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A CHRONOLOGICAL REVIEW OF THE IMPACT OF GREENWASHING ON ESG PERFORMANCE

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Abstract:

This chronological literature review examines the impact of greenwashing on Environmental, Social, and Governance (ESG) research and practice, with emphasis on how scholarly understanding has evolved across recent years. The study is motivated by the growing concern that ESG disclosure, although increasingly important for

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investors, regulators, and other stakeholders, may be undermined by symbolic sustainability claims that do not reflect actual environmental or social performance. Such a condition weakens the credibility of ESG reporting, creates information asymmetry, and may distort sustainable investment decisions. To address this issue, the review applies a systematic advanced search strategy using the Scopus database, guided by the main keywords greenwashing, ESG, and sustainability. After screening and selection, the final primary dataset comprised 104 documents (n = 104). The selected studies were analysed using a chronological approach and grouped into three temporal phases: Foundational Emergence (2020–2021), Early Development and Consolidation (2022–2023), and Rapid Expansion and Intensification (2024–2026). The results indicate a clear growth in publication activity and conceptual maturity over time. In the first phase, the literature mainly focused on disclosure credibility, governance mechanisms, and the early identification of greenwashing behaviour. In the second phase, the discussion expanded toward financial constraints, regulatory pressures, green finance, assurance, and methodological refinement in detecting symbolic ESG conduct. In the third phase, the literature showed substantial intensification, with stronger attention to artificial intelligence, digital governance, investor reactions, policy intervention, and more advanced measurement frameworks for distinguishing substantive ESG performance from reputational signalling. Overall, the review concludes that greenwashing has become a central challenge in ESG literature, not only as a reporting issue but also as a governance, financial, and regulatory concern. The chronological structure provides a clearer understanding of how the field has progressed and where future research should be directed.

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Keywords:

ESG, Greenwashing, Sustainability

Introduction

Green finance and sustainability-oriented investing have positioned ESG performance as a core benchmark in capital allocation and corporate strategy, as strong ESG outcomes are widely associated with reputational benefits, lower financing costs, and improved financial performance, thereby encouraging firms to emphasize their sustainability credentials (S. Chen et al., 2023; Taliento et al., 2019). However, the rapid growth of ESG reporting has outpaced the development of standardized metrics, external assurance, and rigorous oversight, leading to inconsistent ESG scores and disclosure practices that often rely on self-reported data (Sneideriene & Legenzova, 2024; Todaro & Torelli, 2024; Yu et al., 2020). Within this evolving context, greenwashing has emerged as a critical concern, commonly defined as a mismatch between ESG communication and actual ESG performance (Y. Liang & Gao, 2025; Yu et al.,

2020) (P. Hu et al., 2024). Across the literature, greenwashing is shown to undermine ESG data credibility, intensify information asymmetry, and complicate investors' decision-making, while often being driven by financial constraints and regulatory or stakeholder pressures (P. Hu et al., 2024; Poiriazi et al., 2025; Sneideriene & Legenzova, 2024; Yu et al., 2020) (Liao et al., 2023; Y. Liu et al., 2023; D. Zhang, 2022, 2023b). Over time, research has further demonstrated that although greenwashing may generate short-term reputational and financing advantages, it also increases controversies, unsystematic risk, and reputational vulnerability. At the same time, it erodes trust, legitimacy, and financial performance at the firm level, while distorting sustainable capital allocation, ESG signaling, and the credibility of green financial instruments at the market level. (Gregory, 2024; M. Lee & Raschke, 2023; Santos et al., 2023) (Ge et al., 2024; Y. Liang & Gao, 2025; Y. Liu et al., 2023; Santos et al., 2023) (Ge et al., 2024; Poiriazi et al., 2025; Yan et al., 2024). Recent studies also indicate that disclosure quality, readability, and governance factors can either restrain or intensify greenwashing, thereby shaping the broader trajectory of ESG performance (P. Chen & Dagestani, 2023; P. Hu et al., 2024; Sneideriene & Legenzova, 2024; Todaro & Torelli, 2024; Yan et al., 2024; Yu et al., 2020; D. Zhang, 2023b). Against this backdrop, a chronological review is especially valuable for tracing how scholarly understanding of greenwashing and its implications for ESG performance has evolved over time.

Literature Review

Greenwashing, the practice of misleading stakeholders about a company's environmental or sustainability efforts, has emerged as a critical issue in the context of ESG performance. It undermines trust, distorts market signals, and hinders genuine progress toward sustainability goals. Research highlights that greenwashing often arises from firms' attempts to meet stakeholder expectations without implementing substantive changes, thereby creating a disconnection between ESG disclosures and actual performance (Alevizou & Henninger, 2025; X. Wang, Zhao, et al., 2026; Williams, 2024). This deceptive practice not only erodes consumer trust but also impacts corporate accountability and resource allocation, posing significant risks to sustainable development (Alsaggaf, 2025; Q. Chen & Wang, 2026; Durmuş Şenyapar, 2024). The relationship between greenwashing and ESG performance is complex and multifaceted. On one hand, greenwashing can superficially enhance ESG ratings by creating a false impression of compliance, which may attract investors and reduce financing constraints in the short term (Q. Gong et al., 2026; Gregory, 2024). However, this practice often leads to long-term negative consequences, such as increased financial risks, reduced organizational resilience, and stifled innovation (Gregory, 2024; Wu et al., 2025). For instance, studies show that greenwashing undermines Green Total Factor Productivity (GTFP) by tightening financing constraints and encouraging inefficient investments, particularly in firms operating under multiple regulatory environments (Q. Gong et al., 2026). Additionally, greenwashing is more prevalent in industries with fragmented regulations or high environmental performance uncertainty, further complicating its impact on ESG outcomes (Birindelli et al., 2025; Q. Chen & Wang, 2026).

The drivers of greenwashing are rooted in both internal and external factors. Internally, aggressive business strategies, Chief Executive Officer (CEO) turnover, and managerial opportunism have been identified as key contributors to greenwashing behaviours (Niu et al., 2025; X. Wang, Zhao, et al., 2026). Externally, inconsistent regulatory frameworks, weak enforcement mechanisms, and stakeholder pressures exacerbate the issue (Birindelli et al., 2025; S. Hu et al., 2025). For example, firms in heavily polluting industries or those facing

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high marketization levels are more likely to engage in greenwashing to maintain legitimacy and avoid scrutiny (Feng et al., 2025). Moreover, the lack of standardized ESG disclosure requirements and third-party verification further enables deceptive practices (Birindelli et al., 2025; Cheng & Cheng, 2025).

Efforts to mitigate greenwashing and improve ESG performance emphasize the need for robust governance mechanisms, enhanced transparency, and stakeholder engagement. Studies suggest that green finance reforms, when effectively implemented, can curb greenwashing by intensifying stakeholder monitoring, reducing information asymmetry, and strengthening regulatory oversight (Cao, 2025; Cheng & Cheng, 2025). Additionally, technological advancements such as blockchain and Internet of Things (IoT) have been proposed as tools to enhance transparency and verify sustainability claims (Alsaggaf, 2025; Durmuş Şenyapar, 2024). Institutional investors also play a critical role in mitigating greenwashing by holding firms accountable and promoting genuine ESG practices (Feng et al., 2025; X. Wang, Zhao, et al., 2026). Nevertheless, achieving these goals requires harmonized international regulatory frameworks and a shift toward substantive, rather than symbolic, ESG improvements (Q. Gong et al., 2026; X. Wang, Shen, et al., 2026).

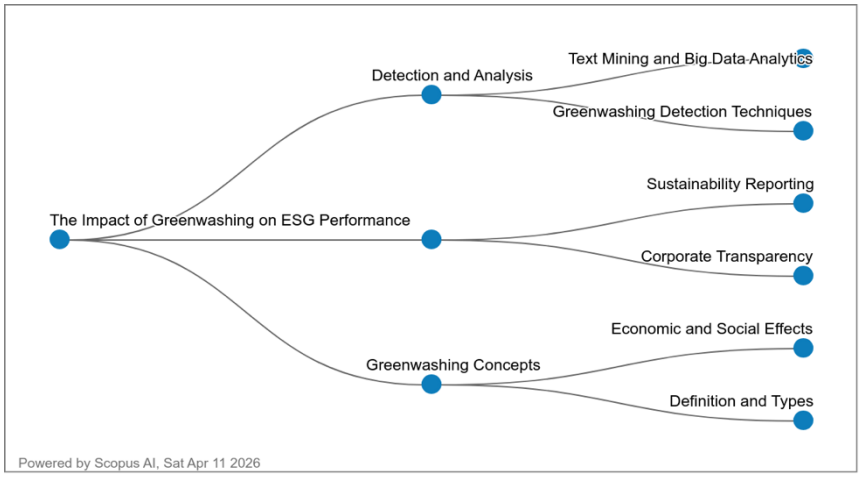

Figure 1: Mapping Concept Map for Literature Study

In conclusion, while greenwashing poses significant challenges to ESG performance, it also highlights the urgent need for systemic reforms and innovative solutions. Addressing this issue requires a multifaceted approach that combines stricter regulations, technological advancements, and active stakeholder participation. By fostering transparency and accountability, firms can align their ESG disclosures with genuine sustainability practices, thereby restoring trust and advancing global sustainability goals. The outline of this review paper consists of three sections: Section 1 discusses an introduction and related research, and Section 2 describes the review data. The conclusions of this research are discussed in Section 3.

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Materials and Methods

Data Collection

The growing importance of ESG in corporate strategy, investment assessment, and regulation has intensified scholarly concern over greenwashing as a threat to the credibility of sustainability claims. A chronological review of greenwashing's impact on ESG is therefore timely, as it enables a structured examination of how its concepts, measurement, and consequences have evolved. This study uses a single-step data collection approach through the Scopus database to identify relevant, high-quality publications. Scopus was selected for its broad interdisciplinary coverage, rigorous indexing standards, and strong representation of peer-reviewed research in business, finance, environmental studies, and governance. Keywords related to greenwashing and ESG were systematically applied, and records were screened for relevance, quality, and alignment with the review objective. Using one established bibliographic source ensures consistency, reduces duplication, and supports transparency and replicability. This rigor strengthens the reliability of temporal patterns and helps trace shifts in scholarly focus, emerging debates, and greenwashing's influence on ESG disclosure quality, stakeholder trust, and sustainability legitimacy.

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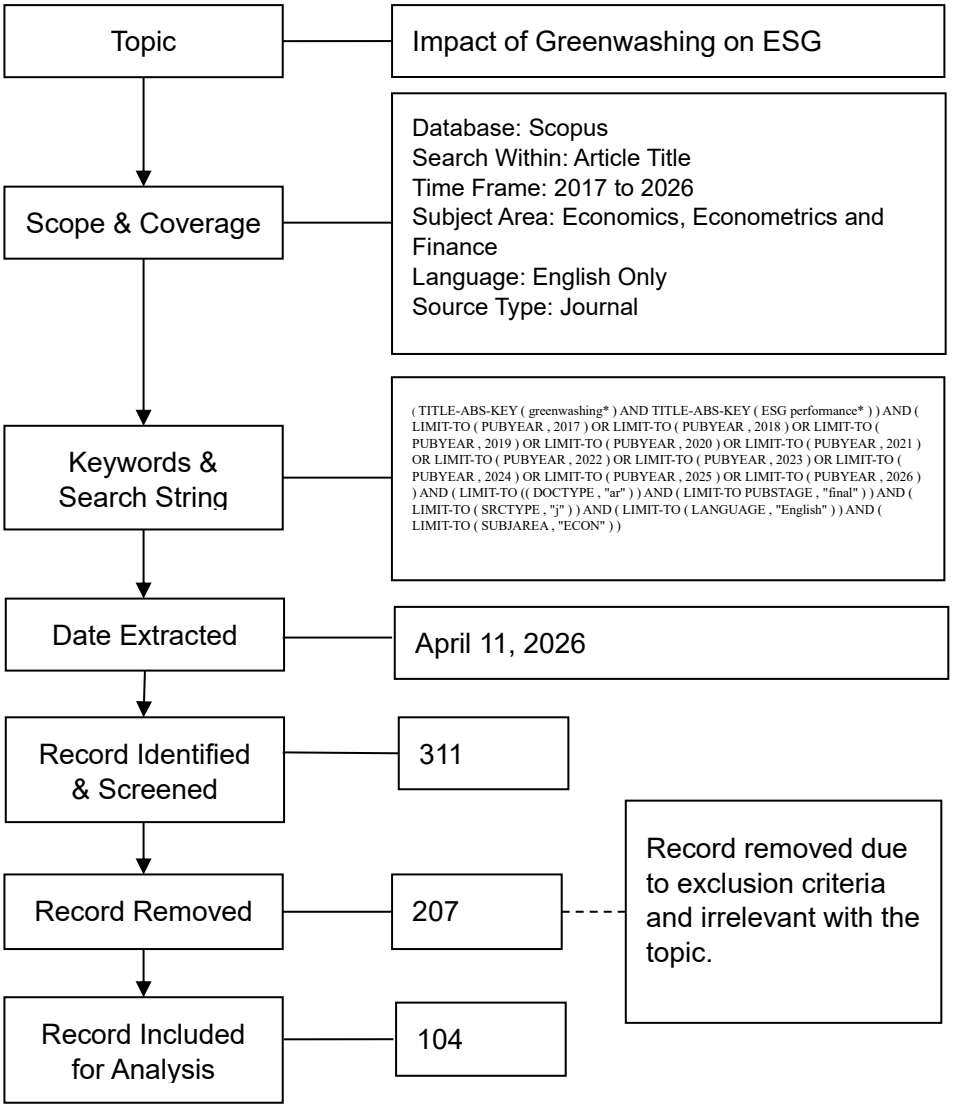

Figure 2: Flow Diagram of the Search Strategy.

Source: (Moher et al., 2009)

This review employed a structured and selective Scopus search strategy to build a methodologically sound evidence base aligned with examining greenwashing's impact on ESG performance over time. The search string (TITLE-ABS-KEY(greenwashing*) AND TITLE-ABS-KEY(ESG performance*)) was applied in Scopus and refined by publication years 2017–2026, article document type, final publication stage, journal source type, English language, and the Economics, Econometrics and Finance subject area. These criteria captured the recent, policy-relevant phase of ESG scholarship, ensured reliance on mature peer-reviewed work, improved comparability across studies, and maintained focus on ESG as a financial and governance-related construct. The initial search produced 311 records; after screening for relevance, thematic fit, and analytical usefulness, 207 were excluded, leaving 104 articles for final analysis. This reduction strengthens the review by demonstrating quality control and conceptual focus. Concentrating on studies directly addressing greenwashing and ESG performance within a defined temporal and disciplinary scope improves trend reliability, thematic validity, and understanding of literature evolution amid changing sustainability

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expectations, market scrutiny, stakeholder demands, corporate reporting, investment decision-making, regulation, and responsible finance debates globally today.

Data Clustering

In a chronological review on the impact of greenwashing on ESG, clustering publication data is an important analytical step because it converts a simple year-by-year count into a more meaningful structure for interpreting the field's development over time. When bibliographic data are systematically collected from a credible source such as Scopus using clearly defined keywords and search strategies, they provide a reliable basis for tracing shifts in scholarly attention. Nonetheless, raw annual publication counts alone may not clearly reveal the underlying stages of research development. By grouping years based on publication volume and temporal proximity, clustering helps identify phases of emergence, growth, and intensification, making patterns in the literature more visible. This is particularly useful for evolving topics such as greenwashing and ESG, where changes in research output may reflect wider developments in regulation, stakeholder expectations, reporting standards, and sustainability discourse. As a result, clustering improves interpretability, strengthens trend analysis, and provides a clearer understanding of how the field has progressed from early conceptual interest to more sustained academic attention.

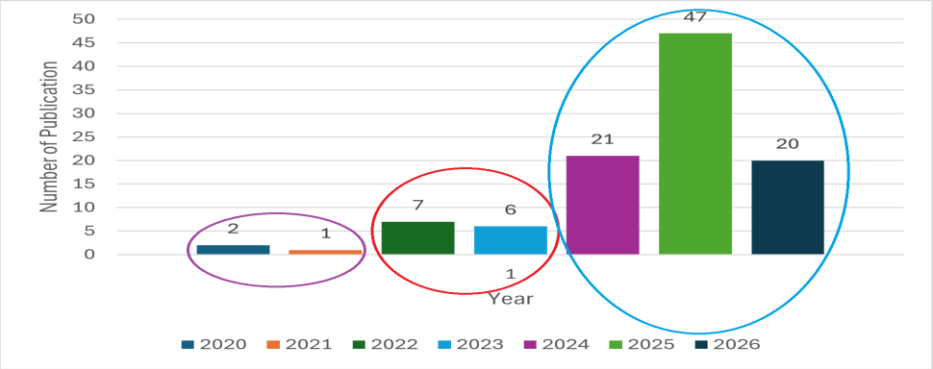

Figure 3: Number of Documents Per Year

Phase 1: Foundational Emergence (2020–2021). This phase represents the foundational emergence of the literature on the impact of greenwashing on ESG. Research productivity was very limited, with only 2 publications in 2020 and 1 publication in 2021, suggesting that scholarly attention was still in its infancy. Studies in this stage were likely exploratory and conceptual, focusing on defining the relationship between greenwashing and ESG and positioning the topic within the broader sustainability discourse. As such, this period can be understood as the intellectual starting point of the field, where initial awareness was established, but research remained fragmented and low in volume.

Phase 2: Early Development and Consolidation (2022–2023). This phase reflects the transition from early emergence to more visible academic engagement. Publication output increased noticeably and remained relatively stable across the two years, indicating that the field was beginning to take shape as a distinct area of inquiry. Research in this stage may be interpreted as moving beyond initial awareness toward a more focused examination of how greenwashing influences ESG performance, disclosure quality, stakeholder trust, and firm legitimacy. This phase, therefore, marks the early structuring of literature.

Phase 3: Rapid Expansion and Intensification (2024–2026). The final phase, covering 2024 to 2026, may be labelled rapid expansion and intensification. This is the most dynamic stage in the dataset, with publications increasing sharply to 21 in 2024, peaking at 47 in 2025, and remaining high at 20 in 2026. This substantial increase reflects a strong surge in scholarly interest and suggests that the topic has become a major area of concern within ESG and corporate sustainability research. The sharp rise in 2024 marks a decisive turning point, while the 2025 peak indicates heightened maturity and urgency in the field. Even though 2026 is lower than 2025, it still far exceeds the earlier phases, reinforcing the view that the literature has entered a high-impact and highly active stage of development.

Result and Discussion

Phase 1: Foundational Emergence (2020–2021)

Phase 1, labelled Foundational Emergence (2020–2021), marks the formation of the greenwashing–ESG debate. It comprises 2020 as a formative stage, centered on ESG disclosure credibility and unreliable sustainability self-reporting, and 2021 as an early critical reassessment stage, focused on ESG usefulness during market stress. Early scholarship treated ESG information as potentially distorted rather than inherently reliable.

In 2020, misleading ESG communication was central. (Yu et al., 2020) show that firms may disclose extensive ESG information while still performing weakly in ESG terms, separating disclosure quantity from substantive sustainability conduct. By constructing peer-relative greenwashing scores, the study shows that greenwashing can be identified systematically. It also identifies governance discipline as a corrective mechanism: independent directors, institutional investors, cross-listing status, and stronger public-interest pressure in less corrupt settings reduce greenwashing tendencies. (Antoncic, 2020) shifts the discussion from governance control to information architecture, arguing that weak sustainability reporting standards limit reliable ESG data, risk assessment, and responsible capital allocation. The study proposes alternative data systems using artificial intelligence, machine learning, and natural language processing to reduce self-reporting bias and uncover ESG or Sustainable Development Goal (SDG). outcomes. Together, these studies show formal ESG narratives may conceal weak performance.

In 2021, the literature became skeptical and market-oriented. (Demers et al., 2021) challenge the assumption that high ESG scores protect firms during the COVID-19 market shock. After controlling for industry effects, market risk, accounting performance, financial position, and intangible investment, the study finds that ESG has no significant explanatory power for stock returns during either the first-quarter crisis or the broader 2020 pandemic year, whereas internally generated intangible assets do. Robust checks across alternative return measures and multiple ESG datasets support this conclusion, indicating that ESG's weak explanatory role is not merely a data-source issue. This marks a shift from identifying greenwashing to questioning whether ESG scores have the practical market value often attributed to them.

Methodologically, Phase 1 includes cross-country comparative scoring in (Yu et al., 2020), computational and big-data-based signal extraction in (Antoncic, 2020), and regression-based crisis-period market analysis in (Demers et al., 2021). ESG, therefore, remains a contested domain in which credibility, bias, monitoring, and financial relevance require careful examination.

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Phase 2: Early Development and Consolidation (2022–2023)

Phase 2, labelled Early Development and Consolidation (2022–2023), reflects a broadening of the greenwashing–ESG literature. It comprises 2022 as a consolidation stage, focused on motives behind responsible claims, disclosure limits, and stronger evaluation tools, and 2023 as an applied expansion stage, in which research moved into regulatory responses, finance-based remedies, assurance, and behavioral consequences of ESG performance.

In 2022, one theme is economic incentives behind responsible branding. (H. Liang et al., 2022) show that hedge funds endorsing the Principles for Responsible Investment (PRI) attract stronger investor inflows, greater asset accumulation, and higher revenues, yet still underperform after risk adjustment, especially where ESG exposure and incentive alignment are weak. Likewise, (D. Zhang, 2022) finds that financial constraints drive ESG greenwashing, while leverage intensifies this pressure, and financial intermediation helps reduce misleading ESG behavior. Together, these studies frame greenwashing as an economically rational response to market and financing conditions. A second theme concerns whether markets can detect or price greenwashing. (G. Xu et al., 2022) find greenwashing in the Chinese green bond market and associate it with wider credit spreads, while third-party certification is linked with lower spreads depending on trading venue and issuer ESG quality. Consolidation is also methodological and institutional. (Reig-Mullor et al., 2022) introduce a neutrosophic Analytic Hierarchy Process–Technique for Order Preference by Similarity to Ideal Solution (AHP-TOPSIS) model to improve ESG performance evaluation under uncertainty. (Lokuwaduge & De Silva, 2022) argue that fragmented standards, inconsistent objectives, and weak regulation increase greenwashing risk, while (Frank et al., 2022) show that risk, compliance, and legal functions can help integrate ESG risks into institutional frameworks. (M. T. Lee & Suh, 2022) note that the ESG–financial performance relationship remains inconclusive and that greenwashing may explain part of this inconsistency.

In 2023, the literature became empirical and focused on how external interventions shape greenwashing behavior. (Liao et al., 2023) show that financial report comment letters are followed by higher greenwashing in ESG disclosures among Chinese listed firms, with stronger comment-letter intensity linked to greater greenwashing. The study links this to crisis-management behavior: firms respond with tone management and symbolic disclosure expansion rather than substantive action, while stronger internal and external governance reduces the effect. This shows that regulatory scrutiny does not automatically improve ESG quality and may trigger more sophisticated impression management. Another 2023 development is a focus on green finance and digital finance as corrective forces. (Zheng et al., 2023) find that green bond issuance significantly improves corporate ESG performance through easier financing access, lower financing costs, better debt structures, stronger governance, and improved environmental management. Similarly, (D. Zhang, 2023a) shows that digital finance empowerment improves green innovation by reducing extreme ESG hypocrisy resistance measured through greenwashing, especially among non-state-owned firms, heavily polluting firms, and firms facing stronger competition. Relatedly, (D. Zhang, 2023b) finds that green finance development reduces extreme hypocritical ESG risk and improves ESG performance quality by lowering greenwashing incentives, increasing green innovation and profitability, and reducing financing pressure, with stronger effects in state-owned firms, pollution-intensive firms, and firms under stronger environmental regulation. Together, these studies show that the literature has moved beyond diagnosing greenwashing to testing whether financial system design can restrain it. (Gu et al., 2023) add a technology angle,

arguing that traditional audit logic is insufficient for ESG assurance and proposing an Audit 4.0 approach using continuous, data-rich, physical-world verification, illustrated through satellite-based methane estimation. (He et al., 2023) find that ESG ratings are associated with lower corporate risk-taking, especially among firms with poorer information transparency, weaker governance, and lighter external monitoring.

Phase 2 reflects a more mature direction than the earlier foundational period. Methodologically, it shows diversity, including fund-level performance analysis, bond spread analysis, panel regressions, assurance proof-of-concept design, and multicriteria decision models under uncertainty. Thematically, the period shifts from asking whether greenwashing exists to examining when it intensifies, how markets price it, which institutions worsen or reduce it, and what tools can strengthen the credibility of ESG-related information.

Phase 3: Rapid Expansion and Intensification (2024–2026)

Phase 3, labelled Rapid Expansion and Intensification (2024–2026), reflects a broader and more complex research landscape than the earlier phases. The literature no longer asks only whether greenwashing exists. It increasingly examines when greenwashing is rewarded or punished, which institutional conditions intensify it, and which governance or technological mechanisms can restrain it. For chronological interpretation, this phase can be divided into three clusters: 2024 as an early acceleration stage, 2025 as a broad intensification stage, and 2026 as a governance-and-verification stage. One 2025 item, namely (Singh, 2025), did not provide an abstract, so no findings or discussion were available for inclusion.

In the early 2024 acceleration, one stream examines green finance and sustainable-label credibility. (Zhou & Kythreotis, 2024) find that green bond issuance after net-zero adoption is not significantly linked to carbon reduction, although firms relying only on green bonds show better ESG ratings, lower emissions, and lower financing costs than mixed issuers, raising greenwashing concerns. Likewise, (Roggi et al., 2024) show that stronger ESG performance lowers GSS bond spreads. However, detailed use-of-proceeds disclosure is the stronger safeguard by reducing unexplained risk and greenwashing. (H. M. Dong et al., 2024) show that green bond issuance supports green innovation, R&D, lower financing constraints, and stronger environmental investment and ESG performance. Yet, (Jin et al., 2024) caution that green financial regulation may shift firms toward disclosure-heavy rather than action-based ESG. (Teti et al., 2024) find no significant abnormal returns after greenwashing exposure, while ESG ratings do not fully capture environmental quality, and (Kräussl et al., 2024) note that investor preference for ESG remains strong and may lower the cost of capital.

A second trend concerns digitalization, artificial intelligence (AI) and reform. (Peng & Kong, 2024) show that environmental regulation promotes green innovation, but part of the response still operates through both ESG performance and greenwashing behaviour, indicating substantive and symbolic reactions. By contrast, (Z. Li et al., 2024) find that China's social responsibility reform significantly curbs greenwashing by improving disclosure behaviour and moderating external regulatory pressure. (D. Li et al., 2024) find that artificial intelligence inhibits greenwashing by reducing agency problems and financing constraints and increasing external attention, while (D. Zhang, 2024) shows that AI improves ESG disclosure quality and curbs greenwashing, especially in state-owned, less pollution-intensive, and highly regulated settings and regions with weaker green finance development. (Z. Wang & Tang, 2024) distinguish substantive digital innovation, which improves ESG performance and restrains

greenwashing, from symbolic digital innovation, which does not generate similar environmental gains. (Sun, 2024) likewise shows that stronger bank competition reduces greenwashing by easing financial constraints.

A third 2024 line covers investor voice, supply chains, governance, and performance consequences. (Luo & Ye, 2024) find that minority investors' ESG questions improve ESG performance without encouraging opportunistic greenwashing, while (Sun et al., 2024) show that customer ESG quality improves supplier green innovation quality only when customer commitment is genuine rather than greenwashing-based. (Yuan et al., 2024) distinguish exaggerating, distracting, and window-dressing as separate greenwashing forms and show that greenwashing firms can still gain higher market returns through signalling. (Nguyen et al., 2024) find that engagement motives and sustainability committees improve stock liquidity, though committees may also reward greenwashing-driven motives. (Gregory, 2024) shows that greenwashing can lower the cost of capital and support image benefits, yet also raises controversy exposure, unsystematic risk, and weakens return on equity. ESG reporting mandates do not appear to suppress it. Performance evidence remains mixed in (Birindelli et al., 2024), (Tohang et al., 2024), (Martinez Meyers et al., 2024), and (Matemane et al., 2024). Overall, the 2024 literature highlights the promise and limits of ESG claims, with growing emphasis on substance over appearance.

The 2025 broad intensification stage is marked first by a sharp rise in studies on financial consequences and market pricing. (Gidage et al., 2025) find that greenwashing weakens bank financial performance in developing markets, although boardroom gender diversity softens the damage, and ESG controversies amplify it. (Gallas et al., 2025) report a similar pattern in European banks: greenwashing depresses Tobin's Q and return on equity (ROE) but may still generate short-term operational gains in return on assets (ROA), while authentic environmental practices mitigate the negative valuation effect. A more direct decarbonization test appears in (J. D. Li et al., 2025), which finds a positive link between ESG scores and carbon emissions or carbon intensity, especially among highly internationalized companies, suggesting strategic impression management rather than real decarbonization. Market reaction studies also become more fine-grained. (Dorfleitner et al., 2025) show that stock market punishment is concentrated in smaller firms, financially material cases, and compliance-related allegations. (Mirza et al., 2025) find that greenwashing can temporarily reduce perceived risk, but this effect fades as markets detect the mismatch. (M. Xu et al., 2025) report negative stock market reactions to greenwashing news globally, with stronger punishment for manufacturing firms, high-ESG firms, Asia-Pacific firms, and cases supported by clear evidence. Likewise, (Chai et al., 2025) show that high ESG performance does not protect firms during ESG violations when greenwashing risk is high, or ESG is treated as a short-term profitability tool. In pre-listing disclosure research, (Alyasa-Gan & Che-Yahya, 2025) find that voluntary pre-IPO ESG disclosure in Malaysia is associated with weaker long-term performance, especially through the social dimension. Together, these studies show that market discipline exists, but it is selective, conditional, and often delayed.

A second 2025 development concerns the credibility of labels, bonds, loans, funds, and exchange-traded funds (ETFs). (Apergis et al., 2025) show that in European bank green bonds, concrete measures such as ESG performance, emissions, and alignment with climate-relevant SDGs lower yields, while the green label alone or broad SDG alignment without relevance does not. (Berdiev, 2025) finds that Japan's greenium is not universal and disappears after 2021, consistent with growing greenwashing concern. (Kim et al., 2025) distinguish between high-

transparency and low-transparency sustainability-linked loans, showing that only the former maintains ESG quality after issuance. The fund literature also becomes more precise. (Kolling & Busch, 2025) show that sustainability-labelled equity funds have better carbon and SDG profiles than matched controls, though differences in classical ESG scores are less clear. By contrast, (Fassas & Papadamou, 2025) find that the ESG factor in United States (US) ESG ETFs is inconsistent and sometimes statistically insignificant, while (Cotugno et al., 2025) show that ESG incidents hurt both green and conventional bonds in the secondary market, weakening the idea of a stable sustainability premium. Similarly, (Oluwakemi & Mishelle, 2025) find that transparency in ESG financial materiality disclosure alone is not enough to improve firm financial performance and that over-disclosure remains a concern. Overall, the 2025 finance literature suggests that labels still affect valuation, but investor confidence now depends more on specific, verifiable, and transparent structures.

A third 2025 cluster focuses on governance drivers, political links, media influence, and contrasting investor effects. (H. Dong et al., 2025) show that executives' media ties increase greenwashing by helping firms package favourable ESG information without improving actual performance, while (H. Liu et al., 2025) find that political connections increase greenwashing because government and media pressure become weaker around connected firms. Leadership instability matters as well: (Niu et al., 2025) show that CEO turnover increases ESG greenwashing, especially when outside successors face strong performance pressure. Governance structures alone are not always protective. (Pratama et al., 2025) find that sustainability committees in Southeast Asia do not prevent greenwashing, and larger committees dominated by executives may even encourage more symbolic behaviour. Relatedly, (Mohapatra et al., 2025) find that ESG disclosure can restrain accrual manipulation, but high ESG scores are linked with greater real earnings management. Investor attention produces mixed effects. (Yang et al., 2025) show that retail investor attention can curb greenwashing through stronger activism and stakeholder scrutiny, leading to higher environmental investment, more green patents, and better ESG ratings. In contrast, (W. Li et al., 2025) show that retail investor attention can also drive greenwashing by encouraging more ESG disclosure without real improvement, especially under financial constraints and weak managerial foresight. This tension is extended by (Y. L. Fan et al., 2025), who show that corporate governance structures and policy-derived rhetorical strategies jointly shape the relationship between investor pressure and greenwashing practices. Overall, investor attention is not uniformly disciplinary. Its effect depends on governance quality, investor sophistication, and firm incentives.

A fourth 2025 strand turns to policy interventions and external governance tools. (Zhu et al., 2025) find that climate-adaptive urban development pilot policies reduce greenwashing by increasing executive environmental awareness and improving access to green finance. (Gan et al., 2025) show that environmental auditing enhances ESG performance by restraining greenwashing, strengthening management discipline, lowering violations, and attracting more media and public attention. (Cheng & Yan, 2025) likewise find that environmental management system certification suppresses greenwashing through better internal governance, stronger stakeholder attention, lower inefficient investment, and reduced earnings management. (L. Chen et al., 2025) add that digital government improves ESG performance and curbs extreme greenwashing by increasing regulatory efficiency and broadening public, analyst, and institutional scrutiny. Nevertheless, not all interventions work positively. (Han & Zhang, 2025) show that China's Environmental Protection Tax Law increased greenwashing, especially among firms with high financing constraints. (G. Liu et al., 2025) find that environmental

subsidies also promote greenwashing because the catering effect outweighs the incentive effect, especially among heavy polluters, state-owned firms, politically connected firms, and poor ESG performers. A related symbolic adaptation appears in (D. Wang et al., 2025), where environmental taxes increase green mergers and acquisitions (M&A) among heavy polluters without corresponding ESG or innovation gains. (Aibai et al., 2025) provide a mixed result: Morgan Stanley Capital International (MSCI) inclusion improves ESG performance through transparency and foreign investor channels, yet greenwashing incentives remain part of the mechanism. More positive findings appear in (Du et al., 2025), where ecosystem-oriented green business performance boosts innovation willingness and curbs greenwashing, and in (Efthalitsidou et al., 2025), where efficiency in Greek public and financial institutions is tied to verifiable metrics and governance integration rather than funding volume alone. Thus, 2025 shows that policy tools can either reduce or stimulate greenwashing depending on how incentives, monitoring, and reporting pressure are designed.

A fifth 2025 line focuses on detection tools, measurement frameworks, and review-based synthesis. (Łudzińska, 2025) concludes from a rapid review that AI generally improves ESG performance through information governance, innovation, digital transformation, and greenwashing mitigation, though the effect remains context dependent. (Sari et al., 2025) validate an AI-based greenwashing detection model with strong agreement with major commercial databases and a negative relationship between greenwashing and financial performance. (R. Wang & Wang, 2025) contribute to a Chinese Corporate Greenwashing Index that captures temporal and firm-level variation. (Patil et al., 2025) present blockchain as a means of making ESG reporting more traceable and auditable, while (Sklavos et al., 2025) show that many European financial institutions combine strong ESG transparency with weak green accounting substance. A disclosure-quality angle also appears in (Stander, 2025), whose sentiment analysis shows a shift from climate-risk to climate-opportunity language in South African corporate reports. Review-based studies reinforce similar concerns. (Marwane et al., 2025) call for standardized metrics and stronger greenwashing mitigation in responsible investment research. (Rahman & Varghese, 2025) identify transparency and standardization as key challenges for ESG-friendly value creation in Japan. (Harinathan et al., 2025) show through bibliometric analysis that attention has risen strongly around ESG regulation and reporting, while empirical and technological applications remain uneven. (Ybarra & Turk, 2025) argue that only strategic ESG based on difficult-to-imitate capabilities can create sustainable advantage, whereas greenwashing and bureaucratic ESG cannot. This cluster shows a clear movement from broad concern toward more precise empirical identification and stronger methodological tools.

The 2026 governance-and-verification stage becomes even more focused on data infrastructures, AI governance, and external information environments. (B. Gong et al., 2026) find that digital supply chain finance through the Zhongzheng Accounts Receivable Financing Service Platform (ZARFS) platform improves ESG performance and reduces greenwashing by easing financing constraints, improving government-business relations, and enhancing disclosure. (M. Liu et al., 2026) show that government open data suppresses ESG greenwashing through lower financing constraints and stronger monitoring by regulators, investors, media, and the public. A related mechanism appears in (C. Zhang et al., 2026), where data element marketization improves ESG performance and reduces greenwashing through financing relief, digital transformation, and stronger supervision. AI studies also become more governance sensitive. (Jiang et al., 2026) show that AI reduces greenwashing by improving environmental disclosure, reducing financial information manipulation, and increasing supply-chain

transparency, though the effect weakens when executives already show strong greenwashing tendencies. (Lei et al., 2026) add that even AI adoption announcements can reduce greenwashing by attracting analyst attention and easing financing constraints. In 2026, the main issue is therefore not only technology adoption, but the interaction between technology, monitoring, and executive oversight.

A second 2026 pattern concerns the distinction between disclosure quantity and substantive sustainability outcomes. (Kercher et al., 2026) show that advanced and large countries display the highest ESG performance and lowest greenwashing. While emerging and Asia-Pacific (APAC) countries combine high disclosure with weaker performance and higher greenwashing, showing clearly that disclosure quantity does not equal disclosure quality. (Ding et al., 2026) reach a similar conclusion at the firm level, finding that ESG practices can worsen carbon performance because agency conflicts and greenwashing weaken real environmental improvement, though internal controls and institutional investor oversight help contain the problem. The assurance issue is sharpened by (Sakchuenyos & Haji, 2026), who find no direct investor penalty for greenwashing itself, but a stronger negative reaction when ESG disclosure assurance remains absent over time. More precise disclosure-quality evidence is provided by (Gaur et al., 2026), whose mixed-method green bond study shows that clear, balanced, and verifiable narratives produce better market reactions and better post-issuance performance than vague and overly optimistic communication. Likewise, (P. Zhang et al., 2026) find that better ESG performance raises green premiums in China, especially when bonds lack greenwashing motivation, and ESG disagreement is lower. (Baldissarro et al., 2026) also shows that in European financial firms, only the environmental pillar significantly improves market value, while social and governance scores offer limited differentiation. Overall, 2026 reinforces the view that substance, assurance, and disclosure quality matter more than reporting volume alone.

A third 2026 trend extends the discussion of macro-level sustainability, organizational instability, and sophisticated manipulation. (Xin et al., 2026) show that ESG performance advances energy justice, strengthened by Confucian cultural values and digital finance through transparency and lower greenwashing. (Liya et al., 2026) find that green finance and ESG performance improve environmental sustainability in Brazil, Russia, India, China, and South Africa (BRICS) economies, although agency conflicts still leave room for greenwashing. (Y. B. Fan et al., 2026) show that CEO turnover damages ESG performance in the social and governance pillars, while the environmental pillar deteriorates less because symbolic disclosure partly offsets substantive weakness. (Q. Gong et al., 2026) show that ESG greenwashing reduces green total productivity through financing constraints and inefficient investment. (Thi Quynh Anh et al., 2026) show that ESG disclosures are timed around insider-driven pump-and-dump schemes in Taiwan, and high-ESG firms generate larger abnormal returns. (Siddique et al., 2026) likewise find that high-carbon-risk firms disclose more ESG information under reputational and regulatory pressure, but symbolic reporting remains prevalent. (M. Li & Gan, 2026) show that strategic ESG disclosure fuels green innovation bubbles by increasing innovation quantity rather than quality, with greenwashing and information asymmetry as mediators. (Yeh & Liao, 2026) add that ESG performance functions as insurance only when ESG exposure risk is low. Under high exposure risk, high ESG scores intensify stock price losses, confirming a greenwashing channel. Finally, (Walker & Akhtar, 2026) show ESG risk spillovers across multinational peers without a strong performance response.

Across 2024–2026, literature progresses. 2024 studies test whether green finance, digital tools, investor monitoring, and governance reforms generate sustainability gains or polished disclosure. 2025 studies expand the debate to pricing, governance failures, side effects, and detection using AI, indices, and accounting frameworks. 2026 studies centre on data openness, AI oversight, assurance, disclosure quality, governance, executive behaviour, and manipulation timing. Across the phase, ESG disclosure alone is insufficient. Stronger outcomes require verifiable action, oversight, lower financing pressure, and external monitoring.

Conclusions

This chronological review examined how research on the impact of greenwashing on ESG has evolved over time in terms of direction, depth, and methodological development. Using a systematic Scopus search, the study analysed 104 journal articles to trace how scholarly attention progressed from early conceptual concern to a broader and more evidence-based understanding of greenwashing and ESG.

The review reveals a clear temporal progression. In Phase 1: Foundational Emergence (2020–2021), the literature focused mainly on disclosure credibility, weak reporting standards, and the early recognition of greenwashing as a threat to ESG reliability. In Phase 2: Early Development and Consolidation (2022–2023), the field became broader and more analytical, with growing attention to financial constraints, market reactions, green finance, external assurance, and regulatory pressure. In Phase 3: Rapid Expansion and Intensification (2024–2026), the literature expanded sharply, with more diverse empirical settings and stronger emphasis on governance structures, digital systems, market penalties, policy interventions, and technological tools for detecting symbolic ESG behaviour.

Several patterns stand out across these phases. First, greenwashing consistently weakens ESG as a signal of genuine sustainability performance. Second, disclosure quantity does not guarantee disclosure quality, and high ESG scores do not always reflect substantive environmental or social outcomes. Third, the field has moved from conceptual and descriptive work toward more advanced empirical approaches, including panel regression, quasi-natural experiments, event studies, index construction, machine learning, text analysis, and AI-based detection models. The growing use of AI and digital governance tools especially reflects the increasing maturity of the field, where the concern is no longer only whether greenwashing exists, but how it can be measured, monitored, and reduced in real institutional contexts.

The chronological structure of the review offers an important contribution by revealing shifts in research intensity, dominant questions, and analytical tools that may be less visible in a conventional thematic review. It highlights key turning points, including the move from basic concerns over ESG disclosure credibility to later studies on AI, blockchain, digital government, and advanced assurance mechanisms. This structure also clarifies how the field has matured in response to changing sustainability reporting practices, financial markets, regulation, and stakeholder expectations.

The findings carry both practical and research implications. For practice, regulators, investors, firms, and assurance providers should place greater emphasis on substance, verifiability, and monitoring quality in ESG disclosure. Stronger governance, better reporting standards, independent verification, and data-driven oversight are essential for reducing symbolic reporting and improving ESG credibility. For future research, the field would benefit from more

interdisciplinary work combining finance, governance, sustainability, data science, behavioural analysis, and regulatory studies, with greater attention to cross-country comparison, developing markets, sectoral differences, and the gap between reported ESG performance and actual operational outcomes.

This review also has limitations. It relies on a single database, a restricted set of keywords and selection filters, and a recent time window that may not fully capture earlier conceptual foundations. Future reviews could expand database coverage, broaden keyword combinations, and incorporate more qualitative and interdisciplinary evidence.

Overall, this review shows that research on greenwashing and ESG has developed from a small exploratory stream into a mature and rapidly expanding field with substantial academic and practical relevance. A chronological approach is especially valuable because it captures how concerns, methods, and solutions evolve over time, while offering a more structured understanding of the field's progress and its implications for sustainability practice, governance, and corporate accountability.

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References

Aibai, A., Julaiti, J., Kang, T., & Peng, Y. (2025). Green Horizons Beyond Borders: The Impact of Capital Market Globalization on ESG Performance Via A-Shares' MSCI Inclusion. *Journal of International Financial Management and Accounting*, *36*(3), 562–580. https://doi.org/10.1111/jifm.12236

Alevizou, P., & Henninger, C. E. (2025). Greenwashing. In *Vocabulary for Sustainable Consumption and Lifestyles: A Language for Our Common Future* (pp. 353–355). Taylor and Francis. https://doi.org/10.4324/9781003584056-86

Alsaggaf, H. A. (2025). When green is not clean: A synthesis of evidence on greenwashing and consumer trust. *International Journal of Advanced and Applied Sciences*, *12*(7), 211–220. https://doi.org/10.21833/ijaas.2025.07.021

Alyasa-Gan, S. S., & Che-Yahya, N. (2025). Is sustainability beneficial in the long term? The significance of pre-ipo esg disclosure . *Review of Business and Economics Studies*, *13*(4), 31–43. https://doi.org/10.26794/2308-944X-2025-13-4-31-43

Antoncic, M. (2020). Uncovering hidden signals for sustainable investing using big data: Artificial intelligence, machine learning and natural language processing. *Journal of Risk Management in Financial Institutions*, *13*(2), 106–113. https://doi.org/10.69554/cikj7477

Apergis, N., Chesini, G., & Poufinas, T. (2025). BANK GREEN TRANSITION OR GREENWASHING? HOW TRULY GREEN ARE THE PROJECTS FINANCED BY GREEN BONDS ISSUED BY EUROPEAN BANKS? *Journal of Financial Management, Markets and Institutions*, *13*(2). https://doi.org/10.1142/S2282717X25500070

Baldissarro, G., Iazzolino, G., & Ielapi, F. (2026). ESG and Performance of European Listed Financial Companies: An Empirical Analysis. *Journal of Risk and Financial Management*, *19*(2). https://doi.org/10.3390/jrfm19020153

Berdiev, U. (2025). What shapes greenium in bond markets? Evidence from Japan. *ECONOMIC MODELLING*, *151*. https://doi.org/10.1016/j.econmod.2025.107159

Birindelli, G., Chiappini, H., & Jalal, R. (2024). Greenwashing, bank financial performance and the moderating role of gender diversity. *RESEARCH IN INTERNATIONAL BUSINESS AND FINANCE*, *69*. https://doi.org/10.1016/j.ribaf.2024.102235

Birindelli, G., Miazza, A., Palea, V., & Aliano, M. (2025). The Influence of External Contextual and Firm-Specific Stakeholder Voices on Banks' Greenwashing: Effective Monitoring or an Incentive to Deceive? *Business Strategy and the Environment*, *34*(8), 10881–10902. https://doi.org/10.1002/bse.70151

Cao, J. (2025). The role of green financing in promoting environmental accountability and corporate growth through ESG integration. *GeoJournal* , *90*(4). https://doi.org/10.1007/s10708-025-11406-5

Chai, H., Cheng, Z., & Wu, W. (2025). Is ESG performance a protective umbrella for ESG violations? *International Review of Financial Analysis*, *98*. https://doi.org/10.1016/j.irfa.2024.103858

Chen, L., Dai, T., Zhang, C., & Zhang, Z. (2025). Digital government and corporate ESG performance. *International Review of Financial Analysis*, *105*. https://doi.org/10.1016/j.irfa.2025.104379

Chen, P., & Dagestani, A. A. (2023). Greenwashing behavior and firm value – From the perspective of board characteristics. *Corporate Social Responsibility and Environmental Management*. https://doi.org/10.1002/csr.2488

Chen, Q., & Wang, X. (2026). Integrating market structure and supervisory efficacy: A game-theoretic model of strategic greenwashing in ESG governance. *Journal of Management Science and Engineering*, *11*(2), 207–226. https://doi.org/10.1016/j.jmse.2026.02.001

Chen, S., Song, Y., & Gao, P. (2023). Environmental, social, and governance (ESG) performance and financial outcomes: Analyzing the impact of ESG on financial performance. *Journal of Environmental Management*, *345*, 118829. https://doi.org/10.1016/j.jenvman.2023.118829

Cheng, Z., & Cheng, Y. (2025). Can green finance reform curb corporate ESG greenwashing? *Environment, Development and Sustainability*. https://doi.org/10.1007/s10668-025-07142-y

Cheng, Z., & Yan, X. (2025). Environmental management system certification and corporate ESG greenwashing. *Energy Economics*, *149*. https://doi.org/10.1016/j.eneco.2025.108800

Cotugno, M., Fiorillo, P., Monferrà, S., & Severini, S. (2025). ESG incidents and corporate green bond market reaction. *Journal of International Financial Markets, Institutions and Money*, *102*. https://doi.org/10.1016/j.intfin.2025.102178

Demers, E., Hendrikse, J., Joos, P., & Lev, B. (2021). ESG did not immunize stocks during the COVID-19 crisis, but investments in intangible assets did. *Journal of Business Finance and Accounting*, *48*(3–4), 433–462. https://doi.org/10.1111/jbfa.12523

Ding, B., Luo, S., & Zhou, G. (2026). Substance over form: A carbon performance examination on corporate ESG practices. *International Review of Economics and Finance*, *106*. https://doi.org/10.1016/j.iref.2026.104902

Dong, H., Li, C., & Wang, X. (2025). Friendly press, fading greens: The effect of media connection on firm greenwashing. *Global Finance Journal*, *68*. https://doi.org/10.1016/j.gfj.2025.101179

Dong, H. M., Zhang, L., & Zheng, H. H. (2024). Green bonds: Fueling green innovation or just a fad? *ENERGY ECONOMICS*, *135*. https://doi.org/10.1016/j.eneco.2024.107660

Dorfleitner, G., Eckberg, J., Utz, S., & Brehm, T. (2025). What drives stock market reactions to greenwashing? An event study of European companies. *Finance Research Letters*, *86*. https://doi.org/10.1016/j.frl.2025.108795

Du, A. M., Sun, Z. N., Li, Z. Y., & Boateng, A. (2025). Green business performance and innovation willingness: Exploring the impact of ecosystem-oriented business models. *INTERNATIONAL REVIEW OF FINANCIAL ANALYSIS*, *105*. https://doi.org/10.1016/j.irfa.2025.104423

Durmuş Şenyapar, H. N. (2024). Unveiling greenwashing strategies: A comprehensive analysis of impacts on consumer trust and environmental sustainability. *Journal of Energy Systems*, *8*(3), 164–181. https://doi.org/10.30521/jes.1436875

Efthalitsidou, K., Kanavas, V., Kagias, P., & Sariannidis, N. (2025). Public Funding, ESG Strategies, and the Risk of Greenwashing: Evidence from Greek Financial and Public Institutions. *Risks*, *13*(8). https://doi.org/10.3390/risks13080143

Fan, Y. B., Guo, M. M., & Pan, Y. K. (2026). Succession without Sustainability? CEO turnover and ESG performance: Evidence from China. *INTERNATIONAL REVIEW OF ECONOMICS & FINANCE*, *105*. https://doi.org/10.1016/j.iref.2025.104843

Fan, Y. L., Wang, R. F., Alkaraan, F., & Wu, W. (2025). Decoding greenwashing practices toward sustainability: The synergistic influence of governance structure and policy-derive rhetorical strategies. *ENERGY ECONOMICS*, *148*. https://doi.org/10.1016/j.eneco.2025.108632

Fassas, A. P., & Papadamou, S. (2025). Investigating Greenwashing in the US Equity ETF Market. *Journal of Beta Investment Strategies*, *16*(2), 30–42. https://doi.org/10.3905/jbis.2025.1.083

Feng, C., Wang, Y., & Cheng, X. (2025). Local governmental environmental responsibility and corporate greenwashing: Quasi-experimental evidence from China. *Journal of Asian Economics*, *100*. https://doi.org/10.1016/j.asieco.2025.101990

Frank, J., Barolak, J., & Pieterse, G. (2022). Winning a seat at the ESG table. *Journal of Risk Management in Financial Institutions*, *15*(1), 93–104. https://www.scopus.com/inward/record.uri?eid=2-s2.0-85128380645&partnerID=40&md5=2df872e4151ce07ab29888479758d7ee

Gallas, S., Chouchene, M. R., & Bouzgarrou, H. (2025). Greenwashing Illusion and Financial Performance: The Moderating Role of Environmental Practices. *BUSINESS STRATEGY AND DEVELOPMENT*, *8*(4). https://doi.org/10.1002/bsd2.70234

Gan, T., Zhang, K., Du, J., & Liu, L. (2025). Is post-event accountability effective-analysis of the effect and mechanism of environmental auditing on corporate ESG impacts. *International Review of Economics and Finance*, *103*. https://doi.org/10.1016/j.iref.2025.104392

Gaur, P., Irfan, M., Ramasamy, R. K., Mohammad Mir, S., & Subramanian, P. (2026). ESG Narrative Quality in Green Bond Disclosures: Implications for Risk Perception, Transparency, and Market Trust. *Risks*, *14*(1). https://doi.org/10.3390/risks14010001

Ge, P., Liu, Y., Tang, C., & Zhu, R. (2024). Green bonds and corporate Environmental social and governance performance: Innovative approaches to identifying greenwashing in green bond markets. *Corporate Social Responsibility and Environmental Management*. https://doi.org/10.1002/csr.3005

Gidage, M., Bhide, S., Kolte, A., Gyamfi, B. A., & Asongu, S. A. (2025). Greenwashing and Bank Financial Performance in Developing Markets: The Role of Boardroom Diversity and ESG Controversies. *BUSINESS STRATEGY AND DEVELOPMENT*, *8*(4). https://doi.org/10.1002/bsd2.70260

Gong, B., Xu, S. Y., Xu, Z. Y., & Cheng, C. (2026). Digital supply chain finance, government-business relationship and ESG performance: Evidence from the ZARFS platform in China. *JOURNAL OF INTERNATIONAL ACCOUNTING AUDITING AND TAXATION*, *60*. https://doi.org/10.1016/j.intaccaudtax.2026.100754

Gong, Q., Kong, Z., Li, L., Dong, X., & Li, Y. (2026). The consequences of hypocrisy: how ESG greenwashing undermines green total factor productivity. *Journal of International Financial Markets, Institutions and Money*, *106*. https://doi.org/10.1016/j.intfin.2025.102241

Gregory, R. (2024). How Greenwashing Affects Firm Risk: An International Perspective. *Journal of Risk and Financial Management*. https://doi.org/10.3390/jrfm17110526

Gu, Y., Dai, J., & Vasarhelyi, M. A. (2023). Audit 4.0-based ESG assurance: An example of using satellite images on GHG emissions. *International Journal of Accounting Information Systems*, *50*. https://doi.org/10.1016/j.accinf.2023.100625

Han, W., & Zhang, B. (2025). Environmental protection law, green investment, and corporate greenwashing behavior. *Finance Research Letters*, *86*. https://doi.org/10.1016/j.frl.2025.108915

Harinathan, R. M., Shanmugam, V., Swamy, T. N. V. R. L., Singh, S., & Shanmugam, S. (2025). Greenwashing in economics, econometrics, and finance: mapping recent trends and future directions through a bibliometric SMART framework. *International Journal of Green Economics*, *19*(4), 409–428. https://doi.org/10.1504/IJGE.2025.151324

He, F., Ding, C., Yue, W., & Liu, G. (2023). ESG performance and corporate risk-taking: Evidence from China. *International Review of Financial Analysis*, *87*. https://doi.org/10.1016/j.irfa.2023.102550

Hu, P., Li, X., Li, N., Wang, Y., & Wang, D. (2024). Peeking into Corporate Greenwashing through the Readability of ESG Disclosures. *Sustainability*. https://doi.org/10.3390/su16062571

Hu, S., Chen, P., & Zhang, C. (2025). How does green finance reform affect corporate ESG greenwashing behavior? *International Review of Financial Analysis*, *102*. https://doi.org/10.1016/j.irfa.2025.104037

Jiang, N., Wu, G., Zou, W., & Chen, X. (2026). Responsible use of artificial intelligence and the mitigation of corporate greenwashing: The role of executive oversight. *Socio-Economic Planning Sciences*, *105*. https://doi.org/10.1016/j.seps.2026.102436

Jin, X., Qi, H., & Huang, X. (2024). Green financial regulation and corporate strategic ESG behavior: Evidence from China. *Finance Research Letters*, *65*. https://doi.org/10.1016/j.frl.2024.105581

Kercher, K., Duncan, K., Moore, G., & Southam, C. (2026). Global State of Play for Extended Sustainability Disclosures, Performance, and Assurance—Insights From Cross-Country Benchmarking. *Accounting and Finance*, *66*(1), 824–848. https://doi.org/10.1111/acfi.70185

Kim, S., Kumar, N., Lee, J., & Oh, J. (2025). ESG lending. *Journal of Financial Economics*, *173*. https://doi.org/10.1016/j.jfineco.2025.104150

Kolling, C., & Busch, T. (2025). Sustainability labels matter. *Finance Research Letters*, *73*. https://doi.org/10.1016/j.frl.2024.106609

Kräussl, R., Oladiran, T., & Stefanova, D. (2024). A review on ESG investing: Investors' expectations, beliefs and perceptions. *Journal of Economic Surveys*, *38*(2), 476–502. https://doi.org/10.1111/joes.12599

Lee, M., & Raschke, R. (2023). Stakeholder legitimacy in firm greening and financial performance: What about greenwashing temptations?☆. *Journal of Business Research*. https://doi.org/10.1016/j.jbusres.2022.113393

Lee, M. T., & Suh, I. (2022). Understanding the effects of Environment, Social, and Governance conduct on financial performance: Arguments for a process and integrated modelling approach. *Sustainable Technology and Entrepreneurship*, *1*(1). https://doi.org/10.1016/j.stae.2022.100004

Lei, X., Kocoglu, M., & Nikbakht, E. (2026). The announcement effect: How AI adoption reduces corporate ESG greenwashing. *Finance Research Letters*, *99*. https://doi.org/10.1016/j.frl.2026.109890

Li, D., Zhang, Z., & Gao, X. (2024). Does artificial intelligence deter greenwashing? *Finance Research Letters*, *67*. https://doi.org/10.1016/j.frl.2024.105954

Li, J. D., Peng, X. H., Gao, J., & Tang, Q. L. (2025). Detecting Greenwashing Behaviour in Decarbonization Performance. *ACCOUNTING AND FINANCE*, *65*(4), 3739–3762. https://doi.org/10.1111/acfi.70088

Li, M., & Gan, Y. (2026). From disclosure to distortion: How strategic ESG disclosure shapes green innovation bubbles. *Borsa Istanbul Review*, *26*(1). https://doi.org/10.1016/j.bir.2025.10.019

Li, W., Mao, Z., Ren, X., & Liang, J. (2025). Retail investor attention: Guardian of corporate ESG integrity or catalyst for greenwashing? *Energy Economics*, *144*. https://doi.org/10.1016/j.eneco.2025.108361

Li, Z., Luo, T., Li, J., & Tian, Y. (2024). Does social responsibility reform curb corporate greenwashing: Evidence from a quasi-natural experiment in China. *International Review of Financial Analysis*, *96*. https://doi.org/10.1016/j.irfa.2024.103623

Liang, H., Sun, L., & Teo, M. (2022). Responsible Hedge Funds. *Review of Finance*, *26*(6), 1585–1633. https://doi.org/10.1093/rof/rfac028

Liang, Y., & Gao, X. (2025). Greenwashing and financial performance in public health firms: the mechanism of organizational legitimacy erosion. *Frontiers in Public Health*, *13*. https://doi.org/10.3389/fpubh.2025.1565703

Liao, F., Sun, Y., & Xu, S. (2023). Financial report comment letters and greenwashing in environmental, social and governance disclosures: Evidence from China. *Energy Economics*. https://doi.org/10.1016/j.eneco.2023.107122

Liu, G., Fang, Y., Qian, H., Ding, Z., Zhang, A., & Zhang, S. (2025). Incentive or catering effect of environmental subsidies? Evidence from ESG reports on greenwashing. *International Review of Financial Analysis*, *103*. https://doi.org/10.1016/j.irfa.2025.104242

Liu, H., Wang, Q., & Li, J. (2025). Political connections and greenwashing: Chinese evidence. *Applied Economics*, *57*(37), 5661–5679. https://doi.org/10.1080/00036846.2024.2365455

Liu, M., Wang, Y., & Yin, Z. (2026). How does government open data suppress corporate ESG Greenwashing? Evidence from the dual mechanisms of financing constraints and external monitoring. *International Review of Economics and Finance*, *108*. https://doi.org/10.1016/j.iref.2026.105185

Liu, Y., Li, W., Wang, L., & Meng, Q. (2023). Why greenwashing occurs and what happens afterwards? A systematic literature review and future research agenda. *Environmental Science and Pollution Research*, *30*, 118102–118116. https://doi.org/10.1007/s11356-023-30571-z

Liya, Z., Su, C.-W., Baz, S., & Xue, Z. (2026). Governance and greenwashing in the BRICS: The moderating role of national ESG performance in sustainable finance outcomes. *Journal of Innovation and Knowledge*, *12*. https://doi.org/10.1016/j.jik.2025.100893

Lokuwaduge, C. S. D. S., & De Silva, K. M. (2022). ESG Risk Disclosure and the Risk of Green Washing. *Australasian Accounting, Business and Finance Journal*, *16*(1), 146–159. https://doi.org/10.14453/aabfj.v16i1.10

Łudzińska, K. (2025). THE FIRM-LEVEL AI-ESG PERFORMANCE NEXUS: A RAPID LITERATURE REVIEW AND FUTURE RESEARCH AGENDA . *Economics and Environment*, *95*(4). https://doi.org/10.34659/eis.2025.95.4.1170

Luo, R. M., & Ye, Y. (2024). Do firms listen to the ESG voices of minority investors? Evidence from China. *INTERNATIONAL REVIEW OF FINANCIAL ANALYSIS*, *96*. https://doi.org/10.1016/j.irfa.2024.103562

Martinez Meyers, S., Ferrero-Ferrero, I., & Muñoz-Torres, M. J. (2024). ARE sustainable funds doing the talk and the walk? An ESG score analysis of fund portfolio holdings. *International Review of Economics and Finance*, *93*, 1526–1541. https://doi.org/10.1016/j.iref.2024.04.023

Marwane, B., Mariame, A., & Sanaa, F. (2025). Responsible Investment and Sustainability: Systematic Literature Review. *International Journal of Accounting and Economics Studies*, *12*(5), 272–282. https://doi.org/10.14419/2918ap08

Matemane, R., Msomi, T., & Ngundu, M. (2024). Environmental, social and governance and financial performance nexus in South African listed firms. *South African Journal of Economic and Management Sciences*, *27*(1). https://doi.org/10.4102/sajems.v27i1.5387

Mirza, R., Bhuiyan, T., & Hoque, A. (2025). False Stability? How Greenwashing Shapes Firm Risk in the Short and Long Run. *Journal of Risk and Financial Management*, *18*(12). https://doi.org/10.3390/jrfm18120691

Mohapatra, S., Kumar, A., Mohapatra, M. R., & Srivastava, V. (2025). Does CEO duality moderate environmental, social, and governance performance-earnings management relationship? Evidence from emerging markets. *Finance Research Letters*, *73*. https://doi.org/10.1016/j.frl.2024.106616

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. (2009). Preferred Reporting Items for Systematic Reviews and MetaAnalyses: The PRISMA Statement. *PLoS Med*, *6 (7)*(4), 264. http://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1000097

Nguyen, P. M., Jubb, C., & Dias, R. (2024). Motives for environmental and social engagement and stock liquidity: The moderating role of sustainability committees. *PACIFIC-BASIN FINANCE JOURNAL*, *87*. https://doi.org/10.1016/j.pacfin.2024.102501

Niu, Z., Zhu, Y., Wang, Y., & Zhong, M. (2025). CEO turnover and ESG greenwashing: evidence from China. *Applied Economics Letters*, *32*(19), 2778–2782. https://doi.org/10.1080/13504851.2024.2345317

Oluwakemi, A. A., & Mishelle, D. (2025). Effect of ESG Financial Materiality on Financial Performance of Firms: Does ESG Transparency Matter? *Journal of Risk and Financial Management*, *18*(6). https://doi.org/10.3390/jrfm18060315

Patil, R. V, Kashid, P. V, Gaidhani, V. A., Poddar, G. M., Patil, M. P., Bhadane, G. G., & Patil, S. R. (2025). Blockchain-Enabled ESG for Secure and Transparent Sustainability Accounting. *International Journal of Accounting and Economics Studies*, *12*(6), 273–282. https://doi.org/10.14419/nab7g102

Peng, D., & Kong, Q. X. (2024). Corporate green innovation under environmental regulation: The role of ESG ratings and greenwashing. *ENERGY ECONOMICS*, *140*. https://doi.org/10.1016/j.eneco.2024.107971

Poiriazi, E., Zournatzidou, G., Konteos, G., & Sariannidis, N. (2025). Analyzing the Interconnection Between Environmental, Social, and Governance (ESG) Criteria and Corporate Corruption: Revealing the Significant Impact of Greenwashing. *Administrative Sciences*. https://doi.org/10.3390/admsci15030100

Pratama, A., Yusoff, H., Yadiati, W., & Jaenudin, E. (2025). Sustainability-related corporate governance and greenwashing practices: preliminary evidence from southeast Asian companies. *MEDITARI ACCOUNTANCY RESEARCH*. https://doi.org/10.1108/MEDAR-07-2024-2579

Rahman, A., & Varghese, V. (2025). Non-financial Capital Value Creation: Assessing Japan's Path to an ESG-Friendly Economy Through the Yanagi's Model. *Green and Low-Carbon Economy*, *3*(3), 272–282. https://doi.org/10.47852/bonviewGLCE32021262

Reig-Mullor, J., Garcia-Bernabeu, A., Pla-Santamaria, D., & Vercher-Ferrandiz, M. (2022). EVALUATING ESG CORPORATE PERFORMANCE USING A NEW NEUTROSOPHIC AHP-TOPSIS BASED APPROACH. *TECHNOLOGICAL AND ECONOMIC DEVELOPMENT OF ECONOMY*, *28*(5), 1242–1266. https://doi.org/10.3846/tede.2022.17004

Roggi, O., Bellardini, L., & Conticelli, S. (2024). Effects of ESG performance and sustainability disclosure on GSS bonds' yields and spreads: A global analysis. *FINANCE RESEARCH LETTERS*, *68*. https://doi.org/10.1016/j.frl.2024.105988

Sakchuenyos, P., & Haji, A. A. (2026). The Effect of Greenhushing and ESG Disclosure Assurance on Investors' Judgements. *Accounting and Finance*, *66*(1), 979–996. https://doi.org/10.1111/acfi.70157

Santos, C., Coelho, A., & Marques, A. (2023). The greenwashing effects on corporate reputation and brand hate, through environmental performance and green perceived risk. *Asia-Pacific Journal of Business Administration*. https://doi.org/10.1108/apjba-05-2022-0216

Sari, R. C., Sholihin, M., Cahaya, F. R., Ishola, A., Yuniarti, N., Pranesti, A., Sari, A. R., & Haryanto. (2025). Artificial Intelligence-Based ESG Greenwashing Detection: Road to Net Zero Carbon and Its Impact on Corporate Performance. *Business Strategy and Development*, *8*(4). https://doi.org/10.1002/bsd2.70228

Siddique, M. A., Karim, S., Haque, M. R., & Mia, P. (2026). The truth behind sustainability claims: Examining carbon risk, ESG disclosures, and greenwashing. *INTERNATIONAL REVIEW OF FINANCIAL ANALYSIS*, *109*. https://doi.org/10.1016/j.irfa.2025.104735

Singh, K. (2025). The autobiography of environmental, social and governance (ESG). *Journal of Economic and Administrative Sciences*, *41*(3), 1279–1285. https://doi.org/10.1108/JEAS-02-2023-0041

Sklavos, G., Zournatzidou, G., Ragazou, K., & Sariannidis, N. (2025). Unmasking Greenwashing in Finance: A PROMETHEE II-Based Evaluation of ESG Disclosure and Green Accounting Alignment. *Risks*, *13*(7). https://doi.org/10.3390/risks13070134

Sneideriene, A., & Legenzova, R. (2024). Greenwashing prevention in Environmental, Social, and Governance (ESG) disclosures: a bibliometric analysis. *Research in International Business and Finance*. https://doi.org/10.1016/j.ribaf.2024.102720

Stander, Y. S. (2025). Climate Sentiment Analysis on the Disclosures of the Corporations Listed on the Johannesburg Stock Exchange. *Journal of Risk and Financial Management*, *18*(9). https://doi.org/10.3390/jrfm18090470

Sun, Y. (2024). Bank competition and firm greenwashing: Evidence from China. *Finance Research Letters*, *63*. https://doi.org/10.1016/j.frl.2024.105279

Sun, Y., Shen, Y., & Tan, Q. (2024). The spillover effect of customers' ESG performance on suppliers' green innovation quality. *China Journal of Accounting Research*, *17*(3). https://doi.org/10.1016/j.cjar.2024.100362

Taliento, M., Favino, C., & Netti, A. (2019). Impact of Environmental, Social, and Governance Information on Economic Performance: Evidence of a Corporate 'Sustainability Advantage' from Europe. *Sustainability*. https://doi.org/10.3390/su11061738

Teti, E., Etro, L. L., & Pausini, L. (2024). Does greenwashing affect Company's stock Price? Evidence from Europe. *International Review of Financial Analysis*, *93*. https://doi.org/10.1016/j.irfa.2024.103195

Thi Quynh Anh, D., Thu Quang, L., Duy Linh, N., Duc Thuc, T., & Hoang Vu, T. (2026). Does ESG Contribute to Pump-and-Dump Schemes of Insider Investors on the Stock Market? *Economics*, *20*(1). https://doi.org/10.1515/econ-2025-0192

Todaro, D. L., & Torelli, R. (2024). From greenwashing to ESG-washing: A focus on the circular economy field. *Corporate Social Responsibility and Environmental Management*. https://doi.org/10.1002/csr.2786

Tohang, V., Hutagaol-Martowidjojo, Y., & Pirzada, K. (2024). The Link Between ESG Performance and Earnings Quality. *Australasian Accounting, Business and Finance Journal*, *18*(1), 187–204. https://doi.org/10.14453/aabfj.v18i1.12

Walker, L., & Akhtar, S. (2026). ESG Risk Spillover Between Peers. *Journal of Risk and Financial Management*, *19*(1). https://doi.org/10.3390/jrfm19010068

Wang, D., Wang, Y., & Zhou, M. (2025). Can environmental tax promote green M&A in emerging market firms? Evidence from China's heavy polluters. *Business Ethics, the Environment and Responsibility*, *34*(4), 1450–1474. https://doi.org/10.1111/beer.12721

Wang, R., & Wang, W. (2025). Chinese corporate greenwashing index. *Finance Research Letters*, *85*. https://doi.org/10.1016/j.frl.2025.107991

Wang, X., Shen, S., Xie, J., Fujii, H., Keeley, A., & Managi, S. (2026). Environmental, Social, and Governance Factors as Tools for Improving Market Efficiency: A Study on Equity Misvaluation. *Business Strategy and the Environment*. https://doi.org/10.1002/bse.70486

Wang, X., Zhao, M., & Cheng, L. (2026). Lies behind the green: can business strategy lead to greenwashing? *Business Process Management Journal*, *32*(1), 170–197. https://doi.org/10.1108/BPMJ-08-2024-0727

Wang, Z., & Tang, P. (2024). Substantive digital innovation or symbolic digital innovation: Which type of digital innovation is more conducive to corporate ESG performance? *International Review of Economics and Finance*, *93*, 1212–1228. https://doi.org/10.1016/j.iref.2024.05.023

Williams, J. (2024). Greenwashing: Appearance, illusion and the future of 'green' capitalism. *Geography Compass*, *18*(1). https://doi.org/10.1111/gec3.12736

Wu, Z., Long, S., & Wang, Y. (2025). ESG greenwashing and organizational resilience: Exploring sustainable development paths from the perspective of unsystematic risk. *Journal of Environmental Management*, *390*. https://doi.org/10.1016/j.jenvman.2025.126395

Xin, B., Wang, Y., Peng, W., Tan, H., & Kwon, J. (2026). Advancing energy justice through ESG: The role of confucian culture and digital finance. *Research in International Business and Finance*, *83*. https://doi.org/10.1016/j.ribaf.2026.103296

Xu, G., Lu, N., & Tong, Y. (2022). Greenwashing and credit spread: Evidence from the Chinese green bond market. *Finance Research Letters*, *48*. https://doi.org/10.1016/j.frl.2022.102927

Xu, M., Tse, Y. K., Geng, R. Q., Liu, Z. Y., & Potter, A. (2025). Greenwashing and market value of firms: An empirical study. *INTERNATIONAL JOURNAL OF PRODUCTION ECONOMICS*, *284*. https://doi.org/10.1016/j.ijpe.2025.109606

Yan, Feng, G., Yin, Z., & Chang, C. (2024). ESG disclosures, green innovation, and greenwashing: All for sustainable development? *Sustainable Development*. https://doi.org/10.1002/sd.3210

Yang, Z., Lu, R., Lu, R., & Yan, Q. (2025). The green governance effect of retail investor attention: Evidence from China's investor interactive platforms. *Pacific Basin Finance Journal*, *93*. https://doi.org/10.1016/j.pacfin.2025.102848

Ybarra, C. E., & Turk, T. A. (2025). THE BACKLASH AGAINST ENVIRONMENTAL, SOCIAL, AND GOVERNANCE IN THE UNITED STATES: A RESOURCE-BASED VIEW. *Corporate Governance and Sustainability Review*, *9*(3 Special Issue), 266–275. https://doi.org/10.22495/cgsrv9i3sip7

Yeh, Y.-H., & Liao, C.-C. (2026). Does ESG performance mitigate ESG-negative events? Examining the insurance-like vs. greenwashing effect. *Energy Economics*, *155*. https://doi.org/10.1016/j.eneco.2026.109163

Yu, E., Luu, B., & Chen, C. (2020). Greenwashing in environmental, social and governance disclosures. *Research in International Business and Finance*, *52*, 101192. https://doi.org/10.1016/j.ribaf.2020.101192

Yuan, X., Xu, J., & Shang, L. (2024). Exaggerating, distracting, or window-dressing? An empirical study on firm greenwashing recognition. *Finance Research Letters*, *67*. https://doi.org/10.1016/j.frl.2024.105845

Zhang, C., Lin, F., & Shi, Y. (2026). Data Elements Marketization and Corporate ESG Performance: A Quasi-Natural Experiment Based on China's Data Trading Platforms

Pilot Policies. *Economics and Politics*, *38*(1), 287–305. https://doi.org/10.1111/ecpo.70023

Zhang, D. (2022). Are firms motivated to greenwash by financial constraints? Evidence from global firms' data. *Journal of International Financial Management & Accounting*. https://doi.org/10.1111/jifm.12153

Zhang, D. (2023a). Can digital finance empowerment reduce extreme ESG hypocrisy resistance to improve green innovation? *Energy Economics*, *125*. https://doi.org/10.1016/j.eneco.2023.106756

Zhang, D. (2023b). Does green finance really inhibit extreme hypocritical ESG risk? A greenwashing perspective exploration. *Energy Economics*. https://doi.org/10.1016/j.eneco.2023.106688

Zhang, D. (2024). The pathway to curb greenwashing in sustainable growth: The role of artificial intelligence. *Energy Economics*, *133*. https://doi.org/10.1016/j.eneco.2024.107562

Zhang, P., Liu, L., & Shi, B. (2026). ESG Performance and Green Premium: Evidence from China. *Emerging Markets Finance and Trade*, *62*(6), 1897–1914. https://doi.org/10.1080/1540496X.2025.2520889

Zheng, J., Jiang, Y., Cui, Y., & Shen, Y. (2023). Green bond issuance and corporate ESG performance: Steps toward green and low-carbon development. *Research in International Business and Finance*, *66*. https://doi.org/10.1016/j.ribaf.2023.102007

Zhou, D., & Kythreotis, A. (2024). Why issue green bonds? Examining their dual impact on environmental protection and economic benefits. *Humanities and Social Sciences Communications*, *11*(1). https://doi.org/10.1057/s41599-024-04318-1

Zhu, Y., Li, S., Niu, J., & Wang, Y. (2025). Pilot policies for climate-adaptive urban development and corporate greenwashing behavior. *International Review of Economics and Finance*, *104*. https://doi.org/10.1016/j.iref.2025.104741