

A Comprehensive Systematic Review of Sustainable Finance, ESG Integration and Green Financial Innovation, 2019–2024: An Antecedents–Decisions–Outcomes Synthesis

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Abstract

This study synthesises evidence from research published between 2019 and 2024 on the drivers, practices, and financial consequences of sustainable finance and ESG integration. A systematic, criteria-based review was conducted of 21 peer-reviewed articles, comprising 8 review studies and 13 empirical studies, published in *Sustainability* and the *Journal of Risk and Financial Management*. The selected studies were systematically coded according to research design, sample characteristics, geographical region, and key findings, and subsequently synthesised using an Antecedents–Decisions–Outcomes (ADO) framework. The findings indicate that the strongest evidence supports a positive but conditional association between ESG and firm value, lower cost of capital, and greater resilience during the 2020 crisis. However, evidence remains comparatively limited regarding changes in ESG ratings, nonlinear relationships, and situations in which ESG disclosure is not accompanied by corresponding performance. The review also identifies substantial research gaps concerning ESG antecedents and emerging-market banking institutions. The findings imply that investors should consider ESG ratings as informative but incomplete indicators, while regulators should complement disclosure requirements with appropriate assurance mechanisms. Based on these findings, the study proposes an ADO-based research agenda to guide future research on sustainable finance and ESG integration.

Keywords: sustainable finance; ESG; green bonds; greenwashing; green fintech; systematic review

1. INTRODUCTION

Sustainable finance has grown from a niche into a mainstream field in less than a decade. Green bonds, ESG funds, sustainability reporting and climate-risk analytics are now part of ordinary investment and banking practice. The research that supports them has grown just as quickly, but it is scattered across journals, methods and regions, and individual studies often report different or even contradictory results. A systematic synthesis is therefore needed to show what is established, what is contested and what is missing.

This paper reviews evidence published between 2019 and 2024. The period covers the years after the Paris Agreement took effect, the COVID-19 market shock of 2020 and the rapid expansion of green fintech. Existing reviews tend to focus on one instrument, such as green bonds, or on one

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outcome, such as financial performance. This paper instead organises the evidence with an Antecedents–Decisions–Outcomes framework, which asks what drives sustainable finance, what firms and investors do, and what results follow.

The window is chosen to capture recent developments and not the earlier foundational work, which has been summarised elsewhere. It also allows the paper to ask whether findings reported in the first years of the window survive in the later ones.

Four research questions guide the study.

- RQ1. How has the literature on sustainable finance developed between 2019 and 2024 in terms of volume, design and context?
- RQ2. What antecedents and decisions does the literature identify?
- RQ3. What outcomes are reported, and how consistent is the evidence?
- RQ4. What gaps should future research address, particularly for emerging economies such as India?

The paper contributes in three ways. It provides a compact, coded map of 21 studies. It reports the direction of evidence by outcome in a single matrix. And it translates the gaps into an ADO research agenda.

2. REVIEW OF LITERATURE

2.1 Antecedents: what drives sustainable finance

Scholars locate the origins of sustainable finance in climate policy, investor preferences, institutions and technology. Kouwenberg and Zheng (2023) analysed 1,347 climate finance articles published between 1991 and 2021 and report rapid growth after the 2015 Paris Agreement, with four themes: renewable energy financing, climate risk effects on finance, green investor preferences, and the pricing and hedging of climate risk. Kashi and Shah (2023) mapped 723 sustainable finance publications and found that sustainable and green banking is highly relevant to development but sparsely studied.

Institutions condition how ESG information is valued. Engelhardt et al. (2021) found that the market benefit of high ESG ratings in early 2020 was stronger in low-trust countries and in countries with weaker securities regulation and lower disclosure standards. Technology is a further driver. Saeedi and Ashraf (2024) reviewed 90 sources and report that artificial intelligence and machine learning support risk assessment of green projects, crowdfunding platforms can create new green products and regulatory technology helps compliance. Kwong et al. (2023) conclude from 776 fintech and 1,428 green finance articles that green fintech, regulation in developing countries and green investment are priorities for research.

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2.2 Decisions: instruments, disclosure and integration

Green bonds are the most studied instrument. Liaw (2020) surveyed pricing studies and found that most report a lower yield on green bonds than on comparable conventional bonds from the same issuer, a gap called the greenium, while green bond funds remained small and lagged their benchmarks. Cortellini and Panetta (2021) narrowed 216 records to 53 empirical studies published from 2007 to 2020 and grouped them into six strands. The greenium evidence is mixed in primary markets and more common in secondary markets, and share prices generally rise after issuance announcements. Zairis et al. (2024) reviewed 80 studies and identified four themes: value creation, green bonds, ESG ratings and performance, and sustainable banking and risk.

Disclosure is a second decision. Oncioiu et al. (2020) built an analytic hierarchy model for 143 companies from eight countries over 2008 to 2018 and conclude that ESG reporting works as a channel for stakeholder communication and a tool for financial transparency, with the finance sector ranking highest. Chytis et al. (2024) mapped 1,034 ESG articles and identified six research clusters. Gregory (2024) shows the downside: greenwashing, measured for 3,973 companies in 70 countries, is associated with controversies and higher unsystematic risk. Investors also decide how far to integrate ESG, as in the study of European sustainable funds by Pisani and Russo (2021).

2.3 Outcomes: value, risk, capital cost and the environment

Most empirical studies examine firm value. Kim and Li (2021) combined Compustat data with MSCI ratings for 1991 to 2013 and report that ESG is linked to higher return on assets, most strongly for large firms and for governance. Gholami et al. (2022) studied 3,422 Australian firms and report that disclosure is associated with higher profitability, with all three pillars significant for financial firms and only governance for non-financial firms. Bashir et al. (2023) analysed 13,412 firm-years from 19 emerging economies and report that ESG performance raises future product-market value creation.

Banking results are more varied. Miralles-Quirós et al. (2019) studied 166 listed banks from 31 countries and found positive effects of environmental and governance scores on Tobin's Q but a negative effect of the social score. Ersoy et al. (2022) found no linear relationship for United States banks but an inverted U-shape for overall ESG and for the social score, and a U-shape for the environmental score.

Risk and capital costs are the third group. Engelhardt et al. (2021) studied 1,452 European firms and found higher abnormal returns and lower idiosyncratic volatility for high-ESG firms during the early-2020 collapse. Pisani and Russo (2021) found that higher-rated European funds outperformed and were more resilient. Ernst and Woithe (2024) found that better-rated S&P 500 firms had lower costs of equity and debt, although the weighted average cost of capital did not improve. Tawfiq et al. (2024) report lower leverage and lower WACC for Fortune 500 firms with higher disclosure. Maccarrone et al. (2024), however, found no significant market-value response to 840 rating updates for 75 firms and suggest that rating divergence may be one explanation. Finally, Shobande and Ogbeifun (2022) found that investor confidence was associated with lower greenhouse gas emissions in OECD countries.

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2.4 Research Gaps

Eight of the 21 articles are themselves reviews, and their designs shape what is known. Four are bibliometric maps, which show where research is concentrated but not what it finds. Three are systematic reviews and one is a survey of pricing studies, and these concentrate on single topics: green bonds, ESG importance in investment and technology for green finance. No review in the corpus compares outcomes across instruments, pillars and sectors in one framework, and none focuses on banks in emerging economies. The gap motivates the ADO synthesis and the evidence matrix used later in this paper.

3. METHODOLOGY

The study is a systematic, criteria-based literature review. It differs from the narrative approach of earlier work by fixing the protocol before synthesis and by coding every study in the same way. The review is purposive and not exhaustive, and its scope is stated explicitly in Table 1.

Table 1. Review protocol

Element	Specification
Question frame	Antecedents, decisions and outcomes of sustainable finance (RQ1 to RQ4)
Publication window	2019 to 2024
Sources	Sustainability; Journal of Risk and Financial Management (MDPI)
Search	Topic searches on green finance, ESG performance, ESG ratings, green bonds, climate finance, ESG disclosure, greenwashing and green fintech
Inclusion	Peer reviewed; finance or economic outcome; sustainability, ESG or green finance focus
Exclusion	Outside window; editorials; no finance outcome; unrelated sectors
Corpus	21 articles
Coding	Year, journal, design, sample, region, constructs, direction of finding
Synthesis	ADO framework and evidence matrix

The ADO framework was chosen because it separates three questions that are often confused: why sustainable finance arises (antecedents), what actors do (decisions) and what follows (outcomes).

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Each coded finding was assigned to one element, and the evidence matrix was then built from the outcome findings. Candidate titles returned by the searches were screened against the criteria. For each of the 21 articles retained, the bibliographic record and abstract were read and coded. Direction of evidence was recorded as positive, negative, nonlinear or null, and no effect sizes were pooled because the studies use different measures. The results are reported by research question.

Several steps were taken to limit bias. The same coding template was applied to every article. Contradictory and null findings were retained and reported with equal prominence. Review articles were coded separately from empirical studies so that secondary evidence was not counted as primary evidence. The protocol was applied before the synthesis was written, and no article was excluded because its result disagreed with others.

Four limitations apply. The sources are two journals from one publisher, so the corpus is not representative of all research. Coding relied on abstracts and records and not on full-text appraisal or quality scoring. Seven of the 21 studies are from 2024, which reflects the retrieval route and not a trend. And relationships reported in different samples may not be comparable.

4. RESULTS

4.1 Corpus profile (RQ1)

Table 2 shows the 21 studies by year and design. Eleven appeared in *Sustainability* and ten in the *Journal of Risk and Financial Management*. Reviews, which are bibliometric, systematic or survey studies, number eight and empirical studies number thirteen. Contexts include the United States, Europe, Australia, OECD countries and multi-country samples that include emerging economies; none of the empirical studies is dedicated to India.

Table 2. Corpus profile by year and design

Year	Studies	Reviews	Empirical
2019	1	0	1
2020	2	1	1
2021	4	1	3
2022	3	0	3
2023	4	3	1
2024	7	3	4
Total	21	8	13

Table 3 lists the included studies with their designs and main findings.

Table 3. Characteristics of the included studies

Study	Design and sample	Main finding
Miralles-Quirós et al. (2019)	166 banks, 31 countries, 2010–2015	Environmental and governance scores raise Tobin's Q; the social score lowers it
Liaw (2020)	Survey of green bond pricing studies	Greenium common; green funds small and lagging their benchmarks
Oncioiu et al. (2020)	143 firms, 8 countries, 2008–2018	ESG disclosure supports financial transparency
Cortellini & Panetta (2021)	Systematic review, 53 studies	Greenium mixed at issuance; positive announcement effects
Pisani & Russo (2021)	30 European funds	Higher-rated funds more resilient in 2020
Engelhardt et al. (2021)	1,452 European firms	High ESG: higher abnormal returns and lower volatility in the 2020 fall
Kim & Li (2021)	Compustat and MSCI data, 1991–2013	ESG raises return on assets and credit ratings
Ersoy et al. (2022)	U.S. banks, 2016–2020	No linear effect on market value; nonlinear patterns
Shobande & Ogbeifun (2022)	OECD panel, 1980–2019	Investor confidence reduces emissions
Gholami et al. (2022)	3,422 Australian firms, 2007–2017	Disclosure raises profitability; pillars differ by sector
Kashi & Shah (2023)	Bibliometric, 723 publications	Sustainable banking sparsely studied
Kouwenberg & Zheng (2023)	Bibliometric, 1,347 articles	Growth after the Paris Agreement; four themes

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Study	Design and sample	Main finding
Bashir et al. (2023)	13,412 firm-years, 19 emerging economies	ESG raises product-market value creation
Kwong et al. (2023)	Bibliometric, 776 FinTech and 1,428 green finance articles	Green fintech is a priority direction
Zairis et al. (2024)	Systematic review, 80 studies	Four themes: value, green bonds, ratings, banking and risk
Ernst & Woithe (2024)	498 S&P 500 firms	Lower costs of equity and debt; WACC unchanged
Maccarrone et al. (2024)	840 rating updates, 75 firms	No market-value reaction
Saeedi & Ashraf (2024)	Systematic review, 90 sources	AI, crowdfunding and RegTech address risk, products and compliance
Gregory (2024)	3,973 firms, 70 countries, 2012–2022	Greenwashing brings controversy and risk; lower WACC through debt
Chytis et al. (2024)	Bibliometric, 1,034 articles	Six clusters; fragmented field
Tawfiq et al. (2024)	25 Fortune 500 firms	Disclosure lowers leverage and WACC

4.2 Antecedents and decisions (RQ2)

Antecedents are the least studied element. Only the climate finance and sustainable finance maps, the technology review and the cross-country trust evidence address why sustainable finance grows. They point to climate policy, investor preferences, institutional quality and technology, but they are descriptive. Decisions are better covered: green bond issuance and pricing, ESG disclosure and greenwashing, and investor integration of ESG through funds. The decision studies show that choices are not neutral, since the same disclosure can reflect performance or image management. Green bond studies agree that issuance is generally received well by equity markets but disagree on whether issuers pay less to borrow, and the greenium appears sensitive to the sample, period and method. Disclosure studies agree that disclosure is associated with better financial outcomes, but the one

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study that measures greenwashing shows that the association is not evidence of environmental performance. Fund studies indicate that investor integration of ESG paid off most visibly in a crisis.

4.3 Outcomes and consistency (RQ3)

Table 4 summarises the direction of evidence by outcome.

Table 4. Evidence matrix by outcome

Outcome	Direction of evidence	Studies
Firm value and profitability	Mostly positive, conditional on pillar; sector and size; nonlinear for United States banks; social score negative in a bank sample	Kim & Li (2021); Gholami et al. (2022); Bashir et al. (2023); Miralles-Quirós et al. (2019); Ersoy et al. (2022)
Market response to rating changes	Null	Maccarrone et al. (2024)
Risk and crisis resilience	Positive for high ESG in 2020; greenwashing raises risk	Engelhardt et al. (2021); Pisani & Russo (2021); Gregory (2024)
Cost of capital and leverage	Lower costs of equity and debt and lower leverage; WACC effect not uniform	Ernst & Woithe (2024); Tawfiq et al. (2024); Gregory (2024)
Green bond pricing	Greenium mixed at issuance, more common in secondary markets; positive announcement reactions	Liaw (2020); Cortellini & Panetta (2021)
Environmental outcomes	Investor confidence associated with lower emissions	Shobande & Ogbeifun (2022)
Transparency	ESG reporting aids stakeholder communication	Oncioiu et al. (2020)

Three patterns stand out. First, positive associations dominate but depend on the pillar, the sector and the size of the firm, so a single ESG score hides large differences. Second, crisis evidence is consistent: both the stock-level and the fund-level studies for 2020 favour high-ESG assets. Third, outcomes weaken where the measure itself is unstable: rating changes did not move prices, and greenwashing separates disclosure from performance. Real environmental outcomes are rarely measured, and only one study links finance directly to emissions. A fourth pattern concerns time.

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Most studies examine ESG after 2010, and the strongest crisis evidence comes from a short window in 2020, so it is not yet clear whether the resilience benefit persists in other crises or whether it has been priced in as sustainable investing has grown. Longer samples and later periods would help to answer this.

4.4 Reconciling the mixed findings

Three explanations help to reconcile the differences. The first is measurement. Ratings from different agencies diverge, which may explain why rating changes did not move prices, and pillars behave differently: the social score lowered Tobin's Q in the cross-country bank sample, while the environmental score had a negative effect on credit ratings in the corporate sample. The second is functional form. The inverted U-shape for United States banks implies that tests assuming a straight line can find nothing even when a relationship exists. The third is context and timing. The crisis studies cover a period when uncertainty was high, and the stronger effect in low-trust, weakly regulated countries suggests that ESG ratings are most valuable when other information is scarce. Taken together, these points suggest that ESG pays under identifiable conditions and not universally.

4.5 Implications for emerging economies

None of the thirteen empirical studies is dedicated to India, and only one, covering 19 emerging economies, explicitly addresses emerging markets. The conditioning role of trust and regulation implies that the value of ESG information in India may depend on the quality of disclosure and enforcement and not only on the rating itself. Research on Indian listed firms and banks, on green bond markets and on green fintech platforms would therefore address a clear gap.

4.6 Answers to the research questions

In answer to RQ1, the literature is growing, increasingly dominated by reviews and empirical work on firm value, and concentrated in developed markets and multi-country samples. In answer to RQ2, antecedents are described but rarely tested, while decisions on green bonds, disclosure and ESG integration are well covered. In answer to RQ3, outcomes are mostly favourable but conditional, and the weakest evidence concerns rating changes, nonlinear effects and the link between disclosure and real environmental performance. In answer to RQ4, the main gaps are causal evidence on antecedents, measurement of real environmental outcomes and dedicated studies of banks and firms in India and similar economies.

5. CONCLUSION AND FUTURE RESEARCH

This review of 21 studies published between 2019 and 2024 shows that sustainable finance research has expanded rapidly but unevenly. Evidence on outcomes is substantial and mostly favourable, yet conditional. Evidence on antecedents is thin, and emerging-market banking is under-represented. For investors, the findings suggest using ESG ratings as an input and not a verdict, since rating divergence and greenwashing weaken their signal. For regulators, they suggest combining disclosure rules with assurance. For banks and firms, they suggest that performance and not reporting alone is rewarded

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in the long run.

For policymakers in emerging economies such as India, the evidence supports building trust in disclosure through assurance and enforcement, encouraging transparent green bond markets and supporting research on local firms and banks so that decisions rest on local evidence and not only on results from developed markets.

The review also has theoretical implications. The conditional and nonlinear results do not support a simple claim that ESG always pays, nor a claim that it never does. They support a contingent view in which the value of ESG information depends on the pillar, the sector, the level of trust and regulation, and the stability of the rating used. Future theory should therefore specify boundary conditions and not only average effects, and future empirical work should test them directly.

The study has limitations, which suggest where to go next. Table 5 sets out an ADO research agenda.

Table 5. ADO research agenda

Element	Priority question	Suggested approach
Antecedents	How do regulation, investor demand, trust and technology trigger sustainable finance in emerging economies?	Policy evaluation using quasi-experimental designs; India-specific data
Decisions	Does disclosure or green bond issuance lead to real investment and emissions reduction?	Link disclosure text to project-level data; assurance studies
Outcomes	Why are results nonlinear, null or sector specific, and how does rating divergence contribute?	Longer panels; alternative ratings; bank-specific samples
Contexts	How do effects differ for banks, small firms and green fintech platforms?	Multi-group and mixed-method designs

Future reviews should widen the sources beyond one publisher, appraise methodological quality and update the corpus as new evidence appears.

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