

## ESG Signals and Capital Market Responses : A Bibliometric Review of Global Research Trends and Future Research Agenda

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### ABSTRACT

This study examines the global research landscape on ESG signals and capital market responses through a bibliometric analysis of publications indexed in the Scopus database. Using VOSviewer as the primary analytical tool, the study constructs and interprets keyword co-occurrence networks to identify dominant research themes, thematic clusters, temporal evolution patterns, and research density distributions in this field. The analysis reveals that the literature is anchored around ESG, sustainability, and capital market, with ESG disclosure, ESG performance, and ESG rating functioning as key mediating constructs linking corporate environmental, social, and governance signals to market valuation outcomes. The findings show that the field has expanded from early disclosure-oriented research toward themes of green bonds, greenwashing, ESG rating disagreement, and firm value, with China increasingly representing the dominant empirical setting. Overlay visualization indicates that ESG rating disagreement, financing constraints, and corporate social responsibility are among the most recently active themes, while density analysis confirms ESG, sustainability, capital market, and ESG performance as the most intensively studied constructs. These findings provide a comprehensive map of the field and identify promising directions for future research on ESG signaling and capital market behavior.

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## **A. INTRODUCTION**

Environmental, social, and governance (ESG) information has become a central signaling mechanism through which firms communicate their sustainability commitments to capital market participants, shaping how investors price risk, allocate capital, and form expectations about long-term firm value (Arévalo et al., 2024). As ESG ratings, disclosures, and controversies increasingly mediate the relationship between corporate non-financial performance and market outcomes, the literature has expanded rapidly across accounting, finance, and management disciplines, examining how ESG signals translate into stock returns, liquidity, cost of capital, and firm valuation (Mervelskemper & Streit, 2017).

The growing scholarly interest in this phenomenon has produced a heterogeneous body of literature spanning mandatory disclosure regulation, voluntary reporting practices, and rating-based signaling. Early research concentrated on the determinants and consequences of ESG disclosure (Arayssi et al., 2020), while more recent studies have extended the field toward ESG rating disagreement and its capital market consequences (J. Wang et al., 2024) greenwashing detection and deterrence (Li et al., 2024) and the role of green bonds as a sustainable financing instrument . Parallel streams of research examine how ESG performance affects stock price synchronicity, liquidity, and crash risk, reflecting growing concern about the information content embedded in ESG signals (Hu et al., 2023).

As this literature expands across regulatory regimes and geographic contexts, it becomes increasingly difficult for researchers to maintain a structured understanding of the field's intellectual trajectory and emerging directions. This is especially true for research situated in emerging capital markets, where ESG signaling operates under distinct institutional, regulatory, and ownership conditions, as reflected in studies from China (Zhang et al., 2022), (Tang & Yang, 2024), the Gulf Cooperation Council (Arayssi et al., 2020), and Latin America (Arévalo et al., 2024). Without a systematic overview, scholars risk duplicating prior efforts or overlooking significant thematic gaps in this fast moving field.

Bibliometric analysis offers a robust quantitative framework for examining the intellectual evolution of a research field by analyzing patterns in publication volume, citation structures, and keyword co-occurrence (Tsang et al., 2023). Applied to ESG signals and capital market responses, bibliometric techniques can reveal how the field has evolved conceptually, which financial outcomes and market mechanisms have gained prominence, and how the intersection with rating disagreement, greenwashing, and green finance is reshaping scholarly priorities.

Despite the breadth of existing literature, comprehensive bibliometric investigations that map the global intellectual structure of ESG signaling and capital market research, with explicit attention to emerging markets, remain limited. The present study addresses this gap by conducting a bibliometric analysis of Scopus-indexed publications on ESG signals and capital market responses. VOSviewer is employed to generate network, overlay, and density visualizations that together provide a multi-dimensional view of the field's intellectual structure, its temporal evolution, and its most influential publications.

## **B. RESEARCH METHOD**

This study adopts a bibliometric methodology to systematically examine the global research landscape of ESG signals and capital market responses from 2009 to 2026. Bibliometric analysis is a well-established quantitative approach that enables researchers to evaluate the scientific output and intellectual structure of a research field by analyzing patterns in publication volumes, citation relationships, and keyword co-occurrence networks. This methodological framework is particularly suited to the objectives of the present study, as it allows for the systematic mapping of a large and diverse body of ESG and capital-market literature in an objective and reproducible manner, without the subjectivity inherent in traditional narrative reviews. The methodological design of this study encompasses three primary stages: data collection, data preparation, and bibliometric visualization and analysis.



Figure 1 presents the keyword co-occurrence network generated from the bibliometric analysis of ESG signals and capital market responses research. The network displays an interconnected knowledge structure organized into four distinct thematic clusters, each differentiated by color. Node size reflects keyword occurrence frequency, while edge thickness represents the strength of co-occurrence relationships between keyword pairs. The visualization reveals a field with a clearly defined conceptual core surrounded by multiple thematic domains, reflecting the cross-disciplinary reach of ESG and financial market research.

At the center of the network, ESG and sustainability occupy the most prominent positions, functioning as the primary conceptual anchors around which other themes are organized. The green cluster encompassing ESG, sustainability, corporate governance, greenwashing, ESG ratings, green bonds, green finance, sustainable finance, and sustainable development goals represents the disclosure and governance dimension of ESG signaling, capturing research on how rating quality, board composition, and reporting transparency shape investor perceptions (Arayssi et al., 2020), (Krueger et al., 2024). The blue cluster comprising financial markets, sustainable development, commerce, electronic trading, and performance reflects a substantial research stream connecting sustainability practice to broader market infrastructure and trading behavior.

The red cluster, encompassing ESG performance, capital market, ESG disclosure, China, financing constraints, and risk assessment, indicates a robust research stream examining the direct financial market consequences of ESG signals, including stock liquidity, financing access, and risk pricing in the Chinese capital market (K. Wang et al., 2023), (Tang & Yang, 2024). The yellow cluster linking environmental, corporate sustainability, firm value, and financial performance to corporate social responsibility reflects research connecting ESG activity directly to valuation outcomes (Feng & Wu, 2023). Finally, the close interconnection between ESG rating disagreement, esg rating, and esg rating divergence across the green and red clusters captures an emerging research stream investigating how inconsistent ESG assessments distort the information content of ESG signals reaching capital markets (Y. Wang et al., 2024), (Wang et al., 2024), (Liu et al., 2024).

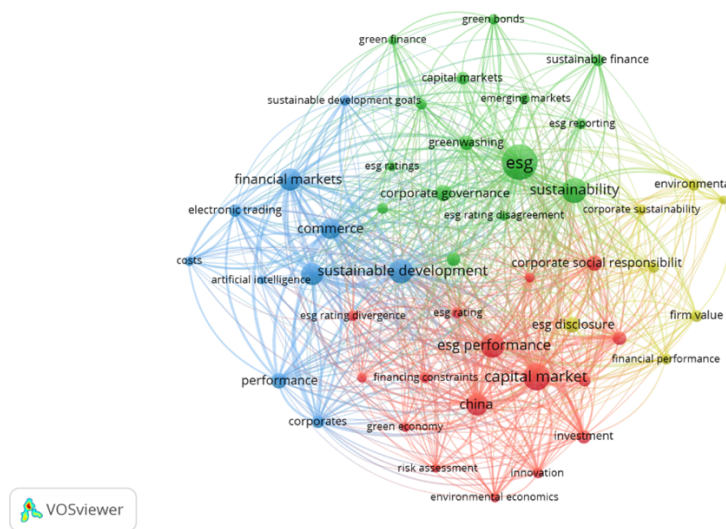


Figure 2. Overlay Visualization  
Source: Data Analysis

Figure 2 presents the overlay visualization of the keyword co-occurrence network, where node color reflects the average publication year of articles associated with each keyword. Darker blue-purple tones indicate keywords predominantly active in earlier years of the study period (around 2023 and before),

while greener and yellow tones signal more recently active research themes (2024–2025). This temporal mapping reveals how scholarly attention has shifted over the course of the study period.

Keywords rendered in darker blue-purple tones, including capital markets, electronic trading, investment, and corporate governance, reflect earlier research areas associated with foundational studies on disclosure regulation and governance mechanisms (Arayssi et al., 2020). In contrast, keywords displayed in lighter green and yellow tones, including ESG rating disagreement, financing constraints, costs, and corporate social responsibility, signal more recently active research themes. This pattern indicates that research connecting inconsistent ESG assessment with financing frictions and market response has experienced significant growth in the most recent years of the study period (J. Wang et al., 2024). The overlay visualization confirms that ESG and capital market research is undergoing a meaningful thematic shift, with rating-credibility and financing-access perspectives gaining prominence alongside the field's established disclosure and governance foundations.

The transitional, mid-spectrum (teal-green) nodes occupying the center of the overlay map, including ESG, sustainability, ESG performance, and capital market, indicate that the field's core constructs have remained continuously active across the entire study period rather than belonging to a single temporal phase. This persistence suggests that while peripheral themes have shifted markedly toward rating disagreement and financing constraints, the foundational vocabulary linking ESG signals, disclosure, and capital market outcomes continues to be reproduced and reinterpreted by newer studies (Hu et al., 2023), (Tang & Yang, 2024). The simultaneous presence of long-standing core themes and rapidly emerging peripheral themes indicates a maturing field that is consolidating its theoretical foundations while actively incorporating new financial and informational concerns, including rating credibility and green economic growth in emerging-market contexts (Huang, 2024).

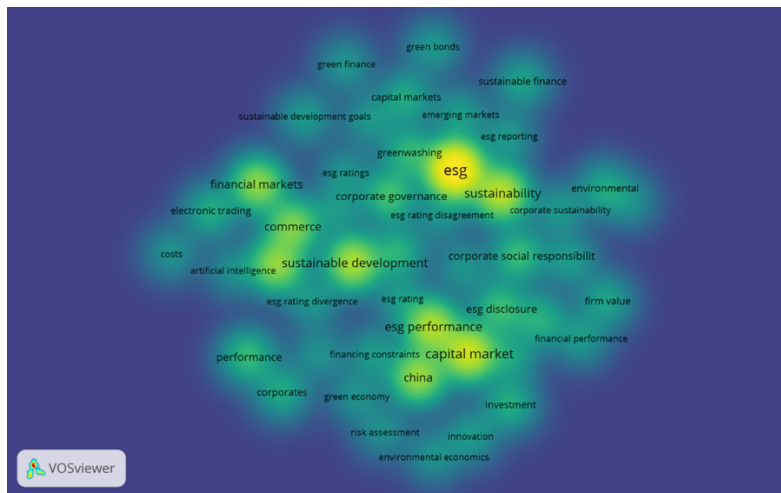


Figure 3. Density Visualization  
Source: Data Analysis

Figure 3 presents the density visualization of the keyword co-occurrence network, in which bright yellow regions indicate high co-occurrence concentration and research intensity, while green and blue areas reflect progressively lower research density. The highest density regions are concentrated around ESG, esg performance, capital market, and sustainable development, confirming their status as the dominant organizing constructs of the field and the strong interconnectedness between ESG signaling, financial performance, and market behavior (Feng & Wu, 2023).

Moderate density areas surround corporate social responsibility, ESG disclosure, china, and corporate governance, representing well-developed but secondary research areas that attract substantial scholarly attention without reaching the concentration levels of the innermost core (Tang & Yang, 2024).

The peripheral regions of the density map, encompassing terms such as firm value, financial performance, esg rating, and esg rating divergence, suggest that while these areas are active, they represent frontier zones with significant potential for further scholarly development, particularly regarding rating-quality and valuation-channel mechanisms (Liu et al., 2024).

The relatively isolated, low-density nodes such as environmental economics, innovation, and risk assessment indicate niche but conceptually important sub-themes that have not yet been fully integrated into the field's dominant research clusters. Their separation from the high-density core suggests that connections between ESG signaling and emerging concerns such as innovation outcomes, biodiversity risk, and systemic risk assessment remain underexplored relative to more established themes (Bassen et al., 2024). This pattern points to a promising avenue for future research, as strengthening the linkage between these peripheral constructs and the field's central themes of ESG, capital market, and esg performance could generate more integrated theoretical models of how ESG signals are transmitted into market pricing and risk assessment.

**Citation Analysis**

Table 1. Most Cited Article

<b>Citations</b>	<b>Author and Year</b>	<b>Title</b>	<b>Publication</b>
626	(Tsang et al., 2023)	Environmental, Social, and Governance (ESG) disclosure: A literature review	British Accounting Review
430	(Arayssi et al., 2020)	The impact of board composition on the level of ESG disclosures in GCC countries	Sustainability Accounting, Management and Policy Journal
331	(Krueger et al., 2024)	The Effects of Mandatory ESG Disclosure Around the World	Journal of Accounting Research
285	(Mervelskemper & Streit, 2017)	Enhancing Market Valuation of ESG Performance: Is Integrated Reporting Keeping its Promise?	Business Strategy and the Environment
241	(Yu & Luu, 2021)	International variations in ESG disclosure – Do cross-listed companies care more?	International Review of Financial Analysis
189	(Minutolo et al., 2019)	Exploring environmental, social, and governance disclosure effects on the S&P 500 financial performance	Business Strategy and the Environment
187	(Saygili et al., 2022)	ESG practices and corporate financial performance: Evidence from Borsa Istanbul	Borsa Istanbul Review
147	(Feng & Wu, 2023)	ESG Disclosure, REIT Debt Financing and Firm Value	Journal of Real Estate Finance and Economics

129	(J. Wang et al., 2024)	ESG rating disagreement and stock returns: Evidence from China	International Review of Financial Analysis
124	(Al Amosh et al., 2023)	Environmental, social and governance impact on financial performance: evidence from the Levant countries	Corporate Governance (Bingley)

Source: Scopus, 2026

## Discussion

The findings of this bibliometric analysis offer a comprehensive portrait of the global intellectual landscape surrounding ESG signals and capital market responses. Taken together, the network, overlay, and density visualizations reveal a field that is theoretically anchored in the disclosure-governance foundations established by (Tsang et al., 2023) and (Arayssi et al., 2020), while simultaneously diversifying into rating-disagreement, greenwashing, and financing constraint research streams. The consistent prominence of ESG, sustainability, and capital market across all three visualization modes confirms that the field's core architecture remains centered on the transmission of ESG information into market valuation.

A particularly significant finding concerns the growing scholarly attention devoted to ESG rating disagreement as a determinant of capital market response. The overlay visualization demonstrates that this construct is among the most recently active in the dataset, signaling a meaningful shift in how scholars conceptualize the credibility dimension of ESG signaling (J. Wang et al., 2024). This trend suggests that researchers are increasingly moving beyond examining whether ESG performance predicts financial outcomes toward examining how inconsistent or noisy ESG signals distort information efficiency, particularly in emerging markets such as China (Liu et al., 2024), (Tang & Yang, 2024).

The density visualization further reinforces these observations by confirming that while the conceptual core of the field remains tightly organized around ESG, esg performance, and capital market, emerging thematic zones including financing constraints, greenwashing, and green bonds are gaining scholarly momentum (Huang, 2024). This reflects the field's increasing engagement with the mechanisms through which ESG signals are validated, contested, or exploited as firms respond strategically to investor and regulatory pressure.

The citation analysis adds an important dimension by identifying the specific contributions that have most significantly shaped the field's intellectual trajectory. The dominance of (Tsang et al., 2023) and (Krueger et al., 2024) in citation counts reflects continued reliance on regulatory and disclosure-quality frameworks for understanding ESG signaling. The appearance of Mervelskemper and (Mervelskemper & Streit, 2017) and (Minutolo et al., 2019) among the top cited works underscores the field's expansion from disclosure determinants toward integrated reporting and direct financial performance linkages. The cross-disciplinary reach of the field is also evident, with contributions from real estate finance (Feng & Wu, 2023), accounting (Krueger et al., 2024), and emerging-market finance (Zhang et al., 2022) appearing together, confirming that ESG and capital-market research has established a broad and diverse scholarly footprint.

Theoretically, the findings suggest that this research field stands at an important juncture. The convergence of established disclosure and governance frameworks with rating-disagreement, greenwashing, and green-financing perspectives creates significant opportunities for theoretical enrichment grounded in signaling theory. At the same time, this convergence raises important questions about the conceptual boundaries of ESG signal credibility, particularly as artificial intelligence-based monitoring, biodiversity risk, and analyst coverage increasingly mediate how ESG information reaches capital markets (Bassen et al.,

2024). Addressing these questions represents a timely agenda for future research, especially in under-represented emerging capital market contexts.

## **D. CONCLUSION**

This study concludes that research on ESG signals and capital market responses has developed into an active and increasingly diversified field within global accounting and finance scholarship. Based on a bibliometric analysis of 650 Scopus-indexed publications from 2009 to 2026, the findings show that the literature is strongly centered on the relationship between ESG, sustainability, capital market, ESG performance, and ESG disclosure. The keyword co-occurrence analysis confirms that ESG functions as the main intellectual anchor of the field, while related concepts such as sustainability, corporate governance, and capital market form the core theoretical foundation of the research landscape.

The results also indicate that the field has expanded beyond its original focus on disclosure determinants and regulatory compliance. Recent studies increasingly connect ESG signaling with rating disagreement, greenwashing detection, green bond financing, and financing constraints in emerging-market contexts. This shift demonstrates that current scholarship is no longer limited to examining whether ESG disclosure improves firm performance, but increasingly investigates how the credibility and consistency of ESG signals shape capital market pricing, liquidity, and risk.

The citation analysis further confirms the strong influence of foundational works by Tsang and Frost and Arayssi et al. on disclosure quality and governance, alongside the growing influence of valuation-oriented and China-focused empirical studies. Overall, this study provides a systematic map of the intellectual structure, dominant themes, and emerging directions in research on ESG signals and capital market responses. Future studies should give greater attention to the role of artificial intelligence in greenwashing detection, the credibility mechanisms underlying ESG rating disagreement, and the financing consequences of ESG signaling in emerging capital markets to provide a more nuanced understanding of how ESG-driven capital markets develop across diverse institutional contexts.

Beyond its theoretical contributions, this bibliometric mapping carries practical implications for regulators, rating agencies, and corporate practitioners navigating an increasingly signal-dense ESG environment. As capital markets continue to price ESG information into firm valuation, liquidity, and cost of capital, the persistent tension between disclosure volume and signal credibility identified throughout this analysis underscores the need for standardized rating methodologies and stronger assurance mechanisms to reduce informational noise. Methodologically, this study is not without limitations, as it relies exclusively on Scopus-indexed documents and keyword-based co-occurrence mapping, which may not fully capture grey literature, regional ESG disclosure standards, or nuanced qualitative insights from individual case studies. Future bibliometric work could therefore be complemented with systematic content analysis or meta-analytic techniques to validate the thematic clusters identified here, while longitudinal replications of this mapping exercise would help track how the field's center of gravity continues to shift as ESG regulation, rating infrastructure, and capital market responses co-evolve over the coming decade.

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