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MASTER
MASTERS' IN FINANCE

MASTER´S FINAL WORK
SYSTEMATIC LITERATURE REVIEW

GREEN FINANCE IN EMERGING MARKETS: A SYSTEMATIC LITERATURE REVIEW AND BIBLIOMETRIC ANALYSIS

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GLOSSARY

ABS - Academic Journal Guide (Association of Business Schools)

BRIC - Brazil, Russia, India, China

BRICS - Brazil, Russia, India, China, South Africa

CCPI - Climate Change Performance Index

CSR - Corporate Social Responsibility

DeFi - Decentralized Finance

EID - Environmental Information Disclosure

ER - Environmental Responsibility

ESG - Environmental, Social, and Governance

ETS - Emissions Trading Scheme

FDI - Foreign Direct Investment

GCP - Green Credit Policy

GI - Green Innovation

IPPF - Intellectual Property Pledge Financing

IT - Intelligent Transformation

M&A - Mergers and Acquisitions

R&D - Research and Development

SMEs - Small and Medium-sized Enterprises

SOEs - State-Owned Enterprises

TFP - Total Factor Productivity

TPB - Theory of Planned Behavior

WoS - Web of Science

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By Luca Brigham

ABSTRACT, KEYWORDS AND JEL CODES

This systematic literature review addresses the critical and complex role of green finance in emerging markets. While essential for transitioning to a low-carbon economy, these rapidly industrializing economies face significant challenges, including a multi-trillion-dollar green investment gap, limited ESG data transparency, perceived investment risks, and short-term investor behaviour. This study aims to synthesize the fragmented understanding of green finance in these environmentally and economically pivotal regions.

To achieve this, a comprehensive systematic literature review (SLR) and bibliometric analysis of peer-reviewed research were conducted. Adhering to a predefined protocol and the PRISMA framework, 64 eligible articles were identified from the Web of Science Core Collection. The methodology integrated qualitative content analysis with bibliometric mapping using VOSviewer 1.6.20, specifically employing bibliographic coupling to identify conceptual linkages and research trajectories.

KEYWORDS: Green finance; Emerging Markets; Systematic Literature Review; Bibliometric Analysis.

JEL CODES: G20, Q56, O16, G38, Q58, O44.

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TABLE OF CONTENTS

List of Figures

List of Tables

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This systematic literature review was developed with strict adherence to the academic integrity policies and guidelines set forth by ISEG, Universidade de Lisboa. The work presented herein is the result of my own research, analysis, and writing, unless otherwise cited. In the interest of transparency, I provide the following disclosure regarding the use of artificial intelligence (AI) tools in the creation of this thesis/internship report/project:

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OR

2. I disclose that AI tools were employed during the development of this thesis as follows:

- AI-based research tools were used to assist in the literature review and data collection.
- AI-powered software was utilized for data analysis and visualization.
- Generative AI tools were consulted for brainstorming and outlining purposes. However, all final writing, synthesis, and critical analysis are my own work. Instances where AI contributions were significant are clearly cited and acknowledged.

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Luca Brigham (27/06/2025)

1. INTRODUCTION

The escalating urgency of global climate change necessitates an unprecedented mobilization of financial resources to transition towards a sustainable, low-carbon economy (Campiglio, 2016). In this critical endeavour, green finance has emerged as a powerful and indispensable financial instrument, specifically designed to channel capital into environmentally beneficial projects and initiatives, ranging from renewable energy to sustainable agriculture (Banga, 2019; Chiesa & Barua, 2019; Guild, 2020; Ji & Zhang, 2023). The global community has witnessed an exponential rise in green bond issuance, reflecting a growing investor interest in sustainable investment options (Ji & Zhang, 2023).

The global expansion of green finance represents a transformative shift in aligning financial systems with environmental sustainability goals. However, its relevance in emerging markets is particularly critical and uniquely complex (Mirza et al., 2023; J. Wang et al., 2023). These rapidly industrializing economies, while contributing significantly to global economic growth, simultaneously face severe environmental challenges, including high carbon emissions and environmental degradation (Ding et al., 2023). As a result, emerging markets shoulder a disproportionate share of the global environmental burden and confront a substantial green investment gap, when compared to developed markets estimated in the trillions of dollars annually. Addressing this shortfall requires not only domestic commitment but also the scaling up of cross-border green capital flows (Banga, 2019). Yet, the realization of green finance's full potential in emerging markets is hindered by a constellation of structural and institutional barriers. One major challenge is the limited availability and transparency of ESG-related data. The absence of robust mechanisms for tracking capital flows and measuring environmental impact complicates due diligence and increases the risk of "greenwashing" (Azad et al., 2024).

Perceived investment risks also play a critical role. Macroeconomic volatility, high transaction costs, and uncertain credit environments in many emerging economies deter international investors, raising borrowing costs and stalling capital mobilization (Chan et

al., 2025). Moreover, investor behaviour in these regions is frequently driven by short-term returns rather than long-term environmental impact, reflecting a relatively underdeveloped culture of ethical or responsible investing (Magale, 2021).

Despite these constraints, empirical research points to the powerful and positive role of green finance in catalyzing environmental improvements in emerging economies (Ji & Zhang, 2023). Green financial instruments have been shown to alleviate financing constraints, particularly for high-emission industries undergoing green transitions, by reducing credit distortions and improving capital access (Ji & Zhang, 2023). Additionally, innovations in digital finance enhance transparency and stakeholder engagement, thereby addressing information asymmetries and enabling more efficient capital allocation(J. Wang et al., 2023). Green finance also fosters the development and diffusion of eco-innovations, promoting the adoption of environmentally sound technologies and the strengthening of green management practices within firms (Kong et al., 2022).

However, the effectiveness of these mechanisms varies significantly across contexts. Factors such as disparities in financial development, differences in ownership structures (e.g., state-owned versus private enterprises), and the broader financial ecosystem shape how green finance is implemented and its outcomes (Pan & Lin, 2025).

This systematic literature review seeks to address the fragmented and evolving understanding of green finance in emerging markets. By synthesizing a diverse body of scholarly work, it examines the impacts, operational mechanisms, barriers, and policy solutions associated with green finance in these contexts. In doing so, it offers a comprehensive and nuanced perspective that is essential for academics, policymakers, and practitioners. Ultimately, the review aims to provide actionable insights into how green finance can be more effectively harnessed to drive sustainable development, close investment gaps, and accelerate the green transition in some of the world's most environmentally and economically pivotal regions.

This study addresses the green investment gap through a comprehensive systematic literature review (SLR) and bibliometric analysis of peer-reviewed research on green finance in emerging markets. Using the PRISMA framework (Page et al., 2021) and a predefined protocol we identified and screened relevant articles from the Web of Science

Core Collection, applying strict eligibility and quality criteria to ensure academic rigor. In line with recent reviews by (Linnenluecke et al., 2020), we adopted both content analysis and bibliographic coupling techniques (Jan van Eck & Waltman, 2017.) to extract thematic insights and visualize intellectual structure. The selected literature spans diverse geographies, methodologies, and perspectives, allowing us to map the contours of this rapidly expanding but still fragmented field.

2. METHODOLOGY

This study employs a systematic literature review to comprehensively examine and integrate existing scholarly research on green finance in emerging markets. Guided by a pre-established review protocol as evidenced in Table 1, the process systematically directed the identification, selection, and analysis of relevant literature. The methodology is grounded in well-established frameworks proposed by Linnenluecke et al., (2020), ensuring methodological rigor and transparency. The primary objective is to map the conceptual foundations, practical applications, and evaluative approaches to green finance within emerging economies, with a particular focus on identifying thematic patterns, knowledge gaps, and evolving directions in the academic discourse.

The screening and selection process shown in table 2, followed the PRISMA 2020 flow diagram Page et al., (2021). We conducted our literature search using the Web of Science (WoS) database. The search strategy was based on the keywords *"green finance"* and *"emerging market"*, selected deliberately to reflect the limited body of literature on this specific topic within the database.

Including additional keywords would have resulted in the retrieval of studies that did not maintain a primary focus on emerging markets or developing countries. Given the relatively small number of relevant studies, no temporal restrictions were applied. To ensure the quality of the selected literature, we included only peer-reviewed journal articles written in English and indexed in the 2024 edition of the Academic Journal Guide (AJG) published by the Association of Business Schools (ABS), irrespective of disciplinary field. The use of the ABS journal list as a quality benchmark provided a robust filter, ensuring that all included articles had undergone rigorous peer review and were published in reputable academic outlets. This selection process resulted in a final

sample of 64 articles. Table 2 outlines the flow of information through the different stages of the review process, following the PRISMA guidelines Page et al., (2021). We opted to rely solely on the WoS database, as a comparative analysis showed a high degree of overlap with Scopus, particularly when filtering by ABS-listed journals. Hence, incorporating Scopus would have offered minimal additional value for the purposes of this review.

Systematic review protocol
Background and Motivation
• Green finance as a mechanism to support sustainable development in emerging markets
• Growing academic and policy interest in green bonds, ESG finance, and climate-aligned investments
• Limited synthesis of how green finance is studied and applied in emerging market contexts
Objectives
• To identify the scope and focus areas of green finance literature in emerging markets
• To explore theoretical approaches, methodologies, and tools used in this research area
• To highlight institutional, financial, and regulatory drivers and barriers
• To map future research opportunities
Criteria for Considering Studies for This Review
• Peer-reviewed academic journal articles
• Studies must analyze green finance in the context of one or more emerging markets
• Empirical, or conceptual research
• Articles must go beyond passing mentions to provide clear analytical focus
Search Strategy for Identification of Studies
• Web of Science Core Collection
• Search terms: “Green Finance” AND “Emerging Market”
• No time restriction applied (search conducted through 2025)
• Search conducted using the “Topic” field (title, abstract, keywords)
Eligibility
The inclusion criteria
• English language
• Focus on emerging market economies (per IMF, World Bank, or MSCI classifications)
• Must examine green finance instruments, institutions, or outcomes
The exclusion criteria
• Non-peer-reviewed materials (e.g., conference papers, book chapters, editorials)
• Review-based research
• Duplicate records or inaccessible full texts
Data Collection
• Only peer-reviewed academic journal articles
Assessment of Methodological Quality
• Based on ABS Academic Journal Guide (Association of Business Schools), 2024
Synthesis
• Aggregation, synthesis, and thematic clustering based on content analysis

Table 1 – Systematic Review Protocol

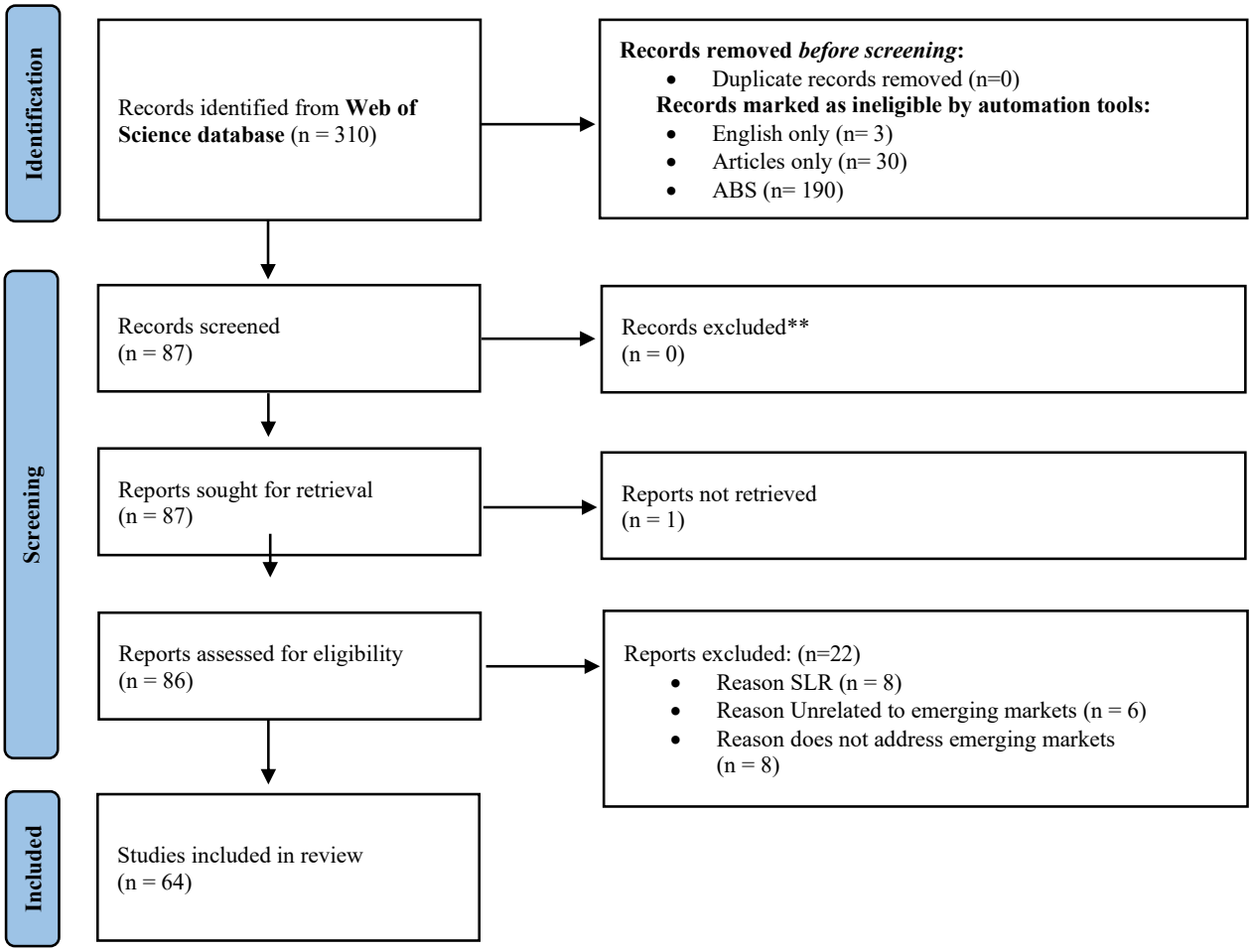

Table 2 – Flow of information through the different phases of the systematic review (PRISMA).

To extract structure and meaning from this literature, we combined qualitative content analysis with bibliometric mapping using VOSviewer 1.6.2. We applied the bibliographic coupling technique, which clusters articles by shared reference lists—highlighting conceptual proximity even when topic keywords diverge. Bibliographic coupling was chosen over co-citation due to its temporal stability and replicability (Caputo et al., 2019; Jan van Eck & Waltman, 2017.). To address age-based citation bias, we enabled normalized citation weighting, ensuring that recently published but influential articles received equal analytical consideration.

3. BIBLIOMETRIC ANALYSIS

3.1 Top Articles Analysis

Table 3 displays the top ten most-cited articles within the field of green finance in emerging markets. (Campiglio, 2016) leads with 390 citations, closely followed by (J. Wang et al., 2023) with 388, and (Banga, 2019) with 269. These highly cited studies explore a broad range of topics, including sustainable investment frameworks, policy design, and institutional barriers. Notably, the most frequently cited works tend to be either foundational or policy-relevant, suggesting a strong demand for practical guidance and theoretical clarity in this evolving field. It is also evident that older publications, such as (Campiglio, (2016) and (J. Wang et al., 2020), have had more time to accumulate citations, which partially explains their leading positions. However, the presence of more recent articles such as (Ding et al., 2023; Kong et al., 2022; D. Zhang, 2023) highlights the increasing momentum and scholarly attention green finance is receiving in the context of emerging economies.

Table 3 - Top ten articles by the number of citations

Rank	Green Finance in Emerging Market	
	Article	Citations
1	Campiglio (2016)	390
2	Wang (2023)	388
3	Banga (2019)	269
4	Wang (2020)	210
5	Kong (2022)	178
6	Sadiq (2022)	155
7	Ding (2023)	127
8	Zhang (2023)	119
9	Naqvi (2021)	105
10	Li (2020)	75

3.2 Countries' Analysis

Table 4 and Figure 1 present the top ten contributing countries to green finance research in emerging markets, ranked by total citations. The People's Republic of China leads by a significant margin, with 1,452 citations across 37 publications, reflecting both its strategic national focus on green financial mechanisms and the scale of academic production aligned with its domestic green policies. England follows with 525 citations and 7 publications, while France, with only 5 publications, shows an impressive citation-per-publication ratio of 104.20—indicating highly influential contributions despite a modest output. Similarly, Australia, Pakistan, and Malaysia each contribute 4 publications, yet all record strong citation rates, with Pakistan and Australia averaging over 80 citations per publication. Notably, India appears with 6 publications but a lower citation-per-publication average of 15.33, suggesting emerging engagement but less global visibility or impact thus far. The United States and Bangladesh round out the list with smaller contributions, the former demonstrating a relatively low average impact (6.75 citations per paper).

Table 4 - Top ten countries by number of citations

Rank	Article	Publications	Citations	Citations per publications
1	Peoples Republic of China	37	1452	39.24
2	England	7	525	75.00
3	France	5	521	104.20
4	Australia	4	347	86.75
5	Pakistan	4	326	81.50
6	Malaysia	4	171	42.75
7	India	6	92	15.33
8	Italy	2	74	37.00
9	USA	4	27	6.75
10	Bangladesh	2	24	12.00

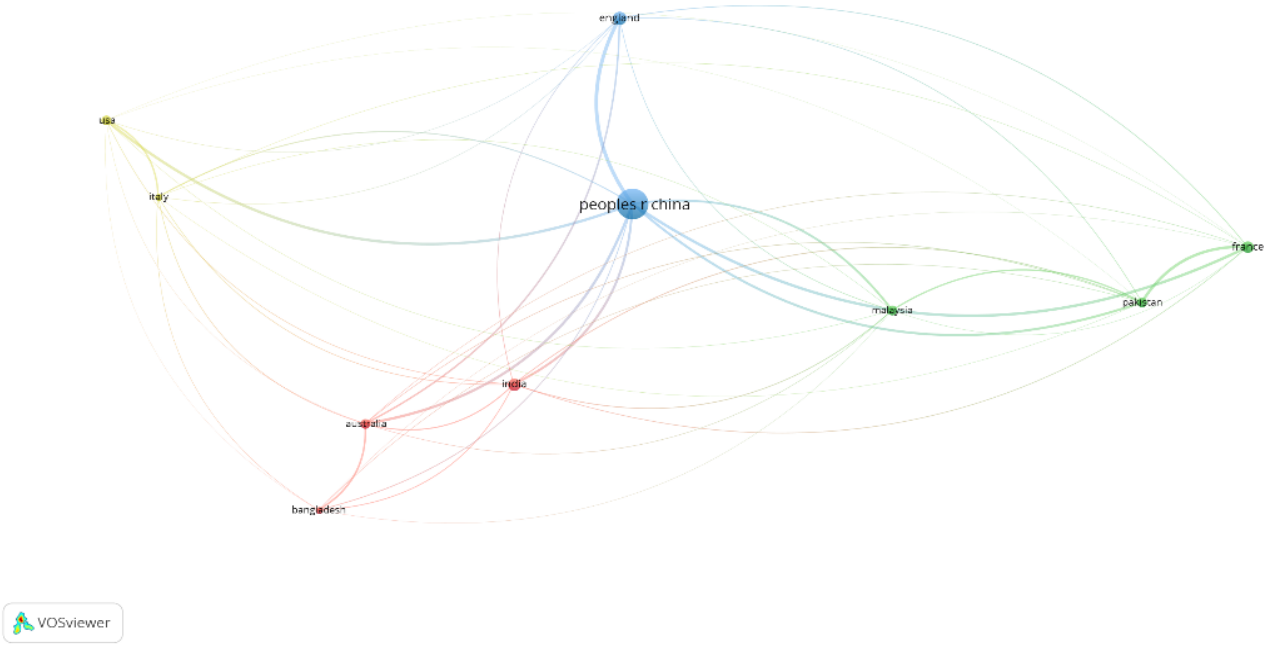

Figure 1 – Normalized citations of countries.

These figures underscore the dominant role of China and the growing presence of South and Southeast Asian economies in this research domain, while also highlighting the high-impact precision of scholarship from countries like France, Australia and Pakistan. The diversity in productivity and impact across these nations suggests both concentration and opportunity, while a few countries lead in volume, others are producing fewer but more impactful studies, pointing to the need for broader geographic engagement in the green finance discourse.

3.3 Journals' Analysis

Table 5 shows the top journals contributing to green finance research in emerging markets International Review of Financial Analysis ranks first with 411 citations from just three efficiency despite fewer outputs publications, indicating the highest impact per article (137.0). It is followed by the Journal of Sustainable Finance & Investment (383 citations) and Energy Economics (293), both with strong overall influence. Notably, Emerging Markets Finance and Trade and China Finance Review International also show high citation efficiency despite fewer outputs.

Table 5 - Top ten journals by the number of citations

Rank	Article	Publications	Citations	Citations per publications
1	International Review of Financial Analysis	3	411	137.00
2	Journal of Sustainable Finance & Investment	5	383	76.60
3	Energy Economics	6	293	48.83
4	Pacific-Basin Finance Journal	5	238	47.60
5	Emerging Markets Finance and Trade	2	178	89.00
6	China Finance Review International	2	156	78.00
7	Economic Analysis and Policy	5	144	28.80
8	Business Strategy and the Environment	4	97	24.25
9	Energy Policy	3	85	28.33
10	Corporate Social Responsibility and Environmental Management	3	55	18.33

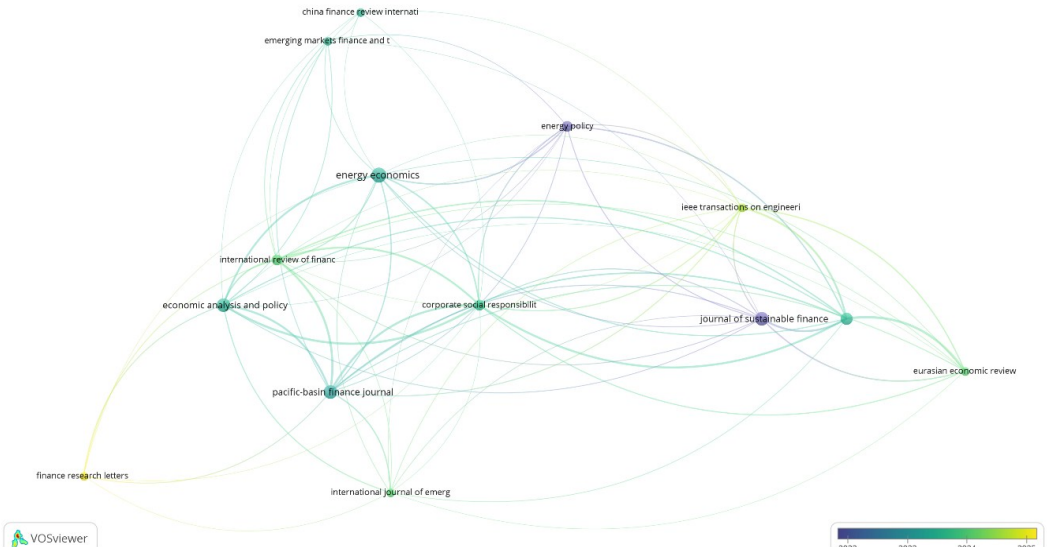

Figure 2 - Normalized citations of journals by year

Regarding normalized citations, Fig. 2 shows that Journal of Sustainable Finance was the most cited journal in 2022. Energy Economics was the most cited journal in 2023 while International Review of Financial Analysis was the most cited journal overall and in 2024. The journals from 2025 did not meet the criteria to be ranked amongst the top 10 journals.

3.4 Authors' Analysis

Table 6 identifies the most cited authors in green finance research within emerging markets. Mirza, Nawazish ranks first with 232 citations from three publications, followed by Sun, Guanglin (189 citations) and Umar, Muhammad (127), both with high citation-per-publication ratios. These three authors stand out as key contributors to the field. In contrast, authors like Lin, Bai, Tian, and Zhao show lower citation counts and impact, suggesting more recent or narrowly focused contributions. Overall, a small number of authors account for a significant share of citations when accounting for a minimum of 2 published journals, indicating concentrated influence within the literature. Fig. 3 shows Tian, Zhao, Bai, and Lin published in 2024, reflecting more recent contributions, while the remaining authors published in 2022, which helps explain their higher citation counts.

Table 6 - Top seven authors by the number of citations

Rank	Author	Publications	Citations	Citations per publications
1	Mirza, Nawazish	3	232	77.33
2	Sun, Guanglin	2	189	94.50
3	Umar, Muhammad	2	127	63.50
4	Lin, Boqiang	3	11	3.67
5	Bai, Xiao	2	8	4.00
6	Tian, Geran	2	8	4.00
7	Zhao, Wenyao	2	8	4.00

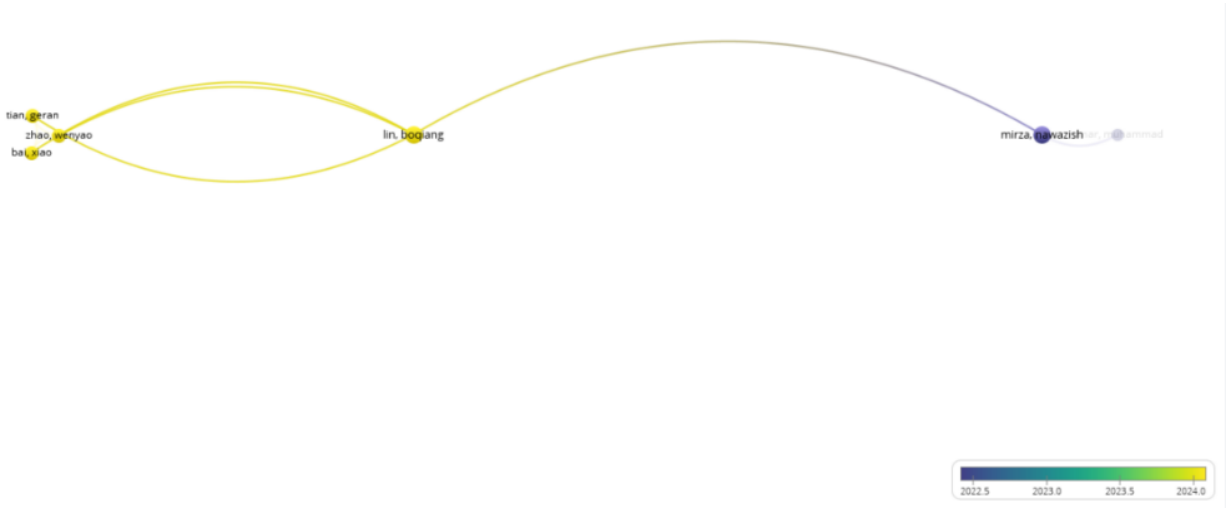

Figure 3 – Normalized citations of author by year

3.5 Institutions Analysis'

Table 7 shows the top ten institutions by citation count. Capital University of Economics & Business ranks highest with 531 citations, followed by Shandong University and Excelia Business School. Institutions like Zhejiang University and Nanjing University of Finance & Economics show strong citation efficiency. Most top contributors are Chinese, with Excelia as the only non-Chinese institution.

Fig. 4 shows that regarding nornalized citations, Excelia Business School and Shandong University were the most cited institutions in 2022. However, in 2023 the most cited institutions was Nanjing University Finance & Economics and Zhejiang University. In 2024 Capital University Economics & Business was the most cited institution.

Table 7 - Top ten institutions by the number of citations

Rank	Article	Publications	Citations	Citations per publications
1	Capital University Economics & Business	5	531	106.20
2	Shandong University	3	296	98.67
3	Excelia Business School	3	232	77.33
4	Zhejiang Univeristy	2	211	105.50
5	Nanjing University Finance & Economics	3	208	69.33
6	Qingdao University	2	127	63.50
7	Nanjing University	2	34	17.00
8	Anhui University Finance & Economics	2	23	11.50
9	Xiamen University	4	16	4.00
10	Xi An Jiao Tong University	2	15	7.50

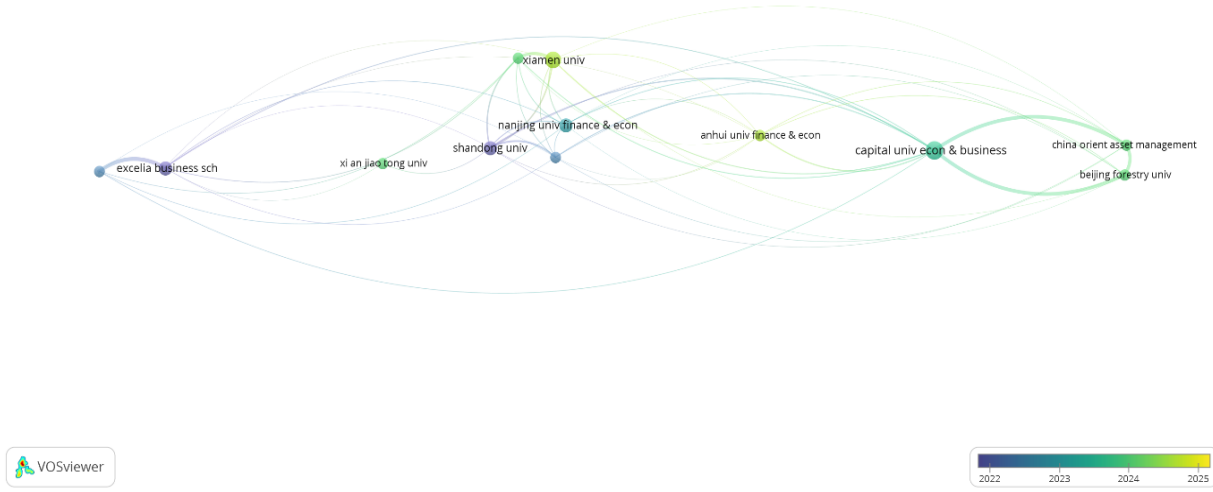

Figure 4 – Normalized citations by institutions by year.

4. Literature Findings

The empirical analysis aims to distill the selected body of literature into coherent thematic clusters that reveal the intellectual structure, research evolution, and key areas of focus within the green finance discourse in emerging markets. Based on the systematic selection process described in the methodology section, a total of 64 peer-reviewed journal articles retrieved from the Web of Science Core Collection were included in the final dataset. These articles were analyzed using bibliographic coupling, allowing for the identification of conceptual linkages and shared research trajectories.

The analysis resulted in six major thematic clusters, each representing a distinct yet interconnected dimension of green finance in emerging market contexts.

4.1 Green Investment & Financial Policy

The global effort to transition towards a sustainable, low-carbon global economy has made corporate environmental responsibility, green innovation, and green initiatives, crucial areas of focus (M. Li & Lin, 2024; Ma, 2025; Sun et al., 2024). This important theme grows in urgency by environmental pollution and climate change, which necessitates protocols to reduce global warming and reduce carbon emissions (Kong et al., 2022; Pan & Lin, 2025). The main goal is not just about following environmental rules but about promoting green growth and improving total factor productivity (TFP) in a time of rising climate change and resource scarcity (Ding et al., 2023). Building on this perspective, recent research underscores the tangible economic benefits of green innovation at the urban level. Q. Gao et al., (2024) demonstrates that urban green innovation can significantly boost the export of low-carbon products by lowering production costs, alleviating internal financing constraints, and enabling firms to better adapt to green trade barriers. Additionally, it contributes to reduced energy consumption and pollution, while promoting greater diversification in both the destinations and varieties of low-carbon exports (Q. Gao et al., 2024).

The studies present a complex view of how firms interact with and are impacted by green finance. Green mergers and acquisitions (M&A) have become a key strategy for heavy polluters. These deals help them improve energy efficiency and cut pollution,

which enhances their legitimacy and helps them access important resources. Paradoxically, such M&A activities can also increase the risk-taking ability of heavy polluters by easing financial constraints and reducing tax burdens (B. Li et al., 2020). In addition, green credit policies (GCP) are identified as a vital tool for directing funds toward environmental protection (Y. Chen et al., 2023). Research shows that GCP enhances energy efficiency in heavily polluting companies by reducing energy use, improving the sharing of environmental information, and encouraging technological innovation (Pan & Lin, 2025). The positive results stem from lower debt costs and increased R&D spending for carbon-intensive firms (Y. Chen et al., 2023). However, the success of GCP is shaped by local government regulations, financial market maturity, and public awareness of environmental issues (Pan & Lin, 2025). Furthermore, the impact of GCP is more significant for large businesses and in areas with higher marketization and energy intensity (Pan & Lin, 2025). Nonetheless, while the benefits of green credit policies are well-documented, recent evidence highlights potential unintended consequences. Gao et al., (2024) find that such regulations may inadvertently reduce stock market efficiency by heightening operational uncertainty and diminishing the quality of financial disclosures in pollution-intensive firms. These adverse effects tend to intensify in markets dominated by more irrational investor behaviour (Gao et al., 2024).

In addition to policy-driven mechanisms, corporate ownership structures also play a role in shaping green innovation outcomes. Xu, (2025) finds that cross-ownership can enhance green innovation by easing financing constraints and mitigating agency conflicts, aligning with the "governance synergy" perspective. However, such structures may facilitate collusion, potentially distorting market dynamics and undermining green innovation (Xu, 2025).

4.1.1 Digital Finance

Beyond traditional green credit, new mechanisms are emerging in the digital age. Digital finance consistently enables corporate green investment and innovation, especially in heavily polluted sectors (Ding et al., 2023). It helps companies by reducing financing constraints and improving cash flow (Ding et al., 2023). Additionally, digital finance encourages green innovation by alleviating information asymmetry between financial institutions and firms, enhancing the quality of environmental information

disclosure (Kong et al., 2022). The benefits of digital finance are more significant due to the broad reach and digital services available, rather than just depth of usage (Ding et al., 2023). Importantly, the positive effects of digital finance on green investment are more noticeable in state-owned enterprises (SOEs) and businesses in regions with strict environmental and financial regulations. The positive effects of digital finance on green investment are more noticeable for state-owned enterprises (SOEs) and firms in regions with strict environmental and financial regulations (Ding et al., 2023).

4.1.2 "Dual Synergistic" Transformation

The broader idea of "dual synergistic" transformation, combining digital advancements and greening, shows a strong positive link with a firm's total factor productivity (TFP) (Tang et al., 2025). Government subsidies strengthen this relationship by easing financial pressures and promoting R&D investment (Tang et al., 2025). This synergistic effect is more pronounced in non-state-owned enterprises, heavily polluting industries, and non-high-tech and capital-intensive firms (Tang et al., 2025). Another financial innovation, intellectual property pledge financing (IPPF), has been shown to help green innovation by giving firms better access to bank loans, thus alleviating financial barriers (Shi et al., 2024).

4.1.3 ESG ratings

ESG ratings from third-party agencies are crucial for boosting corporate green innovation, particularly for green invention patents that indicate higher technological progress and innovation quality (J. Wang et al., 2023). These ratings reduce the information gap between managers and shareholders, influencing management toward green innovation (J. Wang et al., 2023). The positive effects are more apparent in non-SOEs, firms with less short-sighted investors, and those with higher financial constraints (J. Wang et al., 2023). Similarly, quality carbon disclosure directly improves firm performance, with green innovation mediating this relationship (Ma, 2025). This is particularly relevant for non-SOEs that use disclosure to ease financing constraints and enhance competitiveness, while SOEs often align their disclosure with regulatory standards (Ma, 2025).

However, the effectiveness of ESG ratings can be undermined by inconsistencies across rating agencies. High ESG rating disagreement increases analyst forecast errors and dispersion by amplifying information asymmetry (X. Liu et al., 2024). This effect is stronger in firms with weaker information environments such as non-SOEs or those lacking standard disclosures though experienced analysts can partially offset the impact through better information processing (X. Liu et al., 2024).

4.1.4 Banking Competition

Banking competition has nuanced effects on green finance. When green finance faces banking competition, it can lead to a decrease in the financial performance of high-risk (hard-to-abate) companies by limiting access to credit and raising interest costs (Zhou & Zhang, 2023). Nevertheless, this scenario can also encourage green innovation at the firm level, showing how banking competition can play a role in evaluating and lowering environmental risks in lending (Zhou & Zhang, 2023).

Complementing the role of banking competition, bank-specific factors also shape green finance transparency. Patel et al., (2024) find that larger banks with strong capital and governance are more likely to disclose green loans, while high market valuation and rapid growth reduce disclosure. Such transparency is vital for promoting sustainable finance (Patel et al., 2024).

4.1.5 Uncertainty and Social Media

However, the landscape has its complexities and challenges. Increased economic and policy uncertainty leads to a long-lasting decline in green innovation, especially impacting green patents more than non-green ones, particularly in financially constrained sectors (Bettarelli et al., 2024). This negative trend worsens during economic downturns and periods of financial strain (Bettarelli et al., 2024). Furthermore, market factors, such as retail investor concerns expressed on social media, can dampen corporate intentions for green investments, especially in the early phases of green initiatives, even if they may encourage end-pipe treatment (H. Zhang et al., 2025). This demonstrates that online public sentiment can significantly influence market behaviour, moving beyond traditional media (Bettarelli et al., 2024). H. Zhang et al., (2025) proposes that enhancing the reliability of corporate information disclosure may help reduce the adverse effects. Online

social platforms allow retail investors to form "convergence groups," which can shape corporate decision-making and serve as a medium for information exchange, thereby improving comprehension of corporate strategies even amid market noise (H. Zhang et al., 2025).

4.2 Carbon Transitioning

One of the most pressing challenges of the 21st century, demanding enormous, demanding investments in green finance is the transition to a low-carbon global economy (Banga, 2019; Z. Chen et al., 2022; Naqvi et al., 2021; Rahat & Nguyen, 2022; Wasan et al., 2024) The urgency is particularly directed to emerging economies, which face an annual green finance gap estimated at $2.5 trillion (Wasan et al., 2024).

Addressing this financing gap has spurred innovation in green financial instruments, notably green bonds. Monk & Perkins, (2020) trace their rise to strategic efforts by actors like Multilateral Development Banks, technical learning among early market participants, and broader shifts favouring climate-focused investments. Their study underscores the importance of a systems perspective and highlights the catalytic role of policy in advancing environmental finance.

4.2.1 Policy and Financial Institutions

The foundation of effective green finance lies in policy innovation and the strategic involvement of financial institutions. (Campiglio, 2016) argues that market failures in credit allocation render carbon pricing alone insufficient to stimulate low-carbon investment. Instead, it emphasizes the need for complementary monetary and macroprudential tools such as differentiated reserve requirements particularly relevant in emerging economies where central banks retain significant control over credit distribution (Campiglio, 2016)

Building on the role of financial institutions, (Z. Chen et al., 2022) provides empirical evidence from GCC countries showing that sustainable lending practices not only reduce default risk but also improve profitability, especially for smaller banks (Z. Chen et al., 2022). These findings provide confidence in the prospects for a green recovery, as they show that banks have financial incentives to support sustainable enterprises, thereby facilitating the shift toward a low-carbon economy. (Z. Chen et al., 2022)

In contrast, (Guild, 2020) exposes the challenges faced when political will and institutional capacity are lacking. Despite demand for green capital, Indonesia's renewable energy sector remains hindered by weak human capital, poor project design, and regulatory uncertainty, underscoring the importance of governance in green finance outcomes (Guild, 2020).

4.2.2 Cross-border flows

Shifting to market mechanisms, green bonds have emerged as a vital instrument in mobilizing climate finance. (Banga, 2019) underscores their growing role, while also pointing out persistent structural barriers such as high issuance costs, small deal sizes, and weak institutional support that continue to constrain adoption in developing countries (Banga, 2019). The study advocates for stronger roles by development banks and local government guarantees (Banga, 2019). Expanding on market determinants, (Banga, 2019) analyzes the drivers of corporate green bond issuance and finds that larger issue sizes are linked to favourable financial characteristics, including higher credit ratings, coupon rate, financial health, currency denomination and the issuers sector. This indicates that investor confidence is shaped by both financial fundamentals and cross-border signalling (Chiesa & Barua, 2019).However, (Chan et al., 2025) raises a critical concern regarding taxonomy misalignment between developed and emerging markets. The study introduces the concept of "green capital leakage," whereby funds intended for environmentally aligned projects in developed markets are redirected to less rigorous investments due to conflicting classification systems challenging the coherence of global green finance frameworks (Chan et al., 2025).

Amid ongoing structural and classification challenges in global green finance, some Global South countries are forging alternative models. Larsen, (2024) shows how Vietnam implemented a state-led green transition by using its state-owned utility, EVN, to de-risk renewable investments through high feed-in tariffs and state backing without relying on Western financial guarantees. This approach attracted regional capital and led to rapid growth in renewables, illustrating that state capacity can enable green investment despite international financial constraints (Larsen, 2024).

4.2.3 Market Connectedness

Turning to investment dynamics, the financial performance of green assets remains contested. (Naqvi et al., 2021) casts doubt on the profitability of green investments, finding that traditional energy funds generally outperform renewable counterparts in emerging markets, particularly during crises like COVID-19 (Naqvi et al., 2021).

In contrast, Rahat & Nguyen, (2022) presents a more optimistic picture. Using data from BRICS countries, the study shows that green stocks outperform fossil-fuel-based ("black") portfolios on a risk-adjusted basis, supporting divestment as a financially sound strategy (Rahat & Nguyen, 2022). Additional insights emerge from market connectivity studies. (Tian et al., 2022) reveals that in emerging economies green bonds are highly susceptible to shocks from broader financial markets, making them poor hedging tools.

Meanwhile, Rao et al., (2022) finds that green bonds correlate closely with gold, offering some diversification potential but limited protection during crises. Notably, Bitcoin fails to act as an effective hedge. Looking ahead, Zhu et al., (2023) introduces quantitative trading strategies in new energy markets, demonstrating how dynamic portfolio rebalancing can enhance returns and reduce risk. Finally, Oben et al., (2025) explores the underexamined intersection of DeFi tokens, traditional metals and S&P green markets, finding that DeFi tokens offers low correlation and significant diversification benefits suggesting untapped potential diversification in green finance portfolios.

Building on this, recent work highlights the vulnerability of green assets to broader market shocks. Studies on market interconnectedness show that in emerging economies, the “Carbon-Commodity-Finance” system exhibits time-varying spillovers, heavily shaped by economic policy uncertainty(Tian et al., 2022). Green bonds, in particular, act as major recipients of shock contagion, with stock markets identified as key transmitters (Tian et al., 2022).

4.3 Corporate Sustainability and Environmental Governance

Several papers investigate the determinants of green bond performance and investor behaviour. Russo et al., (2021) show that green bond returns are enhanced by eco-efficient projects, strong environmental commitments, and third-party verification, while higher

sovereign credit risk can diminish performance. In the Chinese context, Wang et al., (2020) identify a significant green bond pricing premium, (an average of 34 basis points lower yield spread compared to conventional bonds), especially among firms with strong corporate social responsibility (CSR) reputations and for firms with less concentrated ownership and a greater share of long-term institutional investors. Complementing this, investor responses are more significantly tied to bond listing events than announcements (Su & Lin, 2025), with liquidity improvements outlasting initial stock price effects, though risks remain largely unaffected (Su & Lin, 2025).

4.3.1 Environmental Information Disclosure (EID)

Firms disclosing environmental information, especially through voluntary means, get larger and cheaper loans from banks (Hui et al., 2024). This suggests that environmental information disclosure lowers firm-specific risk and shows alignment with state-led green finance goals (Hui et al., 2024). This is supported by Liu et al., (2022) demonstrating that green governance practices help polluting firms overcome financing challenges, especially in financially developed areas and among state-owned enterprises.

Regulatory mechanisms further reinforce the financial benefits of transparency in environmental practices. Evidence from China's cap-and-trade policy shows that participation lowers firms' cost of capital by encouraging environmental disclosure and improving the current ratios of the business (Hu et al., 2025). The effect is strongest in eastern regions and among non-polluting firms for equity, while polluting firms see greater reductions in debt costs due to enhanced compliance (Hu et al., 2025).

4.3.2 Green Lending

In green lending and credit risk, Mirza et al., (2023) find that banks in BRIC countries providing sustainable credit to small and medium-sized enterprises experience higher profitability and lower default risk. This offers banks direct financial reasons to expand their sustainable credit offerings to SMEs. However, Wan Mohammad et al., (2025) point out that while efficient resource use lowers a firm’s cost of capital, environmental innovation raises it, likely because of upfront costs, risk assessments, and the need for third-party assurances. This finding stresses the need for policy changes to ease the financial burden of green innovation (Wan Mohammad et al., 2025).

4.3.3 Climate change events

Wider policy and market implications are also clear. (Pandey et al., 2023) show that the Glasgow Climate Pact counterintuitively diminished clean energy stock returns, likely due to market worries about regulatory uncertainty. Yet firms with strong ESG credentials had a lower negative return and firms in nations with high Climate Change Performance Index (CCPI) saw a positive return. Meanwhile, Y. Wang et al., (2025) demonstrate that merging digital and physical industries significantly increases energy productivity in China, particularly when complemented by green finance and strong environmental regulations.

4.4 Green Bonds

The growing global emphasis on environmental issues and the urgent demand for sustainable development have spotlighted green bonds as pivotal financial instruments (Ji & Zhang, 2023). These specialized debt instruments aim to raise money specifically for projects that have a positive environmental impact. They tackle crucial concerns like climate change, renewable energy, and pollution control (Ji & Zhang, 2023). The emergence of green bonds shows a major change in finance, shifting towards a system where companies must increasingly incorporate sustainability into their core business models and risk management policies (Frecautan & Ivashkovskaya, 2024). This collective effort to mobilize both private and public investments for environmental projects highlights the understanding that fighting climate change requires significant financial resources, especially in developing countries that contribute to greenhouse gas emissions and are vulnerable to climate effects (Magale, 2021).

4.4.1 China

In China, green bonds have played a key role in promoting both technological innovation and environmental management, especially after the 2017 regulatory changes. (Ji & Zhang, 2023) looked into how green bonds have impacted environmental protection businesses and found a clear difference in performance before and after 2017. Prior to 2017, issuing green bonds had a negative connection with technological innovation and environmental results (Ji & Zhang, 2023). However, post-2017, during a time of regulatory reforms, the relationship shifted to a positive one. Improvements were noted

in green bond issuance and innovation (1.322), environmental performance value (1.467), and enterprise value (3.268) (Ji & Zhang, 2023). This change shows how clear regulations can turn green bonds into effective tools for promoting sustainable practices and easing financial barriers for eco-innovation (Ji & Zhang, 2023).

Y. Liu et al., (2024) explore China's situation further by studying how green bonds affect corporate environmental responsibility (ER). Their findings indicate that companies issuing green bonds perform better on environmental metrics compared to their counterparts, particularly in industries that have low pollution levels, no environmental subsidies, and stronger management abilities (Y. Liu et al., 2024). The relationship involves two key governance channels: internal management (managers' attention to environmental issues) and external supervision (media attention) (Y. Liu et al., 2024). Despite providing short-term boosts to stock performance (short-term stock yield increases), green bonds have limited effects on short-term financial performance, indicating a trade-off between signalling and quick financial returns (Y. Liu et al., 2024).

4.4.2 India

In India, the green bond market shows both potential and challenges, particularly regarding retail investor involvement. Azad et al., (2024) used the Theory of Planned Behavior (TPB) to analyze what drives Indian retail investors to consider green bonds. Their study finds that intrinsic factors, such as perceived control and individual environmental views, predict investment intentions more effectively than external factors like government policy or social norms (Azad et al., 2024). Moreover, crucial financial indicators, like issuer credit ratings and minimum return expectations, significantly influence investor attitudes (Azad et al., 2024). The study emphasizes that investors often place significant importance on the creditworthiness and financial stability of the issuer (Azad et al., 2024).

4.4.3 Kenya

Kenya represents a case where green finance potential remains largely untapped. Despite many bankable projects, its bond market is not well-developed. Magale, (2021) identifies several structural barriers, including limited awareness throughout the green finance sector, low institutional and technical capacity, high costs of issuing and

monitoring bonds, and a shortage of skilled practitioners. Even with these hurdles, Kenya has a wide range of potential investors and strong government backing.

4.4.4 Bangladesh

In Bangladesh, the green bond market is still in its early stages, but experts underline the importance of institutional and policy frameworks for future development. Hasan et al., (2024) emphasize that the central bank's monetary policy, fiscal actions, legal frameworks, and regulatory clarity are essential for building market confidence.

4.4.5 Other developing countries

On a broader scale, Arshad et al., (2024) assess how green bond issuance affects carbon emissions in 65 developing countries. Their results show that increased issuance correlates with reduced CO_2 emissions, reinforcing the idea that green bonds can support national efforts to lower carbon output (Arshad et al., 2024). However, the study also notes that foreign direct investment (FDI) and urban growth lead to higher emissions, while trade openness helps reduce them (Arshad et al., 2024). This points to the need for green finance to work alongside wider economic and trade policies that support sustainability.

4.5 ESG Risk

Understanding how Environmental, Social, and Governance (ESG) factors influence corporate behaviour, promote green initiatives, and affect financial markets is critical for both policymakers and businesses pursuing sustainable growth (S. Wang et al., 2024). In a study focusing on the Chinese context (S. Wang et al., 2024) specifically examined ESG performance, information disclosure, and green bond issuance. Their findings indicate that firms with strong ESG practices are more likely to issue green bonds. Notably, the study highlights that investor interest in green bonds is more strongly driven by the effectiveness of ESG information disclosure than by ESG performance alone. Furthermore, the research reveals that environmental and corporate governance dimensions exert a stronger positive influence on green bond issuance, whereas the social dimension may exhibit a negative correlation. This suggests that some firms perceive the decision to avoid issuing debt as an expression of social responsibility.

ESG impact can extend further into corporate innovation. Bai et al., (2024) empirical results show a mixed outcome: ESG certification significantly increases the quantity of corporate green innovation, but it does not have substantial impact on its quality (Bai et al., 2024). The higher quantity is driven by the easing of financing constraints and enhanced market monitoring (Bai et al., 2024). However, due to managerial opportunism, there is a lack of improvement in quality as management may focus on superficially meeting ESG requirements instead of making meaningful, long-term investments in quality innovation (Bai et al., 2024; Xiao et al., 2024). Crucially, the quality of green innovation significantly enhances the positive impact of ESG certification on firm value, whereas the quantity of green innovation does not (Bai et al., 2024). This means that the global markets are able to identify genuine and superficial efforts.

Thomas et al., (2024) provide a broader context by mapping the ESG landscape in finance. They confirm the importance of these themes. Their analysis reveals "Prominence of ESG in China and Green Innovations" as a major research group. It also highlights "ESG controversies and information asymmetry" as a key and developing area (Thomas et al., 2024). They point out a widespread challenge: the lack of standardized and comparable ESG data. This, along with inconsistent data availability and quality, greatly contributes to differing ESG ratings and worries about greenwashing (Thomas et al., 2024).

4.6. Green Innovation Performance

Z. Wang & Liu, (2025) examine how intelligent transformation (IT) can enhance corporate green innovation (GI) in emerging markets. By improving financing efficiency through the reduction of debt financing costs, there is a positive outcome achieved. Intelligent transformation, embodied by investments in AI, digital platforms, and data-driven systems, strengthens operational efficiency, reduces costs, improves resource allocation, and enhances financial transparency and creditworthiness (Z. Wang & Liu, 2025). This enables enterprises to access capital more efficiently, mitigating financial constraints that often hinder long-payback green technology initiatives (Z. Wang & Liu, 2025). The positive impact of IT on GI is more pronounced in state-owned enterprises (SOEs) compared to non-SOEs (Z. Wang & Liu, 2025).

Complementing internal digital transformation, external financial reforms also play a role in advancing green innovation. Stock market liberalization promotes green technology innovation by easing financing constraints and enhancing environmental management (L. Wang & Cheng, 2024). Its impact is particularly strong among private, smaller firms and those with high information transparency (L. Wang & Cheng, 2024).

However, region-specific climate risks can undermine these positive drivers of green innovation. Firms headquartered in provinces with higher climate risk face greater financing constraints and reduced operational solvency, limiting their capacity to invest in sustainable initiatives (Quan et al., 2025). Public pressure may also shift focus toward short-term environmental actions over long-term innovation. Notably, SOEs tend to underperform due to agency issues, while non-SOEs show stronger adaptive responses under climate stress (Quan et al., 2025).

4.6.1 Carbon Emission Trading Scheme

Luo et al., (2025) finds a significantly positive impact that carbon ETS has on attracting green investors which is driven by three key mechanisms. Improved corporate green performance, Intensified media coverage and Enhanced environmental disclosure (Luo et al., 2025)

4.6.2 Social Dishonesty

Lastly, T. Liu et al., (2023) delves into an informal institutional factor and the impact on corporate green innovation. The literature shows that social dishonesty significantly inhibits enterprises' green innovation (T. Liu et al., 2023). This negative influence operates through three economic mechanisms. It erodes trust between banks and enterprises, reduces willingness to lend and hindering access to credit for green innovation (T. Liu et al., 2023). It intensifies the information asymmetry between investors and corporations, increasing the cost of debt (T. Liu et al., 2023).

Finally, it leads to a lower ESG rating from third-party organizations as firms market image can be damaged. The negative impact is greater for non-state owned enterprises (T. Liu et al., 2023). However, some factors such as non-negative media coverage and government environmental subsidies can effectively alleviate this inhibitory effect (T. Liu et al., 2023).

Table 8 - Future Research directions in Green Finance and Emerging Markets

Clusters	Main Findings	Future Research
Green Investment & Financial Policy	• Green Mergers & Acquisitions (M&A) increase the risk-taking capacity of heavy polluters • Green Credit Policies (GCP) successfully improve the energy efficiency of heavily polluting enterprises • Digital finance significantly promotes corporate green investment and green innovation • The "dual synergistic" transformation (digitalization and greening) has a significant positive relationship with a firm's total factor productivity (TFP) • Government green subsidies effectively mitigate stock price crash risk	• Compare the effectiveness of policy tools (e.g., subsidies vs. carbon taxes) and examine firm-level responses to uncertainty and regulatory shocks. • Investigate green credit's long-term impact on SMEs, innovation quality, and unlisted firms. • Explore the role of legitimacy, ESG performance, and HR strategies in driving green innovation across sectors and regions. • Assess the effectiveness of green financial disclosures and their impact on capital markets under evolving regulatory conditions.
Carbon Transitioning	• The "Carbon-Commodity-Finance" system in emerging economies exhibits dynamic, time-varying spillovers, significantly influenced by economic policy uncertainties • The COVID-19 pandemic led to a considerable increase in market interconnectedness and volatility transmissions • Green bonds generally acted as safe-haven assets and offered diversification benefits during economic downturns • Green bonds are a rapidly growing and vital source of climate finance for developing countries • Misalignment in sustainable finance taxonomies can lead to "green capital leakage"	• Develop models to assess green bond pricing, risk perception, and greenwashing in emerging markets. • Evaluate the effectiveness of green finance regulations (e.g., taxonomies, CGT) and macroprudential tools in guiding capital toward low-carbon assets. • Analyse post-pandemic and post-2021 trends in green bond governance, ESG regulation, and investor behaviour. • Study sector-specific impacts, cross-border capital flows, and the integration of ESG in new financial instruments like ETFs and DeFi platforms.
Corporate Sustainability & Environmental Governance	• Green bond performance is shaped by project features, corporate sustainability strategies, and country-level factors, advancing sustainability goals • Cap-and-trade regulations can reduce a company's cost of capital • Green governance practices significantly mitigate corporate financing constraints, especially for heavy polluting enterprises in China • Glasgow Climate Pact (GCP) negatively affects the stock returns of clean energy firms • Green lending to SMEs in BRIC countries enhances banking performance by increasing net interest margins and reducing default risk	• Investigate how green bonds and green lending influence firm-level environmental performance, credit terms, and disclosure behaviour. • Compare policy impacts across countries with varying ESG mandates and governance quality. • Examine investor and stakeholder reactions to ESG initiatives, and how greenwashing influences financial outcomes. • Explore interactions between green governance, innovation, and financing constraints in SMEs and private firms.

Green Bonds	• Green bonds enhance ER by strengthening internal management and external supervision • Financial performance was found to be the most significant predictor of an investor's attitude towards green bonds • In Kenya, green bond market growth is hindered by low awareness, weak investment drive, limited capacity, and high issuance costs, while a broad investor base and government support serve as key enablers • In Bangladesh, legal, financial, and institutional frameworks are the main drivers, with societal and political factors playing a lesser role	• Conduct comparative studies of green bond implementation across developed and developing countries. • Analyse post-issuance environmental outcomes and the effectiveness of third-party certification in reducing greenwashing. • Explore the role of mobile-based retail investment and Shariah-compliant green finance in expanding market participation. • Study long-term financial and environmental performance in emerging countries like India, Kenya, Bangladesh, and Vietnam.
ESG Risk	• ESG Disclosure Outperforms Performance for Green Bond Issuance • ESG Rating Disagreement Increases Analyst Forecast Error and Dispersion • ESG Certification Increases Green Innovation Quantity but Not Quality • Green Innovation Quality Enhances Firm Value, Quantity Does Not • Managerial Opportunism Hinders Green Innovation Quality	• Assess the impact of ESG rating disagreements on market forecasts and investor decision-making. • Examine cross-country variation in ESG certification and its influence on innovation volatility and R&D outcomes. • Study fintech's role in enhancing ESG transparency and explore • ESG-linked instruments' effectiveness relative to traditional green bonds. • Evaluate how different ESG disclosure standards affect capital allocation and firm behaviour in diverse regulatory environments.
Green Innovation Performance	• Intelligent transformation significantly enhances corporate green innovation performance, particularly in emerging markets, by improving financing efficiency • The Carbon Emission Trading Scheme (ETS) in China has a significantly positive impact on green investor entry • Stock market liberalization facilitates enterprise green technology innovation • Social dishonesty significantly inhibits enterprises' green innovation	• Investigate how climate risk and social trust affect innovation across sectors and emerging markets. • Examine the long-term outcomes of intelligent transformation on sustainability and green innovation. • Analyse the motivations and effects of green investor entry on environmental outcomes and innovation quality. • Explore the impact of emission trading schemes (ETS) on innovation spillovers and firm strategy beyond covered sectors.

Conclusion

Through this systematic literature review, we contribute to a more comprehensive understanding of green finance in emerging markets. We searched the WoS database, applied a filter to the 2024 ABS journal list, and used VOSviewer 1.6.20 to conduct our bibliometric analysis.

Our bibliometric analysis, China is the continent that has more contributions to this study trend, with France being the country with more citations per publication. Additionally, the most cited journals in our dataset were International Review of Financial Analysis. Moreover, Capital University Economics & Business is an institution with more citations regarding green finance in emerging markets.

We collected enough evidence to identify and explain what is currently known about green finance in emerging markets. Our review reveals that (1) The interaction between government policy and market mechanisms is central to driving green innovation, yet the micro-level effects of such interventions, particularly on individual firms and financial markets, remain underexplored. (2) The transition to a global green economy is inextricably linked to financial system evolution, with innovative instruments and flexible policy frameworks serving as crucial levers for mobilizing climate capital. (3) The integration of green financial tools, such as ESG disclosure and sustainable lending, has begun reshaping firm behaviour and capital allocation, although questions remain about the consistency, reliability, and long-term impact of these instruments. (4) Green bonds have emerged as a pivotal tool for financing sustainability, not only providing capital but also encouraging corporate innovation and institutional reform, though concerns like greenwashing and transparency persist. (5) In China, and increasingly across other emerging economies, ESG practices and green initiatives are demonstrating their influence on corporate strategies and investment behaviour, yet the effectiveness of ESG disclosure remains uneven and often undermined by quality concerns. (6) Finally, advancing green innovation requires an integrated policy framework that addresses both formal regulatory mechanisms and informal institutional factors—such as trust, governance, and media influence while accounting for firm-specific variables and broader financial constraints. This study offers relevant implications for researchers, practitioners,

and policymakers. Scholars are equipped with a structured overview of current knowledge gaps, particularly regarding firm-level behaviour, financial instrument efficacy, and the socio-political dimensions of green finance. For practitioners and investors, this review offers a clearer picture of how sustainable finance instruments function in real markets, highlighting both the opportunities and inherent risks.

The findings of our systematic literature review offer a more focused and context-specific understanding of green finance within emerging markets. By synthesizing recent empirical and conceptual contributions, the review highlights internal dynamics such as green capital leakage, uneven ESG adoption, and the role of intelligent transformation issues that are often overlooked in broader, globally oriented analyses. These insights help illuminate the structural and institutional challenges unique to developing economies, offering depth that complements more generalized overviews. Compared to other literature reviews in the field, ours takes a grounded approach that prioritizes the specific mechanisms shaping green finance implementation in the Global South. For instance, (Joshipura et al., 2025). present a comprehensive and methodologically rich synthesis of climate and green finance, offering a valuable global framework. Their review draws attention to the persistent divide between developed and developing economies in terms of financial infrastructure and regulatory capacity. The current review complements this by examining how those broader trends play out in practice at the regional and firm level.

Similarly, the work by (Bajaj et al., 2022) focuses on sovereign credit risk and the evolving role of ESG factors in shaping national financial stability. While their emphasis is at the macro-financial level, their findings reinforce the relevance of green finance as a critical component of fiscal and economic governance. Importantly, they point toward promising interdisciplinary research avenues at the intersection of ESG, systemic risk, and new asset classes such as cryptocurrencies which align with several emergent themes in our review. Together, these comparisons position the current review as a valuable link between global frameworks and the more granular realities of green finance in emerging markets, helping to advance the field through both theoretical integration and empirical nuance.

Looking ahead, future research should deepen the investigation into underexamined areas such as micro-level policy impacts, the role of informal institutions, ESG standardization, and the evolving intersection of green finance with digital innovations like DeFi. Additionally, cross-country comparative studies and sector-specific analyses will be essential to refine our understanding of green finance's real-world effectiveness across diverse economic contexts. As global attention intensifies around climate action, developing a nuanced, evidence-based, and context-sensitive understanding of green finance will be pivotal in shaping the financial architecture of a sustainable.

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