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ESG Operationalization along the value chain: A combined Bibliometric analysis and Systematic literature review of determinants and firm value implications (2015–2024).

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Abstract

Although increasing regulatory requirements and stakeholder activism around the globe, the operationalization process of firms with respect to their ESG criteria in internal processes, along with its effects on firm value remains theoretically underdeveloped and empirically scattered. This paper aims to fill this gap by conducting a bibliometric analysis and systematic literature review (SLR) of the interrelations among ESG, process, and firm value. Drawing on the Scopus Database, a dataset of 3,119 peer-reviewed journal articles published between 2015 and 2024 was compiled. After the screening process, 168 articles were selected for bibliometric analysis and 40 papers were reviewed in-depth (inter-rater agreement, Cohen's $\kappa = 0.82$). Bibliometric network visualization was accomplished using VOSviewer software. Four main contributions result from this analysis. First, the research output in the area has increased exponentially since 2018, accounting for 35.7% in 2024, reflecting the rise in ESG regulatory frameworks (e.g., CSRD, ISSB). Second, four clusters of knowledge are delineated: (1) transformation of internal processes and dynamic capabilities; (2) ESG integration in supply chain and value chain management; (3) ESG governance and reporting; and (4) ESG integration in SMEs and emerging economies. Third, the SLR proves that ESG operationalization indeed leads to the creation of firm value through operational efficiency, risk management, innovation benefits, stakeholder trust and better access to finance, although the significant gap between multi-year horizons and short-term reporting requirements continues. Fourth, an integrated framework of concepts based on stakeholder theory, Resource Based View, and dynamic capabilities is elaborated, along with six research propositions and research agenda. In doing so, this review makes progress on the state of art by focusing on operationalization rather than ESG disclosure.

Keywords: *ESG integration; ESG operationalization; bibliometric analysis; systematic literature review; firm value; value chain; dynamic capabilities; stakeholder theory*

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1. Introduction

There is a noticeable tendency in academic research to pay attention to ESG integration within companies' operations due to the transformation of business environment, new investment strategies, stakeholder pressure (Freeman, 1984; Porter & Kramer, 2011), as well as regulatory factors like the United Nations' Sustainable Development Goals (UN SDGs), the Paris Agreement, the Corporate Sustainability Reporting Directive (CSRD), and IFRS Sustainability Standards Board (ISSB S1/S2). From the theoretical perspective, several approaches compete for the understanding of the issue. According to shareholder primacy, corporations have a responsibility to maximize shareholders' value without taking into account the rest of society's concerns (Friedman, 1970). On the contrary, stakeholder theory suggests that companies need to be accountable to multiple groups in order to incorporate stakeholders' interests in the process of value creation (Freeman, 1984; Donaldson & Preston, 1995). Within agency theory, managers use ESG initiatives in order to pursue their self-interest goals because of informational asymmetry between principals and agents (Jensen & Meckling, 1976). Depending on these conflicting frameworks, researchers obtain different findings, demonstrating either the positive ESG-firm value connection (Eccles et al., 2014; Lins et al., 2017; Flammer, 2015), or no effect.

The problem is that despite a rich academic tradition, there is still an important theoretical gap. Specifically, although the literature is rich in the studies devoted to ESG disclosure and aggregated ESG performance, the internal process-based mechanisms that help to operationalize ESG criteria within organizations are hardly addressed. It implies that the operationalization is the missing link between ESG criteria and the creation of value (Serafeim, 2020; Whelan & Fink, 2016). Thus, current ESG reviews can be classified as either ESG-firm financial performance (Friede et al., 2015; Gillan et al., 2021), ESG disclosure patterns or company resilience during crisis periods (Broadstock et al., 2021), but none of them is engaged in the identification of ESG integration mechanisms within processes.

In order to bridge this gap, the present study uses a mixed-method approach that combines bibliometrics with a SLR. The reasons for adopting the hybrid strategy lay in the complementarities of both techniques when used together. While bibliometric approach is aimed at visualizing the development of the field over time and geographical space, the SLR helps to identify research

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topics related to ESG and operationalization within organizations (Donthu et al., 2021; Lim et al., 2022).

The objective of this study is therefore to identify and map the process-level mechanisms through which organizations operationalize ESG criteria into value-creating activities, through an approach that involves conducting a bibliometric analysis alongside a systematic literature review (SLR).

This paper aims to address the following research questions. RQ1: What is the timeline of publication activity regarding ESG operationalization in organizational processes? RQ2: Which nations, journals and authors play the most influential role? RQ3: How does the intellectual structure of the field look like and what are the emerging areas? RQ4: Which are the most frequently used keywords and what is their significance? RQ5: What are the main themes related to the connections between ESG, firm performance, and firm value? RQ6: What are the promising research directions in ESG in the future?

This paper makes four contributions. First, it advances ESG process literature by providing an overview of the mechanisms used by companies to create value through ESG operationalization, which has not yet been explored. Second, it maps ESG, process, value literature between 2015 and 2024, presenting four knowledge clusters and their theoretical background. Third, it proposes an integrated framework of theories, antecedents, process-level mechanisms, moderators and consequences. Finally, it formulates six propositions and presents a research agenda.

The rest of the paper is organized as follows. Section 2 will detail the methodology, elaborating on the search strategy, the inclusion and exclusion criteria, and the PRISMA-based selection process. Section 3 will describe the bibliometric analysis, comprising the publication patterns, authors', journals' and countries' analysis, and keyword co-occurrences and clustering. Section 4 will detail the systematic literature review based on four thematic clusters: internal process transformation and dynamic capabilities; ESG incorporation in supply chain and value chain management; ESG governance, management control systems, and reporting; and ESG operationalization in SMEs and emerging markets. Section 5 will discuss the results and develop an integrative theoretical framework with theoretical and practical implications. Section 6 will outline the research agenda. Section 7 will consider the limitations of the study, while Section 8 will be the conclusion.

Figure 1 presents the integrative conceptual framework that constitutes the basis for this research.

Figure N°1 : Integrative Conceptual Framework: ESG Operationalization Along the Value Chain and Firm Value

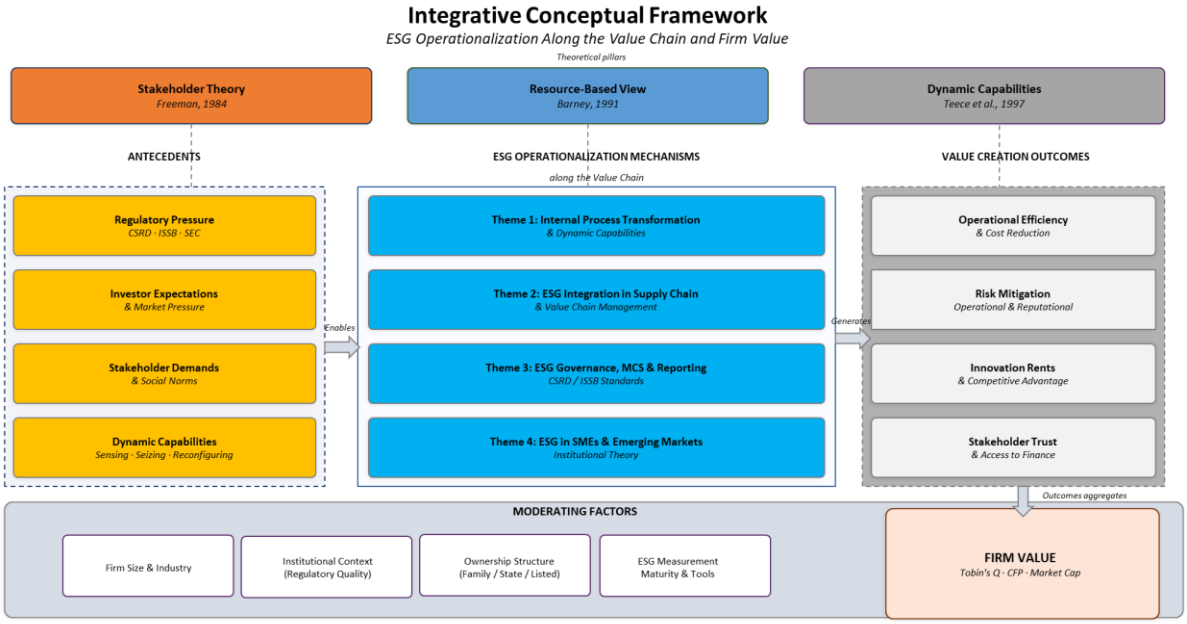

Figure 1. Integrative Conceptual Framework: ESG Operationalization Along the Value Chain and Firm Value

Source : Compiled by the authors

2. Methodology

2.1 Methodological design

This research employs a methodology that is a combination of bibliometric analysis and systematic literature review (SLR), which provides systematic ways to quantify and analyze the development of an area of science by visualizing its architecture, discovering emergent topics, identifying leading countries, journals, authors, and papers in the area (Donthu et al., 2021; Aria & Cuccurullo, 2017). The latter complements the former by offering a way to provide a more in-depth understanding through critical evaluation and synthesis of scholarly sources dedicated to the issue of ESG operationalization within organizations and the impact of these processes on firm value (Tranfield et al., 2003; Moher et al., 2009). Combining the two methods provides unique benefits to this particular research, as they allow for the discovery of structural relationships and their underlying mechanisms, respectively (Lim et al., 2022; Kraus et al., 2022)

The bibliometric mapping analysis was done through VOSviewer version 1.6.19, chosen for its well-documented capabilities and proficiency in creating and presenting various bibliographic

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network structures such as co-occurrence, co-citation, bibliographic coupling, and co-authorship networks as well as its capability in dealing with large sets of data visually (Van Eck & Waltman, 2010). The choice was made considering the better visual quality that VOSviewer possesses than other software packages like Bibliometrix and CiteSpace while analyzing co-occurrence networks (Donthu et al., 2021).

2.2 Search strategy and data collection

Systematic search was carried out through the Scopus database, which is regarded as one of the best multidisciplinary databases for academic literature, having coverage from all leading publishers, such as Elsevier, Emerald, Springer, Taylor & Francis, and IEEE (Mongeon & Paul-Hus, 2016). Comparative studies in the past reveal that Scopus database offers better coverage as compared to the Web of Science for studies relating to management, sustainability, and social sciences.

The search strategy combined keywords across three dimensions: ESG/CSR framing, operationalization or integration within organizational processes, and performance or firm value outcomes. The query was structured as follows:

(("ESG" OR "CSR" OR "Environmental, Social, Governance" OR "Corporate Social Responsibility" OR "sustainability") AND ("operationalization" OR "implementation" OR "integration" OR "process" OR "operations" OR "practices") AND ("firm value" OR "financial performance" OR "firm performance" OR "market valuation"))*

2.3 Inclusion and exclusion criteria

Table 1 presents the formal PICOS-aligned inclusion and exclusion criteria applied during screening (Tranfield et al., 2003).

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Table N°1 : Inclusion and Exclusion Criteria for the SLR Sub-Corpus

Criterion	Inclusion	Exclusion
Document type	Peer-reviewed journal articles	Conference papers, book chapters, books, editorials, reports
Language	English, French	All other languages
Time frame	2015–2024	Before 2015
Database	Scopus (peer-reviewed)	Non-indexed sources (grey literature)
Topic	ESG/CSR operationalization, integration, or implementation in firm processes AND link to performance/value	ESG disclosure without process link; purely financial performance studies without ESG operationalization angle
Methodology	Quantitative, qualitative, mixed-methods, case studies	Purely conceptual without empirical grounding (for SLR sub-corpus)
Availability	Full text accessible	Abstract-only articles

Source : Compiled by the authors

2.4 PRISMA-compliant selection process

The search process employed the PRISMA 2020 four-step model (Page et al., 2021), which is depicted in Figure 2.

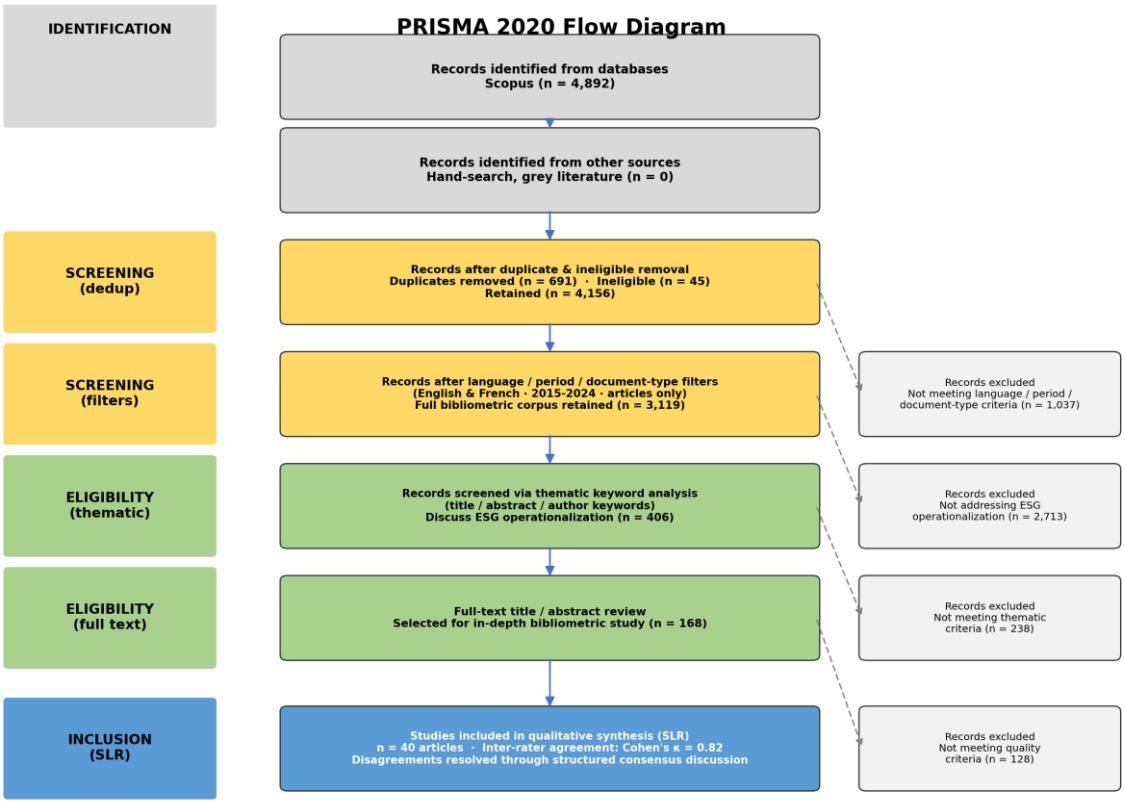
(1) Identification: A total of 4,892 records were sourced from Scopus.

(2) Screening: Discarding 691 duplicate records and 45 non-peer-reviewed sources (e.g., conference proceedings, editorials, book chapters) brought the number of articles down to 4,156, while filtering based on language (only English/French texts), period (2015–2024) and type (article only) left 3,119 studies for full bibliometric examination.

(3) Eligibility: Theme-based keyword screening on the basis of title, abstract, and author keywords resulted in selecting 406 articles that discussed ESG operationalization or integration into organizational processes; upon further analysis of full texts' title and abstract sections, 168 articles were selected for in-depth bibliometric study.

(4) Inclusion: Critical appraisal of each of these 168 studies in terms of scientific and methodological quality, theory and empirical evidence backing, and relevance to the focal concept resulted in final inclusion of 40 articles in the qualitative SLR component. Inter-rater agreement between two independent reviewers was assessed using Cohen's κ coefficient equaling 0.82 (Cohen, 1960), which means excellent agreement levels.

Figure N°2 : PRISMA 2020 Flow Diagram — Systematic Literature Selection Process



Source : Compiled by the authors

2.5 Positioning relative to existing reviews

Table 2 situates this review relative to the most closely related prior bibliometric and systematic reviews. It demonstrates that no prior study combines bibliometric analysis with an SLR specifically targeting ESG operationalization along the value chain over the 2015–2024 period.

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Table N°2 : Positioning of the Present Study Relative to Existing Reviews

Study	Method	Period	Corpus	Key Focus / Gap Addressed
Friede et al. (2015)	Meta-analysis	1970–2014	2,200 studies	ESG–CFP: general meta-analysis, no process level
Broadstock et al. (2021)	SLR	2015–2020	62 articles	COVID-19 & ESG resilience, no operationalization focus
Gillan et al. (2021)	Narrative review	2000–2020	n/a	ESG and corporate finance; limited on internal processes
Li et al. (2022) ⚑	Bibliometric	2000–2021	1,825 articles	ESG research trends; no SLR; no value-chain operationalization
Present study	Bibliometric + SLR	2015–2024	3,119 / 168	ESG operationalization → firm value; integrative framework; research agenda

Source : Compiled by the authors

3. Bibliometric results

3.1 Annual publication trends (RQ1)

The analysis of 168 articles published between 2015 and 2024 (Table 3) shows the dynamic field characterized by successive phases of stimulation that are behind its vigorous and ever-increasing development. The first three years show relatively low publication numbers (n = 18; 10.7%) devoted to readdressing the relationship between CSR and financial performance in light of the 2015 Paris Agreement and UN Sustainable Development Goals. Starting from 2018, the trend changes dramatically due to the increasing adoption of the TCFD recommendations by institutional investors that incentivized firms to integrate ESG practices in their operations rather than just disclose them.

The growth in the number of publications increases sharply from 2020 (n = 16 in 2020; n = 26 in 2023; n = 60 in 2024). It corresponds to three simultaneous events: the successful operation of ESG strategies during the pandemic period (Broadstock et al., 2021), the EU Taxonomy Regulation and its clear process-based definition of sustainable activities, and the policy momentum that led to the CSRD and ISSB S1/S2 due to the consultations of 2021-2022. As a result, there was high demand

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for process level ESG evidence, thus determining the trajectory of the research described herein. Of special interest, in 2024 alone 35.7% (n = 60) of all publications was published. It shows that ESG operationalization has become the leading research direction, an evolutionary change in the field that has been documented by the current study for the first time.

Thus, the trajectory of research in question is reflective of the paradigm shift in the literature that takes place gradually from the question of the effect of ESG engagement on the performance of the organization to the exploration of the ways ESG is embedded in the processes of organizational activity.

Table N°3 : Annual distribution of publications in the SLR sub-corpus (n = 168, 2015–2024)

Year	Articles	% Corpus
2015	3	1.8%
2016	9	5.4%
2017	6	3.6%
2018	13	7.7%
2019	9	5.4%
2020	16	9.5%
2021	11	6.5%
2022	15	8.9%
2023	26	15.5%
2024	60	35.7%
Total	168	100%

Source : Compiled by the authors

3.2 Author analysis (RQ2)

The 168 papers feature 498 signatures from 486 unique authors, meaning that almost all scholars make contributions just once—an indication that the field is indeed young (Donthu et al., 2021). Just 14 authors have featured in two papers (Table 4). None of them made contributions more than twice. This indicates the epistemological diversity—the institutionalist, resource-based, stakeholder, and signaling theories—that define the literature. Consistent themes include: ESG

governance and sustainability performance (Kim, S.; Kim, Y.); financing structure and ESG integration (Kashiramka, S.); operation processes and industry performance (Tarigan, Z.J.H.; Novitasari, M.); reporting and valuation (Zhou, Y.; Rao, A.A.); and transmission effects in emerging markets (Le, T.T.; Tran, M.D.; Phan, T.T.H.).

Table N°4 : Most Prolific Authors (≥ 2 Articles)

Author	Articles	% Corpus	Research Focus
Kim, S.	2	1.2%	ESG governance & sustainable performance
Kim, Y.	2	1.2%	ESG governance & sustainable performance
Kashiramka, S.	2	1.2%	Financial structure & ESG integration
Rao, A.A.	2	1.2%	Disclosure & firm valuation
Tarigan, Z.J.H.	2	1.2%	Operational mechanisms & industrial performance
Novitasari, M.	2	1.2%	Operational mechanisms & industrial performance
Zhou, Y.	2	1.2%	ESG disclosure & market valuation
Le, T.T.	2	1.2%	Emerging markets: ESG–risk–performance
Tran, M.D.	2	1.2%	Emerging markets: ESG–risk–performance
Phan, T.T.H.	2	1.2%	Emerging markets: ESG–risk–performance
Said, J.	2	1.2%	Corporate governance & accountability
Rahman, M.M.	2	1.2%	CSR, sustainability & financial outcomes
Al-sharafi, M.A.	2	1.2%	Digital ESG & technology adoption
Nguyen, T.H.	2	1.2%	Supply chain sustainability, Asia-Pacific

Source : Compiled by the authors

3.3 Journal analysis (RQ2)

The literature is highly clustered in a group of sustainability and corporate responsibility journals (Table 5). *Sustainability* (Switzerland) is the most prevalent (n = 24; 14.3%), followed by *Journal of Cleaner Production* (n = 19; 11.3%). This body of literature is firmly rooted at the interface of

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three different editorial philosophies: environmental sustainability, sustainable strategies, and responsible governance. It should be noted that all top 10 journals have been assigned to Q1 Scopus quartile.

Table N°5 : Most Represented Journals (Top 10)

Journal	Articles	% Corpus	Scopus Q
Sustainability (Switzerland)	24	14.3%	Q1
Journal of Cleaner Production	19	11.3%	Q1
Corporate Social Responsibility and Environmental Management	14	8.3%	Q1
Business Strategy and the Environment	12	7.1%	Q1
Journal of Business Ethics	9	5.4%	Q1
International Journal of Production Economics	7	4.2%	Q1
Finance Research Letters	6	3.6%	Q1
Journal of Environmental Management	5	3.0%	Q1
Emerging Markets Review	4	2.4%	Q1
Pacific-Basin Finance Journal	4	2.4%	Q1
Other journals (n = 52)	64	38.1%	—

Source : Compiled by the authors

3.4 Country analysis (RQ2)

The 1,546 keyword occurrences (Table 7) reveal a clear thematic structure organized around several dominant conceptual poles. The keywords “corporate social responsibility,” “financial performance,” “firm value,” “sustainability,” and “ESG” show that most researches pay attention to the relation between the social and environmental performance of firms and their financial performance.

Newer and more recent keywords like “sustainable practices,” “supply chain management,” “dynamic capabilities,” and “value chain” demonstrate that there is a slow shift from outcome to

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process in the operationalizing of ESG concepts in the business process. It is true in line with the general trend of intellectual evolution of the discipline.

Table N°6 : Geographic distribution of publications (Top 10 Countries, n = 168)

Rank	Country	Articles	% Corpus	Regional Tradition
1	China	28	16.7%	Emerging market focus
2	United States	22	13.1%	Finance & governance
3	United Kingdom	16	9.5%	Corporate governance
4	Vietnam	12	7.1%	Emerging market focus
5	Malaysia	9	5.4%	Islamic finance & CSR
6	Indonesia	8	4.8%	Operational ESG integration
7	India	7	4.2%	Sustainability & finance
8	Australia	6	3.6%	Supply chain sustainability
9	South Korea	6	3.6%	Chaebol governance & ESG
10	Italy	5	3.0%	Sustainability reporting
11–62	Other countries (n = 39)	49	29.2%	—

Source : Compiled by the authors

3.5 Keyword co-occurrence analysis (RQ3, RQ4)

Based on 1,546 keywords occurrence (Table 7), it can be said that the research field is organized through key concepts, which include “corporate social responsibility”, “financial performance”, “firm value”, “sustainability”, and “ESG” and show that the majority of research examines the connection between organizational social involvement and firm performance. Newer keywords, such as “sustainable practices”, “supply chain management”, “dynamic capabilities” and “value chain”, reflect the gradual shift towards operational ESG implementation.

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Table N°7 : Most frequent author keywords (Top 10)

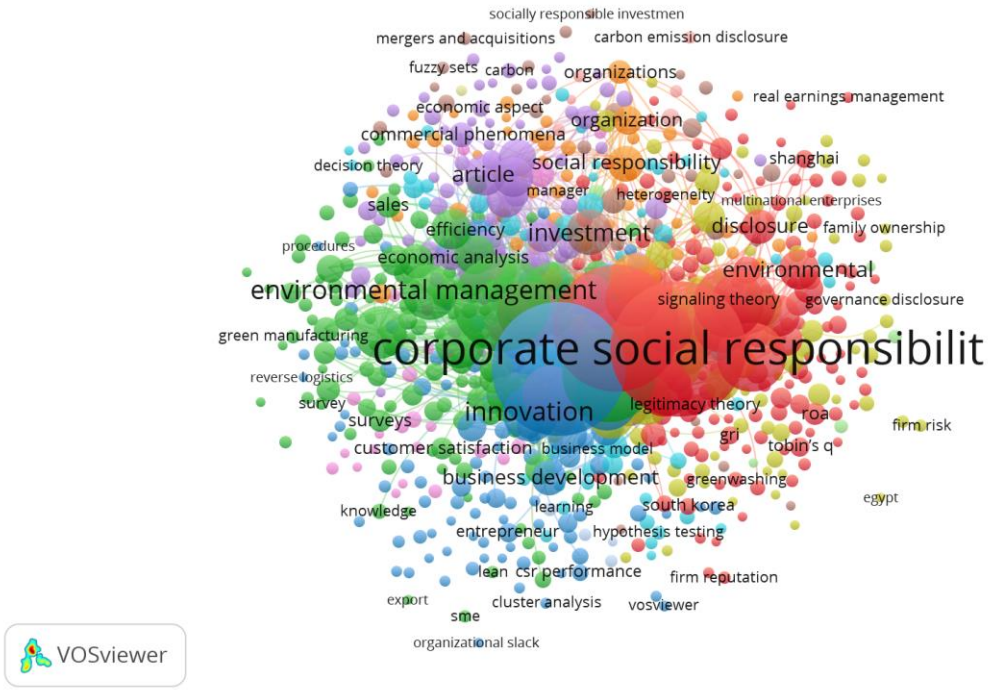
Rank	Keyword	Occ.	Rank	Keyword	Occ.
1	corporate social responsibility	312	11	sustainable practices	58
2	financial performance	287	12	supply chain management	54
3	ESG	241	13	corporate governance	51
4	sustainability	218	14	emerging markets	49
5	firm value	196	15	innovation	46
6	environmental performance	134	16	dynamic capabilities	38
7	Stakeholder theory	112	17	value chain	34
8	ESG disclosure	104	18	industrial performance	31
9	Social responsibility	97	19	board characteristics	29
10	Green management	74	20	resource-based view	27

Source : Compiled by the authors

In addition to the ranking of frequency presented in Table 7, Figures 3 and 4 display the complete VOSviewer co-occurrence network of keywords based on the author-keyword metadata field of the bibliometric corpus. Figure 3 displays the network map visualization, where the node size represents the frequency of occurrences, while the node color shows the affiliation to clusters; the "corporate social responsibility" node is the focal point of a highly dense red cluster (disclosure,

governance, signaling and legitimacy theory) and green cluster (environmental management, green manufacturing, reverse logistics), confirming the presence of the two poles found in Table 7.

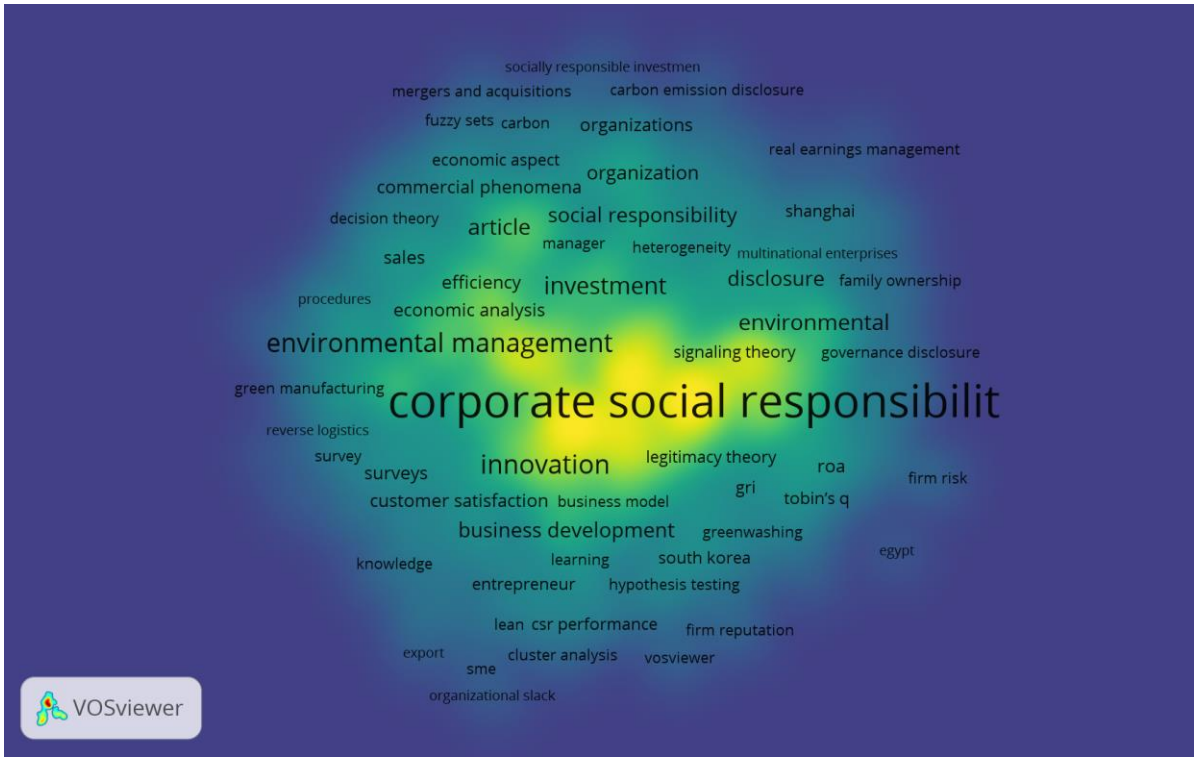
Figure N°3 : VOSviewer Keyword Co-occurrence Network (cluster view)



Source : VOSviewer output generated by the authors from the bibliometric corpus (n = 168)

The density visualization in Figure 4 displays warmer colors (yellow) in those areas where the highest keyword concentration occurs. The highest density occurs around "corporate social responsibility," followed by "environmental management" and "disclosure." This confirms the clustering of research around the field of CSR-financial performance.

Figure N°4 : VOSviewer Keyword Density Visualization



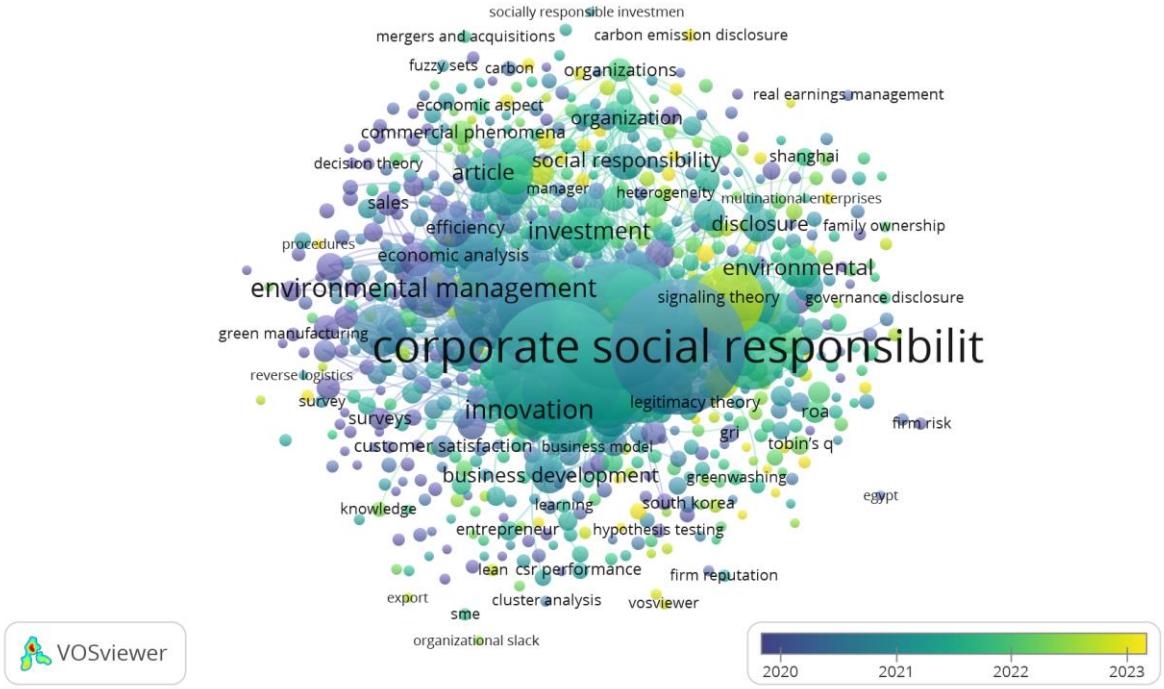
Source : VOSviewer output generated by the authors from the bibliometric corpus (n = 168)

3.6 Knowledge mapping and cluster analysis (RQ3)

In terms of the VOSviewer co-occurrence analysis, the literature sample under study consists of four thematic clusters. Cluster 1 (CSR and Financial Performance) is the largest and most internally consistent one, based on stakeholder theory and RBV, and it deals with the relation between companies' social responsibility and financial performance. Cluster 2 (ESG, Governance, and Disclosure) can be viewed as the most normative and institutional one, dealing with the credibility and transparency of extra-financial reporting (Eccles et al., 2014). Cluster 3 (Environmental Sustainability and Ecological Transition) consists of the intersection between environmental sciences and ecological economics (Porter & van der Linde, 1995). Cluster 4 (Operational Processes, Value Chain, and Sustainable Management) is the most recent and least developed one, being directly connected to the current research contribution, including studies of ESG implementation in microorganizational context using the dynamic capability theory (Teece et al., 1997).

Figure 5 illustrates the VOSviewer overlay visualization and shows the publication years of each keyword (yellow = 2023, dark blue/purple = before 2020). Keywords that correspond to Cluster 4, i.e., terms of operational and process language like "greenwashing," "governance disclosure," and "carbon emission disclosure," are obviously shifted to the yellow part of the spectrum, being the most recent thematic cluster, whereas Cluster 1 keywords ("corporate social responsibility," "environmental management") have much older profile (blue-green nodes).

Figure N°5 : VOSviewer Overlay Visualization (by average publication year)



Source : VOSviewer output generated by the authors from the bibliometric corpus (n = 168)

4. Systematic literature review: thematic synthesis (RQ5)

The following sections synthesize the 40 articles retained for critical appraisal across four thematic axes.

4.1 Internal process transformation and dynamic capabilities

Built upon the theory of dynamic capabilities (Teece et al., 1997; Helfat & Peteraf, 2009), this thematic cluster focuses on corporate practice of process transformation to incorporate ESG criteria and treats ESG operationalization as a continuous process of organizational learning rather than a process of compliance. Dynamic capabilities as described by Teece et al. include sensing

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opportunities in the environment, positioning for success and reconfiguration of routines – and provide a theoretical framework for understanding implementation of ESG criteria.

Three findings from empirical research presented in the SLR sub-corpus can be outlined here. First, companies with strong ESG dynamic capabilities have low costs of operation and of capital based on the resource-based logic in terms of having sustainable competitive advantages through their firm-specific and difficult-to-explain ESG-specific routines (Eccles et al., 2014; Flammer, 2015). Secondly, there is a demonstrable positive effect of integrating the environmental and social key performance indicators into management systems and operational dashboards, resulting in significant decreases in cost of regulatory compliance and waste production. Lastly, cross-functional committees for ESG governance involving operations, finance and sustainability departments accelerate diffusion of sustainable practices and ESG alignment results in innovative processes that improve productivity through process improvement and efficient use of material resources.

However, a fundamental controversy exists regarding the temporal aspect of ESG-driven process transformation. While it can be claimed that ESG process transformation results in tangible financial value over a multi-year period (3–7 years on average), it does not correspond to the timeframe of quarterly reports expected by investors (Whelan & Fink, 2016; Serafeim, 2020). This short-termism issue, well-documented throughout the whole literature on ESG, remains insufficiently solved at the level of ESG process transformation and represents one of the most critical research gaps revealed during this review, motivating Research Proposition P1.

4.2 ESG integration in supply chain and value chain management

The second thematic axis concerns the ways in which ESG criteria can permeate throughout the entire value chain, including upstream supplier selection and procurement, downstream logistics and distribution, and downstream end-of-life product management (Porter & Kramer, 2011; Pagell & Wu, 2009).

From a theoretical perspective, this line of inquiry builds upon stakeholder theory (Freeman, 1984), suggesting that the adoption of ESG cannot be confined to the focal firm only but requires the involvement of supply chain members to legitimize ESG efforts, audit such efforts, and align them with the expectations of multiple stakeholder groups.

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Empirical findings from the review literature converge around four main channels of impact. First, ESG auditing systems of suppliers, involving both third-party certifications and supplier development programmes, help avoid supply chain disruption risks and improve the sustainability performance of suppliers. Second, practices of the circular economy embedded in supply chain operations result in cost savings through reuse of materials and waste reduction as well as better environmental performance outcomes (Ye et al., 2023). Third, green procurement policies are effective at building customer trust and brand equity in B2B markets and, thus, improve customer loyalty and contract retention. Finally, reverse logistics, which represents the end-of-life ESG responsibilities, is positively associated with financial performance, especially in capital-intensive manufacturing industries.

One of the major structural barriers found in the research literature is the problem of what is termed "supply chain decoupling". Firms tend to impose more stringent requirements for ESG compliance on tier-1 suppliers, while exercising limited monitoring of tier-2 and tier-3 suppliers, leaving substantial holes in the overall value chain. This phenomenon is caused by information asymmetries between supply chain tiers, lack of standardization of ESG criteria for low-tier suppliers, and high costs of auditing deep-tier suppliers, especially for SMEs. The forthcoming CSRD Scope 3 reporting requirements will likely revolutionize this area as of 2025.

4.3 ESG governance, management control systems, and reporting

This research cluster explores the issue of embedding ESG-related criteria in institutionalized governance systems, management control systems (MCS), and performance measurement systems, that is, the institutional infrastructure via which ESG-related commitments are translated into organizational practices (Otley, 1999; Simons, 1995). Based on agency theory (Jensen & Meckling, 1976), the general idea of this research is that the implementation of ESG-related criteria goes beyond just strategic intentions and involves changes in incentive mechanisms, reporting structures, and board-level monitoring processes to narrow down the discrepancy between ESG-related performance and ESG-related disclosure.

Four important empirical patterns can be identified based on the literature review. First, compensation schemes including ESG KPIs in variable pay show higher levels of ESG performance and earnings management. Second, independent ESG-related committees established at board level increase the quality of non-financial disclosure and minimize the discrepancy

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between reported and actual ESG performance, which is directly applicable to regulators when creating a CSRD assurance framework. Third, integrated reporting system that connects financial performance and sustainability metrics decreases the information asymmetry in capital markets and analyst coverage. Fourth, balanced scorecard including the ESG dimensions increase the consistency between efficiency and sustainability performance, which eliminates the negative silo effect.

The major gap that still remains largely underresearched in this field is the issue of accounting of Scope 3 emissions through management control systems. Given growing regulatory pressure (such as CSRD Article 29 and SEC climate disclosures requirements), very few papers discuss the implementation of Scope 3 in management accounting systems and its effect on financial performance.

Scope 3 emissions accounting within management control systems. Despite growing regulatory pressure (such as CSRD Article 29 and SEC climate disclosures requirements), very few studies explore the issue of implementing the Scope 3 in the current management accounting systems and its effect on the financial performance.

4.4 ESG operationalization in SMEs and emerging markets

Following the theory of institutions (DiMaggio & Powell, 1983; North, 1990), this thematic axis explores the institutional and structural constraints affecting ESG operationalization in small and medium-sized enterprises (SMEs) and emerging markets. Specifically, it is assumed that the link between ESG and the value of the firm cannot be generalized since it largely depends on such contextual variables as regulatory quality, market development, and institutional norms.

There are four major empirical findings characterizing this cluster. Firstly, SMEs face certain constrains related to the lack of financial resources, lack of expertise among managers in the area of ESG, inability to secure sustainable finance, and low institutional stakeholder pressure. All these factors combined weaken the ESG-firm value relation. Secondly, institutional voids in emerging economies such as weak enforcement of property rights, undeveloped capital markets, and poor regulation influence ESG outcomes and strengthen the positive impact of ESG operationalization on firm value in high-governance countries. Thirdly, family firms operating in this environment exhibit certain behavioral patterns concerning ESG, mainly driven by their socioemotional wealth protection and thus, perform differently from widely-held firms. Finally, collaboration through

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ESG platforms and industry associations becomes an institution substitute in cases of weak formal institutions helping to diffuse norms and develop collective capabilities.

Overall, this cluster is the most heterogeneous in terms of theoretical, methodological and empirical aspects. On the other hand, it seems to be one of the most prospective research areas in the future especially in emerging markets, which are poorly researched at present. For instance, Morocco and Africa as a whole remain under-researched in this respect.

5. Discussion and Integrative Conceptual Framework

5.1 Synthesizing bibliometric and SLR findings

The intersection of results obtained from bibliometrics and SLR provides three main conclusions which exceed those possible to be gained from each technique individually. Firstly, it becomes evident that the field itself is experiencing a structural shift from results-oriented to process-oriented ESG research. Bibliometric indicators such as keyword evolution trends, cluster formation patterns, and rapid popularity of keywords including “dynamic capabilities” and “value chain” prove the shift in thematic focus that has been revealed during the SLR independently for all four clusters. Taken together, they become a strong indication that the ESG research agenda has shifted from “does ESG create value?” to “how ESG creates value?”, which is crucial considering theoretical implications for the field.

Secondly, the usage of theories is quite frequent and extremely fragmented in the field. The three most influential theoretical frameworks – stakeholder theory, Resource-Based View, and dynamic capabilities are frequently used by scholars, but they do it quite separately, without any integration. Integrated multi-theoretical approach is used in a very small share of studies (estimated less than 15%).

The integrative conceptual framework suggested in the paper (Figure 1) tries to fill this gap showing the logic behind the usage of the three theoretical pillars in explanation of the antecedents, mechanisms, and outcomes of ESG operationalization.

Thirdly, the contextual contingencies of ESG-value link, such as firm size, industry sector, institutional setting, and firm ownership are constantly mentioned as moderators of ESG-value relationship in all four clusters. Yet no study in the sub-corpus provides a systematic moderation framework that simultaneously accounts for these contingencies. This constitutes the most

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actionable theoretical gap identified by this review, motivating the formal research propositions developed below.

5.2 Implications for Theory

For stakeholder theory, this systematic review proves that ESG operationalization becomes more successful in multi-stakeholder settings. From the RBV/dynamic capabilities perspectives, ESG-specific organizational routines become a source of sustained competitive advantage if they are firm-specific, path-dependent, and causally ambiguous. According to institutional theory, the ESG–value relationship is significantly contingent on the institutional environment, thus calling for differential approaches to ESG implementation.

Based on the four thematic clusters and the three theoretical pillars of the integrative framework, the following research propositions are developed:

P1: *The positive effect of ESG operationalization on firm value is stronger in the long term (3–7 years) than in the short term (<1 year), and this relationship is moderated by the maturity of the firm's ESG dynamic capabilities.*

P2: *Firms that extend ESG operationalization across the entire value chain, including tier-2 and tier-3 suppliers, achieve higher risk mitigation and greater stakeholder trust than firms limiting ESG practices to their direct operations.*

P3: *The inclusion of ESG KPIs in executive compensation contracts positively moderates the ESG operationalization–firm value relationship by reducing managerial opportunism and ESG–disclosure decoupling.*

P4: *ESG dynamic capabilities (sensing, seizing, and reconfiguring) mediate the relationship between institutional pressure (regulatory and investor) and the quality of ESG operationalization at the firm level.*

P5: *The relationship between ESG operationalization and firm value is positively moderated by institutional quality, such that it is stronger in countries with higher governance standards, regulatory enforcement, and capital market development.*

P6: *SMEs with access to collaborative ESG platforms or industry association support can achieve ESG operationalization and performance outcomes comparable to larger firms, indicating that institutional substitutes can partially offset resource constraints.*

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5.3 Implications for Practice

For managers and leaders, there are three important lessons. First, ESG operationalization requires dynamic capability-building approach with investment in ESG-specific sensing and reconfiguration mechanisms. Second, integration of ESG criteria into MCS through linking incentive structures to ESG KPIs has high leverage on the bottom line. Third, expanding the scope of supply chain ESG governance beyond tier-1 suppliers presents a reputational challenge, as well as an untapped potential for value creation under CSRD Scope 3 requirements. For investors and ESG rating agencies, process-level measures, including supply chain audit coverage, alignment of executive compensation with ESG KPIs, and Scope 3 measurement maturity, should be introduced as criteria for ratings. For regulators, process-level ESG standards—similar to ISO 14001—are worth consideration to address greenwashing risks.

6. Research Agenda (RQ6)

Table 8 outlines a structured research agenda based on seven priority directions derived from bibliometric and SLR analysis. Priority directions 1, 3, and 7 receive the highest rating since they correspond to the most pressing gaps: a lack of longitudinal process-level evidence, insufficient knowledge on the diffusion of ESG throughout supply chain tiers, and ongoing ambiguity around the issue of short-termism in ESG value creation.

Table N°8 : Structured Research Agenda for ESG Operationalization Research

Research Direction	Priority	Suggested Method	Illustrative Research Question
ESG operationalization in SMEs and family firms	High	Mixed methods / case study	How do SMEs translate ESG commitments into operational routines without dedicated sustainability departments?
Micro-level process mechanisms linking ESG to value	High	Longitudinal panel / process tracing	Through which specific organizational routines do ESG practices translate into efficiency gains and risk reduction?

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Research Direction	Priority	Suggested Method	Illustrative Research Question
ESG in supply chain governance	High	Multi-level SEM / dyadic survey	How does ESG integration at the focal firm diffuse across tier-1 and tier-2 suppliers?
ESG dynamic capabilities	Medium	Qualitative comparative analysis (QCA)	What configurations of ESG-related dynamic capabilities lead to sustained competitive advantage?
AI and digital tools for ESG operationalization	Medium	Experimental / big data	To what extent can ML models predict the gap between ESG disclosure and actual practice?
Cross-country studies (Global South)	Medium	Cross-sectional panel / institutional theory	How do institutional voids moderate the ESG integration–firm value relationship in developing economies?
Long-term vs. short-term ESG value creation	High	Event studies / longitudinal	Does the ESG–firm value relationship strengthen with the maturity of ESG implementation?

Source : Compiled by the authors

7. Limitations

This paper identifies several limitations that should help interpret its results correctly.

First, depending solely on Scopus as a database might have excluded the articles available only in Web of Science or Google Scholar. At the same time, previous bibliometric studies comparing Scopus and Web of Science revealed that Scopus has a more comprehensive coverage of research literature in management, sustainability, and social sciences—key domains of the present study (Mongeon & Paul-Hus, 2016). However, future research would be able to benefit from combining different databases for data collection.

Second, even though the article search was based on a fairly extensive set of keywords, there could still be some publications that were not covered. For example, some studies published in operations

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management or accounting journals might address ESG-related topics without mentioning “ESG” or “CSR.” Consequently, this study is likely to suffer from a publication selection bias since it will only consider the papers referring to the topic under discussion explicitly.

Third, the sub-corpus of SLR (n = 40) is still quite small. This limitation is caused by the rigorous quality assessment criteria applied to the studies rather than an overly narrow search performed during the initial stage. Machine learning–based techniques can be used to expand the corpus of articles while maintaining high-quality standards for future studies.

Fourth, while the developed conceptual model is highly integrative, it is currently not empirical. Thus, the six research propositions generated from the conceptual model are to be considered hypotheses to be tested through future longitudinal research.

Fifth, the current analysis did not account for the individual pillars of ESG (environmental, social, and governance), which might lead to some heterogeneity of effects on firm performance. Specifically, prior studies suggest that governance factors (G) tend to have the strongest and most consistent impact on the financial outcomes (Gillan et al., 2021). Therefore, the future studies would be able to examine the three pillars separately.

Finally, the 2024 dataset can be biased due to the publication lag, as some papers submitted at the end of the year might not be indexed yet.

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8. Conclusion

This work applied both bibliometric analysis and systematic literature review (SLR) to create a thorough mapping of the development of research concerning the evolution, intellectual structure, and thematic aspects of ESG operationalization across the value chain and its impact on firm value. The study is based on 3,119 peer-reviewed articles published between 2015 and 2024, from which 168 papers were selected for bibliometric analysis and 40 for the in-depth SLR (Cohen's $\kappa = 0.82$). Four key contributions are made by this paper.

Firstly, the SLR describes and analyzes an identified paradigm shift within the field of ESG studies – from researches that focus mainly on disclosure to those that focus on the process approach. This shift occurs due to the accelerated growth of regulatory frameworks (CSRD, ISSB), the increasing demand for process-level information from investors, and the understanding that ESG scores do not reflect enough operational integration processes.

Secondly, four thematic clusters were defined that comprise the intellectual structure of the field: transformation of internal process and dynamic capabilities; ESG integration into SCM and VCM; ESG Governance, management controls, and reporting; and ESG Operationalization in SMEs and Emerging Markets.

Thirdly, an integrative conceptual framework that links micro-level process mechanisms of ESG and macro-level firm value was introduced. The integrative framework combines the basic theoretical concepts of stakeholder theory, the resource-based approach, and dynamic capabilities.

Fourthly, based on the findings, six formal research propositions and seven directions for future empirical research on ESG operationalization were developed.

The relevance of this contribution is increased by recent regulatory changes. Since CSRD and ISSB IFRS S1/S2 standards impose more and more requirements on process-level disclosure, assurance, and reporting Scope 3, the research community is encouraged to create empirical evidence on ESG operationalization and how it generates value for the organization. ESG operationalization should no longer be perceived as a black box that exists between disclosure and value generation. This paper opens the black box and invites researchers to dig deeper into the topic, especially in emerging markets.

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