

Trends on environmental, social and governance (ESG), business risk, and corporate leverage

Darman Saputra

`darman.saputra@mhs.unsoed.ac.id`

University Jenderal Soedirman

Najmudin Najmudin

University Jenderal Soedirman

Dian Purnomo Jati

University Jenderal Soedirman

Research Article

Keywords: Environmental Social Governance, ESG, Business Risk, Corporate Leverage, Capital Structure, Financing Decisions, Bibliometric Analysis, Systematic Literature Review

Posted Date: October 15th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-11170416/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Additional Declarations: No competing interests reported.

Abstract

This study examines the development of research on Environmental, Social and Governance (ESG), Business Risk, and Corporate Leverage by integrating bibliometric analysis with a Systematic Literature Review (SLR). The bibliometric analysis uses VOSviewer to identify keyword density, network relationships, and temporal developments, while the SLR synthesizes the mechanisms, measurements, theoretical perspectives, and empirical findings of 15 selected studies. The bibliometric findings indicate that ESG has become closely connected with corporate governance, financial performance, financing constraints, cost of capital, leverage, and information asymmetry, whereas Business Risk remains more fragmented across concepts related to operating uncertainty and risk management. The SLR further demonstrates that ESG is associated with corporate financial decisions through information, governance, financing, and institutional mechanisms, while Business Risk operates through operating uncertainty, cash flow stability, debt capacity, and fixed financial commitments. The combined findings establish two distinct but complementary pathways linking corporate characteristics to Corporate Leverage. However, substantial heterogeneity in measurement, institutional context, ownership structure, industry, and empirical methods limits direct comparability across studies. Future research should therefore employ consistent construct measurement, examine ESG dimensions separately where appropriate, test financing and governance mechanisms, and apply longitudinal and stronger causal identification strategies.

1. Introduction

Corporate financing decisions are increasingly examined alongside non-financial corporate characteristics. Environmental, Social, and Governance (ESG) information can shape how firms are evaluated by investors, lenders, and other capital providers, while Business Risk captures uncertainty generated by the firm's operating activities. Corporate Leverage, in turn, represents an observable financing outcome reflecting the degree to which firms rely on debt. The coexistence of these constructs creates an important research intersection, yet the existing literature remains fragmented because ESG, Business Risk, and Corporate Leverage have frequently been examined within separate research streams.

The relationship between these constructs is particularly relevant because ESG and Business Risk represent conceptually distinct dimensions of corporate characteristics. ESG represents environmental, social, and governance characteristics, practices, disclosures, or assessments that may influence how stakeholders perceive a firm. Business Risk, by contrast, refers to uncertainty in operating outcomes generated by demand, sales, costs, competition, technology, industry conditions, and operating structures. Financial Risk is associated with fixed financial commitments such as interest and debt obligations and therefore should not be used as a substitute for Business Risk. Corporate Leverage represents the financing outcome that connects these two explanatory pathways and reflects the extent to which firms rely on debt financing.

The literature also contains substantial measurement heterogeneity across these constructs. ESG may be measured using overall ratings, separate environmental, social, and governance scores, disclosure indices, or provider-specific measures. Business Risk may be proxied by sales volatility, EBIT volatility, cash flow volatility, coefficient of variation, degree of operating leverage, or industry-adjusted operating uncertainty. Corporate Leverage may be measured using total debt to total assets, total debt to equity, interest-bearing debt ratios, long-term debt ratios, or market leverage. These differences in operationalization can generate apparently inconsistent findings even when studies address similar theoretical questions, making systematic comparison particularly important.

Previous reviews and empirical studies provide valuable evidence on ESG, sustainability, capital structure, financing constraints, and risk, but they do not necessarily address the same research question. A review focused only on ESG and capital structure cannot fully explain whether operating uncertainty constitutes an independent channel to Corporate Leverage. Conversely, a capital structure review focused on Business Risk may not adequately incorporate the information, governance, and stakeholder mechanisms associated with ESG. This fragmentation creates a need for a more integrated examination of the two explanatory streams within a common financing framework.

Accordingly, this review is motivated by four interrelated research gaps. First, the ESG and Corporate Leverage literature has expanded rapidly but is often embedded within broader discussions of sustainable finance, responsible investment, and corporate sustainability. Second, Business Risk and operating uncertainty remain more fragmented across capital structure and risk literatures. Third, relatively little synthesis explicitly compares ESG and Business Risk as two distinct explanatory channels within a common framework of Corporate Leverage. Fourth, differences in measurement, theoretical perspectives, institutional contexts, and empirical identification strategies have not been systematically integrated into a unified research agenda.

To address these gaps, the review positions the literature around two complementary explanatory pathways. The first is an information, governance, and financing pathway, through which ESG may affect transparency, information asymmetry, governance quality, perceived risk, financing constraints, and financing costs. The second is an operating risk, debt capacity, and financing pathway, through which Business Risk may affect cash flow stability, expected financial distress costs, debt capacity, and firms' tolerance for fixed financial commitments. Positioning these pathways within a common framework enables a more comprehensive examination of how different dimensions of corporate characteristics and operating uncertainty may influence financing decisions.

The original manuscript identified this research intersection but relied too heavily on a small set of illustrative studies and VOSviewer maps. The revised review therefore treats bibliometric analysis and systematic synthesis as complementary rather than interchangeable activities. Bibliometric analysis is used to describe the structure and evolution of the research field, whereas the systematic review is used to examine mechanisms, measurement choices, empirical findings, theoretical explanations, and research gaps. This distinction is consistent with methodological guidance that separates performance

analysis from science mapping and emphasizes transparent procedures for bibliometric research (Donthu et al., 2021; Mukherjee et al., 2022).

By integrating these approaches, the review makes several contributions to the existing literature. First, it integrates two previously fragmented explanatory streams, namely ESG and Business Risk, within a common Corporate Leverage framework. Second, it separates bibliometric mapping from systematic evidence synthesis, reducing the risk of treating keyword co occurrence as evidence of causality. Third, it systematically compares measurement choices for ESG, Business Risk, and Corporate Leverage and identifies potential sources of cross study heterogeneity. Fourth, it synthesizes theoretical mechanisms involving agency theory, information asymmetry, trade off theory, and pecking order theory. Fifth, it develops a research agenda addressing conceptual, measurement, methodological, contextual, and identification gaps. Through this integrated approach, the review aims to provide a more coherent understanding of how ESG and Business Risk relate to Corporate Leverage and to identify important directions for future research.

RQ 1. How has research on ESG, Business Risk, and Corporate Leverage evolved during the review period?

RQ 2. Which journals, authors, institutions, countries, and publications have shaped the field?

RQ 3. What intellectual, conceptual, and thematic structures characterize the literature, and how have they evolved?

RQ 4. How is ESG associated with Corporate Leverage, and through which information, governance, risk, and financing mechanisms?

RQ 5. How is Business Risk associated with Corporate Leverage, and through which operating-risk and debt-capacity mechanisms?

RQ 6. How are ESG, Business Risk, and Corporate Leverage operationalized across empirical studies?

RQ 7. What theoretical, methodological, contextual, and empirical inconsistencies remain, and what future research agenda follows?

2. Literature review

2.1 Environmental, social and governance (ESG)

ESG is defined in this review as a multidimensional representation of corporate environmental practices, social practices, and governance arrangements (Sugianto et al., 2022; Zahid et al., 2023; Bilyay-Erdoğan, 2022). The construct therefore captures how a firm manages environmental exposure, relationships with employees and communities, responsible business practices, board and ownership arrangements, accountability, transparency, and related governance mechanisms (Sugianto et al., 2022; R & P., 2026).

ESG should not be treated as synonymous with Sustainability Performance. Sustainability Performance is an outcome-oriented concept that asks what the organization achieves across financial, environmental, and social dimensions. ESG is instead an organizational characteristic or information construct describing policies, practices, structures, and disclosed performance attributes (Sugianto et al., 2022; Huang et al., 2025). The distinction allows ESG to function as X1 rather than as the dependent outcome (Pinto & Gaio, 2025; Bilyay-Erdoğan, 2022).

The supplied VOSviewer maps reinforce this distinction. ESG is centrally connected to corporate governance, financial performance, finance, cost of capital, leverage, financing constraints, and information asymmetry (Yang et al., 2024; Singhanian & Saini, 2021; Bilyay-Erdoğan, 2022; Sugianto et al., 2022). The map therefore supports examining ESG as a possible determinant of financing conditions rather than simply as another name for sustainability performance (Zahid et al., 2023; Yang et al., 2024; Jiang et al., 2025).

2.2 Business risk

Business Risk refers to uncertainty in operating performance that arises from the firm's business activities independently of the financing mix (Wagiyu & Setiawan, 2021; Karim, 2026; Esther et al., 2026). Sources can include demand volatility, sales instability, input-cost uncertainty, competitive pressure, operating-cost rigidity, industry conditions, technological change, and exposure to changes in the business environment (Wagiyu & Setiawan, 2021; Zhao & Ayoup, 2025; Esther et al., 2026).

Business Risk must be distinguished from Financial Risk. Financial Risk is associated with the consequences of fixed financial commitments, particularly debt and interest obligations (Wagiyu & Setiawan, 2021; Rao & Kumar, 2026; Lumbantobing et al., 2025). Business Risk exists before the financing decision, whereas financial leverage can amplify the consequences of operating volatility (Wagiyu & Setiawan, 2021; Rao & Kumar, 2026). In this review, Business Risk is therefore treated as X2 and Corporate Leverage as Y, preserving the conceptual direction from operating uncertainty to financing structure (Aleksnevičienė & Valkauskaitė, 2026; Farah & Firdayetti, 2022; Cortez, 2025).

Business Risk can be operationalized in several ways (Wagiyu & Setiawan, 2021; Esther et al., 2026; Wagiyu & Setiawan, 2021). A study may use the volatility of sales, volatility of EBIT, the coefficient of variation of operating income, operating leverage, or industry-adjusted measures of operating uncertainty (Wagiyu & Setiawan, 2021; Esther et al., 2026). Because these proxies capture different aspects of uncertainty, inconsistent operationalization is an important source of heterogeneity in the literature (Karim, 2026; Aleksnevičienė & Valkauskaitė, 2026).

2.3 Corporate leverage

Corporate Leverage represents the degree to which a firm relies on debt financing relative to its asset or equity base (Rao & Kumar, 2026; Lumbantobing et al., 2025; Zahid et al., 2023). It is the dependent construct in this SLR. Common accounting representations include total debt to total assets and total

debt to equity, while some studies use long-term debt ratios or market-based leverage (Newton et al., 2023; Cortez, 2025).

Corporate Leverage is narrower than Capital Structure. Capital Structure refers to the overall composition and design of financing sources, while leverage is a measurable degree of debt reliance (Karim, 2026; Rao & Kumar, 2026). Consequently, the terms should not be used interchangeably in the conceptual model even though capital-structure theories often provide the theoretical background for leverage decisions (Hamad, 2025; Rao & Kumar, 2026; Hamad, 2025).

The financing role of leverage makes it particularly relevant to ESG and Business Risk (Zahid et al., 2023; Yang et al., 2024; R & P., 2026). ESG may alter information quality, stakeholder confidence, governance monitoring, and perceived risk (Pinto & Gaio, 2025; Bilyay-Erdoğan, 2022; Jiang et al., 2025). while Business Risk may influence debt capacity and the firm's willingness to accept fixed financial obligations (Aleknevičienė & Valkauskaitė, 2026; R & P., 2026; Cortez, 2025). These mechanisms provide the basis for examining Corporate Leverage as Y (Zahid et al., 2023; Yang et al., 2024; Zhao & Ayoup, 2025).

2.4 Conceptual boundaries of the three variables

Table 1 Conceptual boundaries of ESG, business risk, and corporate leverage			
Construct	Core meaning	Typical secondary-data indicators	What it is NOT
ESG	Environmental, social and governance practices, structures, and disclosed attributes.	Overall ESG score; E, S, and G component scores; ESG disclosure index; dimension-specific scores.	Not identical to Sustainability Performance; not a financial performance ratio.
Business Risk	Uncertainty in operating outcomes generated by the business itself.	Sales volatility; EBIT volatility; coefficient of variation; operating leverage; industry-adjusted operating uncertainty.	Not Financial Risk; not the same as leverage or debt risk.
Corporate Leverage	Degree of debt reliance in corporate financing.	Total debt/total assets; total debt/equity; long-term debt/total assets; market leverage.	Not the whole concept of Capital Structure; not profitability or firm value.

Source: Authors’ own synthesis based on the reviewed literature.

3. Research method

This study adopts an integrated bibliometric analysis and Systematic Literature Review (SLR). The methodological structure follows the supplied manuscript: planning the review, establishing the search and selection protocol, mapping the intellectual structure, synthesizing the literature thematically, and

identifying research gaps. The content of the review is redesigned around ESG, Business Risk, and Corporate Leverage.

The intended database is Scopus because it provides structured bibliographic metadata suitable for systematic screening and VOSviewer mapping. The review protocol is designed for the 2020–2026 period to maintain comparability with the supplied SLR template. The search concept should combine ESG-related terms, business-risk terms, and leverage/capital-structure terms rather than the sustainable-performance search string used in the original manuscript.

For bibliometric mapping, VOSviewer can be used to examine keyword co-occurrence, network relationships, and temporal overlay. Bibliometrix can complement this by describing publication development, sources, authors, countries, and thematic evolution. The present document does not invent article counts, annual growth rates, citation averages, or other bibliometric statistics that are not contained in the supplied VOSviewer outputs.

The supplied VOSviewer visualizations are incorporated as visual evidence. Their interpretation is limited to the keywords and relationships visibly represented in the maps. The figures are therefore used to support thematic interpretation, not to claim a newly calculated dataset.

3.1 Article selection criteria

Table 2
Article selection criteria

No.	Criterion
1	Peer-reviewed scientific articles indexed in Scopus.
2	Articles written in English and available in sufficient bibliographic detail for screening.
3	Publication period: 2020–2026.
4	Search concepts explicitly connected to ESG, Business Risk, and/or Corporate Leverage.
5	Studies containing conceptual, empirical, review, or bibliometric analysis relevant to the three constructs.
6	Records screened using title, abstract, keywords, and methodological relevance.
7	Final synthesis organized around the three-variable relationship rather than broad sustainable-performance outcomes.

Source: Authors’ own compilation.

3.2 Proposed search logic

Core search structure

(ESG OR "environmental social governance" OR "ESG performance" OR "ESG score") AND ("business risk" OR "operating risk" OR "operating uncertainty") AND (leverage OR "corporate leverage" OR "debt ratio" OR "financial leverage").

This search logic is intentionally different from the original sustainable-performance search strategy. It is constructed to retrieve literature in which the three constructs can be connected within a corporate-finance framework.

3.3 Data extraction framework

Table 3
Data extraction framework

Extraction field	Purpose
Bibliographic information	Identify publication year, source, document type, and study context.
Research objective	Determine which relationship or mechanism is examined.
ESG construct and proxy	Identify overall ESG measures versus E/S/G dimensions and disclosure-based measures.
Business Risk construct and proxy	Separate operating uncertainty from financial risk and leverage.
Corporate Leverage proxy	Record accounting or market-based leverage measures.
Theory/mechanism	Classify information, governance, risk, financing, and capital-structure explanations.
Method	Classify panel data, cross-sectional analysis, time-series analysis, experiments, qualitative studies, reviews, or bibliometric approaches.
Context	Record country, industry, firm type, and institutional setting.
Main relationship	Record the direction and nature of the documented association without imposing a uniform effect.
Research gap	Identify limitations in measurement, context, method, theory, or causal identification.

Source: Authors’ own compilation.

4. Analysis and discussion

4.1 Analysis result

4.1.1 Bibliometric landscape

The supplied VOSviewer density visualization shows a strong concentration around ESG. The densest region is connected with sustainability reporting, financial performance, ESG performance, corporate

governance, and finance. A second set of visible terms extends toward financing constraints, cost of capital, leverage, information asymmetry, and ESG rating. This distribution indicates that ESG research is already embedded in financial decision-making discussions rather than being confined to environmental topics.

The density map should be read as a concentration map rather than as a causal model. High density around ESG indicates repeated co-occurrence with nearby terms. The presence of leverage, financing constraints, cost of capital, and information asymmetry provides a useful basis for a financing-oriented SLR, while the absence or lower visibility of the exact phrase Business Risk suggests that business-risk research may be more fragmented across alternative labels such as operating risk, risk management, financial constraints, and uncertainty.

4.1.2 Temporal development

The supplied overlay visualization indicates that the mapped literature contains a temporal layer extending into the most recent period represented in the figure. Recent-position keywords include ESG-related performance, corporate governance, digital transformation, artificial intelligence, financing constraints, and cost of capital. Earlier-position keywords include several finance, sustainability, and corporate-performance terms. The temporal pattern suggests increasing integration between sustainability information and financial decision-making.

For the present SLR, the important implication is not that newer topics automatically replace older ones, but that ESG is increasingly connected with financial mechanisms. The research opportunity is to move from broad ESG-performance discussions toward a specific financing outcome—Corporate Leverage—and to distinguish the effect of ESG from the independent role of Business Risk.

4.1.3 Network structure

The network visualization shows ESG as a major connecting node within a dense web that includes financial performance, sustainability reporting, corporate governance, ESG performance, finance, leverage, financing constraints, cost of capital, information asymmetry, and related terms. The network therefore supports a multi-channel interpretation: ESG can be studied through information quality, governance, perceived risk, financing conditions, and capital allocation.

The network also highlights why Business Risk should not be collapsed into ESG. Risk-related financial concepts appear in the same broader network, but their conceptual role is different. ESG describes organizational practices and information, whereas Business Risk describes uncertainty in operating outcomes. Corporate Leverage then captures the financing position through which the consequences of these conditions may be observed.

4.1.4 Systematic literature analysis

The selected literature demonstrates the growing integration of Environmental, Social, and Governance (ESG) considerations with corporate financial decisions, reporting practices, governance mechanisms,

and firm-level outcomes. Existing studies examine ESG in relation to real earnings management, digital finance, institutional co-ownership, internal control, corporate social responsibility, tax avoidance, sustainability reporting, and corporate environmental governance. Other research highlights the role of ESG in corporate responses to geopolitical events, financial flexibility, managerial sentiment, default risk, executive compensation, risk-taking, managerial overconfidence, investment intensity, leverage, and cash holdings. The literature also increasingly addresses the influence of regulatory and institutional developments, particularly through the Corporate Sustainability Reporting Directive (CSRD), sustainability reporting requirements, and country-level governance characteristics. Furthermore, ESG performance has been associated with green transformation, mergers and acquisitions, stock price crash risk, corporate financing under environmental uncertainty, financial performance, and corporate liquidity risk. Across these studies, the keywords indicate several interconnected research dimensions, including corporate governance, financial policy, corporate reporting, sustainability, risk management, regulatory compliance, and environmental transformation, suggesting that ESG has evolved from a primarily non-financial reporting concern into a multidimensional factor closely connected to corporate financial and strategic decision-making.

Table 4
List of reviewed articles: journals and keywords (bibliometric mapping)

No.	Article Name	Journal Name	Keyword
1	ESG performance, digital finance, and corporate real earnings management	<i>International Review of Economics and Finance</i>	ESG performance; Digital finance; Market structure; Real earnings management
2	Institutional co-ownership, corporate internal control and ESG performance	<i>International Review of Economics and Finance</i>	Institutional co-ownership; IC; ESG performance; Mechanism; Heterogeneity
3	Beyond borders: Investigating how country progressiveness and governance shape the interconnection between corporate social responsibility and tax avoidance in European countries	<i>Journal of International Accounting, Auditing and Taxation</i>	Corporate social responsibility (CSR); Environmental; Social; Corporate governance (ESG); Tax avoidance (TA); Country-level progressiveness; Country-level governance
4	Varieties of capitalism and sustainability reporting: Text analysis-based evidence on European companies	<i>Sustainable Futures</i>	Varieties of capitalism (VOC); ESG reporting, ESRS compliance; Text analysis; Financial performance; Corporate reporting; Sustainability
5	Financing divestment from Russia	<i>International Review of Economics and Finance</i>	Divestment; Russia–Ukraine war; Financial flexibility; ESG
6	Open data as knowledge infrastructure for enabling corporate green transformation	<i>Journal of Innovation & Knowledge</i>	Public data; Knowledge infrastructure; Green transformation; Corporate environmental governance
7	Managerial Sentiment and Default Risk: Evidence from China	<i>Journal of Risk and Financial Management</i>	Managerial sentiment; Default risk; Ownership concentration; R&D intensity; Industry competition; Financial constraints; ESG; China
8	Nonfinancial Performance Metrics in Executive Pay and Corporate Risk-Taking—Evidence From S&P 500 Firms	<i>Journal of Corporate Accounting & Finance</i>	Analyst coverage; Corporate risk-taking; ESG; ESG pay; Executive compensation; Nonfinancial performance metrics
9	Managerial Overconfidence and ESG Performance: Financial Policy Channels in an Emerging Market	<i>Journal of Risk and Financial Management</i>	ESG performance; Managerial overconfidence; Financial policy; Investment intensity; Leverage; Cash holdings; Behavioral finance; Emerging markets
10	Unveiling the effects of the Corporate Sustainability Reporting Directive (CSRD) on company	<i>Sustainability Accounting, Management and Policy Journal</i>	Sustainability reporting; Corporate Sustainability Reporting Directive; German companies; Paradigm shift; Institutional pressures;

No.	Article Name	Journal Name	Keyword
	sustainability reporting practices: a case of German companies		Regulatory compliance; Stakeholder influences
11	From greenwashing to green transformation: evidence from mergers and acquisitions	<i>International Journal of Managerial Finance</i>	Mergers and acquisitions; ESG; Greenwashing; Sustainability; Announcement returns
12	Unlocking value: exploring the impact of ESG performance and board gender diversity on mitigating stock price crash risk	<i>International Journal of Disclosure and Governance</i>	ESG performance; Stock price crash risk; CSR; Board gender diversity; China
13	"It can't rain all the time." The effects of heavy rains on European firms financing	<i>Review of Accounting and Finance</i>	Corporate governance; Capital structure; Corporate finance; Environmental social and governance
14	ESG Practices and the Economic and Financial Performance of Energy Companies: A Multi-Method Analysis	<i>Journal of Risk and Financial Management</i>	ESG; Corporate financial performance (CFP); Energy sector; Structural equation (SEM) modelling; ROCE; Trade-off theory; Energy transition
15	Financial Regulatory Intensity and Corporate Liquidity Risk: Evidence from Chinese A-Share Listed Companies	<i>International Journal of Financial Studies</i>	Financial regulatory intensity; Corporate liquidity risk; Current ratio; ESG performance; Financial leverage; Ownership heterogeneity; China

Source: Authors' own compilation from the Scopus-indexed articles reviewed in this study.

The literature identifies several research gaps concerning the mechanisms through which ESG affects corporate financial decisions and outcomes. Prior studies have examined ESG in relation to real earnings management, tax avoidance, sustainability reporting, green transformation, corporate financing, default risk, executive compensation, and liquidity risk, but important mechanisms remain underexplored. These include the roles of digital finance, financing constraints, internal control, financial policy, managerial characteristics, institutional environments, regulatory intensity, and corporate governance. The literature also shows limited evidence on how these relationships vary across ownership structures, industries, regions, firm characteristics, and national institutional contexts. In addition, emerging issues such as mandatory sustainability reporting under the CSRD, geopolitical shocks, climate-related financing pressures, and ESG-linked executive compensation indicate that the relationship between ESG and corporate financial behavior remains an evolving area of research.

The findings generally indicate that ESG is associated with meaningful changes in corporate behavior, although the direction and strength of these relationships depend on the underlying mechanism and context. Higher ESG performance is generally associated with lower real earnings management, tax avoidance, default risk, and stock price crash risk, while institutional co-ownership, open data, and stronger internal control can support better ESG performance and green transformation. However, ESG-

related policies and practices may also involve trade-offs, such as transitional costs, increased strategic risk-taking, or differences in financial outcomes. The evidence further demonstrates that factors such as digital finance, financing constraints, financial policy, board gender diversity, leverage, regulatory intensity, stakeholder pressure, and institutional conditions can mediate or moderate ESG-related outcomes. Overall, the literature suggests that ESG should be examined not only as an independent determinant of corporate performance, but also through the financial, governance, institutional, and strategic mechanisms that shape corporate decision-making.

Table 5
List of selected articles: research gaps and findings (systematic literature review)

No.	Article Name	Research Gap	Findings
1	ESG performance, digital finance, and corporate real earnings management	Studi sebelumnya telah membahas ESG dan earnings management, tetapi masih terbatas yang menjelaskan bagaimana digital finance memperkuat hubungan ESG dengan real earnings management, termasuk mekanisme financing constraints dan perbedaan menurut struktur kepemilikan, industri, dan wilayah.	ESG performance berhubungan negatif dengan real earnings management. Digital finance dan persaingan industri memperkuat hubungan tersebut, sedangkan market concentration melemahkannya. Financing constraints berperan sebagai mediator parsial, dengan pengaruh yang berbeda menurut kepemilikan, industri, dan wilayah.
2	Institutional co-ownership, corporate internal control and ESG performance	Literatur sebelumnya memberikan hasil yang belum konsisten mengenai dampak institutional co-ownership terhadap praktik ESG. Mekanisme internal control serta heterogenitas berdasarkan karakteristik perusahaan dan lingkungan institusional masih perlu dijelaskan.	Institutional co-ownership meningkatkan ESG performance dan efektivitas internal control. Internal control berperan sebagai mekanisme mediasi. Pengaruh tersebut berbeda menurut marketization, ownership, dan stabilitas institutional co-ownership.
3	Beyond borders: Investigating how country progressiveness and governance shape the interconnection between corporate social responsibility and tax avoidance in European countries	Penelitian CSR–tax avoidance sebelumnya cenderung belum mengintegrasikan secara memadai faktor institusional tingkat negara, khususnya country-level progressiveness dan governance, serta belum cukup membedakan tax avoidance yang terlihat dan strategi yang lebih opaque.	CSR memiliki hubungan negatif dengan tax avoidance. Namun, hubungan tersebut dipengaruhi oleh konteks nasional. Di negara yang lebih progresif, CSR lebih membatasi tax avoidance yang terlihat, sedangkan dalam lingkungan governance yang tinggi pengaruh CSR cenderung melemah.
4	Varieties of capitalism and sustainability reporting: Text analysis-based evidence on European companies	Literatur sustainability reporting masih membutuhkan penjelasan mengenai bagaimana institutional varieties of capitalism memengaruhi kedalaman pengungkapan ESG/ESRS, khususnya ketika disclosure diukur secara tekstual dan dibandingkan lintas sistem ekonomi.	Terdapat perbedaan sistematis dalam cakupan ESRS antar kelompok kapitalisme. Firm size menjadi determinan positif yang paling konsisten, sedangkan profitability menunjukkan hubungan yang lebih lemah/tidak konsisten dan leverage lebih sering berkaitan dengan environmental disclosure yang lebih tipis.
5	Financing divestment from Russia	Masih terbatas bukti empiris mengenai bagaimana financial flexibility, leverage, ESG, dan karakteristik perusahaan memengaruhi keputusan	Perusahaan yang lebih besar, memiliki Russian sales, cash reserves, dan leverage lebih tinggi lebih mungkin melakukan divestment. Perusahaan

No.	Article Name	Research Gap	Findings
		divestment ketika perusahaan menghadapi geopolitical shock. Penelitian juga menghadapi ketidakpastian mengenai mekanisme dominan dalam keputusan keluar dari pasar Rusia.	dengan ESG score yang tinggi juga menunjukkan kecenderungan lebih besar untuk keluar dari Rusia.
6	Open data as knowledge infrastructure for enabling corporate green transformation	Studi sebelumnya lebih banyak berfokus pada green technological innovation, sementara mekanisme bagaimana open public data diterjemahkan menjadi corporate green transformation dan bagaimana pengaruhnya berbeda menurut konteks institusional masih kurang diteliti.	Open data platforms meningkatkan corporate green transformation melalui knowledge encoding, knowledge flows, dan knowledge recombination. Pengaruhnya lebih kuat pada perusahaan yang lebih terdigitalisasi, menghadapi environmental-policy uncertainty, SOEs, dan perusahaan dengan tingkat polusi tinggi.
7	Managerial Sentiment and Default Risk: Evidence from China	Penelitian sebelumnya masih terbatas dalam menjelaskan apakah managerial sentiment yang diperoleh dari textual analysis dapat menjadi prediktor default risk menggunakan ukuran financial distress berbasis accounting dan market models pada perusahaan China.	Positive managerial sentiment menurunkan default risk. Pengaruh tersebut lebih kuat pada perusahaan dengan ownership concentration, R&D intensity, dan industry competition tertentu serta leverage yang lebih tinggi. Financial constraints dan ESG ratings menjadi saluran mediasi.
8	Nonfinancial Performance Metrics in Executive Pay and Corporate Risk-Taking—Evidence From S&P 500 Firms	Literatur sebelumnya banyak membahas ESG ratings dan nonfinancial performance metrics secara umum, tetapi masih terbatas bukti mengenai ESG-linked executive pay sebagai mekanisme insentif dan pengaruhnya terhadap corporate risk-taking, khususnya perbedaan antara ESG metrics dan nonfinancial metrics lainnya.	NFPM-linked pay, khususnya ESG-linked pay, berkaitan dengan lower financial leverage, tetapi juga higher volatility in operating and stock returns serta peningkatan strategic risk-taking. Dampaknya lebih kuat pada perusahaan dengan analyst coverage yang lebih tinggi.
9	Managerial Overconfidence and ESG Performance: Financial Policy Channels in an Emerging Market	Literatur sebelumnya banyak menempatkan faktor eksternal sebagai penjelas ESG performance, sementara mekanisme internal melalui managerial overconfidence dan financial policy channels masih kurang dieksplorasi, terutama dalam emerging market.	Managerial overconfidence tidak menunjukkan pengaruh langsung yang seragam terhadap ESG performance, tetapi bekerja secara tidak langsung melalui financial policy. Liquidity menunjukkan hubungan yang relatif lebih kuat, sedangkan financing dan investment channels menunjukkan hasil yang lebih

No.	Article Name	Research Gap	Findings
			lemah atau sensitif terhadap pengukuran.
10	Unveiling the effects of the Corporate Sustainability Reporting Directive (CSRD) on company sustainability reporting practices: a case of German companies	Karena CSRD masih relatif baru, bukti empiris mengenai implementasi CSRD, perubahan praktik sustainability reporting, tantangan perusahaan, dan respons organisasi terhadap mandatory reporting masih terbatas.	CSRD mendorong perubahan dalam sustainability reporting. Perusahaan publik beradaptasi lebih cepat, sementara perusahaan nonpublik dan SMEs menghadapi keterbatasan sumber daya dan kompleksitas regulasi. Stakeholder pressures dan institutional pressures turut membentuk respons perusahaan.
11	From greenwashing to green transformation: evidence from mergers and acquisitions	Masih terbatas penelitian yang menjelaskan apakah perusahaan dengan riwayat greenwashing menggunakan M&A untuk menutupi kelemahan ESG atau benar-benar melakukan green transformation, serta bagaimana pasar merespons strategi tersebut.	Acquirers dengan greenwashing lebih tinggi cenderung mengakuisisi target dengan ESG ratings lebih tinggi. Pasar awalnya merespons negatif transaksi tersebut, tetapi greenwashing acquirers menurun secara signifikan satu tahun setelah M&A, yang menunjukkan perubahan menuju green transformation.
12	Unlocking value: exploring the impact of ESG performance and board gender diversity on mitigating stock price crash risk	Penelitian sebelumnya telah menguji ESGP dan board gender diversity secara terpisah terhadap stock price crash risk, tetapi interaksi ESGP × BGD masih sangat terbatas. Bukti sebelumnya juga berasal dari sampel kecil sehingga generalisasinya terbatas.	ESG performance berhubungan negatif dengan stock price crash risk, sedangkan board gender diversity secara individual berhubungan positif. Interaksi ESGP dan BGD menunjukkan hubungan negatif dengan crash risk, sehingga BGD memoderasi hubungan ESGP dengan SPCR.
13	"It can't rain all the time." The effects of heavy rains on European firms financing	Penelitian climate finance sebelumnya lebih banyak berfokus pada temperature anomalies dan catastrophic events serta perusahaan besar. Bukti mengenai recurrent heavy rainfall dan financial conditions perusahaan SMEs yang tidak terdaftar masih terbatas.	Heavy rainfall menurunkan cash flow dan productivity SMEs serta meningkatkan leverage. Green policy indicators membantu memperbaiki kondisi finansial, tetapi juga berkaitan dengan short-term productivity losses yang menunjukkan adanya transitional compliance costs.
14	ESG Practices and the Economic and Financial Performance of Energy Companies: A Multi-Method Analysis	Hubungan ESG–corporate financial performance masih menunjukkan hasil yang tidak konsisten, terutama pada sektor capital-intensive yang menghadapi regulatory pressures dan transition costs.	Economic performance memiliki hubungan positif tetapi tidak signifikan dengan ESG ratings. Financial leverage menunjukkan hubungan positif yang marginally significant. Hasil menunjukkan bahwa ESG

No.	Article Name	Research Gap	Findings
		Studi sektoral dengan pendekatan multi-method masih diperlukan.	ratings tidak hanya berkaitan dengan profitability, tetapi juga kondisi strategis, organisasional, governance, dan financing.
15	Financial Regulatory Intensity and Corporate Liquidity Risk: Evidence from Chinese A-Share Listed Companies	Terdapat tiga gap utama: penelitian sebelumnya lebih banyak berfokus pada financial institutions; peran masing-masing dimensi ESG dalam hubungan regulation–liquidity belum dipisahkan secara memadai; dan peran leverage sebagai moderator belum diuji secara formal.	Regulatory enforcement yang lebih ketat menurunkan current ratio. Governance memberikan indirect effect positif, social responsibility memberikan indirect effect negatif, sedangkan environmental dimension tidak signifikan. Financial leverage memoderasi hubungan regulation–liquidity secara non-monotonik.

Source: Authors' own compilation from the reviewed literature.

4.2 Discussion

The bibliometric analysis reveals that research on Environmental, Social and Governance (ESG), Business Risk, and Corporate Leverage is increasingly connected to corporate finance rather than being confined to sustainability reporting. The VOSviewer density and network maps show ESG as a central keyword linked with corporate governance, financial performance, financing constraints, cost of capital, leverage, information asymmetry, and sustainability reporting, while the temporal map indicates more recent connections with digital transformation, artificial intelligence, financing constraints, and cost of capital. This pattern suggests that the research field is moving toward examining ESG as a factor associated with financial decision making and financing conditions. At the same time, the relatively limited visibility of the exact term Business Risk in the bibliometric maps is important because it indicates that research on operating uncertainty is more dispersed across terms such as operating risk, uncertainty, risk management, and financial constraints. Therefore, the bibliometric evidence identifies a structural characteristic of the literature: ESG has developed as a relatively interconnected research domain, whereas the Business Risk dimension remains less consolidated within the ESG and corporate leverage literature.

The Systematic Literature Review (SLR) provides a more substantive explanation of the relationships suggested by the bibliometric structure by examining the mechanisms, measurements, theoretical perspectives, and empirical findings reported in the selected studies. The 15 studies summarized in the review demonstrate that ESG is examined through multiple corporate financial and organizational channels, including real earnings management, financing constraints, tax avoidance, sustainability reporting, green transformation, default risk, executive compensation, leverage, liquidity risk, and corporate financing. Importantly, the evidence does not support treating ESG as having a uniform effect across all corporate outcomes. Several studies report relationships involving lower real earnings

management, tax avoidance, default risk, and stock price crash risk, but the strength or direction of relationships varies with digital finance, financing constraints, ownership structure, industry competition, governance, regulatory intensity, managerial characteristics, and institutional conditions. The review also identifies substantial measurement heterogeneity, particularly in ESG measurement, Business Risk proxies, and Corporate Leverage measures, which can contribute to differences across empirical findings. Thus, the SLR moves beyond identifying what topics are connected to ESG and shows that the observed relationships depend substantially on the mechanism and context through which ESG and operating uncertainty affect corporate financial decisions.

Taken together, the bibliometric analysis and SLR produce a more specific research structure rather than merely confirming that ESG, Business Risk, and Corporate Leverage are related topics. The bibliometric results identify the intellectual and thematic proximity between ESG and financing concepts, while the SLR clarifies that this proximity can be interpreted through at least two conceptually different channels. The first is an ESG related information, governance, and financing channel, in which ESG may affect information asymmetry, governance quality, perceived risk, financing constraints, and financing costs. The second is a Business Risk channel, in which operating uncertainty can affect cash flow stability, expected financial distress costs, debt capacity, and the firm's willingness to accept fixed financial commitments. These two channels should not be merged because ESG represents organizational practices, structures, and disclosed attributes, whereas Business Risk represents uncertainty arising from operating activities, with Corporate Leverage representing the observable financing position. Consequently, the combined findings generate a finance oriented framework in which ESG and Business Risk can be examined as distinct explanatory constructs of Corporate Leverage. More importantly, the review shows that the existing literature has not yet fully integrated these two channels within a common empirical framework, particularly with consistent measurement and identification strategies.

For future research, the evidence supports moving from broad examinations of ESG and financial outcomes toward an integrated empirical investigation of how ESG and Business Risk independently and jointly relate to Corporate Leverage. Such research should first preserve the conceptual distinction between Business Risk and Financial Risk and between Corporate Leverage and the broader concept of Capital Structure, because the reviewed literature indicates that these constructs are sometimes operationalized through different and potentially non comparable measures. Second, future studies could explicitly separate overall ESG scores from the individual Environmental, Social, and Governance dimensions and examine whether their relationships with leverage differ, while measuring Business Risk through operating uncertainty indicators such as sales volatility, EBIT volatility, coefficient of variation, or operating leverage. Third, the empirical model should test mechanisms that are repeatedly identified in the reviewed studies, particularly financing constraints, cost of capital, information asymmetry, and governance, rather than assuming a direct ESG to leverage relationship. Fourth, because the SLR identifies heterogeneity across ownership structures, industries, firm characteristics, and institutional environments, future research should incorporate these factors as moderators or conduct appropriately designed subgroup analyses. Finally, panel data and stronger identification strategies would be particularly useful because the current evidence contains substantial contextual and measurement

variation, making it difficult to determine whether observed associations reflect ESG itself, operating risk, financing conditions, or other firm and institutional characteristics. This direction is directly grounded in the gaps identified by the review and would allow future research to test the proposed ESG and Business Risk financing channels more rigorously rather than simply expanding the number of studies examining their separate associations with corporate outcomes.

5. Conclusions and recommendations

This study concludes that the literature on Environmental, Social and Governance (ESG), Business Risk, and Corporate Leverage has increasingly developed toward an integrated corporate finance perspective, although these three constructs remain insufficiently synthesized within a common analytical framework. The bibliometric analysis demonstrates that ESG occupies a central position in a research network associated with corporate governance, financial performance, financing constraints, cost of capital, leverage, and information asymmetry, while Business Risk appears less consolidated and is represented through broader concepts such as operating uncertainty and risk management. The Systematic Literature Review further indicates that ESG is associated with corporate financial behavior through multiple mechanisms, including information asymmetry, financing constraints, governance, financial policy, regulatory conditions, and managerial characteristics, while Business Risk operates primarily through operating uncertainty, cash flow stability, debt capacity, and the ability to accommodate fixed financial commitments. Accordingly, the main contribution of this review is the identification of two complementary but conceptually distinct pathways linking corporate characteristics to Corporate Leverage, namely an ESG-related information, governance, and financing pathway and a Business Risk-related operating uncertainty and debt-capacity pathway. Nevertheless, the findings should be interpreted in light of several limitations. The bibliometric analysis is based on the available VOSviewer visualizations and therefore does not provide sufficient evidence to establish precise publication growth, citation performance, or statistical differences across bibliometric indicators, while the SLR is based on a relatively limited set of 15 selected studies and consequently cannot be interpreted as exhaustive evidence of the entire literature. In addition, substantial heterogeneity exists in the measurement of ESG, Business Risk, and Corporate Leverage, as well as in countries, industries, ownership structures, institutional environments, and empirical methods, which limits direct comparability across studies. Future research should therefore develop a more systematic empirical framework that simultaneously examines ESG and Business Risk as distinct determinants of Corporate Leverage, employs consistent and clearly justified measures, separates the individual E, S, and G dimensions where appropriate, and explicitly tests mechanisms such as financing constraints, information asymmetry, cost of capital, and corporate governance. Longitudinal panel data and stronger causal identification strategies would also be valuable for distinguishing genuine relationships from contextual associations, while cross-country, industry, ownership, and institutional comparisons could further clarify the conditions under which these relationships vary. In this respect, the present review provides a structured basis for advancing the literature from fragmented associations toward more

mechanism-oriented and empirically testable explanations of how ESG and operating uncertainty are incorporated into corporate financing decisions.

Declarations

Author Contribution

D.S. conceived and designed the study, conducted the bibliometric analysis using VOSviewer and the systematic literature review, prepared Figures 1–3 and all tables, and wrote the main manuscript text. N. supervised the research, contributed to the conceptual framework and research methodology, and critically reviewed and revised the manuscript. D.P.J. contributed to the literature search and screening, data extraction, and reference compilation, and reviewed the manuscript. All authors read and approved the final manuscript.

Acknowledgement

The authors would like to express their appreciation to the Doctoral Scholarship Program for Indonesian Lecturers, Center for Higher Education Funding and Assessment, and Ministry of Higher Education, Science and Technology of Republic Indonesia for their continuous support and assistance during the completion of this research. Their support has been invaluable in facilitating the successful accomplishment of this study.

References

1. Adeneye, Y., & Kammoun, I. (2022). Capital structure and speed of adjustment: the impact of environmental, social and governance (ESG) performance. *Sustainability Accounting, Management and Policy Journal*. <https://doi.org/10.1108/sampj-01-2022-0060>
2. Aleknevičienė, V., & Valkauskaitė, A. (2026). Does the choice of capital structure depend on business risk? Evidence from Lithuanian family farms. *Journal of Baltic Studies*, 57, 573–594. <https://doi.org/10.1080/01629778.2026.2621696>
3. Bagh, T., Hunjra, A. I., Guo, Y., & Bouri, E. (2024). Corporate capital structure in BRICS economies: An integrated analysis of ESG, firm, industry, and macroeconomic determinants. *International Journal of Finance & Economics*. <https://doi.org/10.1002/ijfe.3036>
4. Bhatti, A. Q., Ling, S., & Ming, W. P. (2026). Environmental, Social, and Governance Performance and Corporate Leverage: Evidence from G20 Countries. *Journal of Political Stability Archive*. <https://doi.org/10.63468/jpsa.4.3.43>
5. Bilyay-Erdogan, S. (2022). Corporate ESG engagement and information asymmetry: the moderating role of country-level institutional differences. *Journal of Sustainable Finance & Investment*, 16, 804–840. <https://doi.org/10.1080/20430795.2022.2128710>

6. Cortez, M. A. A. (2025). Determinants of Corporate Capital Structure and the Emerging Role of Intangibles and Innovation: The Case of Japanese Corporations¹. *DLSU Business & Economics Review*. <https://doi.org/10.59588/2243-786x.1144>
7. Esther, O., Opuodho, G., & Ochieng', L. (2026). OPERATING LEVERAGE AND FINANCIAL PERFORMANCE OF LISTED MANUFACTURING FIRMS IN KENYA. *International Journal of Accounting, Management, Economics and Social Sciences (IJAMESC)*. <https://doi.org/10.61990/ijamesc.v4i2.729>
8. Farah, F. A. M., & F. (2022). Effect of Financial Performance and Business Risk on Capital Structure. *Journal of Applied Management and Business (JAMB)*. <https://doi.org/10.37802/jamb.v3i2.269>
9. Feng, Z., & Wu, Z. (2021). ESG Disclosure, REIT Debt Financing and Firm Value. *The Journal of Real Estate Finance and Economics*, 1–35. <https://doi.org/10.1007/s11146-021-09857-x>
10. Gallucci, C., Santulli, R., & Tipaldi, R. (2025). ESG Disclosure and Access to Credit: A Configurational Analysis of European Listed Firms. *Business Strategy and the Environment*. <https://doi.org/10.1002/bse.4274>
11. Gao, C., & Tsusaka, T. (2023). Economic Uncertainty and Firms' Capital Structure: Evidence from China. *Risks*. <https://doi.org/10.3390/risks11040066>
12. Hamad, S. (2025). Debt versus Equity in Corporate Financing: Distinction and Resemblance Between Agency Theory and Market Timing Theory in Capital Structure Decisions. *European Scientific Journal, ESJ*. <https://doi.org/10.19044/esj.2025.v21n13p93>
13. Harper, A., Lu, Y., & Tembhurne, S. (2025). Firm Policies and Uncertainty About Risk. *Journal of Risk and Financial Management*. <https://doi.org/10.3390/jrfm18020096>
14. Huang, Q.-Y., Zhang, Y., Li, X., Mu, X., & Wang, M. (2025). Unmasking Isomorphic Behaviors in Corporate Sustainability: Evidence From ESG Disclosure and Practices in Emerging Markets. *Corporate Social Responsibility and Environmental Management*. <https://doi.org/10.1002/csr.3202>
15. Huang, Y.-J., Bai, F.-P., Shang, M., & Ahmad, M. (2023). On the fast track: the benefits of ESG performance on the commercial credit financing. *Environmental Science and Pollution Research*, 30, 83961–83974. <https://doi.org/10.1007/s11356-023-28172-x>
16. Hutaaruk, F. N. (2026). The Role of Business Risk in the Capital Structure of Islamic Commercial Banks with Company Size as a Moderating Variable. *Indonesian Economic Review*. <https://doi.org/10.53787/iconv.v6i1.82>
17. Jiang, K., Zhang, J., Zhou, M., & Chen, Z. (2025). ESG disagreement and corporate debt maturity: evidence from China. *Financial Innovation*, 11. <https://doi.org/10.1186/s40854-024-00724-1>
18. Karim, H. (2026). Capital Structure Decisions from Optimal Leverage to Financial Flexibility. *International Journal of Advanced Multidisciplinary Research and Studies*. <https://doi.org/10.62225/2583049x.2026.6.4.6668>
19. Kim, S., & Li, Z. F. (2021). Understanding the Impact of ESG Practices in Corporate Finance. *Sustainability*. <https://doi.org/10.3390/su13073746>
20. Li, L., Suhrab, M., Radulescu, M., & Banuta, M. (2025). Moving Toward Sustainable Finance: Leveraging Environment, Social and Governance (ESG) Performance and Risk Management to Drive

- Corporate Financing Efficiency. *Engineering Economics*. <https://doi.org/10.5755/j01.ee.36.1.36361>
21. Li, S., & Liu, C. (2025). Corporate strategic greenwashing under ESG disclosure uncertainty: Financing incentives and nonlinear effects.. *Journal of environmental management*, 394, 127473. <https://doi.org/10.1016/j.jenvman.2025.127473>
 22. Liao, Y., Marquez, R., Cheng, Z., & Li, Y. (2025). Can ESG Performance Sustainably Reduce Corporate Financing Constraints Based on Sustainability Value Proposition?. *Sustainability*. <https://doi.org/10.3390/su17177758>
 23. Liu, R., Li, J., & Wu, M. (2025). The Impact of Climate Change Risk on Corporate Debt Financing Capacity: A Moderating Perspective Based on Carbon Emissions. *Sustainability*. <https://doi.org/10.3390/su17146276>
 24. Lumbantobing, C. R., Iriyadi, I., Puspitasari, R., Tullah, D. S., & Febrian, J. (2025). FINANCIAL RISK: THE INTERPLAY OF LEVERAGE, INTANGIBLES, AND EARNINGS MANAGEMENT. *Riset*. <https://doi.org/10.37641/riset.v7i2.2623>
 25. Madyan, M., & Widuri, S. (2023). Environmental, Social, Governance (ESG) Performance and Capital Structure: The Role of Good Corporate Governance. *Jurnal Manajemen Teori dan Terapan| Journal of Theory and Applied Management*. <https://doi.org/10.20473/jmtt.v16i3.47483>
 26. Martiny, A., Testa, F., Tagliatela, J., & Iraldo, F. (2024). Determinants of Environmental Social and Governance (ESG) Performance: A Systematic Literature Review. *Journal of Cleaner Production*. <https://doi.org/10.1016/j.jclepro.2024.142213>
 27. Newton, D. P., Ongena, S., Xie, R., & Zhao, B.-R. (2023). Firm ESG reputation risk and debt choice. *European Financial Management*. <https://doi.org/10.1111/eufm.12468>
 28. Pinto, I., & Gaio, C. (2025). ESG Performance and Information Asymmetry: The Moderating Role of Ownership Concentration. *Corporate Social Responsibility and Environmental Management*. <https://doi.org/10.1002/csr.3260>
 29. R, A., & P, R. (2026). A Study on Debt Vs. Equity: A Comparative Analysis of Capital Structure In High-Growth Firms Vs. Stable Firms.. *International Scientific Journal of Engineering and Management*. <https://doi.org/10.55041/isjem08420>
 30. Raimo, N., Caragnano, A., Zito, M., Vitolla, F., & Mariani, M. (2021). Extending the benefits of ESG disclosure: The effect on the cost of debt financing. *Corporate Social Responsibility and Environmental Management*. <https://doi.org/10.1002/csr.2134>
 31. Rao, M. P., & Kumar, K. S. (2026). The Dynamics of Debt-Equity Mix and Financial Outcomes: A Comprehensive Study of Indian listed firms. *International Scientific Journal of Engineering and Management*. <https://doi.org/10.55041/isjem08021>
 32. Sanoran, K. (2026). Differential effects of ESG dimensions on firm leverage and capital structure amid COVID-19: moderating role of firm size. *Corporate Governance: The International Journal of Business in Society*. <https://doi.org/10.1108/cg-04-2025-0234>
 33. Shan, M., & Zhu, J. (2024). Do ESG ratings inhibit corporate leverage manipulation? The moderating effects of internal and external supervision. *Sustainability Accounting, Management and Policy*

Journal. <https://doi.org/10.1108/sampj-08-2023-0542>

34. Singhania, M., & Saini, N. (2021). Institutional framework of ESG disclosures: comparative analysis of developed and developing countries. *Journal of Sustainable Finance & Investment*, 13, 516–559. <https://doi.org/10.1080/20430795.2021.1964810>
35. Sugianto, N., Riandy, C. N., Zainavy, S. F., & Hartikasari, A. (2022). The Contribution of Environmental, Social, and Governance (ESG) Disclosure to Reduce Investor Asymmetry Information. *Proceedings Series on Social Sciences & Humanities*. <https://doi.org/10.30595/pssh.v7i.472>
36. Tawfiq, T., Tawaha, H., Tahtamouni, A., & Almasria, N. (2024). The Influence of Environmental, Social, and Governance Disclosure on Capital Structure: An Investigation of Leverage and WACC. *Journal of Risk and Financial Management*. <https://doi.org/10.3390/jrfm17120570>
37. Tian, Y., Lai, E., Fu, Y., & Li, Y. (2025). Exploring the Impacts of ESG Disclosure on Corporate Financing Constraints: A Perspective of Classifying Corporate Carbon Emissions. *Corporate Social Responsibility and Environmental Management*. <https://doi.org/10.1002/csr.70097>
38. Wagiyu, W., & Setiawan, H. (2021). BUSINESS RISK ANALYSIS IN ARI WIBOWO'S CENTRAL TILE INDUSTRY IN LOHJINAWI VILLAGE, PRINGSEWU REGENCY IN 2018–2020. *Riset*. <https://doi.org/10.37641/riset.v3i2.99>
39. Wang, X.-Z. (2025). ESG Performance and Corporate Performance in China's Manufacturing Firms: The Roles of Trade Credit Financing and Environmental Information Disclosure Quality. *Sustainability*. <https://doi.org/10.3390/su17219567>
40. Xiao, S. (2025). The Role of ESG Information Disclosure in Reducing Information Asymmetry and Alleviating Financing Difficulties for SMEs in Developing Countries. *Advances in Economics and Management Research*. <https://doi.org/10.56028/aemr.15.1.908.2025>
41. Yang, X.-H., Yang, T., Lv, J., & Luo, S. (2024). The Impact of ESG on Excessive Corporate Debt. *Sustainability*. <https://doi.org/10.3390/su16166920>
42. Yanti, Y., Sastra, E., & Kurniawan, T. B. (2022). The Impact of Financial Flexibility and Business Risk on Capital Structure with Firm Size as a Moderating Variable. *Proceedings of the tenth International Conference on Entrepreneurship and Business Management 2021 (ICEBM 2021)*. <https://doi.org/10.2991/aebmr.k.220501.048>
43. Yu, Z. (2023). Can corporate ESG performance ease financing constraints. *Highlights in Business, Economics and Management*. <https://doi.org/10.54097/hbem.v16i.10671>
44. Zahid, R. A. M., Saleem, A., & Maqsood, U. (2023). ESG performance, capital financing decisions, and audit quality: empirical evidence from Chinese state-owned enterprises. *Environmental Science and Pollution Research International*, 30, 44086–44099. <https://doi.org/10.1007/s11356-023-25345-6>
45. Zhai, Y., Cai, Z., Lin, H., Yuan, M., Mao, Y., & Yu, M. (2022). Does better environmental, social, and governance induce better corporate green innovation: The mediating role of financing constraints. *Corporate Social Responsibility and Environmental Management*. <https://doi.org/10.1002/csr.2288>
46. Zhao, Y., & Ayoup, H. (2025). ESG, Climate Risk, and Debt Management—Evidence from Chinese Listed Companies. *International Journal of Financial Studies*. <https://doi.org/10.3390/ijfs13030118>

47. Zheng, L.-S. (2026). Digital Disclosure of ESG Information, FinTech Supervision and Corporate Financing Costs. Scientific Journal of Economics and Management Research.
<https://doi.org/10.54691/s6nvvr56>

Figures



Figure 1

Density visualization of the supplied VOSviewer keyword landscape

Source: Authors’ own elaboration using VOSviewer.

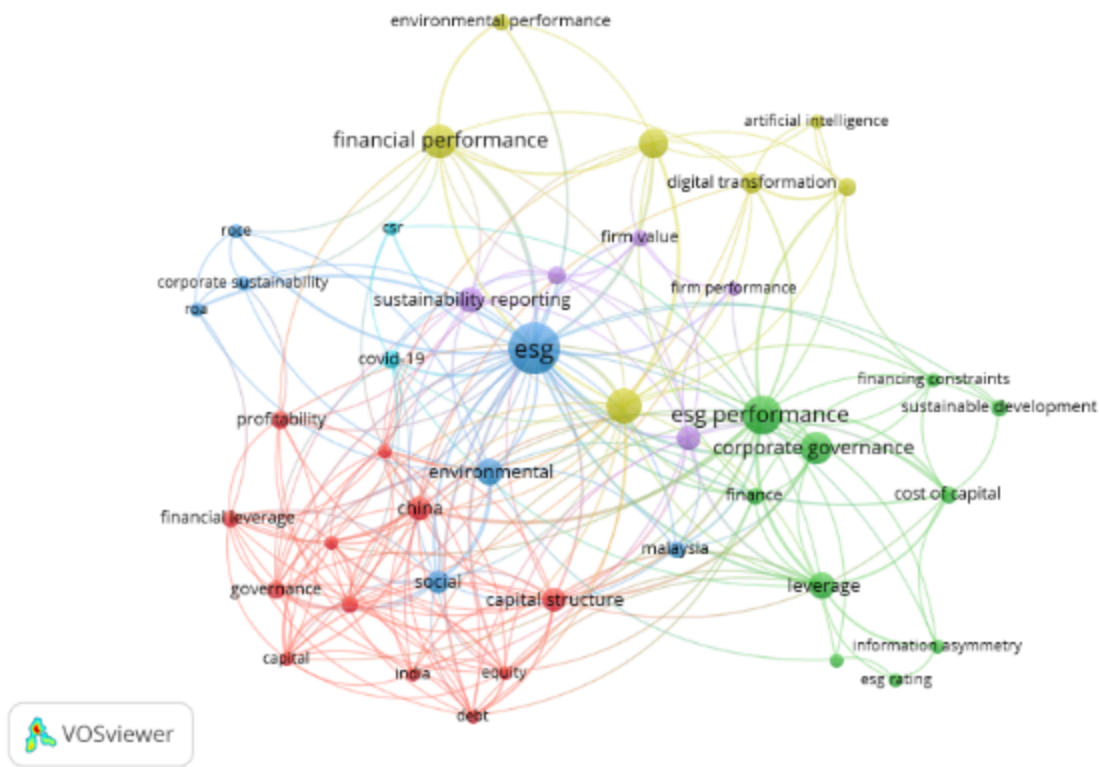


Figure 3

Network visualization of the supplied VOSviewer keyword relationships

Source: Authors' own elaboration using VOSviewer.