudinal data tracking, dimensional decomposition models, and behaviour recognition methods to further reveal the essential meaning of ESG ratings and their true role in the value creation process, especially in key industries such as automotive transformation.

2.4 "Greenwashing" Behaviour

Against the backdrop of ESG ratings becoming a key reference indicator in the capital market, the phenomenon of companies manipulating their sustainable image through strategic communication methods is becoming increasingly prominent, with "greenwashing" behaviour receiving particular attention. Greenwashing refers to a situation where a company actively disseminates its environmentally friendly behaviour to the

outside world despite poor environmental performance, resulting in a mismatch between information and reality [20].

Greenwashing behaviour can be divided into two categories: one is "symbolic management", which involves showcasing a green image through marketing, public relations, or vague terminology, but lacks corresponding actions in reality; The second is' substantial decoupling', which refers to the situation where companies commit to environmental policies but fail to see substantial improvements in their internal governance or operations. That is to say, greenwashing may be reflected in both selective disclosure and symbolic management to conceal true performance. Specific manifestations also include "visual greenwashing" (such as using green visual symbols to create an environmental impression) and "fake ecolabels" (forging green labels). In addition, in recent years, research has also extended to sub types such as "carbon washing", especially under the promotion of carbon neutrality policies, some companies deliberately amplify their advantage indicators in carbon information disclosure to conceal the overall weak ESG performance.

The challenge in identifying greenwashing behaviour lies in its diversity and ambiguity. In recent years, the academic community has proposed three mainstream identification paths. Firstly, text analysis method. Identify greenwashing tendencies by comparing semantic patterns used by companies in sustainability reports through natural language processing techniques. For example, when using vague terms such as eco-friendly and green frequently but lacking quantitative action indicators, it may imply greenwashing risks. The second approach is to analyze the consistency difference between ESG information disclosure and the actual performance of the company, that is, to measure the matching degree between what the company says and does. This method is used to reveal the deviation between symbolic compliance and genuine sustainable actions. Thirdly, investor response analysis. This method is based on Event Study, which measures the market's response to corporate greenwashing behaviour by observing abnormal fluctuations in stock prices before and after exposure to greenwashing events. Based on empirical research on 121 global greenwashing events, manufacturing companies were particularly affected by negative stock price shocks after the events, and market reactions were stronger when the company's original ESG reputation was higher or there was more evidence of greenwashing.

By misleading investors and exaggerating corporate environmental performance, green drift may lead to resource mismatch and "green foam" risk. Although companies may receive higher ESG ratings, if these ratings are primarily based on symbolic commitments rather than substantive improvements, the predictive power of their ESG scores on financial performance may decrease. Greenwashing behaviour is therefore seen as a key factor that disrupts market signals and weakens the effectiveness of ESG tools. Therefore, in the empirical identification of the path through which ESG affects financial performance, identifying and controlling "greenwashing" factors has become a key prerequisite for improving model interpretability and policy judgment accuracy.

2.5 The Three Dimensions of ESG

In recent years, ESG related research has gradually shifted from a single overall rating to dimensional refinement and dynamic signal decoding. The academic community is

increasingly concerned about the heterogeneity between the three dimensions of environment (E), society (S), and governance (G), which not only involves the explanatory power of research, but also has important implications for policy design and investment decisions. Specifically, information disclosure in the environmental and social dimensions is often found to have a positive impact on corporate value, while the governance dimension shows relatively insignificant performance. For example, a study using Chinese listed companies found that only ESG information disclosure in the environmental and social dimensions can significantly improve corporate value, especially in high carbon emission industries where the effect of the environmental dimension is particularly prominent. The difference between this rating and actual performance has prompted researchers to pay more attention to the consistency between ESG rating, disclosure, and actual performance.

In this context, academia is gradually applying the "ESG signal theory" to re-examine the effectiveness of the rating system. Companies transmit ESG signals through advertising spending, social media engagement, research and development investment, and if the signal content is consistent with the actual behaviour of the company, consumers tend to interpret it as true sustainability performance; On the contrary, it may be suspected of greenwashing.

Therefore, dimension refinement and signal consistency analysis have gradually become important trends in ESG research. This method not only helps to reveal key value drivers, but also clarifies the causal chain between ratings, signals, and actual performance.

3 Policy recommendations and future research directions

Although ESG ratings have become a key reference in global capital markets, existing research reveals ongoing controversies in both theory and empirical findings. A central concern is the difficulty in establishing causality between ESG performance and corporate financial performance (CFP), as ESG outcomes are shaped by complex factors such as regulation, industry conditions, and internal governance. Without natural experiments or long-term data, causal inference remains limited.

Another critical issue is the opacity and inconsistency of ESG rating methodologies. Agencies like MSCI and Sustainalytics differ significantly in their dimension definitions, weighting schemes, and data sources, leading to divergent scores for the same firm. Furthermore, many rating providers do not disclose the underlying factors behind score changes, making it difficult for companies to respond strategically or improve performance effectively. As a result, ESG scores may reflect disclosure quantity rather than actual sustainability improvements, raising concerns about their reliability.

To address this, stronger regulatory oversight is needed. The EU's 2024 ESG rating regulation offers a model for improving rating consistency and restoring trust. Future research should examine how rating differences influence investment outcomes and explore frameworks for harmonized ESG evaluation.

A deeper challenge lies in distinguishing between genuine sustainability and symbolic greenwashing. Some firms may project an eco-friendly image without real operational changes, resulting in inflated ESG scores that fail to reflect substantive transformation. Regulators should mandate performance-based disclosures with third-party verification to deter misleading claims. Cases like Volkswagen's scandal highlight the gap between public environmental claims and actual practices. Thus, verifying ESG performance through empirical data is essential.

In conclusion, enhancing ESG transparency, curbing greenwashing, and strengthening the integrity of sustainability data are vital for aligning ESG ratings with financial performance and promoting authentic green transformation. This requires coordinated efforts from both regulators and scholars—through institutional reform, improved rating systems, and data-driven, context-sensitive research across industries and countries.

4 Conclusion

This study explores whether ESG ratings in the automotive industry truly reflect a company's sustainable efforts or primarily stem from symbolic compliance behaviour, focusing on the core question of whether "greenwashing" or "substantive impact". Against the backdrop of rapid growth in global ESG investment and the pressure of green transformation in the automotive industry, ESG ratings, as an important basis for investor decision-making, need to be empirically tested for their effectiveness and credibility.

Through literature review and mechanism analysis, this article draws three main conclusions. Firstly, there are significant differences in method design, indicator selection, and data processing among mainstream ESG rating agencies such as MSCI, Sustainability, and LSEG, resulting in highly inconsistent rating results. This "rating heterogeneity" not only weakens the comparability of ratings, but also reduces their credibility as a reference tool for resource allocation.

Secondly, although a large number of empirical studies support a positive relationship between corporate ESG performance and financial performance (CFP), this relationship is often disrupted by "greenwashing" behaviour in high polluting industries such as automobiles. Some companies improve their ESG scores through selective disclosure, symbolic commitments, and other means, rather than truly improving environmental or governance performance, resulting in rating results that do not accurately reflect the true performance of the company, thereby weakening the explanatory power of ESG scores on financial performance.

Thirdly, recent research trends indicate that the three dimensions of ESG should be broken down to identify the heterogeneous impact of different dimensions on financial performance. For the automotive industry with high carbon emission intensity, the "environment" dimension often has stronger financial relevance. However, the deviation between ESG ratings, information disclosure, and actual performance remains an important challenge, and how to identify real ESG signals has become a focus of academic attention.

Overall, this article emphasizes the need to enhance the transparency and consistency of the ESG rating system, and to develop a multidimensional methodology for identifying "greenwashing" behaviour. This is the key to promoting sustainable transformation in the automotive industry and achieving coordinated development between ESG and financial performance.

References

1. Grand View Research, ESG Investing Market Size, Share, & Trends Analysis Report by Type (ESG Integration, Impact Investing, Sustainable Funds, Green Bonds), by Investor Types, by Application, by Region, and Segment Forecasts, 2024–2030, (2024). https://www.grandviewresearch.com/industry-analysis/esg-investing-market-report
2. United Nations Economic Commission for Europe (UNECE), United Nations adopts landmark global decarbonization strategy in transport by road, rail and inland waterway, (2024). https://unece.org/climate-change/press/united-nations-adopts-landmark-global-decarbonization-strategy-transport-road
3. United States Environmental Protection Agency (EPA), Learn About Volkswagen Violations, (n.d.) https://www.epa.gov/vw/learn-about-volkswagen-violations
4. RepRisk, On the Rise: Navigating the Wave of Greenwashing and Social Washing, (2023). https://www.reprisk.com/insights/reports/on-the-rise-navigating-the-wave-of-greenwashing-and-social-washing/20adb3d8
5. Delmas, M. A., & Burbano, V. C., The Drivers of Greenwashing, California Management Review, 54(1), 64–87 (2011). https://doi.org/10.1525/cmr.2011.54.1.64
6. Berg, F., Kolbel, J. F., & Rigobon, R., Aggregate Confusion: The Divergence of ESG Ratings, Review of Finance, 26(6), 1315–1344 (2022). https://doi.org/10.1093/rof/rfac033
7. United Nations Principles for Responsible Investment (UNPRI), What are the Principles Responsible Investment?, UNPRI, 2024. https://www.unpri.org/about-PRI/what-principles-for-responsible-investment
8. United Nations Principles for Responsible Investment (UNPRI), What are the Principles Responsible Investment?, UNPRI, 2024. https://www.unpri.org/about-PRI/what-principles-for-responsible-investment
9. MSCI ESG Research, MSCI ESG Symbols and Definitions, MSCI Inc., 2024.
10. MSCI, ESG Risk Ratings Methodology – Version 3.1, Morningstar Sustainalytics, 2024.
11. LSEG (London Stock Exchange Group), ESG Scoring Guide, 2023. https://www.lseg.com/en/data-analytics/sustainable-finance/esg-scores
12. Berg, F., Kolbel, J. F., & Rigobon, R., Aggregate Confusion: The Divergence of ESG Ratings, Review of Finance, 26(6), 1315–1344 (2022). https://doi.org/10.1093/rof/rfac033
13. Friede, G., Busch, T. & Bassen, A., ESG and Financial Performance: Aggregated Evidence from More Than 2000 Empirical Studies, Journal of Sustainable Finance & Investment, 5(4), 210–233 (2015). https://doi.org/10.1080/20430795.2015.1118917
14. Cornell, B., ESG Preferences, Risk and Return, European Financial Management, 27(2),174–180 (2021). https://doi.org/10.1111/eufm.12295
15. Gidage, M., Bhide, S., Pahurkar, R., & Kolte, A., ESG Performance and Systemic Risk Nexus: Role of Firm Specific Factors in Indian Companies, Journal of Risk and Financial Management, 17(9), 381 (2024). https://doi.org/10.3390/jrfm17090381
16. Geng, Y., Chen, J., & Liu, R., ESG Rating Disagreement and Corporate Green Innovation Bubbles: Evidence from Chinese A-share Listed Firms, International Review of Financial Analysis, 95, 103495 (2024). https://doi.org/10.1016/j.irfa.2024.103495

17. Arhinful, R., Mensah, L., & Owusu-Sarfo, J. S., Board Governance and ESG Performance in Tokyo Stock Exchange-Listed Automobile Companies: An Empirical Analysis, Asia Pacific Management Review, 29(4), December 2024, Pages 397-414 (2024). https://doi.org/10.1016/j.apmrv.2024.11.001
18. Tillu, P. G., Digalwar, A. K., Singh, S. R., & Reosekar, R. S., Towards Sustainable Automobile Ecosystem in India: Integrated Analysis of Technical, Economic, and ESG Dimensions, Cleaner Environmental Systems, 14, 100210 (2024). https://doi.org/10.1016/j.cesys.2024.100210
19. Arhinful, R., Mensah, L., & Owusu-Sarfo, J. S., Board Governance and ESG Performance in Tokyo Stock Exchange-Listed Automobile Companies: An Empirical Analysis, Asia Pacific Management Review, 29(4), December 2024, Pages 397-414 (2024). https://doi.org/10.1016/j.apmrv.2024.11.001
20. Delmas, M. A., & Burbano, V. C., The Drivers of Greenwashing, California Management Review, 54(1), 64–87 (2011). https://doi.org/10.1525/cmr.2011.54.1.64