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TREND IN SUSTAINABLE FINANCE METRICS: A BIBLIOMETRIC LITERATURE REVIEW

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ABSTRACT

Purpose- This study aims to map the literature on sustainable finance and firm performance by conducting a bibliometric analysis of scholarly publications from 2000 to early 2025. It seeks to identify research trends, key contributors, and major thematic clusters in this rapidly growing field.

Methodology- We retrieved publications from the Scopus database using a comprehensive search query combining terms related to sustainable finance (e.g., “sustainable finance”, “ESG”, “green finance”) and firm performance (e.g., “financial performance”, “firm performance”). The final dataset comprised 1,751 documents after data cleaning. We performed descriptive analyses of publication counts by year, country, and journal, and identified the most highly cited works. For content analysis, we processed article titles using text-mining techniques (term frequency–inverse document frequency and Latent Dirichlet Allocation) to uncover key terms and thematic topics.

Findings- Research output in sustainable finance and firm performance has increased exponentially since the mid-2010s, reflecting major sustainability initiatives and broader ESG adoption in business. Leading contributors include China, India, and other emerging economies, alongside traditional research centers in Europe and North America. Key journals are Sustainability, Corporate Social Responsibility and Environmental Management, and Business Strategy and the Environment. Topic modeling revealed five major thematic clusters in the literature: (1) the effect of ESG performance on financial outcomes, (2) ESG investing and green finance and their impact on firm value, (3) bibliometric and review studies of sustainable finance trends, (4) corporate sustainability strategies and broad financial outcomes, and (5) analyses of individual ESG components and CSR dimensions. Topic prevalence analysis shows that themes focused on ESG impact and green finance have grown strongly in recent years, while review-oriented studies have expanded steadily.

Conclusion- The field has matured into a robust, data-driven discipline, and the collective evidence generally supports the view that sustainable practices align with better firm performance – firms often “do well by doing good.” However, these benefits are not automatic; they depend on factors such as implementation quality, strategic alignment, transparency, and context. This analysis provides an overview of dominant trends and gaps, guiding future research and informing stakeholders about the evolving relationship between sustainability and corporate success.

Keywords: Sustainable finance, ESG, corporate performance, bibliometric analysis, green finance
JEL Codes: M14, Q56, G30

1. INTRODUCTION

Sustainable finance is an evolving field that integrates environmental, social, and governance (ESG) principles into financial decision-making to promote long-term corporate responsibility and economic resilience. With increasing global awareness of climate risks, social inequality, and governance failures, investors and firms are under growing pressure to align profitability with sustainability goals (Clark et al., 2015; Fatemi et al., 2018). ESG frameworks have become widely adopted in investment practices, corporate governance codes, and regulatory mandates. Consequently, the academic community has intensified efforts to examine the relationship between sustainable finance and firm performance, addressing a central question: does sustainability enhance or hinder financial outcomes?

Over the past two decades, studies have attempted to empirically assess the business case for sustainability. While early research offered mixed results (Margolis & Walsh, 2003; Orlitzky et al., 2003), more recent meta-analyses suggest a broadly positive relationship between ESG performance and financial returns (Friede et al., 2015; Busch & Friede, 2018). However, contextual differences – such as firm size, industry, governance structure, and country-level regulation – complicate the interpretation of these findings (Wang et al., 2016; Ameer & Othman, 2012). Moreover, the growth of climate finance, ESG investing, green bonds, and sustainability reporting frameworks has expanded the boundaries of the field, demanding updated and comprehensive synthesis.Despite the rich and growing literature, a systematic bibliometric overview of research trends, geographic patterns, and thematic clusters in sustainable finance is still lacking. This study aims to address that gap by mapping the intellectual structure of the sustainable finance literature and identifying dominant research themes. Using bibliometric methods and topic modeling on a Scopus-based dataset spanning 2000–2025, the study provides new insights into how the field has evolved and where future research may be directed.

2. LITERATURE REVIEW

The relationship between sustainability and firm performance has been a prominent research topic since the early 2000s. Initial studies explored whether corporate social responsibility (CSR) enhances profitability, with meta-analyses by Orlitzky et al. (2003) and Margolis & Walsh (2003) showing moderately positive effects. Building on stakeholder theory (Freeman, 1984), these studies posited that firms investing in social and environmental responsibility can reduce risk, strengthen reputation, and improve long-term value creation.Subsequent reviews have broadened this scope. Friede et al. (2015) synthesized over 2,000 studies and concluded that approximately 90% report non-negative ESG–performance relationships. Similarly, Wang et al. (2016) emphasized the role of contextual moderators such as firm size and geographic region. Velte (2017) found strong ESG performance positively influenced accounting and market-based measures in German firms. More recent work by Duque Grisales & Aguilera-Caracuel (2021) highlighted the moderating effects of geographic diversification and financial slack on ESG performance outcomes.

Several scholars have shifted focus to ESG disclosure and transparency. Eccles et al. (2014) showed that firms with high sustainability disclosure practices outperform peers in stock returns and ROA. Chen & Xie (2022) argued that ESG disclosures can mitigate information asymmetry and attract long-term investors. Along similar lines, Fatemi et al. (2018) emphasized that the financial value of ESG practices is amplified when firms integrate these strategies into core decision-making and governance mechanisms.Research has also turned to the investment dimension of ESG. Sustainable investing, green bonds, and impact funds have become mainstream topics (Giese et al., 2019; Amel-Zadeh & Serafeim, 2018). Xie et al. (2019) showed that ESG investing improves risk-adjusted returns, particularly in emerging markets. Albuquerque et al. (2020) further demonstrated that firms with strong ESG performance show greater stock resilience during market downturns, suggesting that sustainability can serve as a buffer against systemic risk. Country-specific studies illustrate the role of regulation and institutional context. For instance, Kumar & Mukherjee (2019) analyzed the impact of India's CSR legislation on corporate behavior. Li et al. (2022) explored ESG integration in Chinese capital markets, while García-Sánchez et al. (2021) assessed how mandatory ESG disclosure affects firm valuation in Europe. These findings support the view that local governance environments mediate the ESG–performance relationship.Bibliometric and review studies have begun to map the field more formally. Busch & Friede (2018) conducted a structural review of ESG-finance literature, while Pätäri et al. (2021) applied bibliometric techniques to ESG investing. These studies underscore the need for data-driven syntheses as the field expands.

In summary, the literature indicates a generally positive – though heterogeneous – link between sustainability and firm performance. Theoretical perspectives such as stakeholder theory, resource-based view (Hart, 1995), and legitimacy theory provide frameworks for understanding why ESG may pay off. However, findings remain context-dependent, and emerging issues such as greenwashing, ESG ratings divergence, and data standardization require deeper investigation (Berg et al., 2022; Christensen et al., 2022). Our study builds on this foundation by offering a systematic, bibliometric analysis of research patterns, key themes, and geographic dynamics in the field of sustainable finance.

3. DATA AND METHODOLOGY

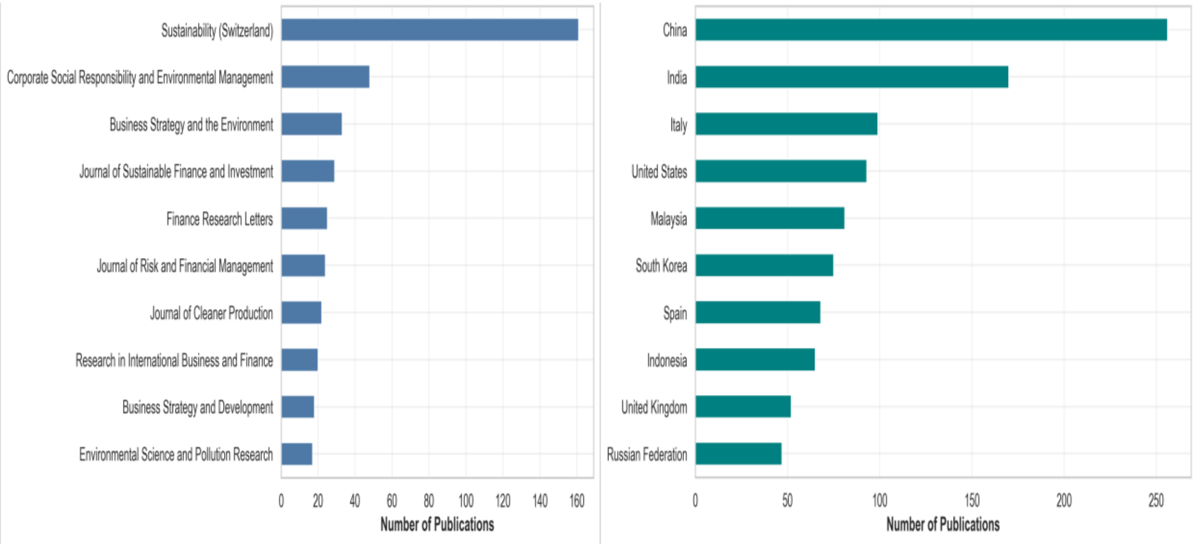
We applied a range of Python-based bibliometric and text mining techniques to analyze the dataset. We first conducted a descriptive bibliometric analysis to understand the publication patterns. This involved counting the number of publications per year, identifying the top contributing countries and top publishing journals, and listing the most highly cited papers in the dataset. These descriptive statistics set the stage for understanding how the field has expanded and who the major players are. To explore the research focus, we analyzed the titles of all publications as a proxy for core content. Abstracts were not readily available for all records, so we used titles, which are concise summaries of each work's topic. We preprocessed the title texts by lowercasing and removing punctuation, numeric characters, and common English stop words. Using this cleaned corpus of title words, we implemented a Term Frequency–Inverse Document Frequency (TF–IDF) analysis. TF–IDF scoring allows us to identify terms that are not just frequent, but also particularly evident or distinctive across the corpus. We computed TF–IDF scores for words in titles (limited to the top 100 terms by weight) and then summed the TF–IDF weights across all documents to find the overall highest-weighted keywords. In addition to single words, we also extracted common two- or three-word phrases from the titles. To do this, we used a CountVectorizer with an n-gram range of (2, 3). After filtering out stop words and limiting to the top 50 n-grams by frequency, we identified the most frequent phrases in the literature. This helps reveal prevalent research themes or constructs.

To uncover the underlying thematic structure of the literature, we employed Latent Dirichlet Allocation (LDA), a probabilistic topic modeling technique. We set up an LDA model with five topics, based on early testing and to maintain a balance between detail and interpretability, using the titles as input. Before applying LDA, we processed the text using a CountVectorizer to create a document-term matrix. It included 1- to 2-word phrases, removed common English stop words, and kept the top 1000 terms. We then used scikit-learn's LDA algorithm (with a fixed random seed for reproducibility) on this matrix, treating each title as a separate "document" of words. The result is a set of five latent topics, each represented by a distribution of terms. We examined the top 10 most probable terms for each topic to understand its main theme. Based on these terms, we gave each topic a simple, intuitive label. Since we only used titles, the topics are necessarily broad; however, even short texts like titles can still reveal meaningful topic groupings in bibliometric studies, because titles often encapsulate a paper's main ideas.We used the trained LDA model to assign each paper to a primary topic by identifying which topic had the highest probability for that title. This helped us explore how research themes have changed over time. We grouped papers by year to see temporal trends, and by country to identify regional differences. To ensure accuracy, we double-checked key results. However, there are some limits to our method. Our dataset only includes Scopus-indexed papers and is based on specific search terms, so we might have missed some relevant studies. Also, since we used only titles, some detailed topics may be omitted.

4. FINDINGS

Our descriptive analysis shows that research on sustainable finance and firm performance has surged in recent years. From only a few publications per year in the early 2000s, output began accelerating around 2016 and jumped dramatically after 2018. The dataset grew to 92 papers in 2021, then to 222 in 2022 and 592 in 2024. Early 2025 data already include over 300 papers. This exponential growth reflects the mainstreaming of ESG concerns and major global sustainability initiatives. Figure 1 show that top journals in this field and leading countries by publication count are China (256 papers), India (170), Italy (99), and the United States (93), followed by Malaysia, South Korea, Spain, and Indonesia. This distribution highlights strong contributions from emerging economies as well as established Western research centers.

Figure 1: Top ten academic journals and countries by number of publications on sustainable finance and firm performance.

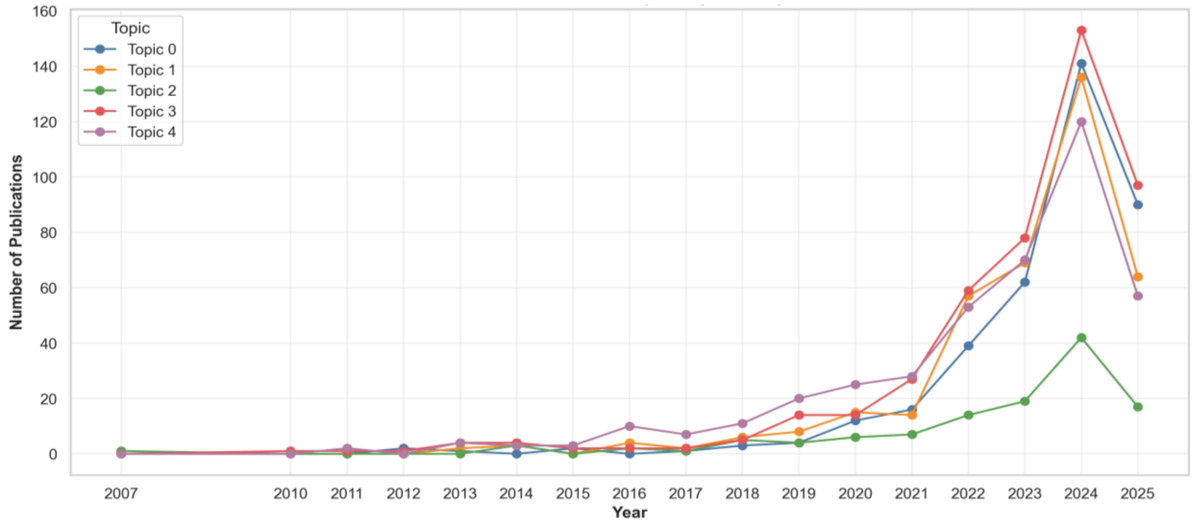


As Figure 2 shows content analysis of article titles highlights the dominant focus on ESG and firm outcomes. The most frequent terms are "ESG", "financial performance", "corporate", "sustainability", and related words such as "impact", "value", "risk", "disclosure", and "investment." Latent Dirichlet Allocation topic modeling revealed five main themes: (1) the effect of ESG performance on financial outcomes (often examining moderators or disclosure practices); (2) ESG investing, green finance, and firm value (often with a regional or industry focus); (3) reviews and bibliometric studies of sustainable finance; (4) corporate sustainability strategies and broad financial outcomes; and (5) analyses of individual ESG components and CSR aspects.

Figure 2: Word cloud of key terms in publication titles, weighted by TF–IDF.

Figure 3 show that tracking these themes over time shows notable trends. Topics 1 and 2 have grown markedly in recent years, reflecting rising interest in how sustainability actions translate into firm value under various conditions. Topic 3 (reviews and bibliometric studies) has steadily expanded, indicating a maturing field that increasingly supports integrative analyses. The core empirical link (Topic 4) remains consistently prominent. Topic 5 (individual ESG pillars and CSR) has declined slightly in relative share, possibly reflecting the shift from CSR terminology to the broader ESG framing. Overall, the results indicate a broad expansion across topics, with a growing emphasis on integrated and nuanced analyses while retaining the field's central focus on the ESG–performance relationship.

Figure 3: Trend in the number of publications per year for each of the five LDA derived topics



5. CONCLUSION

This study conducted a comprehensive bibliometric analysis of the sustainable finance and firm performance literature from 2000 to early 2025, encompassing 1,751 publications. The findings highlight a field that has grown exponentially in the past decade, moving from early debates on whether "it pays to be green" to more nuanced explorations of how sustainable finance contributes to corporate success. Key contributions of this study include: (1) documenting the publication boom and geographical diffusion of research (with notable leadership from China, India, and other emerging economies alongside Western countries); (2) mapping the topical structure of the field into five themes covering everything from ESG disclosure effects to green finance and CSR initiatives; (3) illustrating how the focus of research has shifted over time toward more integrative and analytical works; and (4) summarizing the influential literature that has shaped consensus views.

In summary, the collective evidence suggests that, more often than not, firms can "do well by doing good" – aligning with the positive link reported in major reviews (Orlitzky et al., 2003; Friede et al., 2015). However, the benefits of sustainable finance are not automatic; they depend on factors such as how sustainability is implemented (e.g., with transparency and strategic alignment) and the context in which a firm operates. As the world grapples with sustainability challenges, the role of academic research in guiding business and policy is crucial. The trajectory of this field – as captured through our bibliometric lens – is one of increasing relevance and sophistication, indicating that future research will continue to provide valuable insights into building a more sustainable and financially sound corporate world.

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