

Corporate ESG Performance: Research Review and Prospects

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Abstract. Against the global backdrop of advancing "carbon peak and carbon neutrality" alongside green transformation, ESG (Environmental, Social, and Governance) has emerged as a key research focus in both academia and industry as a comprehensive framework for evaluating corporate sustainable development performance. This paper systematically reviews the definition and theoretical foundations of ESG, highlighting its role in quantifying non-financial corporate performance through dimensions such as environmental responsibility and stakeholder management, while also interacting with long-term financial outcomes. Grounded in stakeholder theory and resource-based theory, this study examines the internal and external antecedents as well as the consequential impacts of ESG. The findings reveal that external factors—such as industry characteristics, macroeconomic policies, and investor attention—alongside internal factors like board governance and firm size, collectively shape the heterogeneous patterns of corporate ESG performance. ESG performance enhances firm value through pathways such as fostering technological innovation, alleviating financing constraints, and reducing stock price crash risk. However, challenges such as policy uncertainty and "greenwashing" practices persist. Future research should integrate micro-level case studies with cross-cultural comparisons and explore the enabling role of emerging technologies (e.g., artificial intelligence) in ESG practices to refine evaluation frameworks and management strategies. This study provides theoretical insights for balancing economic efficiency with social value and offers practical implications for policymaking and investment decisions.

Keywords: ESG, Sustainable Development, Corporate Innovation, Literature Review

1. Introduction

Against the global backdrop of achieving "carbon peak and carbon neutrality" goals and promoting comprehensive green transformation of the economy and society, ESG (Environmental, Social, and Governance) integrates corporate performance across these three dimensions, aligning with the new development philosophy of coordinated growth. ESG represents an evaluation framework that transcends financial metrics, comprising three pillars: Environmental (E), Social (S), and Governance (G)[1]. It measures sustainability and societal impact through these core elements: environmental criteria assess corporate interactions with nature; social criteria evaluate relationships with stakeholders; and governance criteria examine internal controls and leadership practices [2]. The term "ESG" was first systematically introduced in the 2004 UN Global Compact report Who

Cares Wins, which advocated integrating environmental, social, and governance factors into capital market analysis to advance sustainable development. Over the past 25 years, sustainable finance has grown exponentially, evidenced by the surge in corporate ESG disclosures and the expanding scale of ESG investments [3].

"The Outline of the 14th Five-Year Plan for National Economic and Social Development and the Long-Range Objectives Through the Year 2035" proposes to "promote a comprehensive green transformation of economic and social development". Within this context, ESG has emerged as a focal point for academic and industry research, encompassing themes such as ESG disclosure and its relationships with green performance, innovation performance, financial performance, investor preferences, corporate value, and greenwashing. Studies reveal a nonlinear U-shaped correlation between ESG disclosure and green innovation performance, mediated by resource acquisition, governance optimization, and cost-saving effects [4]. Furthermore, ESG performance positively correlates with innovation performance, driven by reputational and resource mechanisms, with more pronounced effects in non-state-owned enterprises [5]. The ESG-financial performance relationship exhibits complex nonlinearity, where disclosure quality moderates improvements in Tobin's Q, ROA, and downside risk mitigation, enabling better ESG goal-setting and implementation [6,7]. Notably, financial materiality significantly influences ESG scoring relevance, allowing investors to identify opportunities by analyzing performance on key ESG issues[8].

Regarding investor preferences, ESG investing reflects market participants' endorsement of sustainability principles. ESG factors capture shifting consumer demand for green products and assets, channeling capital toward environmentally responsible firms and catalyzing economy-wide green transitions [9]. Segura [10] proposes a tri-dimensional analysis of ESG's impact on corporate value, offering a holistic yet granular perspective for sustainable investment insights. Additionally, ESG performance enhances corporate value by alleviating financing constraints, improving operational efficiency, and reducing financial risks [11]. However, greenwashing threatens the accuracy and reliability of ESG reports, complicating decision-making, disrupting financial markets, and eroding stakeholder trust [12], underscoring the need for robust disclosure oversight.

ESG theory not only provides a systematic roadmap for corporate sustainability but also redefines value assessment by integrating multidimensional non-financial indicators. Consequently, optimizing management strategies and evaluation frameworks to enhance ESG implementation has become a pivotal research agenda. This paper reviews ESG's definition and theoretical foundations, synthesizes antecedent and outcome variables, summarizes current developments, and offers heuristic insights for future research. By facilitating the synergy between economic and societal value creation, this study aims to advance the construction of more scientifically rigorous ESG evaluation frameworks.

2. Definition and theoretical foundations of ESG

2.1. Definition of ESG

ESG, as a non-financial sustainability performance metric, intersects with financial (ECON) measures to form a dual-research paradigm. This integrated framework quantifies corporate sustainability through environmental, social, and governance dimensions, ultimately influencing long-term financial outcomes [2,13]. Iamand et al. [14] define ESG as a holistic evaluation system for sustainable practices, systematically analyzing long-term corporate development through ecological stewardship, stakeholder engagement, and institutional governance. Environmental criteria assess ecosystem preservation and resource efficiency; social metrics focus on labor rights

and community relations; governance emphasizes transparent decision-making and regulatory compliance. Heje et al. [15] posit that ESG serves as a comprehensive sustainability benchmark, providing critical firm-level data to optimize investor portfolios beyond traditional risk-return frontiers. Özge et al. [16] highlight ESG's role as a core indicator system, integrating three complementary pillars for non-financial performance evaluation. Muhammad et al. [17] argue that ESG has evolved into a strategic paradigm linking business practices with societal values, underpinned by stakeholder theory, legitimacy theory, and transaction cost economics. Its dynamic nature allows technological advancements to transform ESG from a disclosure tool into a value-creation platform. Feng et al. [18] identify ESG's "double-edged" effect on corporate efficiency amid rapid economic growth, while Xin et al. [19] link ESG performance to financing activities, particularly supply-chain capital allocation during economic transitions.

Synthesizing these perspectives, this study defines ESG as a multidimensional, dynamic framework that quantifies non-financial performance through ecological responsibility, stakeholder management, and compliance mechanisms. It establishes a unified sustainability assessment system, balancing commercial objectives with societal impact while optimizing long-term financial outcomes through resource allocation. ESG embodies dual effects—short-term operational benefits and long-term value creation—ultimately serving as a strategic nexus for synergistic growth between business and society.

2.2. Stakeholder theory

Stakeholder theory, as advanced by Freeman, establishes that sustainable corporate success requires harmonizing competing stakeholder demands. Loi's [20] interpretation emphasizes that value generation for all constituents represents the fundamental corporate purpose, with stakeholder management emerging as a strategic competency. This approach facilitates the simultaneous achievement of economic, social, and environmental objectives while resolving inherent tensions between shareholder priorities and broader stakeholder expectations. Research demonstrates a positive correlation between stakeholder satisfaction levels and the value-enhancing potential of ESG initiatives [21]. Effective ESG implementation produces multiplier effects on organizational performance, where increased stakeholder engagement correlates with enhanced sustainability outcomes and market positioning. Crucially, successful ESG execution depends on coordinated participation from all stakeholder groups, with differentiated roles in the implementation process [22]. The theoretical congruence between stakeholder accountability principles and ESG's three-dimensional structure is evident. The triple-bottom-line paradigm provides the conceptual basis for ESG assessment, while structured stakeholder analysis informs targeted ESG strategy development. This theoretical alignment justifies the selection of stakeholder theory as this study's foundational framework.

2.3. Resource-based theory

Barney's [23] foundational work established that sustainable competitive advantage stems from unique organizational assets possessing four key attributes: value, rarity, inimitability, and organizational fit. This resource-based perspective (RBP) redirects strategic focus from external market conditions to internal resource configurations. While economic and environmental aspects dominate traditional sustainability discussions, the social resource extension theory systematically expands this view through three critical dimensions: social capability variables, multi-stakeholder integration, and shared-value propositions [24]. Empirical evidence confirms that cultural diversity,

when meeting RBP criteria, significantly enhances ESG-related knowledge transfer and overall sustainability performance [25]. Recent studies further demonstrate that ESG excellence contributes to innovation capability development through unique resource accumulation pathways [26]. The RBP framework provides critical insights into how social dimension resources create competitive advantages, offering theoretical grounding for ESG's value creation mechanisms. Importantly, strong ESG performance itself constitutes a strategic resource that drives long-term organizational success through multiple channels: operational optimization, risk reduction, and intangible asset enhancement - all consistent with RBP's fundamental tenets. This theoretical congruence supports our adoption of resource-based theory as a core analytical framework.

3. ESG antecedent variables

3.1. External factors

3.1.1. Industry

Regarding industry, variations in sector-specific characteristics, structure, and lifecycle stages exert differential impacts on ESG performance. In terms of industry attributes, Wanda and EI [27] argue that the energy sector's inherent high environmental sensitivity and stringent regulatory scrutiny generate more pronounced market premiums for ESG practices. This "brown industry transformation effect" underscores industry attributes as a pivotal antecedent variable for ESG performance divergence, wherein ESG investments in high-pollution industries yield disproportionately higher policy dividends and market returns. Juwala et al. [28] posit that industry-level digital technology adoption serves as an antecedent variable that enhances ESG performance by improving operational transparency and resource efficiency. Specifically, digital transformation in manufacturing—encompassing the triple transition (business, workforce, and technology)—positively influences ESG performance through green innovation facilitation, risk-taking encouragement, and resource allocation optimization, contingent on contextual factors and the interplay among drivers and mechanisms [29,30]. Concerning industry structural composition, Huan and Yu [31] further note that multiple causal relationships exist across industries, with diverse causal configurations capable of achieving high ESG performance. Despite inherent sectoral disparities, certain industries share analogous causal pathways, enabling firms to select context-appropriate strategies for ESG improvement. From a lifecycle perspective, Hu highlights that during decline phases, fintech exerts the most substantial marginal impact on corporate ESG performance, followed by maturity and growth stages. In growth phases, green finance demonstrates the strongest moderating effect in amplifying fintech's positive influence on ESG.

3.1.2. Macro policies

Regarding macro policies, green finance initiatives and climate regulations significantly influence corporate ESG performance. Government-led formal institutional frameworks for green finance can positively affect firms' ESG outcomes, with market participants—particularly institutional investors—playing an amplifying role in reinforcing such policy effects [32]. China's Green Credit Guidelines exemplify this dynamic, demonstrating measurable ESG improvements (0.06-point increase on a 6-point scale) among heavily polluting industries, where national policies serve as pivotal antecedent variables that drive corporate ESG enhancement through dual mechanisms of incentive structures and regulatory constraints, thereby offering empirical foundations for both

policymaking and corporate strategy formulation [33]. Conversely, climate policy uncertainty exerts adverse impacts on ESG performance by exacerbating corporate financing constraints and prioritizing short-term financial gains over sustainability objectives [34].

3.1.3. Investors

A correlative relationship exists between investor attention and ESG performance. Investor attention mediates the linkage between ESG performance and corporate reputation while exhibiting a dual-threshold effect, suggesting firms should elevate investor focus beyond market-average levels [35]. Moreover, a mutual suppression effect emerges: a 1% increase in investor attention reduces corporate ESG performance by 0.252%, whereas a 1% ESG improvement decreases investor attention by 2.296%. This relationship further demonstrates significant regional and organizational heterogeneity[36].

3.2. Internal factors

3.2.1. Board of directors

Corporate board characteristics—including size, independence, committee structure, compensation mechanisms, and gender diversity—significantly influence ESG disclosure and performance. Treepongkaruna et al. [37] demonstrate that larger boards are more effective in mitigating ESG controversies, as increased human capital and enhanced stakeholder interaction facilitate sustainable development. Board independence, the establishment of CSR/sustainability committees, and executive compensation schemes likewise positively impact ESG performance [38,39]. Furthermore, Dempere and Abdalla [40] find that gender diversity policies substantially improve ESG disclosure quality, with female board representation strengthening organizational transparency and accountability, thereby elevating ESG disclosure levels and creating value-added outcomes. Lewellyn and Muller-Kahle [41] supplement these findings by noting that the efficacy (or inefficacy) of such board characteristics is contingent on institutional environments.

3.2.2. Management

Regarding corporate management, factors such as the gender composition, professional background, educational attainment, and myopic tendencies of executives are significantly correlated with ESG disclosure and investment. Managerial short-termism negatively impacts ESG performance by curtailing capital expenditures and diminishing green innovation efficiency, with this adverse effect being more pronounced in leadership teams characterized by low gender heterogeneity or lacking professional management expertise [42]. Furthermore, executives' educational levels influence corporate ESG disclosure, particularly in social responsibility dimensions, as those holding advanced degrees (e.g., master's or doctoral qualifications) demonstrate stronger inclinations to promote ESG transparency [43]. Additionally, weak governance mechanisms stemming from interlocked directorates significantly reduce ESG performance by eschewing long-term ESG investments and diluting ESG-related incentives, thereby substantiating the "managerial myopia hypothesis" [44].

3.2.3. Ownership structure

Corporate ownership characteristics, including foreign ownership, ownership concentration, executive shareholding, and institutional ownership, significantly influence ESG disclosure levels and performance. Yavuz et al. [45] demonstrate that foreign ownership and institutional ownership substantially enhance ESG disclosure quality, whereas ownership concentration (dominant shareholder control) exerts a suppressive effect. Additionally, Wu [46] argues that executive and institutional shareholding positively moderate the relationship between ESG performance and corporate value, while the moderating effects of ownership concentration and balance remain statistically insignificant.

3.2.4. Firm size

Firm size plays a critical role in ESG investment and disclosure quality. A threshold effect exists in the relationship between firm size and ESG sustainability. Due to economies of scale, larger firms are more inclined to invest in ESG activities to address stakeholder demands effectively. Their easier access to green financing and lower per-unit ESG compliance costs further amplify the scale-driven moderating effect on ESG performance [47,48]. Moreover, firm size correlates with ESG disclosure quality. Large corporations, leveraging years of voluntary reporting experience, are adept at compiling comprehensive reports and disclosing key performance indicators. In contrast, small and medium-sized enterprises (SMEs) often face challenges such as insufficient expertise, skills gaps, and limited motivation, resulting in inconsistent quantitative ESG data disclosure quality [49].

4. ESG outcome variables

4.1. Corporate innovation performance

In the realm of corporate innovation, ESG policies and performance may influence technological innovation and labor productivity. ESG initiatives initially enhance an enterprise's capacity to undertake innovative activities, subsequently driving value creation through this "indirect value-generation" process, ultimately yielding positive impacts on financial and operational performance [50]. As a metric for sustainable business practices, ESG plays a pivotal role in technological innovation. Specifically, ESG performance fosters innovation through external mechanisms such as reinforcing corporate network positioning and increasing institutional ownership, as well as internal mechanisms including reduced labor costs and alleviated financing constraints [51,52]. ESG-driven firms not only demonstrate superior future innovation outcomes but also consistently outperform non-ESG-driven peers in labor productivity and export competitiveness [53].

4.2. Financing capacity

ESG performance exhibits measurable correlations with corporate financing capabilities, funding efficiency, and capital costs. Enhanced information transparency, optimized supplier concentration, reduced operational risks, and mitigated managerial short-termism collectively strengthen the positive impact of ESG on trade credit financing. Empirical studies indicate that superior ESG performance can improve corporate financing efficiency by approximately 1%, though the proliferation of digital finance may attenuate this facilitative effect [54,55]. Regarding financing costs, Lavin and Montecinos-Pearce [56] demonstrate dual mechanisms: direct channels associate higher ESG disclosure levels with lower capital costs, whereas indirect channels reveal a

countervailing effect—when disclosures interact with growth opportunities (a proxy for forward-looking corporate risks), increased transparency may elevate financing expenses. Thus, ESG disclosure exerts opposing directional influences on capital costs through distinct pathways.

4.3. Social impact

Corporate ESG performance may influence enterprise quality, social influence, social value, and corporate social standing. Strong ESG performance contributes to enhanced enterprise quality with a certain degree of persistence. Among the three ESG dimensions, governance performance exhibits the most significant impact, followed by social performance, while environmental performance shows no statistically significant effect. The improvement in enterprise quality driven by ESG performance primarily operates through two pathways: alleviating financing constraints and boosting labor productivity [57]. Additionally, environmental (E) and social (S) performance demonstrate a significantly positive correlation with economic sustainability, indicating an interdependence between corporate economic value and societal value creation [22]. Furthermore, ESG performance mediates the relationship between corporate social status and innovation [58].

4.4. Investors

Regarding investor preferences, ESG indices and ESG performance are interrelated with investor sentiment, shareholding volume, and investment choices. Kräussl [59] argues that investors generally exhibit ESG preferences, and shareholder engagement can generate positive social impacts. Such ESG-driven investment behavior promotes higher market valuations and reduced capital costs for environmentally conscious firms, incentivizing their transition toward more sustainable policies. Wei L and Wu [60] further suggest that robust ESG performance can significantly enhance institutional investors' shareholding proportions by driving growth in both book value and market value, with a more pronounced preference observed for state-owned enterprises in China. Additionally, Dhasmana [61] highlights an asymmetric relationship between ESG indices and investor sentiment, which is further influenced by extreme market conditions. Counterintuitively, rising ESG indices weaken investor sentiment, whereas underperforming ESG indices stimulate it.

4.5. Corporate stocks

Corporate ESG performance has garnered significant attention due to its impact on stock price crash risk, return volatility, and broader stock market dynamics. Zhang Zenglian and Feng Yongjie [62] argue that heightened corporate emphasis on ESG performance strengthens its mitigating effect on stock price crash risk, creating a "complementary effect." By alleviating principal-agent conflicts, improved ESG performance further reduces crash risk, with such risk suppression identified as a critical pathway through which ESG enhances firm value. Additionally, Ye Yingying and Wang Xiaolin [63] demonstrate that ESG practices reduce firm-level stock return volatility by mitigating information asymmetry and attracting long-term institutional investors, thereby optimizing capital allocation and lowering market-wide volatility. This stabilizing effect promotes efficient market functioning and strengthens financial services' support for the real economy, with the volatility-reducing impact being more pronounced during market downturns.

4.6. Employeeess

In employee-related contexts, corporate ESG performance and disclosure correlate with job satisfaction, turnover rates, and psychological stress. Zhang et al. [64] suggest that ESG behaviors—through enhanced transparency in environmental disclosures and internal control mechanisms—may elevate employee satisfaction. Notably, executive environmental awareness and employee education levels reinforce this relationship. ESG disclosure also exhibits a negative association with turnover rates, though the magnitude of this effect varies by attrition levels, economic sector, and whether disclosure is mandatory or voluntary [65]. Zhou [66] identifies a U-shaped relationship between ESG performance and turnover, where moderate ESG performance reduces attrition. Regarding psychological impacts, ESG activities differentially affect employee mental health: environmental initiatives may exacerbate occupational stress due to bidirectional pressures, social practices alleviate stress by improving job satisfaction or work-life balance, while governance measures negatively impact mental health, potentially acting as stressors [67].

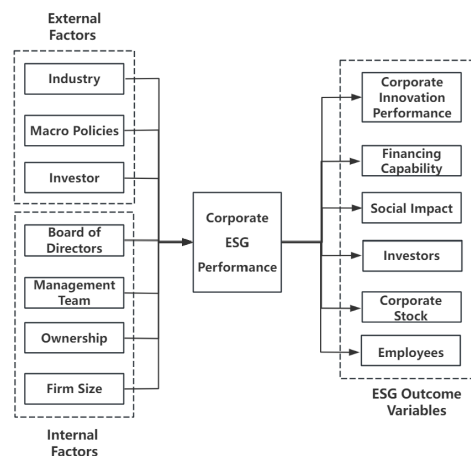


Figure 1. Antecedents and outcome variables of corporate ESG

5. Conclusions and future perspectives

5.1. Research conclusions

This study systematically examines ESG through three key dimensions: definition and theoretical foundations, internal and external influencing factors, and outcome variables. Regarding definition and theoretical underpinnings, ESG integrates the three pillars of environmental, social, and governance dimensions, establishing a comprehensive framework for assessing corporate sustainability. It is grounded in stakeholder theory and the resource-based view, emphasizing the need for firms to balance diverse stakeholder demands while leveraging heterogeneous resources to achieve competitive advantages. In terms of influencing factors, this paper highlights external drivers such as industry characteristics, macroeconomic policies, alongside internal determinants including board governance, managerial attributes, collectively shaping the heterogeneous landscape of ESG performance. Concerning outcome variables, corporate ESG performance enhances firm value through multiple pathways, such as alleviating financing constraints, fostering technological innovation. However, challenges remain, including adverse effects triggered by climate policy uncertainty. Overall, this study provides a structured framework for analyzing corporate ESG

performance, offering theoretical foundations for future ESG research while delivering practical insights for corporate ESG practices, ratings, and performance enhancement.

5.2. Research limitations and future directions

First, this study primarily focuses on macro-level analysis, with limited micro-level case studies on specific industries or enterprises. This may result in conclusions that lack operational recommendations tailored to the unique characteristics of different sectors or firms. Additionally, the impact of national institutional and cultural contexts on ESG practice effectiveness is not examined in detail. The discussion on strategies for addressing ESG-related negative events remains insufficient, as the analysis predominantly emphasizes the positive effects of ESG while neglecting the causes, consequences, and remedial measures of corporate ESG failures. Furthermore, this paper lacks a thorough investigation into the interplay between ESG and emerging topics such as artificial intelligence and embodied intelligence. Topics such as how AI serves as a technological enabler for achieving ESG goals or the transformative role of embodied intelligence in ESG practices warrant further exploration.

Second, building on these limitations, a combination of qualitative and quantitative approaches is recommended, where qualitative insights are translated into quantifiable metrics, standardized using industry benchmarks, and processed via weighted scoring algorithms to generate comparable indices for investment decision-making. Cross-cultural studies are also essential, which can reveal how institutional and cultural differences affect corporate ESG performance, leading to more targeted policies. Furthermore, strategic exploration of AI-driven ESG data collection, integration, and analysis is critical. Future research should also assess the efficacy of AI-powered detection tools in identifying greenwashing practices and improving the credibility of ESG reporting. Additionally, studies may delve into machine learning applications for ESG risk prediction, dynamic big data-based ESG rating models to enhance real-time assessment accuracy, etc.

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