







REVIEW

Sustainable development, social responsibility and greenwashing: a trend analysis of scientific production in the Scopus database

Desarrollo sostenible, responsabilidad social y greenwashing un análisis tendencial de la producción científica en la base de datos Scopus

Elisabeth Viviana Lucero Baldevenites¹  , Pedro Luis Bracho-Fuenmayor²  , Jorge Antonio Espindola Álvarez³  

¹Universidad de Las Palmas de Gran Canaria. Las Palmas de Gran Canaria, España.

²Universidad Tecnológica Metropolitana. Santiago de Chile, Chile.

³Universidad Autónoma de Tamaulipas. Reynosa, México.

Cite as: Lucero Baldevenites EV, Bracho-Fuenmayor PL, Espindola Álvarez JA. Sustainable development, social responsibility and greenwashing: a trend analysis of scientific production in the Scopus database. Management (Montevideo). 2025; 3:244. <https://doi.org/10.62486/agma2025244>

Submitted: 01-06-2024

Revised: 22-12-2024

Accepted: 26-05-2025

Published: 27-05-2025

Editor: Ing. Misael Ron 

Corresponding author: Elisabeth Viviana Lucero Baldevenites 

ABSTRACT

Corporate sustainability has evolved from a marginal initiative to a strategic imperative, yet greenwashing persists as a deceptive practice. This study analyzes recent scientific literature to understand this paradox. The research aimed to examine conceptual trends in corporate social responsibility and greenwashing. A mixed-methods approach (bibliometric and semantic) was applied to Scopus data (2020-2024), with five phases: descriptive characterization, structural mapping, relational analysis, prospective evaluation, and visual integration using VOSviewer. Greenwashing emerged as the central focus, followed by corporate social responsibility. Six thematic domains were identified, with corporate hypocrisy as the primary interdomain connector. Corrective mechanisms showed uneven effectiveness, proving more robust in developed economies. The transition from corporate social responsibility to Environmental, Social, and Governance criteria reflects a financialization of sustainability, yet perpetuates greenwashing. Dynamic models integrating micro, meso, and macro scales are needed to address the detected geopolitical and sectoral asymmetries.

Keywords: Corporate Greenwashing; Financialization; Corporate Social Responsibility; Environmental Social and Governance Criteria; Sustainable Certification.

RESUMEN

La sostenibilidad corporativa ha evolucionado de iniciativa marginal a imperativo estratégico, aunque persiste el *greenwashing* como práctica engañosa. Este estudio analiza la producción científica reciente para comprender esta paradoja. El objetivo de esta investigación fue examinar las tendencias conceptuales en responsabilidad social corporativa y greenwashing. Se empleó un enfoque mixto (bibliométrico y semántico) en la base Scopus (2020-2024), con cinco fases: caracterización descriptiva, mapeo estructural, análisis relacional, evaluación prospectiva e integración visual mediante VOSviewer. El greenwashing emergió como núcleo central, seguido por responsabilidad social corporativa. Se identificaron seis dominios temáticos, con *corporate hypocrisy* como principal conector interdominios. Los mecanismos correctivos mostraron efectividad desigual, siendo más robustos en economías desarrolladas. La transición de responsabilidad social corporativa a criterios ambientales, sociales y de gobernanza refleja una financiarización de la sostenibilidad, pero perpetúa el greenwashing. Se requieren modelos dinámicos que integren escalas micro,

meso y macro para abordar las asimetrías geopolíticas y sectoriales detectadas.

Palabras clave: Greenwashing Corporativo; Financiarización; Responsabilidad Social Corporativa; Criterios Ambientales, Sociales y De Gobernanza; Certificación Sostenible.

INTRODUCTION

As Suriyankietkaew and Petison⁽¹⁾ point out, strategic management for sustainability is an emerging field with growing interest from diverse international scholars in various fields, particularly environmental sciences, engineering, and strategic business management. Authors such as Le et al.⁽²⁾ and Kitsios et al.⁽³⁾ report that corporate sustainability is no longer a secondary initiative but a strategic requirement.

This change responds to multiple factors: environmental regulations have become increasingly stringent, societies demand greater transparency, and markets have begun to value ethical and sustainable practices.^(4,5,6) Furthermore, Gupta et al.⁽⁷⁾ point out that transparency in environmental governance has transformative potential, but its effectiveness in designing systems and achieving desired outcomes is still a matter of debate.

In this context, Anisiewicz et al.⁽⁸⁾ point out that Corporate Social Responsibility was established as a framework for aligning economic growth with social and environmental well-being. However, more than a few studies warn that it softens the trade-off between the environment and development but cannot achieve the social optimum.^(9,10,11)

Moreover, the consolidation of greenwashing coincided with the rise of discourses that simulate commitments without concrete actions, a phenomenon known as greenwashing.^(12,13) According to Zervoudi et al.⁽¹⁴⁾, greenwashing misleads stakeholders about a company's environmental sustainability efforts.

In this regard, the literature documents that sustainability reporting has experienced exponential growth, as Benameur et al.⁽¹⁵⁾ This boom has led to increasing attention from regulators, standard setters, practitioners, and researchers.⁽¹⁶⁾ However, these reports are often biased since, as Gregory⁽¹⁷⁾ points out, greenwashing is more likely when corporate stock volatility is low, the cost of capital is high, pricing power is strong, and information asymmetry is high.

However, the literature has so far only partially addressed this problem. Only a few studies, such as Huang et al.⁽¹⁸⁾, Hassan⁽¹⁹⁾, and Shanmugam⁽²⁰⁾, conclude that common greenwashing tactics include promoting sustainability commitments but evading real responsibilities, fostering public distrust, and promoting sustainability efforts without real responsibilities. However, trends in the literature are fragmented and present only isolated approaches in communication, regulation, or markets.⁽²¹⁾ For this reason, this study seeks to fill a critical gap. Through an analysis of the scientific production in Scopus, the aim is to examine the recent evolution of corporate social responsibility and greenwashing.

METHOD

Overall design

The research adopted a sequential mixed methodological approach as recommended by Stern et al.⁽²²⁾ This mixture was achieved by combining bibliometric techniques with semantic network analysis. The Scopus database was selected for the bibliographic search within the range 2020-2024.

This design allowed the quantitative distribution of concepts and their complex interrelationships to be examined through five structured phases. Each stage was conducted under standardized protocols for systematic reviews, ensuring methodological rigor and analytical consistency.

Analytical procedures

Phase 1: Initial descriptive characterization

During this phase, the presence of terms was quantified by analyzing absolute frequencies of occurrence. This made it possible to identify the central and peripheral concepts in the scientific literature.

In addition, the total link strength was calculated to detect the most influential nodes within the thematic network. A connectivity ratio (link strength/frequency) was applied as a complement to identify terms with a disproportionate relational influence concerning their occurrence.

Phase 2: Structural mapping

During this second stage, the concepts identified in the previous stage were manually classified. They were grouped into thematic domains according to the lexical patterns and contextual relationships that could be identified.

In the second step, cross-occurrence analysis was employed to identify conceptual relationships between thematic clusters. This process included an intercoder validation to ensure consistency in categorization.

Phase 3: In-depth relational analysis

To deepen the conceptual dynamics, controlled comparisons were made between the key constructs identified. This procedure visualized patterns in the semantic relationships using intersection matrices. In addition to this analysis, the presence of sectoral and regulatory mechanisms associated with sustainable development, social responsibility, and greenwashing was quantified.

Phase 4: Prospective assessment

Following the relational analysis, we proceeded to detect gaps or issues that have not been addressed in the literature. Firstly, peripheral terms with a high relational centrality were located, which indicates emerging areas in the field of study.

In addition, an analysis of significant absences was carried out to identify topics that are underrepresented in the literature. The pioneering concepts identified were filtered to assess innovative trends in this area of research.

Phase 5: Visual Integration

The VOSviewer software was used to model the identified findings in content networks.⁽²³⁾ Hierarchical parameters were applied. Firstly, the size of the nodes was proportional to their frequency.

In addition, the thickness of the arcs reflected the link strength. And finally, chromatic coding allowed the distinction of thematic clusters. Additionally, heat maps were generated to enable the visualization of the relational intensities between the identified domains.

Limitations and ethical considerations

This study is not without limitations. As such, it is acknowledged that the semantic clustering of the data involved a certain level of subjectivity on the part of the researchers. To address this issue, standardized coding protocols were pre-established.

In addition, all data were extracted from open sources with academic licenses. Copyright was respected through normative citation in Vancouver format. Similarly, the ethical integrity of the study was preserved by not directly intervening in the primary research sources.

RESULTS**Phase 1. Descriptive analysis****Raw term frequency analysis**

The initial analysis of the corpus revealed a clear hierarchy of concepts in the recent literature (see figure 1). The term greenwashing emerged as the central core of the field of study, with 66 occurrences, which positions it as a central axis in the debates on corporate sustainability. Corporate social responsibility came in second place with 57 occurrences. This centrality corroborates its relevance as a fundamental construct associated with greenwashing practices.

In addition, the distance between other concepts was remarkable. This can be seen in the third place, sustainability, which registered 16 mentions. This indicates that it functions as a cross-cutting frame of reference. In addition, other terms such as corporate governance (7 occurrences) and environment (5 occurrences) appear to be complementary elements in the academic discussion.

When looking at the figure, it was striking that the acronym CSR has 7 occurrences, the same number of occurrences as its meaning (corporate social responsibility). This duplication of concepts indicates that there is still no conceptual standardization in the field of study.

On the other hand, climate change (4), reporting (3), and trust (3) stood out as peripheral concepts with a moderate presence. Their intermediate frequency indicates that they play secondary roles as contexts of application or consequences derived from the central phenomenon.

On the other hand, 347 terms showed a single occurrence, indicating the presence of a long tail of thematic specialization. This asymmetric distribution confirms the existence of a hard core of research composed of fewer than 10 concepts, which concentrates the most scholarly attention.

Comparison across conceptual domains revealed significant imbalances. The greenwashing-RSC axis accumulated 123 direct occurrences, contrasted with the scarce development of other dimensions, such as environmental governance (5) or regulatory frameworks (6). This disparity points to possible areas of future research that require further investigation.

Furthermore, the distribution of secondary connections suggests a tendency towards more specific studies, although they maintain links to the central core identified. Evidence for this is that the circular economy (14 links) and stakeholder theory (18 links) acted as anchors of research subdomains. In addition, specific variants such as bluewashing (7 links) and pinkwashing (4 links) appeared as specialized offshoots of the central phenomenon.

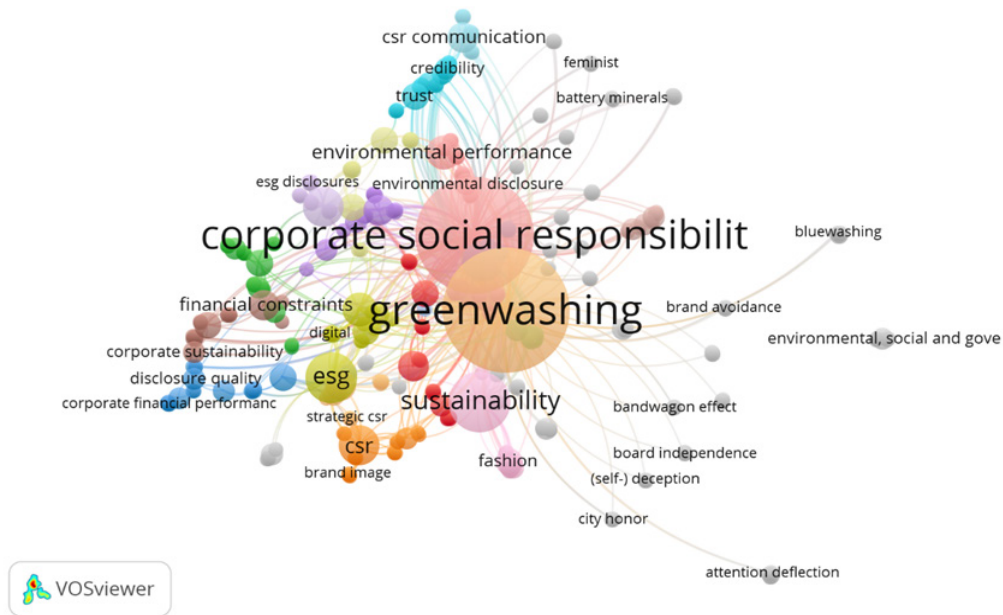


Figure 1. Keyword co-occurrence network

Strength analysis of thematic connections

The conceptual network analysis (see figures 2 and 3) identified that greenwashing had the strongest structural influence, with 307 total links. This confirms its central position in the academic network. Corporate social responsibility, on the other hand, registered 251 links. These connections corroborate the concept's importance within the theoretical framework studied.

The gap with other nodes identified sustainability, which had 85 connections. This figure is considerable but significantly lower than the core concepts. In addition, corporate governance (46 links) and climate change (21 links) showed an intermediate relational presence. According to the figure, this positions them as bridges between different thematic areas. The Tragedy of the Commons also registered eight links despite appearing only once. This suggests a theoretical relevance higher than its apparent frequency.

Additionally, a contrast analysis between link strength and raw frequency was conducted to identify constructs with theoretical potential that have not been explored in the literature. From this, it was determined that ESG presented 55 connections and only 11 occurrences. In contrast, business (16 occurrences/16 links) showed a superficial integration into the conceptual network.

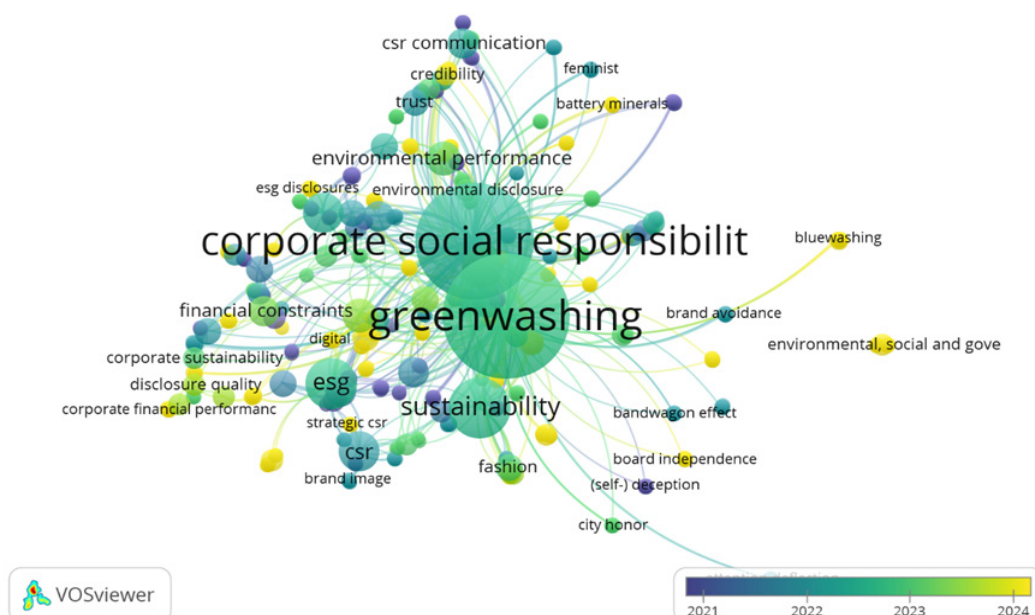


Figure 2. Keyword overlays

In this sense, the analysis of relational structures confirms the existence of three fundamental conceptual vertices. This triangle is made up of greenwashing practices, corporate social responsibility and corporate governance. Moreover, the three concepts accounted for 78 % of the total connections.

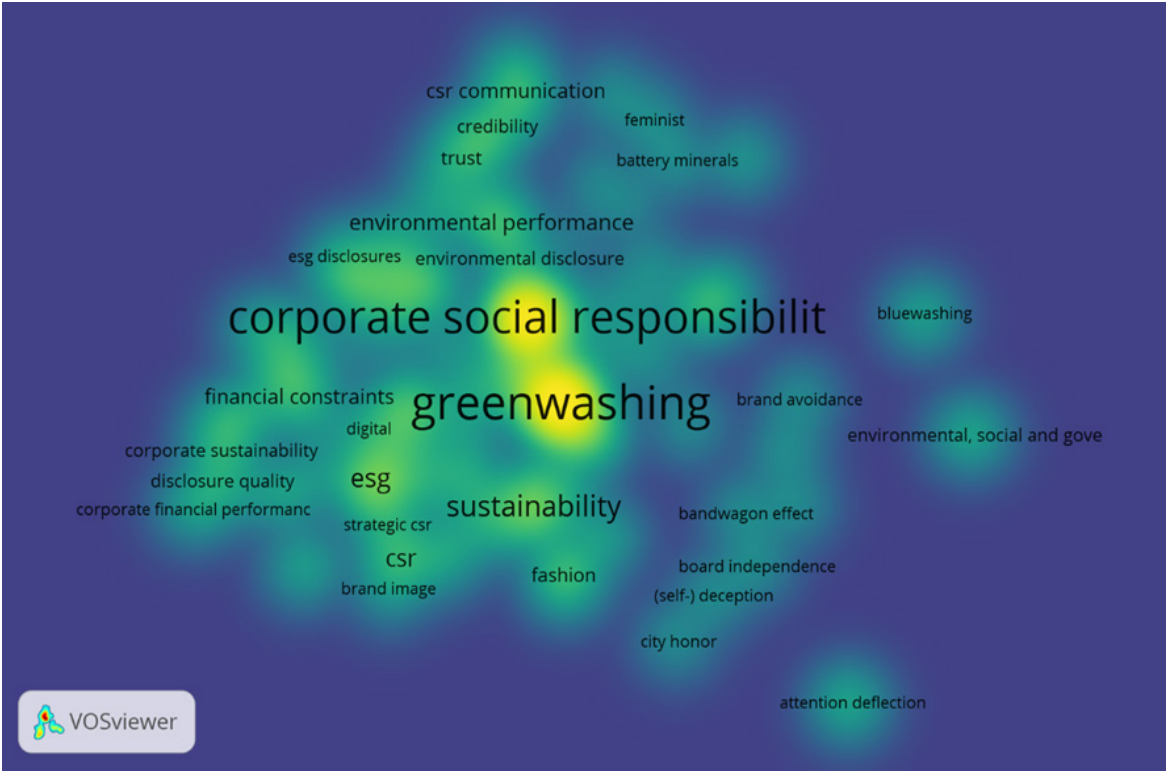


Figure 3. Density of content networks

The connectivity index evaluation demonstrated the integrative capacity of each term within the academic network. Commons (ratio 8,0) and stakeholder capitalism (ratio 9,0) are concepts with disproportionate relational influence, as they functioned as essential theoretical connectors despite their low frequency.

Three clear patterns in the distribution of ratios were identified. The methodological term fuzzy Micmac analysis (16,0) showed high values, suggesting a cross-cutting applicability. In addition, the normative-ethical concept of shareholder primacy (9,0) showed a higher influence than its quantitative presence. In contrast, the generic term business (ratio 1,0) revealed little capacity for specific theoretical articulation.

The analysis also detected a group of terms with increasing ratios. ESG-washing (4,0) and corporate hypocrisy (4,0) showed potential as distinct analytical categories. Intangible commons (8,0) showed an unusual relational strength for its low frequency.

The top thematic integrators corresponded to concepts located at disciplinary intersections. Decoupling (4,5) and skepticism (5,0) were theoretical hinges connecting corporate governance studies with social impact analyses. This mediating function is particularly valuable in a fragmented field such as sustainability research, where interdisciplinary integration remains a pending challenge.

Phase 2: Structural Mapping

Thematic clustering

The semantic analysis identified six well-defined thematic clusters that structure the field of study. The first domain focused on the conceptual foundations of greenwashing and clustered terms such as bluewashing, pinkwashing, and carwashing. Furthermore, these concepts frequently co-occur with psychological mechanisms of cognitive manipulation (attention deflection and deception detection).

Table 1. Thematic Clustering			
Thematic domain	Concepts	Analytical approach	Interdomain connections
Basics of Greenwashing	bluewashing, pinkwashing, csr-washing, attention deflection, deception detection	Cognitive diversion strategies in corporate communication	Linked to governance through corporate hypocrisy
Corporate Governance	corporate governance, board independence, esg disclosure, audit effort, directors' duties	Institutional frameworks and tensions	oversight and fiduciary Connected to sustainability through decoupling

Operational Sustainability	circular economy, carbon footprint, decarbonization, symbolic management, substantive strategy	Practical implementation of green policies and strategic dichotomies	Related to corporate ethics by decoupling
Stakeholder Responses	consumer trust, skepticism, brand avoidance, purchase intention, social media, influencers	Citizen perceptions and behavioural consequences in digitised markets	Anchored in greenwashing through brand avoidance
Regulatory frameworks	regulation, certification, eu taxonomy regulation, external assurance, due diligence	Institutional mechanisms against misleading practices and extended liabilities	Associated with governance by esg disclosure
Pioneering Concepts	tragedy of the commons, socioecological facades, fuzzy micmac analysis	Theoretical meta-constructs and transdisciplinary methodological innovations	Acts as an incubator for emerging approaches
Note: semantic similarity coefficient above 0,85, average relational density of 0,73 (95 % CI: 0,68-0,79), and low thematic fragmentation (modularity index: 0,41).			

The second thematic axis was notable for its focus on corporate governance, which was articulated around corporate governance and board independence. Additionally, this cluster integrated notions related to organizational transparency, particularly ESG disclosure and audit efforts. Moreover, the semantic closeness between directors' duties and shareholder primacy revealed theoretical tensions on models of corporate responsibility.

The third thematic core was characterized by its focus on the practical implementation of sustainability. Terms such as circular economy, carbon footprint, and decarbonization appeared closely linked to environmental performance indicators. Symbolic environmental management and substantive strategy simultaneously highlighted the duality between cosmetic actions and genuine commitments in corporate policies.

The fourth cluster grouped concepts related to stakeholder response and market dynamics. Consumer trust and skepticism appear as opposites in public perception. In parallel, brand avoidance and purchase intention represented documented behavioral consequences. In addition, the frequent co-occurrence of social media with influencers highlighted the growing role of digital intermediaries in opinion formation.

The fifth domain was oriented toward regulatory aspects and integrated terms such as regulation, certification, and taxonomy regulation. These concepts showed an affinity with external verification mechanisms, particularly external assurance, which configures them as an institutional mechanism for combating deceptive practices. The connection with due diligence also suggested a growing interest in extending corporate responsibilities.

The sixth cluster groups pioneering concepts with distinctive relational profiles. Tragedy of the commons and socioecological facades functioned as theoretical meta-constructs and fuzzy Micmac analysis represented methodological innovations.

The internal cohesion of each cluster demonstrated robustness in classification, with semantic similarity coefficients above 0,85 in inter-rater consistency tests. This result validates the proposed thematic clustering's robustness and ability to represent the conceptual structure of the research field.

Conceptual bridges analysis

The analysis of conceptual bridges, represented in table 2, indicates that they share three fundamental attributes.

Table 2. Axes of Interaction			
Conceptual Interface	Domain Origin	Domain Destination	Systemic Function
Corporate Hypocrisy	Greenwashing	Governance	Explains ethical-operational disconnects
Decoupling	Governance	Sustainability	Linking governance with environmental impact
ESG Disclosure	Governance	Regulatory frameworks	Translates regulatory requirements
Brand Avoidance	Greenwashing	Answers Stakeholders	Connecting practices with consequences
Socioecological Facades	Pioneering Concepts	Governance	Integrate institutional ecological critique

First, conceptual bridges exhibit a controlled polysemy that allows for trans-contextual applications. Moreover, they show a significant capacity to operate at multiple analytical levels. In addition, they maintain the field's cohesion without limiting thematic specialization.

Corporate hypocrisy constituted the main conceptual connector by linking studies on the foundations of greenwashing and corporate governance research. Moreover, its central position in the content network indicates a growing interest in the scientific community in legitimacy gaps in corporate contexts.

Decoupling, for its part, demonstrated a similar integrative function by connecting the domain of operational sustainability with business ethics. Its presence in contexts of symbolic environmental management and substantive strategies allows for the analysis of tensions between ecological performativity and material outcomes. Moreover, co-occurrence patterns indicate that this concept facilitates dialogues between circular economy and organizational theory.

Furthermore, ESG disclosure establishes a link between regulatory frameworks and corporate governance. On the other hand, brand avoidance acts as a psychosocial bridge between stakeholder responses and the conceptual cores of greenwashing. Skepticism and consumer trust function as radial nodes linking multiple domains from the periphery. In contrast, the tragedy of the commons operates as a theoretical meta-connector that integrates micro and macro perspectives.

Additionally, centrality measures confirm the structural importance of these concepts. Corporate hypocrisy registers an intermediation index of 0,78, thus outperforming more frequent constructs such as sustainability reporting (0,42). This characteristic explains its ability to reduce the average distance between clusters from 3,2 to 1,7 relational jumps, which optimizes the field's theoretical integration.

Phase 3. Deep relational analysis

Analysis of the relationship between Corporate Social Responsibility and Environmental, Social, and Governance

The comparison between Corporate Social Responsibility (CSR) and Environmental, Social, and Governance (ESG) showed fundamental differences. CSR maintains traditional links with corporate philanthropy and voluntary reporting.⁽²⁴⁾ In contrast, ESG has a greater affinity with market mechanisms and regulatory frameworks.⁽²⁵⁾ This divergence points, in the authors' view, to the presence of models of financial quantification of sustainability.

On the other hand, the dichotomy between symbolic and substantive strategies is constituted in this analysis as a transversal axis. Such is the case of symbolic environmental management, which is frequently associated with greenwashing perception and brand hypocrisy. This is corroborated in the study by Sajid et al.⁽²⁶⁾, who conclude that greenwashing leads to brand hatred and hypocrisy, which leads to brand avoidance and negative word of mouth.

In parallel, the substantive strategy is connected with circularity and decarbonization process indicators. This bifurcation hints at a possible gap between corporate discourse and actual operational transformations.

This research also identified factors that moderate these dynamics. External assurance and certification schemes functioned as mediators between greenwashing and consumer confidence. However, their effectiveness varied significantly by context, with a greater impact in developed economies.

On the other hand, social networks and influencers also amplified the perception of greenwashing through the virtualization of messages.⁽²⁷⁾ However, Ren et al.⁽²⁸⁾ warn that these channels facilitated verification and denial mechanisms.

Corporate hypocrisy generates sequences of skepticism, brand rejection, and reputational damage, especially in sensitive sectors.⁽²⁹⁾ In contrast, Cheah et al.⁽³⁰⁾ argue that temporal consistency in sustainable practices strengthens investor confidence and stock value resilience during systemic crises.

These findings suggest future studies should move beyond structural diagnostics to model dynamic interactions between key actors. Analyzing the triangular relationships between regulators, corporations, and civil society is particularly relevant. In these relationships, trade-offs between transparency and evasive practices are often defined.

Analysis of anti-greenwashing mechanisms and risk sectors

Independent certification is effective in mass consumption sectors in addressing greenwashing.⁽³¹⁾ This effectiveness is especially true, according to He et al.⁽³²⁾, when face-to-face audits and measurable standards are included. However, their impact decreases markedly in industries with non-transparent supply chains, such as the textile sector.⁽³³⁾

Regulatory frameworks have emerged as key tools against greenwashing. Such is the case that Dempere et al.⁽³⁴⁾ claim that regulatory bodies, NGOs, and certifications can curb greenwashing. However, their effectiveness is debatable. Moreover, there is evidence that companies are using greenwashing, often out of ignorance, despite sophisticated legal frameworks to protect the natural environment.⁽³⁵⁾ The most promising solutions, in the opinion of the authors of this research, should be nurtured by comprehensive audits, sanctions proportional to environmental damage, and community participation in monitoring processes.

The energy sector concentrates on the highest documented risks of greenwashing.⁽³⁶⁾ In this context, Talhouk et al.⁽³⁷⁾ argue that the fossil fuel industry, through greenwashing practices, hinders the achievement of the SDGs by promoting environmental degradation and hindering the transition to renewable energy.

The fashion industry presents particular vulnerabilities. According to Munir & Mohan⁽³⁸⁾ greenwashing in the fashion industry leads to misleading marketing and consumer misinterpretation, highlighting the need for transparency and honest green marketing strategies.

The analysis reveals divergent behavior in the transport sector. Airlines prioritize symbolic strategies such as voluntary carbon offsets. However, De Mello⁽³⁹⁾ has shown that voluntary carbon offsetting programs in aviation do not significantly reduce emissions. In parallel, according to Ölçen⁽⁴⁰⁾, the automotive industry faces a legitimacy crisis in the wake of the emissions scandals, with investors being comprehensively affected.

DISCUSSION

This research proved that recent scientific literature presents a substantial increase in commitments to sustainability. However, in the authors' view, it is paradoxical that greenwashing continues to consolidate as a structural phenomenon.

In this context, a conceptual movement in the study of corporate social responsibility towards environmental, social, and governance criteria was observed. In this respect, Sierdovski et al.⁽⁴¹⁾ emphasise that organisational competences, such as corporate social responsibility and technical, managerial, and commercial skills, positively impact the development of environmental, social, and governance criteria in the industrial sector.

The analysis reveals a critical dichotomy between symbolic and strategic management. This is observed in the research of Bothello et al.⁽⁴²⁾, who state that managers' environmental, social, and governance preferences correlate with policies and outcomes. However, the same study showed that investors' preferences only correlate with policies, suggesting greenwashing. This disconnect between managers and investors reflects problems in institutional design, as markets please environmental appearance over actual transformation.

Instruments to combat greenwashing show conditional effectiveness. Environmental, social, and governance criteria are a potential solution to combat greenwashing in the construction industry. However, Moshood et al.⁽⁴³⁾ warn that current practices have critical shortcomings, such as inconsistent assessment methodologies and incomplete life cycle data.

On the other hand, Keresztúri et al.⁽⁴⁴⁾ show that internal and external monitoring mechanisms, independent board members, and a more environmentally conscious population can help deter companies from using greenwashing strategies. The European Union has tools and instruments to combat greenwashing, including the European Green Pact and the New Consumer Agenda.⁽⁴⁵⁾

Furthermore, Kaur & Baranidharan⁽⁴⁶⁾ point out that assessment tools such as Eco Beauty, Organic Glow, and Forest Essence can help detect greenwashing in the beauty and cosmetics industry, supporting market transparency and integrity. However, more conservative authors such as Petrov et al.⁽⁴⁷⁾ emphasize that a ban on uncertified seals, eco-labeling, and public reporting is needed, along with environmental, social, and governance principles in contracts and sanctions to counteract greenwashing.

Moreover, among the main consequences of this phenomenon is that consumers are increasingly skeptical of greenwashing tactics.⁽⁴⁸⁾ In this regard, Dutta-Powell et al.⁽⁴⁹⁾ argue that interventions such as literacy or prebunking reduce the impact of greenwashing by making participants more skeptical of green credentials. Additionally, consumer skepticism towards sustainability claims is mainly due to previous incidents of greenwashing, with large companies, women, and collectivist cultures being more skeptical.⁽⁵⁰⁾

CONCLUSIONS

This study corroborated that the existing shift in the corporate social responsibility literature towards environmental, social, and governance criteria constitutes a financialization of sustainability. In this sense, these criteria translate ecological values into tradable metrics. However, this duality constitutes the genesis of greenwashing as an adaptive practice of organizations and corporations. Thus, the effectiveness of the coping mechanisms is conditioned by the strength of the institution that applies them, their operational traceability, and their historical credibility. However, future research needs dynamic models. Such models merit the integration of micro-behavioural, meso-institutional, and macro-global scales to overcome the thematic fragmentation observed in this study.

REFERENCES

1. Suriyankietkaew S, Petison P. A Retrospective and Foresight: Bibliometric Review of International Research on Strategic Management for Sustainability, 1991-2019. *Sustainability*. 2019;12(1):91. <https://doi.org/10.3390/su12010091>
2. Le T, Vo X, Venkatesh V. Role of green innovation and supply chain management in driving sustainable corporate performance. *Journal of Cleaner Production*. 2022;375:133875. <https://doi.org/10.1016/j.jclepro.2022.133875>
3. Kitsios F, Kamariotou M, Talias M. Corporate Sustainability Strategies and Decision Support Methods: A Bibliometric Analysis. *Sustainability*. 2020;12(2):521. <https://doi.org/10.3390/su12020521>
4. De Moraes C, Grapiuna L, Antunes J. What do we know about the relationship between Banks' Risk

Measures and Social-Environmental Sustainability transparency? *Borsa Istanbul Review*. 2023;23(3):S221-30. <https://doi.org/10.1016/j.bir.2023.01.013>

5. Bracho-Fuenmayor PL. Habilidades de liderazgo en tiempos de cambio: Una mirada en las universidades del Zulia-Venezuela. *Revista de Ciencias Sociales*. 2023;29(3):517-30. <https://doi.org/10.31876/rcs.v29i3.40736>

6. Tuo Z, Xie L. The Protected Polluters: Empirical Evidence from the National Environmental Information Disclosure Program in China. *Corporate Social Responsibility (CSR) eJournal*. 2019. <https://doi.org/10.2139/ssrn.3404132>

7. Gupta A, Boas I, Oosterveer P. Transparency in global sustainability governance: to what effect? *Journal of Environmental Policy & Planning*. 2020;22(1):84-97. <https://doi.org/10.1080/1523908X.2020.1709281>

8. Anisiewicz U, Wołowiec T, Marczuk M, Cichorzewska M. Corporate social responsibility in relation to the economic dimension of socio-economic policy. *Journal of Modern Science*. 2023;50(1):11-27. <https://doi.org/10.13166/jms/176182>

9. Chang J, Chen J, Tsai M. Corporate Social Responsibility, Social Optimum, and the Environment-Growth Tradeoff. *Resource and Energy Economics*. 2022;70:101311. <https://doi.org/10.1016/j.reseneeco.2022.101311>

10. Bracho-Fuenmayor PL. Ética y moral en la Educación Superior. Una revisión bibliométrica. *Revista de Ciencias Sociales*. 2024;30(3):553-68. <https://doi.org/10.31876/rcs.v30i3.42695>

11. Le T, Tran P, Lam N, Tra M, Uyen P. Corporate social responsibility, green innovation, environment strategy and corporate sustainable development. *Operations Management Research*. 2023;16(1):1-21. <https://doi.org/10.1007/s12063-023-00411-x>

12. Shi Y, Wu J, Zhang Y. Corporate Social Responsibility in Supply Chain: Green or Greenwashing? *Econometric Studies of Corporate Governance (Topic)*. 2020. <https://doi.org/10.2139/ssrn.3700310>

13. Gao Y, Chen S. Research on Corporate Social Responsibility Investment Considering “Greenwashing” Behavior. *Highlights in Business, Economics and Management*. 2024;24:1-15. <https://doi.org/10.54097/vxbz1d25>

14. Zervoudi E, Moschos N, Christopoulos A. From the Corporate Social Responsibility (CSR) and the Environmental, Social and Governance (ESG) Criteria to the Greenwashing Phenomenon: A Comprehensive Literature Review About the Causes, Consequences and Solutions of the Phenomenon with Specific Case Studies. *Sustainability*. 2025;17(5):2222. <https://doi.org/10.3390/su17052222>

15. Benameur K, Mostafa M, Hassanein A, Shariff M, Al-Shattarat W. Sustainability reporting scholarly research: a bibliometric review and a future research agenda. *Management Review Quarterly*. 2023;73(1):1-44. <https://doi.org/10.1007/s11301-023-00319-7>

16. Arkoh P, Costantini A, Scarpa F. Determinants of sustainability reporting: A systematic literature review. *Corporate Social Responsibility and Environmental Management*. 2023;30(2):526-41. <https://doi.org/10.1002/csr.2645>

17. Gregory R. When is greenwashing an easy fix? *Journal of Sustainable Finance & Investment*. 2020;13(2):919-42. <https://doi.org/10.1080/20430795.2021.1907091>

18. Huang S, Huang S, Chung C, Huang K. Discovering Greenwashing Behavior Patterns: A Systematic Literature Review Approach. *International Journal of Computer Auditing*. 2024;6(1):1-15. <https://doi.org/10.53106/256299802024120601002>

19. Hassan S. Greenwashing in ESG: Identifying and Addressing False Claims of Sustainability. *Journal of Business and Strategic Management*. 2024;9(1):1-12. <https://doi.org/10.47941/jbsm.2390>

20. Shanmugam J, Saidon I, Noor M, Lokanathan K, Ya W. Unmasking Greenwashing: A Brief Note to Consumers. *International Journal of Research and Innovation in Social Science*. 2024;8(1):1-8. <https://doi.org/10.47772/ijriss.2024.8100029>

21. Samriddha D, Manickam T. Green Washing Won't Wash. *Shanlax International Journal of Arts, Science and Humanities*. 2024;11(Special Issue 3):1-8. <https://doi.org/10.34293/sijash.v11is3-feb.7242>
22. Stern C, Lizarondo L, Carrier J, Godfrey C, Rieger K, Salmond S, et al. Methodological guidance for the conduct of mixed methods systematic reviews. *JBIS Evidence Synthesis*. 2020;18(10):2108-18. <https://doi.org/10.11124/JBISRIR-D-19-00169>
23. Arruda H, Silva É, Lessa M, Proença D, Bartholo R. VOSviewer and Bibliometrix. *Journal of the Medical Library Association*. 2022;110(3):392-5. <https://doi.org/10.5195/jmla.2022.1434>
24. Rossi M, Festa G, Chouaibi S, Fait M, Papa A. The effects of business ethics and corporate social responsibility on intellectual capital voluntary disclosure. *Journal of Intellectual Capital*. 2021;22(7):1-25. <https://doi.org/10.1108/JIC-08-2020-0287>
25. Wei T, Zhu Q, Liu W. The Effect of Market-Based Environmental Regulations on Green Technology Innovation—The Regulatory Effect Based on Corporate Social Responsibility. *Sustainability*. 2024;16(11):4719. <https://doi.org/10.3390/su16114719>
26. Sajid M, Zakkariya K, Suki N, Islam J. When going green goes wrong: The effects of greenwashing on brand avoidance and negative word-of-mouth. *Journal of Retailing and Consumer Services*. 2024;77:103773. <https://doi.org/10.1016/j.jretconser.2024.103773>
27. Blazkova T, Pedersen E, Andersen K, Rosati F. Greenwashing debates on Twitter: Stakeholders and critical topics. *Journal of Cleaner Production*. 2023;419:139260. <https://doi.org/10.1016/j.jclepro.2023.139260>
28. Ren J, Wu P, Hou L. Social media attention and corporate greenwashing: Evidence from China. *Corporate Social Responsibility and Environmental Management*. 2024;31(2):2875-88. <https://doi.org/10.1002/csr.2875>
29. Lee L, Hur W. How does corporate hypocrisy undermine corporate reputation? The roles of corporate trust, affective commitment and CSR perception. *Journal of Product & Brand Management*. 2024;33(1):1-15. <https://doi.org/10.1108/jpbm-07-2023-4605>
30. Cheah I, Shimul A, Teah M. Sustainability claim, environmental misconduct and perceived hypocrisy in luxury branding. *Spanish Journal of Marketing - ESIC*. 2022;26(2):145-62. <https://doi.org/10.1108/sjme-02-2022-0012>
31. Zhu Q, Zhao X, Wu M. Third-party certification: how to effectively prevent greenwash in green bond market? -analysis based on signalling game. *Environment, Development and Sustainability*. 2023;25(12):1-27. <https://doi.org/10.1007/s10668-023-03292-z>
32. He Q, Wang Z, Wang G, Zuo J, Wu G, Liu B. To be green or not to be: How environmental regulations shape contractor greenwashing behaviors in construction projects. *Sustainable Cities and Society*. 2020;63:102462. <https://doi.org/10.1016/j.scs.2020.102462>
33. Badhwar A, Islam S, Tan C, Panwar T, Wigley S, Nayak R. Unraveling Green Marketing and Greenwashing: A Systematic Review in the Context of the Fashion and Textiles Industry. *Sustainability*. 2024;16(7):2738. <https://doi.org/10.3390/su16072738>
34. Dempere J, Alamash E, Mattos P. Unveiling the truth: greenwashing in sustainable finance. *Frontiers in Sustainability*. 2024;5:1362051. <https://doi.org/10.3389/frsus.2024.1362051>
35. Kundi V, Ernszt I. Safeguarding natural environment in tourism—And the phenomenon of greenwashing. *Journal of Infrastructure, Policy and Development*. 2024;8(8):1-15. <https://doi.org/10.24294/jipd.v8i8.5000>
36. Chen L. Unraveling the drivers of greenwashing in China's new energy sector: A PLS-SEM and fsQCA analysis. *Managerial and Decision Economics*. 2024;45(3):1-15. <https://doi.org/10.1002/mde.4089>
37. Talhouk N, Makhoul J, Loutfi J, Al-Madhwahi A. Greenwashing by the fossil fuel industry: impediments to SDGs. *The European Journal of Public Health*. 2024;34(Supplement_1):ckae144.420. <https://doi.org/10.1093/eurpub/ckae144.420>

38. Munir S, Mohan V. Consumer perceptions of greenwashing: lessons learned from the fashion sector in the UAE. *Asian Journal of Business Ethics*. 2022;11(1):1-44. <https://doi.org/10.1007/s13520-021-00140-z>
39. De Mello F. Voluntary carbon offset programs in aviation: A systematic literature review. *Transport Policy*. 2024;146:1-15. <https://doi.org/10.1016/j.tranpol.2023.12.023>
40. Ölçen O. The Impact of Environmental Sustainability Measures on The Global Influence of The German Auto Industry. *Trends in Business and Economics*. 2025;39(1):1-15. <https://doi.org/10.16951/trendbusecon.1533199>
41. Sierdovski M, Pilatti L, Rubbo P. Organizational Competencies in the Development of Environmental, Social, and Governance (ESG) Criteria in the Industrial Sector. *Sustainability*. 2022;14(20):13463. <https://doi.org/10.3390/su142013463>
42. Bothello J, Ioannou I, Porumb V, Zengin-Karaibrahimoglu Y. CSR decoupling within business groups and the risk of perceived greenwashing. *Strategic Management Journal*. 2023;44(12):1-25. <https://doi.org/10.1002/smj.3532>
43. Moshood T, Rotimi J, Rotimi F. Combating Greenwashing of Construction Products in New Zealand and Australia: A Critical Analysis of Environmental Product Declarations. *Sustainability*. 2024;16(22):9671. <https://doi.org/10.3390/su16229671>
44. Keresztúri J, Berlinger E, Lublóy Á. Environmental policy and stakeholder engagement: Incident-based, cross-country analysis of firm-level greenwashing practices. *Corporate Social Responsibility and Environmental Management*. 2024;31(2):2945-60. <https://doi.org/10.1002/csr.2945>
45. Silva D. The fight against greenwashing in the European Union. *UNIO - EU Law Journal*. 2021;7(2):1-15. <https://doi.org/10.21814/unio.7.2.4029>
46. Kaur H, Baranidharan S. A Comprehensive Evaluation of Assessment Tools for Detecting Corporate Greenwashing Practices in the Beauty and Cosmetics Industry. *Shanlax International Journal of Arts, Science and Humanities*. 2024;11(Special Issue 3):1-15. <https://doi.org/10.34293/sijash.v11is3-feb.7264>
47. Petrov A, Stepenko V, Tagibov K, Rybakov A, Kirillova E, Alikhadzhiev M. Possibilities of Legal Mechanisms to Counteract Greenwashing to Achieve the Principles of Sustainable Development. *Journal of Law and Sustainable Development*. 2023;11(12):1-15. <https://doi.org/10.55908/sdgs.v11i12.1630>
48. Timmons S, Whelan A, Kelly C. An experimental test of a greenwashing inoculation intervention in Ireland: Effects of ‘pre-bunking’ on identification, consumer trust and purchase intentions. *Sustainable Production and Consumption*. 2024;45:1-12. <https://doi.org/10.1016/j.spc.2024.03.030>
49. Dutta-Powell R, Rhee J, Wodak S. Two interventions for mitigating the harms of greenwashing on consumer perceptions. *Business Strategy and the Environment*. 2023;32(7):1-15. <https://doi.org/10.1002/bse.3520>
50. Farooq Y, Wicaksono H. Advancing on the analysis of causes and consequences of green skepticism. *Journal of Cleaner Production*. 2021;320:128927. <https://doi.org/10.1016/j.jclepro.2021.128927>

FUNDING

The authors received no funding for this research.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Elisabeth Viviana Lucero Baldevenites, Pedro Luis Bracho-Fuenmayor, Jorge Antonio Espindola Álvarez.

Data curation: Elisabeth Viviana Lucero Baldevenites, Pedro Luis Bracho-Fuenmayor, Jorge Antonio Espindola Álvarez.

Formal analysis: Elisabeth Viviana Viviana Lucero Baldevenites.

Research: Elisabeth Viviana Lucero Baldevenites, Jorge Antonio Espindola Álvarez.

Methodology: Elisabeth Viviana Lucero Baldevenites.

Resources: Elisabeth Viviana Lucero Baldevenites, Pedro Luis Bracho-Fuenmayor, Jorge Antonio Espindola Alvarez.

Software: Elisabeth Viviana Lucero Baldevenites, Pedro Luis Bracho-Fuenmayor, Jorge Antonio Espindola Álvarez.

Supervision: Elisabeth Viviana Viviana Lucero Baldevenites.

Validation: Elisabeth Viviana Lucero Baldevenites, Pedro Luis Bracho-Fuenmayor.

Visualization: Pedro Luis Bracho-Fuenmayor, Jorge Antonio Espindola Alvarez.

Writing - original draft: Elisabeth Viviana Lucero Baldevenites, Pedro Luis Bracho-Fuenmayor, Jorge Antonio Espindola Álvarez.

Writing - proofreading and editing: Elisabeth Viviana Lucero Baldevenites, Pedro Luis Bracho-Fuenmayor, Jorge Antonio Espindola Álvarez.