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Integration of Environmental, Social, and Governance (ESG) criteria: their impacts on corporate sustainability performance

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In a corporate sustainability context, scholars have been studying internal and external relations provided by Environmental, Social, and Governance (ESG) criteria, mostly from the organizational perspective. Therefore, the main objective of this paper is to map and analyze the literature on the impacts of integrating ESG criteria on corporate sustainability performance from different points of view. The methodology used followed the Preferred Report Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines, corroborated by a critical analysis. The results indicate that the integration of ESG criteria, observed from different perspectives, strengthens corporate sustainability performance. They also revealed narrowing gaps in the literature regarding methodological analysis. Most of the papers in the analyzed sample use company-level data and employ regression analysis in their analysis. The present study concludes that companies, regardless of nationality, follow the guidelines of ESG criteria integration and such procedure brings several benefits. It points to the lack of more confirmatory research approaches from a workers' perspective, as the interest remains in the economic-environmental realm from the organizations' point of view. The absence of such evidence points to a gap in the literature that suggests the need for new study initiatives.

Introduction

The discussion surrounding the Environmental, Social, and Governance (ESG) criteria and corporate sustainability has gained significant momentum in recent years, primarily driven by the evolving societal expectations regarding new models of production and consumption (Nishitani et al., 2021). Until the mid-1990s, according to Clarkson (1995), the focus of companies' success was primarily centered on satisfying the needs of a single stakeholder, namely the shareholder. However, as time passed and the panorama shifted, particularly influenced by public policy changes, this perspective has undergone transformations. Gradually, other stakeholders have exerted pressure on companies, resulting in the integration of corporate sustainability into the strategic management of organizations, leading them to practice the ESG criteria (Wang et al., 2018).

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Corporate sustainability performance refers to a company's ability to operate in a manner that upholds ecological integrity, social well-being, and sound governance principles, while simultaneously generating value for its shareholders (Ahmad et al., 2023; Luque-Vilchez et al., 2023). It encompasses the effective management of environmental resources, fostering positive social relationships, and maintaining high standards of ethical conduct (Bellandi, 2023). The assessment of corporate sustainability performance requires the evaluation of both qualitative and quantitative indicators, examining various dimensions such as environmental stewardship, social responsibility, and corporate governance (Sandberg et al., 2022).

ESG criteria are used to assess corporate sustainability and ethical performance of companies and investments (Arora and Sharma, 2022). They are adopted by corporations to monitor and control the impacts of business activities on internal and external environments (Viranda et al., 2020). They mainly include: (i) collecting information; (ii) developing solutions; (iii) dealing with ESG issues in compliance with standards; (iv) conducting training; and (v) providing good communication (Boiral, 2002; Montabon et al., 2007; Merli and Preziosi, 2018). ESG criteria include prevention and preservation performance indicators (Gond et al., 2012). Besides, it requires coordination between the environmental department and other departments within companies, and balance between sustainable development goals and other corporate goals.

ESG criteria incorporates environmental, social, and governance factors into investment and business decision-making processes, and involves conditions relevant to traditional financial metrics when analyzing investments or valuing companies (Madden, 2022). These conditions can include metrics such as carbon emissions, water usage, employee diversity, labor practices, board diversity, executive compensation, etc. Thus, ESG criteria provide quantitative and qualitative information about a company's sustainability practices and their potential impact on various stakeholders (Khalil et al., 2022; Uyar et al., 2023).

ESG integration involves incorporating environmental, social and governance indicators into investment and business decision-making processes. Instead of considering ESG criteria as separate from financial analysis, integration recognizes their materiality and incorporates them alongside traditional financial analysis. This integration can happen at various stages of the investment process, including portfolio construction, risk assessment, due diligence, and ongoing monitoring. Integration aims to identify and manage risks and opportunities related to ESG criteria, ultimately seeking to enhance long-term investment performance and sustainability (Gebhardt et al., 2022; Harasheh and Provasi, 2023).

ESG criteria provide the data and metrics to assess a company's sustainability and ethical performance, while the integration involves incorporating these criteria into investment and business decision-making processes to better understand and manage the potential impacts on financial performance and corporate sustainability (Alda, 2021; Sahoo and Kumar, 2022).

In this sense, the integration of the ESG criteria has become an instrument responsible for defining, planning, operationalizing and executing the actions of corporations directed at environmental prevention and preservation, in addition to social responsibility and the quality performance of their activities (Barbosa et al., 2021).

Both from the standpoint of Sustainable Development Goals and the company response to shifting consumer preferences, interest in corporate sustainability has been increasing importance (Boulhaga et al., 2022). When looking for the relationship between the implementation of the ESG criteria and the corporate sustainability, the literature presents a heterogeneous scenario.

Some researchers advocate a positive relationship (Harymawan et al., 2022; Kim et al., 2022), and others have confirmed a negative relationship (Rajesh and Rajendran, 2020).

As is the case with research by Lee and Isa (2022), they find a positive relationship between the implementation of ESG criteria and financial performance, suggesting that ESG criteria can increase company value. In addition, the authors also find evidence that the disclosure of ESG criteria can improve the relationship with corporate sustainability performance. Already in the study by Xu et al. (2022), the heterogeneity analysis demonstrates that the negative relationship between ESG disclosure and the risk of falling stock prices is more significant in state-owned companies, companies with higher agency costs and in companies in the development phase.

Although the results are ambiguous, there are several positive examples of the relationship between the ESG criteria and the corporate sustainability, which influences the reasons why research on sustainable business models has been carried out and why organizations are changing their business model in the direction of sustainability. Additionally, there is a lot of pressure to consider ESG factors when making decisions, particularly from capital investors and financial institutions (Jonsdottir et al., 2022; Park and Oh, 2022).

Organizations responding to the pressure to implement ESG criteria must manage environmental, social, and economic risks (Triple Bottom Line) and understand their short, medium, and long-term impacts (Bravi et al., 2020). To this end, many companies adopt management systems related to ESG criteria to integrate elements of the Triple Bottom Line, address stakeholder needs, and mitigate risks (Esquer-Peralta et al., 2008).

Thus, the ESG criteria cannot be seen only as a cost, since they can bring benefits to the company and be a competitive advantage over competitors (Barbosa et al., 2023; Zhang et al., 2021).

That said, the need for an innovative and coherent research field focused on ESG issues increases as environmental, social, and governance problems intensifies (Vanderley, 2020).

The literature has already discussed the research situation, qualitatively and quantitatively, regarding ESG criteria through the prism of corporations, usually in the context of trying to improve the field's problem-solving ability in relation to companies' concerns and practices. Baumgartner and Rauter's (2017) research addresses the strategic perspectives of corporate sustainability management to develop sustainable organizations and promote the integration of ESG criteria into business activities and techniques.

This narrow interpretation is criticized by several scholars as being insufficiently analytical, as well as lacking a rigorous appreciation of the historical basis of human-environment interaction, highlighting worker perception (Bryant and Wilson, 1998; Herghiligiu et al., 2019).

Existing research on ESG criteria primarily focuses on the corporate perspective (Bourcet, 2020; Khanchel et al., 2023; Tsang et al., 2023). However, this literature review did not identify any references that support the worker's perspective or address their involvement in organizational management, as highlighted by Ouni et al. (2020).

Therefore, this study aims to map and analyze the literature on the impacts of integrating ESG criteria on corporate sustainability performance through different points of view. The research will employ both qualitative and quantitative analysis and consider the viewpoints of both employers and employees. This study aims to fill the existing gap in the literature, as no significant research has yet converged in this direction.

As is the case with the research of Huang (2021), who conducted a systematic literature review (SLR) to examine the link between ESG activities and organizational financial performance,

focusing on the institutional aspect. Similarly, Taliento et al. (2019), who investigated the impact of ESG factors on economic performance, emphasizing the corporate sustainability advantage and business understanding.

This research holds significance due to the growing global efforts to establish ESG criteria and mitigate environmental, social, and economic risks (Triple Bottom Line) for sustainable development. It aims to comprehend how these risks can affect sustainable development in the short, medium, and long-term, considering both organizational and collaborative perspectives (workers) (Bravi et al., 2020).

In this sense, the main objective of this paper is to map and analyze the literature on the impacts of integrating ESG criteria on corporate sustainability performance through different points of view. To achieve the proposed objective, the investigation addressed the following research questions:

1. What are the main features of the literature on ESG criteria?
2. What are the main methodological approaches used to study ESG criteria impact on corporate sustainability?
3. What are the main impacts of integrating ESG criteria on corporate sustainability performance observed in the literature?

This paper is divided into six sections, including this introduction (section 1). Section “Theoretical backgrounds: Environmental, Social, and Governance (ESG) criteria” refers to the theoretical foundation on the ESG criteria and the construction of the research hypotheses. Subsequently, in section “Methodological procedures”, the methodological procedures of the research are discussed. In section “Results”, the results are developed. Then, in section “Discussion”, a discussion is carried out. And, finally, in section “Conclusion”, the research conclusions are highlighted.

Theoretical backgrounds: Environmental, Social, and Governance (ESG) criteria

The ESG criteria are about the set of organizational practices that considers in its context environmental, social, and governance factors, with a view to achieving long-term sustainability (Sultana et al., 2018). The proportionality of these three aspects in business management has the purpose of analyzing the operations in a holistic way, not limited merely to the economic and financial aspects (Cek and Eyupoglu, 2020). In this sense, the economic, transparency and ethical precepts are articulated, seeking to ensure the competitiveness and the perdurability of a company. (Oncioiu et al., 2020).

The environmental dimension involves assessing the corporation’s carbon footprint, natural resource usage (energy consumption and efficiency), recycling policies, waste management, and efforts to minimize environmental impacts (Rajesh, 2020). The social dimension encompasses the company’s relationships with employees, suppliers, partners, clients, and communities. It includes promoting diversity, non-discrimination, gender pay equality, equal opportunities, employee education, and community protection (Li and Wu, 2020). The governance dimension focuses on leadership, internal controls, executive compensation, audits, shareholder rights, anti-corruption policies, and transparency and accountability practices (Cek and Eyupoglu, 2020).

ESG criteria, also known as sustainable or socially responsible investments, assist investors in assessing companies’ initiatives and commitment to environmental, social, and governance issues. These criteria can be applied internally or externally in a company’s management (Du Rietz, 2018).

That said, compliance with ESG policies and practices is increasingly important to investors, employees, and customers,

shaping company perception and performance evaluation beyond financial measures (Beretta et al., 2019).

While ESG indicators may vary by region, market, and industry, there are emerging best practices in the corporate world (Khalid et al., 2021). Thus, an example of ESG practices can be observed through the Principles for Responsible Investment (PRI), created by initiative of investors in partnership with the United Nations Environment Program Finance Initiative (UNEP FI) and the UN Global Compact, with the aim of guiding the market in the pursuit of responsible development (Bauckloh et al., 2021; Naffa and Fain, 2020).

Therefore, one way to find out whether a particular organization is sustainable is to evaluate its performance by ESG indexes. However, these indexes have limitations as they may not capture the multidimensional aspects of ESG criteria comprehensively. Consequently, a broader focus on ESG criteria is needed, considering corporate sustainability performance.

Methodological procedures

There are distinct alternatives that can be appreciated in the deployment of a SLR, comprising a bibliometric approach, meta-analysis (Hunter et al., 1986) and content analysis approaches. (White and McCain, 1998). These three techniques were applied in the present study. The scope of this study provides qualitative and quantitative analysis of publications, in the synthesis and assimilation of the most explored academic research and authors with the support of citation analysis, as well as in the critical analysis of the sample of articles collected.

To address the research aims, which is to map and analyze the literature on the impacts on corporate sustainability performance provided by the integration of ESG criteria, this study relied on two procedures. The first procedure was a consistent and robust SLR materialized according to the *Preferred Reporting Items for Systematic Reviews and Meta-analysis* (PRISMA) methodology, which blends reference analysis, network analysis, and content analysis. The second method was a critical in-depth analysis of a specific sample of articles collected through the PRISMA structured procedure, which integrated and supported the initial technique, as already used in the sustainability literature (Bolis et al., 2014).

Primary procedure: PRISMA methodology. The PRISMA methodology is a directive that aims to provide scholars to improve the peculiarity of the externalization of research information, as well as to guide in the critical conjecture of a review of articles already published (Page et al., 2021).

Eligibility and ineligibility criteria. The documents eligible for the sample of this research were those published in the last 5 years (period from 2017 to March 2022); belonging to the study domain of environmental, social and governance areas (research area); considered exclusively as research articles (document type); disseminated only in scientific *journals* (*journals*); written only in English language (language); and intrinsic to the topic of this research. The ineligible studies were those without a well-defined scientific structure, those without relevant data implicated in the theme of this research, those without access to the text (*in press*), and those that did not propose quantitative analysis (as this is a relevant point for future research).

Selection of the scientific databases. As a basis for this SLR and starting to answer the questions listed to achieve the objective of this study, the initial sample of articles followed systematic strategies that were adopted to consult the bibliometric databases until March 2022. Three scientific knowledge bases, *Scopus*, *Web*

Table 1 Searches by keyword groups.

Database	Collected documents	Records rejected per reason						Selected articles
		Publication years	Topic area	Document type	Source type	Language	Off-topic	
Scopus	1910	313	83	209	3	5	1117	180
WoS	1758	188	165	101	0	4	1144	156
SD	2092	651	332	176	0	0	911	22
Total	5760	1,152	580	486	3	9	3172	358

Source: Own author.

of Science (WoS), and Science Direct (SD) were used in to identify studies related to the ESG criteria.

The level of quality, the number of publications, the area of knowledge, and the set of metadata essential for the analysis of the references (including titles, abstracts, keywords, year of publication, number of citations, list of authors, countries, among others) were the criteria of choice for these 3 scientific databases. Scopus is one of the largest scientific knowledge bases of peer-reviewed literature (Morioka and de Carvalho, 2016). WoS can cover all indexed journals with an impact factor calculated in JCR (Journal Citation Report) (Carvalho et al., 2013). And SD combines reliable full-text publications in the scientific, technical and health fields (Direct, 2020). Another factor also considered was that all 3 databases provide metadata compatible with Mendeley reference analysis software (Carvalho et al., 2013).

Sampling procedure. The sampling procedure used to screen the articles was search by search terms, which were adapted for each defined bibliographic database. This was performed in March 2022. The keyword terms for the investigation were applied as follows: ("Environmental, Social, and Governance") AND (Impact* OR Effect* OR Performanc* OR Integrat*) AND (Sustainab*).

The initial searches are shown in Table 1.

The first triage was applied as "Article title, Abstract, Keywords" in Scopus, as "Topic" in WoS and as "Title, abstract or author-specified keywords" in SD resulting in 5,760 collected documents ("Initial Sample"). Then, the primary parameter for refining the references was run as "Publication Years", reducing the number of records by 1,152 documents. The secondary elimination criterion was applied as "Topic Area", synthesizing the sample into 580 searches.

Continuing with the exclusion process, the third suppression factor was submitted as "Document Type", summarizing the records into 486 studies. Subsequently, "Source Type" was used as the fourth parameter of reference reduction, reducing the records by 3 documents. Subsequently, the penultimate refinement requirement was performed as "Language", subtracting 9 more references. Finally, the reading of the titles and abstracts of the articles was used as the sixth ground for the refinement of the sample as "Off Topic", restricting to 3,172 documents that did not directly address the topic of this study. Thus, the quantity of rejected documents was 5,402 references, resulting in a sample of 358 research articles selected from the 3 scientific databases.

The references were then entered into Mendeley software to verify the intersections of studies between the databases. The triage identified 229 duplicate documents, which were excluded, reducing the sample to 129 articles. Subsequently, an isolated analysis of each of the 129 selected publications was performed to assess compatibility with the eligibility and ineligibility criteria focusing on the adequacy to the research premises and quality parameters related to the methodological peculiarity of the

publications. This analysis resulted in an exclusion of 82 studies. The "Remaining Sample" became 47 research articles.

After rejecting studies that did not satisfy the "Initial Sample" pre-selection process, that were in duplicate, and that did not have the eligibility criteria, the snowball method was applied (Yin et al., 2020). The references were expanded to incorporate other studies that were cited in the 47 articles in the "Remaining Sample". The total number of records selected through the snowball technique was 2 studies ("Additional Sample"). The inclusion of the additional articles followed the same eligibility (except for the year of publication) and ineligibility criteria cited in section "Eligibility and ineligibility criteria". Thus, the "Final Sample" for the conduct of this SLR was 49 research articles.

Reference analysis. Data tabulation and grouping strategies directed the stratification of information and a narrative synopsis. A spreadsheet (Microsoft Excel 2021) and Mendeley software were used to manage the selected articles to transcribe predominant methodological minutiae of each research study comprising the assessment instrument used, the setting, participants, and substantive findings in terms of validity and credibility. The number of publications summarized by year and journal was the initial parameter of the reference analysis process. This resource made it possible to see how the records succeeded over the years and to discriminate the journals that repeatedly dealt with the theme of this research.

Network analysis. In this step, with the assistance of the VOS-viewer software, the network analysis was performed, considering the compatibility of keywords and authors were analyzed through clustering diagrams. The first citation network developed was that of most relevant keywords. The second network developed was that of co-citations, which shows the degree of equivalence between the references presenting the articles mentioned together. The analysis of this network can help assimilate the intellectual character of a field and map the thematic similarities of scholars and the aspect of how groups of researchers relate to each other (Pilkington and Liston-Heyes, 1999).

Another analysis performed was on the methodological approaches applied among the studies. For this diagnosis, a deductive multivariate approach was applied based on the theoretical foundation and knowledge from the references. This analysis used insights extracted from the keywords and the analysis of important topics.

Content analysis. Each article included in the final sample was specifically cataloged using Mendeley software that comprised the metadata generated by scientific databases. For the content analysis, the articles were classified in order to consider the tools applied, the scope of application, the relevant industries, the research objectives, and the advantages and limitations of the process required to obtain the research results.

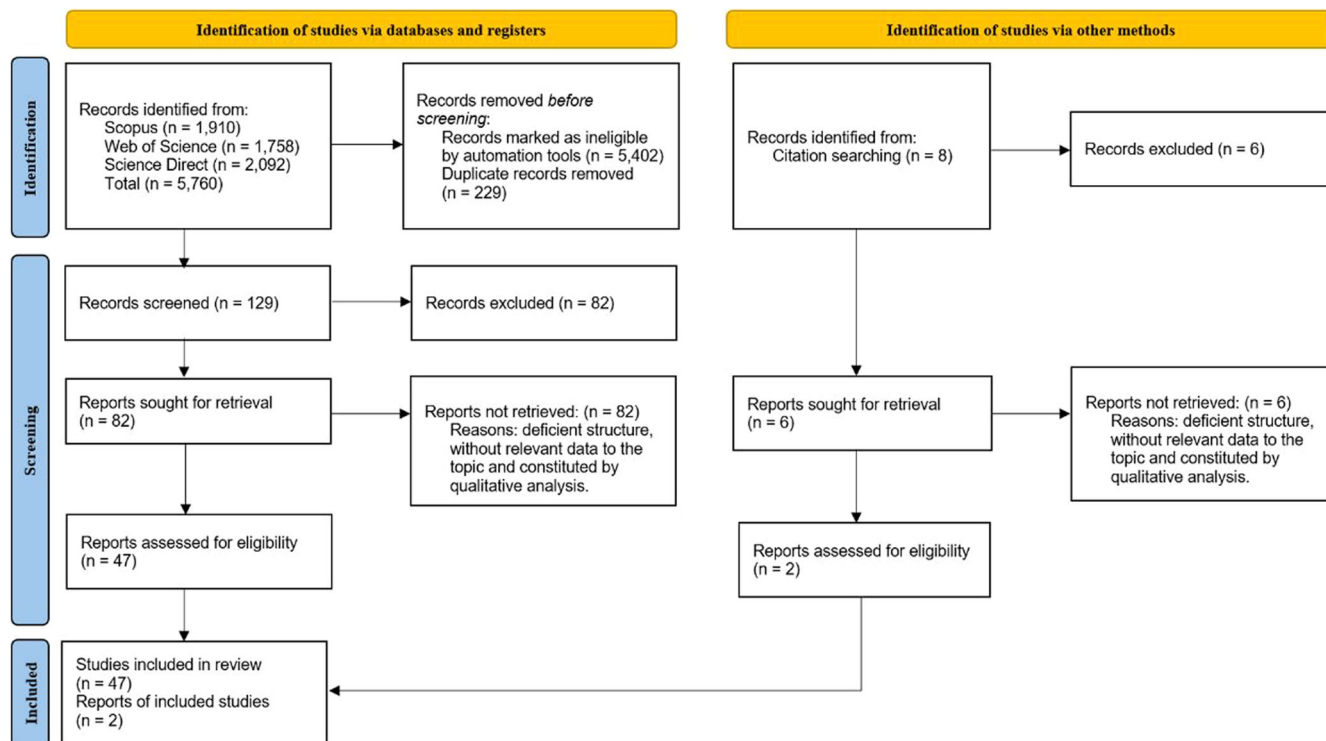


Fig. 1 PRISMA—Flow diagram. Source: Adapted from Page et al. (2021).

Secondary procedure: critical (interpretative) analysis. Critical analysis is a research skill outlined to contribute to the interpretation of complex issues to understand specific conjunctures (Gil-Guirado et al., 2021). Critical analysis involves multiple iterative cycles of interpreting and perceiving the content of parts of the phenomena of interest, and this assimilation of the parts entails a better understanding of the contexts as a whole (Valor et al., 2018).

To deepen the assimilation of the contexts, each researcher involved forms an understanding of their perspective in continuous cycles until a "cognitive fusion" is achieved resulting in a better conception of the phenomena. This approach does not aim to construct a theory, but rather to infer a better understanding of the contexts (Bolis et al., 2014). Thus, to complement the answers to the questions of this research, critical analysis was applied, which involved dialectical reasoning cycles to identify the understanding (systematization of applicable processes to determine the meaning and scope of methodologies) of researchers on the impacts of integrating ESG criteria on corporate sustainability performance with the aim of finding the "cognitive fusion".

The initial cycle demanded a series of reviews, syntheses, and interpretations of the sample of articles collected in the structured procedure (PRISMA). In the next cycle, the collaborative critical process was adhered to, resulting in the refinement of the main methodological characteristics fragmented by each ESG criterion. Later, in the final interpretive cycle, the procedures of the first two cycles were analyzed, which provided additional perspectives and *insights* that complemented the previous interpretations.

Risk of bias. To assess the methodological quality of the included articles, the Prediction Study Trend Risk Assessment Tool (PROBAST) was used. (Wolff et al., 2019). This tool includes 20 questions divided into four domains (participants, predictors, outcome, and analysis). The risk of bias for each domain was rated as low risk, high risk, or very unclear to judgment (Wolff

et al., 2019). Two researchers of the present study independently assessed the risk of bias of the included articles and performed an evaluation by qualitative analysis. Disagreements were resolved by consensus with a third reviewer.

Results

The document collection strategy yielded 129 records, and after screening titles and abstracts and applying eligibility and ineligibility criteria, 49 articles were selected for this systematic literature review (SLR). Please refer to Fig. 1 for the SLR flow diagram.

Consistent with Nishitani et al.'s (2021) assertion, Fig. 2 demonstrates the contemporary nature of discussions on ESG criteria and corporate sustainability, indicating their recent consolidation. In this specific context, the eligibility and ineligibility criteria of the articles were disregarded, and only a keyword search for "Environmental, Social, and Governance" was conducted across three databases. This was solely done to quantify the research related to the theme.

It is evident that there has been an increasing number of studies focused on ESG criteria over the years, with a peak of 649 research articles in 2021 (an average of 54 articles per month). This trend aligns with the growing interest of organizations in implementing ESG criteria (Qureshi et al., 2021).

Literature overview. Starting to answer the first research question (*What are the main characteristics of the literature on ESG criteria?*), an overview of the literature was conducted based on descriptive statistics of the sample of 49 selected articles. Table 2 presents the most influential studies. It lists the publications with 20 or more citations in the *Scopus* database.

The study that stood out the most was that of Xie et al. (2019), which investigates whether environmental, social, and governance activities improve corporate financial performance, with 115 citations over 3 years, an average of 38 citations/year; followed by the respective research of Garcia et al. (2017), which highlights the sensitive emerging market sectors in relation to improved

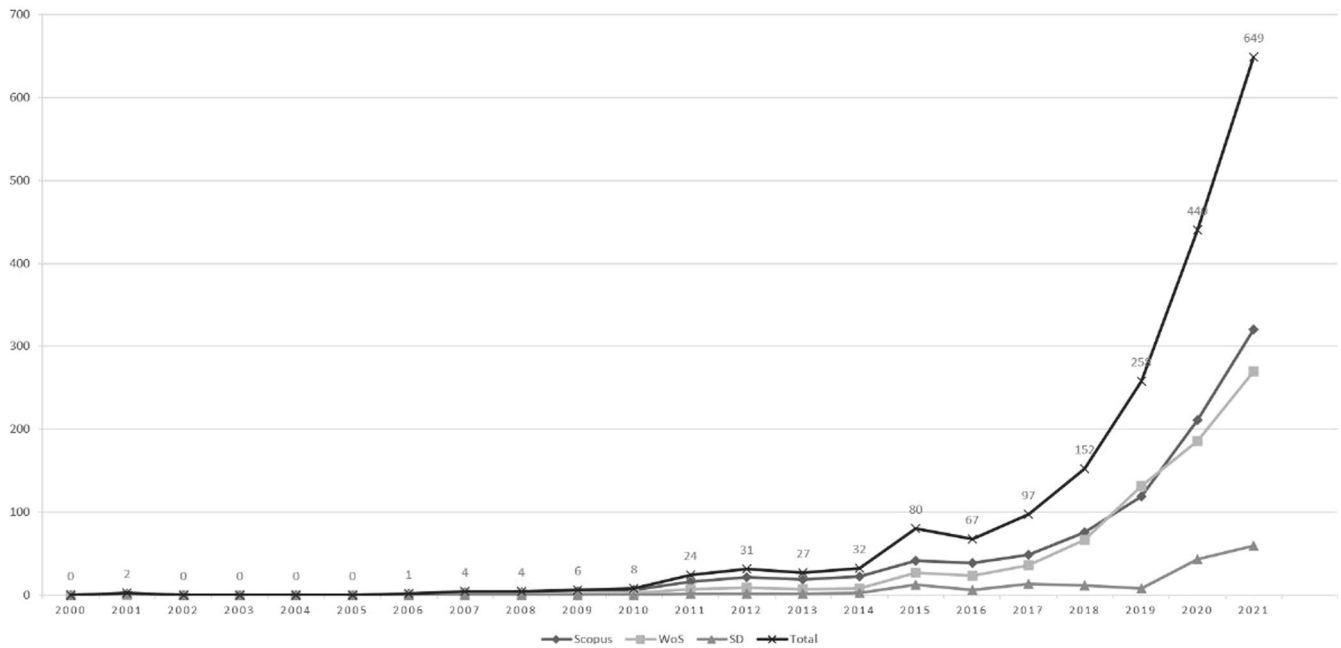


Fig. 2 ESG contemporaneity. Source: Scopus, WoS, and SD.

Table 2 Mosta cited publications per year and journal.

Reference	Citations	Citations/Year	Journal
(Xie et al., 2019)	115	38	<i>Business Strategy and the Environment</i>
(Garcia et al., 2017)	104	21	<i>Journal of Cleaner Production</i>
(Qureshi et al., 2020)	41	21	<i>Business Strategy and the Environment</i>
(Arayssi et al., 2020)	40	20	<i>Sustainability Accounting, Management and Policy Journal</i>
(Lokuwaduge and Heenetigala, 2017)	94	19	<i>Business Strategy and the Environment</i>
(Yu et al., 2020)	36	18	<i>Research in International Business and Finance</i>
(Taliento et al., 2019)	51	17	<i>Sustainability</i>
(Rajesh and Rajendran, 2020)	32	16	<i>Business Strategy and the Environment</i>
(Alsayegh et al., 2020)	30	15	<i>Sustainability</i>
(Bouslah et al., 2013)	134	15	<i>Journal of Banking and Finance</i>
(Birindelli et al., 2018)	50	13	<i>Sustainability</i>
(Atan et al., 2018)	47	12	<i>Management of Environmental Quality: An International Journal</i>
(Miralles-Quirós et al., 2019)	33	11	<i>Corporate Social Responsibility and Environmental Management</i>
(Moneva et al., 2020)	22	11	<i>Journal of Sustainable Tourism</i>
(Bravo and Reguera-Alvarado, 2019)	31	10	<i>Business Strategy and the Environment</i>
(Ting et al., 2020)	20	10	<i>Business Strategy and the Environment</i>
(Bodhanwala and Bodhanwala, 2018)	27	7	<i>Management Decision</i>
(Minutolo et al., 2019)	20	7	<i>Sustainability</i>

Source: Scopus.

ESG performance, published in the year 2017 and has 104 citations; and by Qureshi et al. (2020), which analyzes the moderating role of the impact of sustainability disclosure and board diversity on firm value, with 41 citations in 2 year, both averaging approximately 21 citations per year.

The articles of the core sample were designated from the network analysis of keywords, a quantitative technique practiced to identify the repercussion and expressiveness of an author or an article (Garfield and Morman, 1981). Nevertheless, this methodology should also take into account the relevance of the journal, besides computing the average annual citation (Carvalho et al., 2013), as shown in Table 2.

That said, Fig. 3 shows, through the network analysis of the VOSviewer software, the relationship between the keywords and the articles in the designated sample, with recurrences of at least 2

times (this implies that terms that appear only once were not displayed). Other points to be observed are that the more consistent (full-bodied) the meshes the stronger the connections and the larger the points (nodes) of connections the more relevance they have.

Network analysis enables a better explanation of the consonance between the terms discovered, as well as simplifying the differentiation between the groupings literally associated with its operating principles.

There were 4 sets of keywords identified. Of the 4 sets of the keyword network analysis, 3 contain the term "ESG" and its variations. In the case of the terms "sustainability and performance", all 4 clusters register their presence. This demonstrates that the search terms adopted were assertive, since it can be seen that they adhere to the proposed theme.

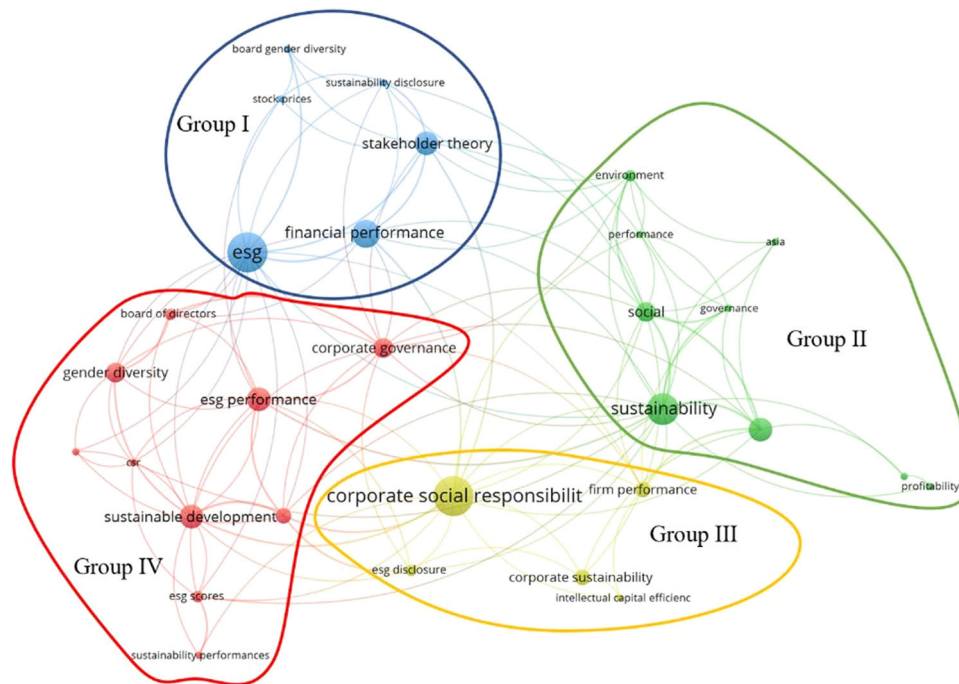


Fig. 3 Keyword network analysis. Source: Scopus, WoS, and SD.

The research by Zhang et al. (2020), which discusses how ESG initiatives affect innovation performance for corporate sustainability; and the research of Xu et al. (2021), which examines the impacts of research and development (R&D) investment and ESG performance on green innovation performance; ratify the cited adherence.

Research topics: the main methodologies. The predominant impacts addressed in the sample of 49 scientific studies collected, classified by level of analysis and methodological interpellation, are evidenced in Table 3, which already awakens the dissolution to the second research question (*What are the main methodological approaches used to study ESG criteria impact on corporate sustainability?*).

A content analysis of the full texts of the articles selected for this SLR was performed and it was found that approximately 87.75% of the studies (43 references) were conducted using information from companies through databases. Analyzes were quantitative, 46 studies, approximately 93.87%, applied regression analysis. Of these, 6 investigations, approximately 13.04%, implemented structural equation modeling. These results, corroborate the conjuncture that there is no evidence in the literature regarding research allusive to a mapping and quantitative analysis of the impacts of the integration of ESG criteria on corporate sustainability performance, from an employee's perspective.

By Fig. 4, it can be distinguished that the organizations' commitment does not focus exclusively on financial performance (12 studies), but also prioritizes corporate sustainability (12 studies).

Financial performance and corporate sustainability were investigated in approximately 49% of the research (24 records), proving corporate concern for both sustainable development and economic performance. Landi et al. (2022), highlight this awareness in their investigation of the incorporation of sustainability into risk management and the impacts on financial performance. Taken together, these practices have the potential to minimize cost and risk, enhance the company's reputation and legitimacy, intensify innovation, and solidify growth paths and

trajectories, all of which are vitally important to stakeholder value creation. (Ting et al., 2020).

The corporate sustainability performance disclosed through the ESG criteria was investigated in an attempt to demonstrate the quality of an organization, because through environmental, social, and governance analysis, it is possible to determine how the company positions itself in relation to society and the planet, in addition to offering more transparency to the investor (Mohammad and Wasiuzzaman, 2021).

Figure 5 displays a broad view of the amount of research performed around the world according to the sample of articles selected for this SLR.

It can be seen that Europe stands out in the evolution of ESG criteria with approximately 32.65% of research, with the highest visibility for Italy and Spain. The research by Conca et al. (2021), on the impacts of ESG reports in European agri-food companies; and (Baraibar-Diez and Odriozola, 2019), related to the effects of ESG parameters on the social responsibility committees of European corporations, highlight the aforementioned evolutionary prominence.

Figure 6 displays the most often consulted databases to collect information about the ESG criteria of the listed companies for their corporate sustainability performance.

Thomson Reuters and Bloomberg databases stand out because they are providers of reliable answers that help organizations make confident decisions and better manage business (Alsayegh et al., 2020). This reinforces the fact that most studies use publicly available data to measure ESG, whether than collect the ESG criteria for the companies under investigation.

Critical analysis. Critical analysis is a method of study for understanding difficult and complex situations, especially when interpretations of the same articulation are possible and competing. It is a form of text analysis and has been handled to discover their original meanings and how they are interpreted (Shephard et al., 2019).

Thus, complementing the results of the primary approach (PRISMA method), a critical analysis was implemented based on

Table 3 Research topics and methodological approaches.

Ref.	Reference	Topic	Focus	Methodologies			Mathematical model
				Period	Sample	Measured variable	
[1]	(Sachin and Rajesh, 2021)	Supply chain sustainability with financial performance	Financial performance	2014–2018	25 companies	Sustainable practices	Thomson Reuters and Bloomberg
[2]	(Pirtea et al., 2021)	ESG interaction and the performance of the agricultural sector	Human capital	2020	412 companies	Social Responsibility	Thomson Reuters
[3]	(Conca et al., 2021)	ESG reports and the impact on the agri-food sector	Financial performance	2010–2018	57 companies	ESG Reports	Bloomberg
[4]	(Garcia and Orsato, 2020)	Institutional difference on ESG performance	Corporate Sustainability	2007–2014	2,165 companies	ESG Performance	Thomson Reuters
[5]	(Ouni et al., 2020)	Gender diversity and financial performance	Financial performance	2002–2019	133 companies	Gender Diversity	DataStream and Asset4
[6]	(Sul and Lee, 2020)	Effects of social responsibility on corporate value	Social Responsibility	2011–2016	295 companies	Enterprise Value	Korea Exchange
[7]	(Baralbar-Diez et al., 2019)	Sustainable offset policies and their ESG effect	Remuneration policy	2005–2015	197 companies	Compensation policies	Ibex35, CAC, DAX and FTSE100
[8]	(Moneva et al., 2020)	Social Responsibility and Tourism Performance	Social Responsibility	2004–2017	134 companies	Tourism Performance	Thomson Reuters
[9]	(Baralbar-Diez and Odriozola, 2019)	Social Responsibility Committees and their ESG Effect	Social Responsibility	2005–2015	197 companies	Composition of the committee	Ibex35, CAC, DAX and FTSE100
[10]	(Bravo and Reguera-Alvarado, 2019)	Sustainable development and gender diversity on the audit committee	Audit committee	2012–2015	375 biographies	Compensation policies	Madrid Stock Exchange and Bloomberg
[11]	(Gangi et al., 2021)	Equity mutual funds in ESG policies and gender diversity in management	Gender Diversity	2014–2018	212 equity mutual funds	Equity mutual funds	Thomson Reuters
[12]	(De Masi et al., 2021)	Sustainable behavior and the critical mass of gender diversity	Sustainable behavior	2005–2017	Unidentified	Gender Diversity	FTSE-MIB
[13]	(Terzani and Turzo, 2021)	Corporate sustainability and the effect of religiosity on ESG disclosure	Religious Affliction	2004–2017	17,432 observations	Religiosity	S&P GLOBAL 1200LM and Thomson Reuters
[14]	(Romano et al., 2020)	ESG performance and board gender diversity	Gender Diversity	2017–2018	64 companies	ESG Performance	Bloomberg and Blau Index
[15]	(Birindelli et al., 2018)	Board composition and impact on ESG performance	Board composition	2011–2016	108 commercial banks	Intellectual coefficient	Thomson Reuters
[16]	(Reboredo and Sowaity, 2022)	ESG disclosure and intellectual capital efficiency	ESG Disclosure	2009–2018	104 companies	Intellectual coefficient	Amman Stock Exchange
[17]	(Shakil, 2021)	ESG performance, financial risk, and board gender diversity	Financial performance	2010–2018	70 companies	Gender Diversity	Refinitiv Elkon
[18]	(Qureshi et al., 2020)	Disclosure of sustainability and board diversity in company value	Gender Diversity	2011–2017	812 companies	Enterprise Value	Thomson Reuters
[19]	(Ting et al., 2020)	Social performance and company performance	Company performance	2014–2018	4,886 companies	ESG Performance	Thomson Reuters
[20]	(Arif et al., 2020)	The attributes of the audit committee in the quality and quantity of ESG actions	ESG Performance	2009–2018	24 companies	Audit Committee	Bloomberg
[21]	(Minutolo et al., 2019)	The effects of ESG disclosure on financial performance	Financial performance	2009–2015	467 companies	ESG Performance	
[22]	(Miralles-Quiros et al., 2019)	ESG performance and stock prices in the banking sector	Financial performance	2002–2015	51 commercial banks	Market share value	Stock Exchange and Thomson Reuters
[23]	(He et al., 2021)	ESG incidents in bank loan agreements	Loan contracts	2007–2016	2001 companies	ESG Incidents	ReRisk and Thomson Reuters
[24]	(Landi et al., 2022)	Sustainability in risk management and the impact of ESG ratings on financial risk	Financial performance	2014–2018	222 companies	Socio-environmental assessment	Standard & Poor's Index
[25]	(Arayssi et al., 2020)	Board composition and level of ESG disclosures	Board composition	2008–2017	184 comments	ESG Performance	Thomson Reuters
[26]	(López-Toro et al., 2021)	ESG indicators and the financial performance of companies	Financial performance	2018–2019	30 companies	Return on Assets	

Table 3 (continued)

Ref.	Reference	Topic	Focus	Methodologies			Mathematical model
				Period	Sample	Measured variable	
[27]	(Peng and Isa, 2020)	ESG Practices and Performance in Shariah Companies	Social Responsibility	2010–2017	461 companies	ESG Performance	Regression analysis
[28]	(Shahzad et al., 2021)	Intellectual capital efficiency and ESG performance	Social Responsibility	2009–2018	2,132 companies	Intellectual capital	Econometric Model
[29]	(Nitescu and Cristea, 2020)	ESG Risks and the challenges for sustainability	Financial performance	2007–2016	12 commercial banks	ESG Risks	Regression analysis
[30]	(Koroleva et al., 2020)	Company performance and ESG factors	Company performance and ESG factors	2018–2019	30 companies	Investment capital	RAEX
[31]	(Alsayegh et al., 2020)	Corporate ESG sustainability through ESG disclosure	Corporate Sustainability	2005–2017	1,244 companies	ESG Performance	Thomas Reuters and Bloomberg
[32]	(Garcia et al., 2017)	Sensitive sectors produce better ESG performance	Social and environmental responsibility	2010–2012	365 companies	Financial Profile	Thomson Reuters
[33]	(Zhang et al., 2020)	ESG initiatives and innovative performance	Innovative Performance	2007–2017	224 companies	ESG Initiatives	Thomson Reuters, SIPO and CSMAR
[34]	(Xu et al., 2021)	R&D investment, ESG performance and green innovation performance	Green Innovation	2015–2018	223 companies	Investment in R&D and ESG	SynTao Green Finance
[35]	(Qureshi et al., 2021)	ESG efforts, financial performance and gender diversity	Corporate Performance	2009–2018	100 companies	Gender Diversity	Thomson Reuters
[36]	(Aboud and Diab, 2019)	Financial consequences, ESG ratings and political volatility	Corporate Performance	2007–2016	100 companies	Political Influence	S&P/EGX
[37]	(Ortas et al., 2019)	National Institutions, Stakeholder Engagement and ESG Performance	Corporate social performance	2008–2015	4,751 companies	Institutional Influence	Thomson Reuters
[38]	(Rajesh and Rajendran, 2020)	Relating ESG scores and sustainability performance	Corporate social performance	2014–2018	1,820 companies	Controversial ESG Scoring	Structural Equations
[39]	(Shaikh, 2021)	ESG practices and firm performance	Corporate Performance	2010–2018	30 companies	Non-financial information Sustainability	Regression analysis
[40]	(Bodhanwala and Bodhanwala, 2018)	Corporate sustainability and profitability	Profitable performance	2010–2015	58 companies	Sustainability indicators	T-test
[41]	(Tallento et al., 2019)	ESG impact, economic performance and a sustainability advantage	ESG Performance	2014–2017	151 companies	Sustainability indicators	Structural Equations
[42]	(Xie et al., 2019)	ESG activities and corporate financial performance	Corporate Performance	2015	6,631 companies	Corporate Efficiency	Multivariate method
[43]	(Atan et al., 2018)	ESG factors and company performance	ESG Performance	2010–2013	54 companies	Capital Value	Regression analysis
[44]	(Ng et al., 2020)	Sustainability, financial development and ESG performance	Corporate social performance	2013–2017	210 comments	Financial performance	
[45]	(Mohammad and Wasuzzaman, 2021)	ESG disclosure, competitive advantage and company performance	Competitiveness	2012–2017	661 companies	ESG Disclosure	Stock exchange
[46]	(Yu et al., 2020)	Greenwashing in ESG disclosures	Dissemination of information	Unidentified	1925 companies	Greenwashing Behavior	Bloomberg
[47]	(Kuo et al., 2021)	Corporate social responsibility and financial performance	Social Performance	2012–2017	30 companies	Financial performance	Thomson Reuters
[48]	(Bouslah et al., 2013)	The impact of ESG dimensions and enterprise risk	Corporate Performance	1991–2007	4,850 companies	ESG Performance	MSCI and Thomson Reuters
[49]	(Lokuwaduge and Heenetigala, 2017)	Integrating ESG disclosure for sustainable development	Corporate Communications	2013	30 companies	ESG Performance	Australian Securities Exchange and Global Reporting Index

Source: Own author.

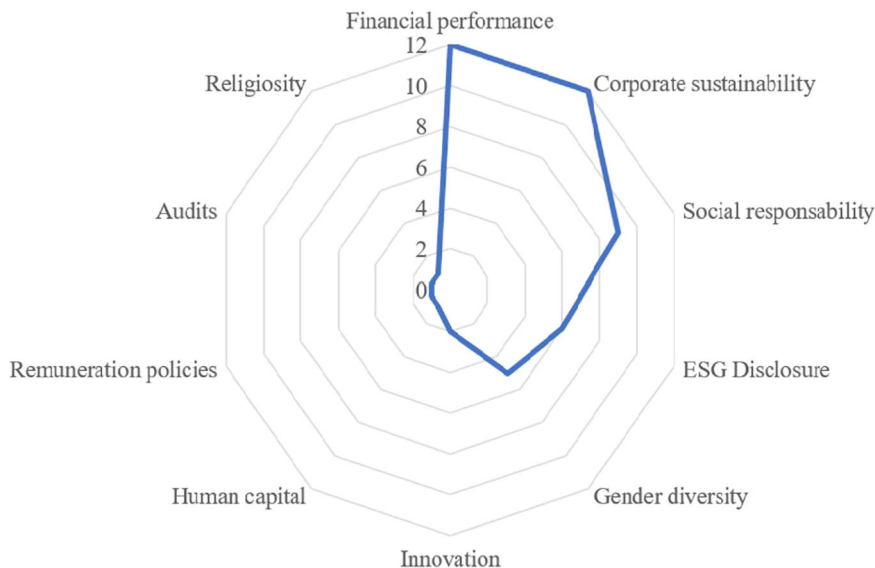


Fig. 4 Main organizational focuses. Source: Scopus, WoS, and SD.

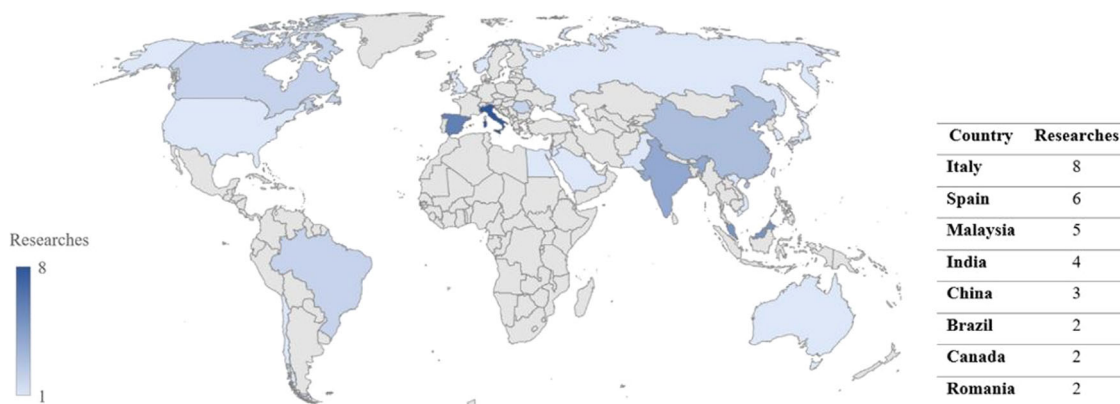


Fig. 5 World view of investigations with more than one research. Source: Scopus, WoS, and SD.

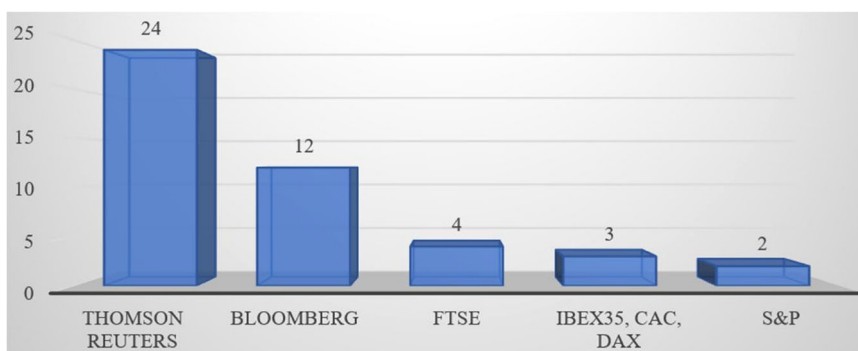


Fig. 6 Number of queries per database. Source: Table 3.

the selection of 49 articles considered for discussion. The aim was to answer the third question of this research (*What are the main impacts of integrating ESG criteria on corporate sustainability performance observed in the literature?*). Table 4 shows the main perceptions of the fragmented research according to each of the ESG criteria.

The cycles of the critical analysis involved a series of reviews, syntheses, and interpretations of ESG criteria affecting corporate sustainability performance identified in the 49 selected articles

corroborating the structured process of this SLR. The results are shown in Tables 3 and 4, which summarize the focus of the research, the methodologies applied, and the main gaps, contributions, and limitations of the studies.

In this SLR, the need for future empirical studies was also identified. There are still several research questions that need to be answered in depth. Some propositions for future investigations and possible research questions are outlined in Table 5.

Table 4 ESG impacts and critical analysis.

Criterion	Main impacts identified	Major gaps filled	Main contributions	Main limitations	Critical analysis	Ref. no. Table 3
Environmental	<ul style="list-style-type: none"> - Water pollution - Soil degradation - Air Pollution - Solid Waste - Energy consumption - Renewable Energies - Recycling - Green Innovation 	<p>Sustainable supply chain interventions, social responsibility and human capital benefiting activities in the environmental sector. Innovative profiles (green sustainability) and varieties of institutional systems associated with environmental performance. Transnational sustainability strategies outside the market and profitability in environmental performance.</p> <p>Management control to improve the quality and quantity of ESG disclosures for an environmentally sensitive sector.</p>	<p>The theoretical implications of the study are in the direction with focus on ecological modernization theory. The assumption that sustainable performances have their financial advantages. The actions of environmental responsibility are essential to enhance the profitability of the company, contribute to eradicate extreme poverty. Awareness of managers especially in environmental directions and recognition of human capital in order to improve the financial performance of companies. Supplying environmental policies in order to improve corporate sustainability practices.</p>	<p>Companies were not incorporated into the study due to lack of ESG data. The results of the study cannot be generalized due to the proportion of data. Reduced availability of data for longer time series. The observed results are limited to a specific sector, not confirming an overall picture. Adopted techniques may result in biases due to variables that have not been studied.</p>	<p>Corporate environmental initiatives have direct positive impacts on innovation performance. This indicates that these strands are characterized by positive signals in organizational image, which increases stakeholders' trust and leads to their heterogeneous resources, resulting in company innovation. Companies that already adopt ESG practices have significant positive impacts on environmental performance, implying ecological modernization. There are significant and favorable direct influences of human capital characteristics on environmental performance that should be implemented as a value creation strategy and key tool for sustainable development. There is evidence that improved accountability, transparency and stakeholder trust as a consequence of incorporating and disclosing a robust framework combining the three ESG pillars in the organization strengthens corporate sustainability performance.</p>	<p>[1], [2], [11]-[20], [31], [21], [22], [4]-[10]</p>
Social	<ul style="list-style-type: none"> - Gender Diversity - Remuneration policy - Intellectual empowerment - Equal Opportunity - Community social actions - Investment in innovation - Culture and religion - Relationship with stakeholders 	<p>The effect of gender diversity on the board of directors, executive committee, and audit committees. Institutional difference hypothesis, institutional strategies and the social relationship. Remuneration policies based on ESG criteria. Social performance and stakeholder benefits. Bidirectional connections between social responsibility performance and cultural and intellectual actions.</p>	<p>Helps find nuances that explain the mixed results on the relationship between social responsibility and financial performance in developed and emerging countries. Relationship between gender diversity in the boardroom and corporate financial performance. The effects of female participation in mutual fund management teams. Policies to improve corporate governance practices by encouraging diversity and avoiding concentration of power. How the level of religiosity influences the extent of companies' ESG disclosure. The influence of intellectual capital on social development.</p>	<p>Organizational level analysis, individual level measures that would focus on worker perception. Lack of information on compensation policies and studies that include different compensation structures. Shortage of information about the social responsibility committee. Explore different legal and/or institutional contexts to analyze gender diversity and ESG information attributes. Disregard of the impact of religiosity on small and medium-sized companies. Exploring managers' religiosity and its impact on their ESG disclosure decisions. The relationship between board characteristics and corporate social performance may be affected by endogeneity bias.</p>	<p>Institutional weaknesses affect the corporate social performance of companies. This may be because in such circumstances companies are more likely to prioritize capital accumulation and not recognize the potential strategic benefit of socially responsible investments. The argument for introducing gender diversity on the board is based on what this diversity brings in terms of a cognitive framework that allows directors to better understand institutional weaknesses from different perspectives, creating a positive effect on company value. Another factor that contributes to institutional improvement is gender-equal compensation policies, as they are designed to reward past behavior and influence future behavior, playing a key role in human resource management. Gender diversity is a key variable that impacts the company's socially responsible performance, making the disclosure of ESG information more comprehensive and useful to stakeholders.</p>	<p>[1], [2], [11]-[19], [23], [3], [24]-[33], [4], [34]-[38], [5]-[10]</p>

Table 4 (continued)

Criterion	Main impacts identified	Major gaps filled	Main contributions	Main limitations	Critical analysis	Ref. no. Table 3
Governance	<ul style="list-style-type: none"> - Audits - Financial performance - Competitiveness - Human capital - Compensation policies - Fighting corruption - Transparency - Enterprise value (capital) 	<p>The impact of audit committee activism and independence on the quality and quantity of ESG disclosures. The effects of transparency and anti-corruption on the financial performance and competitiveness of companies. Analysis of human capital and value-added relationship between stock prices and the level of ESG performance. The effects of intensity and influence of ESG incidents on contract values and quantity.</p>	<p>The impact of audit committee attributes, independence, and activism on the transparency and quality of ESG disclosures, and on anti-corruption. The relationship between ESG incidents and bank loan agreements. Investments made toward sustainability can be considered a business opportunity that is preserved over time through added economic value. Companies that appoint a sustainability and/or governance committee tend to engage in more impactful social and environmental activities. Policymakers, executives, and shareholders, support board participation among women, independent directors, and the formation of sustainability committees to ease engagement in effective social activities.</p>	<p>More current analysis period with the goal of including a broader sample. Limitation in data availability and depth of various board characteristics to institute some level of internal governance. Policy that strongly permeates companies but was not analyzed. Sectoral study and focuses on multinational companies in a certain area. Data set limited to companies in a given country and cannot generalize. Not paying attention to the separate effects of particular events or political regimes that made up the current situation of political volatility. Restriction to the analysis of accounting performance parameters. Restriction to defining competitive advantage only to the resource-based competitive advantage of firms.</p>	<p>The vital role of governance requires sufficient independence and engagement to achieve a balance between managerial and stakeholder goals regarding ESG disclosures, and this can be acquired through audit committees. That said, companies take a strategic position with respect to governance and employ managerial discretion to voluntarily disclose ESG requirements. In this way, corporate governance performance is evaluated positively and significantly by stakeholders. Companies should be encouraged to continuously improve their governance performance and show their ESG reporting and ratings, thereby attracting more investment. Governance performance can be interpreted as a measure of management quality, representing the company's ability to address long-term trends while supporting a competitive advantage by improving its non-financial indicators such as consumer satisfaction, market acceptance, lower cost of debt, and the social values it brings to its stakeholders.</p>	<p>[1], [2], [11]-[19], [39], [3], [40]-[49], [4]-[10]</p>

Source: Own author.

Table 5 Opportunities for further study.

Focus	Future studies	Inquiries	Keywords
Environmental	Sustainability performances and financial data looking at the impact of implementing supply chain management practices considering ESG indicators on financial performance through other perspectives.	How can the implementation of ESG practices impact financial performance through diverse perspectives?	- Environmental management - Sustainability management
	The recognition of the importance of environmental and human capital characteristics in shaping financial performance through a consensus on the direction, nature, and magnitude of the impact, induced by these coordinates on financial results.	How can environmental responsibility and human capital impact the bottom line through different perspectives?	- Environmental characteristics - Human capital
Social	Gender diversity in corporate management as it relates to environmental, social and governance performance.	How can gender diversity influence corporate performance through diverse perspectives?	- Gender diversity - Corporate performance
	Sustainable compensation policies reflect a willingness to manage biased behavior related to financial performance, so the effectiveness of sustainable policies remains unexplored.	How can people compensation policies impact financial performance through different perspectives?	- Compensation policies - Financial performance
Governance	To understand how corporate risk can be affected by corporate sustainability in the stock market from both a systematic risk and total risk perspective.	How can ESG criteria impact the stock market through diverse perspectives?	- Corporate sustainability - ESG criteria
	The Relationship of ESG indicators to financial performance in the case of multinational industries.	How do the ESG criteria impact financial performance through different perspectives?	- Financial performance

Source: Own author.

Risk of bias. Analyzing the risk of bias in scientific research is of paramount importance as it can significantly impact the validity and reliability of research findings. It helps ensure that research outcomes accurately reflect reality and can be trusted by other researchers, policymakers, and the public (McGuinness and Higgins, 2021). Reproducibility is a fundamental principle of scientific research and transparently analyzing bias allows researchers to identify potential pitfalls and enhance the reproducibility of their work. Ethical considerations are also important as biased research can lead to harm, perpetuate discrimination, or favor specific individuals or groups unjustly (Marshall et al., 2015). Analyzing bias helps to improve the quality of evidence available for decision-making processes and ensures that the scientific literature remains reliable, allowing researchers to build upon a solid foundation of unbiased evidence. By carefully evaluating and addressing bias, researchers can enhance the quality and impact of their work (Revez et al., 2015; Wang et al., 2022).

In accordance with Table 6 (PROBAST diagnostics), most (93.9%) of the included research evidenced a minimal risk of bias and a low concern for applicability. The participants were the companies selected in each study; the predictors were the variables measured; the results were verified by the mathematical models; and the analysis, encompass the techniques used. The quality of the studies included in this study was rated from satisfactory to excellent.

Discussion

Drawing upon rigorous research, this paper elucidates the prominent features that have appeared from the examination of ESG criteria. Table 2 and Fig. 3 show the repercussion, expressiveness and relevance of studies, authors, and journals.

The content analysis highlighted in Table 3 found that the literature on ESG criteria were carried out with information from

companies through databases and applied regression analysis. These findings support the idea that there is no evidence in the study literature that maps or quantifies the effects of incorporating ESG criteria on corporate sustainability performance from the viewpoint of employees.

Ouni et al. (2020), in their study on the mediating role of ESG strands in relation to executive board gender diversity and corporate financial performance, highlighted the need for future research that focuses not only on organizational understanding, but especially on the perception of women (workers) themselves, as board members, of their role and their contribution to financial performance, which strengthens the gap characterized in this SLR.

Researchers employ various methodologies to study ESG criteria, allowing for nuanced insights and robust analysis (see Table 3). Quantitative studies utilize large-scale data sets, statistical models, and financial indicators to explore the relationship between ESG criteria and financial performance, risk management, and firm valuation (Alkaraan et al., 2022; Mavlutova et al., 2022). Qualitative research methods employ interviews, case studies, and content analysis to investigate the organizational processes, stakeholder perceptions, and contextual factors that influence ESG practices and outcomes (Petavratzi et al., 2022). Some studies adopt an integrated approach by combining quantitative and qualitative methods to gain a comprehensive understanding of the multifaceted nature of ESG criteria. These integrated approaches contribute to a holistic understanding of ESG-related phenomena (Aldowaish et al., 2022; Rehman et al., 2021).

Recognizing the strengths and limitations of methodologies, researchers have increasingly adopted mixed-methods approaches to investigate the impact of ESG criteria on corporate sustainability, integrating data collection and analysis processes to provide a comprehensive understanding of the research problem (Gebhardt et al., 2022). This approach allows researchers to

Table 6 Tabular presentation of PROBAST results.

Ref. no. Table 3	ROB				Applicability			Overall	
	Participants	Predictors	Outcome	Analysis	Participants	Predictors	Outcome	ROB	Applicability
[1]	+	+	+	+	+	+	+	+	+
[2]	+	+	+	+	+	+	+	+	+
[3]	+	+	+	+	+	+	+	+	+
[4]	+	+	+	+	+	+	+	+	+
[5]	+	+	+	+	+	+	+	+	+
[6]	+	+	+	+	+	+	+	+	+
[7]	+	+	+	+	+	+	+	+	+
[8]	+	+	+	+	+	+	+	+	+
[9]	+	+	+	+	+	+	+	+	+
[10]	+	+	+	+	+	+	+	+	+
[11]	+	+	+	+	+	+	+	+	+
[12]	-	+	+	?	-	+	+	-	-
[13]	+	?	+	+	+	?	+	-	-
[14]	+	+	+	+	+	+	+	+	+
[15]	+	+	+	+	+	+	+	+	+
[16]	+	+	+	+	+	+	+	+	+
[17]	+	+	+	+	+	+	+	+	+
[18]	+	+	+	+	+	+	+	+	+
[19]	+	+	+	+	+	+	+	+	+
[20]	+	+	+	+	+	+	+	+	+
[21]	+	+	+	+	+	+	+	+	+
[22]	+	+	+	+	+	+	+	+	+
[23]	+	+	+	+	+	+	+	+	+
[24]	+	+	+	+	+	+	+	+	+
[25]	+	+	+	+	+	+	+	+	+
[26]	+	+	+	+	+	+	+	+	+
[27]	+	+	+	+	+	+	+	+	+
[28]	+	+	+	+	+	+	+	+	+
[29]	+	+	+	+	+	+	+	+	+
[30]	+	+	+	+	+	+	+	+	+
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[34]	+	+	+	+	+	+	+	+	+
[35]	+	+	+	+	+	+	+	+	+
[36]	+	+	+	+	+	+	+	+	+
[37]	+	+	+	+	+	+	+	+	+
[38]	+	+	+	+	+	+	+	+	+
[39]	+	+	+	+	+	+	+	+	+
[40]	+	+	+	+	+	+	+	+	+
[41]	+	+	+	+	+	+	+	+	+
[42]	+	+	+	+	+	+	+	+	+
[43]	+	+	+	+	+	+	+	+	+
[44]	+	+	+	+	+	+	+	+	+
[45]	+	+	+	+	+	+	+	+	+
[46]	+	+	-	?	+	+	-	-	-
[47]	+	+	+	+	+	+	+	+	+
[48]	+	+	+	+	+	+	+	+	+
[49]	+	+	+	+	+	+	+	+	+

Source: Adapted from Wolff et al. (2019).
 PROBAST prediction model risk of bias assessment tool, ROB risk of bias.
 + Indicates Low ROB/Low concern regarding applicability.
 - Indicates High ROB/high concern regarding applicability.
 ? Indicates unclear ROB/unclear concern regarding applicability.

triangulate findings, validate results, and gain a more nuanced perspective on the relationship between ESG criteria and corporate sustainability (Harasheh and Provasi, 2023). By leveraging the strengths of methodologies, research offers a more holistic and robust approach to studying complex phenomena.

The positive relationship of voluntary disclosure of corporate sustainability through the ESG criteria of organizations found in this study (see Table 4) provides evidence that the implementation of environmental and social strategies within an efficient

system of corporate governance in the company strengthens the performance of corporate sustainability. The results also show that environmental performance and social performance are significantly positively related to sustainable economic performance, indicating that the corporation's economic value and the creation of value for society are interdependent.

A similar fact was also found in the investigation of Zhang et al. (2020), on environmental, social and governance initiatives that affect innovative performance for corporate sustainability,

which revealed that corporate governance initiatives play a moderating role in the relationship between environmental initiatives and performance innovation and the relationship between social initiatives and innovative performance.

Shaikh (2021), in his study on ESG practices and solid performance, explains the importance of voluntary reporting of non-financial indicators and a company's responsibility towards stakeholders, reflected in the corporation's accounting performance.

Integrating ESG criteria into business practices can have potential negative impacts, although specific effects may vary depending on context and implementation. As shown by the investigations of Wasiuzzaman et al. (2022), which verifies the extent to which culture can affect the relationship between ESG disclosure and company performance, evidencing the negative impact on the profitability of energy companies; and of Suttipun and Yordudom (2022), which analyzes the extent, level and trend of ESG disclosure in companies in Thailand, to test the different levels between high and low profile industries, which found a negative impact of governance disclosure on market reaction. Another example is the research of Yu et al. (2020), about Greenwashing in ESG disclosures, which identified organizations' manipulations of ESG disclosures to increase market value.

While these concerns exist, effectively integrating ESG criteria can drive long-term value creation, risk management and stakeholder confidence. Implementing robust ESG practices requires careful consideration, transparency, and ongoing evaluation to mitigate potential negative impacts and ensure sustainable results.

Conclusion

The main objective of this article is to map and analyze the literature concerning the impacts of the integration of ESG criteria on corporate sustainability performance. To this end, an SLR was performed using the PRISMA methodology, with the intention of selecting the most relevant articles.

Figure 2 revealed an increase in the number of publications on ESG criteria. In 2017, there were only 97 published papers. Already in 2021, this number expanded to 649 manuscripts, an evolution of approximately 570%.

The references were systematically appraised using a hybrid approach that combined literature review methodologies, including structured and objective techniques such as bibliometric analysis, network analysis, and content analysis, to identify key highlights and gaps in the literature related to the theme of this investigation; as well as subjective text interpretation technique (critical analysis), to robust the structured analysis.

This study assisted in diagnosing the methodologies addressed and narrowing the gaps in the literature in four ways. Initially, the article presents a bibliometric analysis with a perspective on ESG criteria and sustainability performance based on the sampling of 49 research studies outlining the main papers and journals (according to Table 2). Subsequently, with the aid of network analysis the main keywords were highlighted (see Fig. 3).

Next, based on an in-depth content analysis, the article presents the main study highlights, the focus of the research, and the stratification of methods (Table 3). Finally, the critical analysis is juxtaposed to consolidate the initial structured analysis (Table 4).

Several authors have discussed the topic addressed by this SLR, such as Lokuwaduge and Heenetigala (2017), who made an interpellation of the integration of ESG precepts for an organizational sustainable development. Another reference is the paper by Bouslah et al. (2013), which analyzed the ESG dimensions and corporate risks.

But there is no evidence, to the knowledge of the authors of this paper, in the sample selected for this SLR, of research on a mapping and quantitative analysis of the impacts of integrating of ESG criteria on corporate sustainability performance as a result of

workers' perceptions. The study points out the lack of more confirmatory research approaches applying a multidimensional perspective of workers, as the interest remains in the economic-environmental perspective from the organizations' point of view. It was also found that none of the studies listed made use of other types of diagnostic instruments diverging from the databases.

That said, the absence of such evidence highlights a gap in the literature that suggests the need for new study initiatives to fill it.

In addition to the opportunities for future studies proposed in Table 5, future researches could explore the developing standardized metrics, common metrics that are relevant across different sectors and geographies; the relationship between ESG and financial performance, mechanisms behind this relationship, such as the impacts of ESG criteria on customer loyalty or employee satisfaction; the impacts of ESG criteria on non-financial stakeholders, such as employees, customers, and communities; the role of technology in ESG, such as artificial intelligence and blockchain in ESG reporting and decision-making; and on emerging ESG issues, such as the impact of climate change on supply chains or the ethical considerations of artificial intelligence.

Therefore, it would be important to establish standards and parameters that allow companies to understand and evaluate ESG criteria. In this sense, the International Organization for Standardization (ISO) could develop a global standardization on ESG that defines parameters, guidelines, and criteria with quality indicators, in line with the ISO 9001 standard already recognized worldwide.

This exploratory work highlights as a contribution the aspect of guiding corporations in understanding how the integration of ESG criteria can positively impact corporate sustainability performance, providing investment optimization and better business planning.

Furthermore, some important conclusions related to the ESG criteria can be obtained. It was observed that companies, regardless of nationality, follow the guidelines of ESG criteria integration and such procedure brings many benefits, such as: improving the organization's image with stakeholders; increasing the corporation's competitiveness; promoting corporate sustainability; improving the conjuncture in relation to gender diversity; improving intellectual opportunities; among others.

This research has limitations related to the use of keyword search engines and the filters of the selected databases. The keyword groups are asked to be elaborated in diverse ways, so the combinatorial analysis of the groupings may bring different answers. The filters of the scientific databases have disparate search characteristics, which may cause divergences in the answers. Another limitation was the critical analysis that may have generated an interpretation bias. Nevertheless, the PRO-BAST method and the systematic multi-method approach applied (bibliometric, network analysis, and content analysis) helped to mitigate this limitation.

Data availability

Data sharing is not applicable to this research as no data were generated or analyzed.

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Author contributions

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Competing interests

The authors declare no competing interests.

Ethical approval

This article does not contain any studies with human participants performed by any of the authors.

Informed consent

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Additional information

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