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Sustainability Transition in SMEs: Stakeholder Incentives, Reporting Frameworks, and Performance Implications

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Background and purpose: This paper examines sustainability transition in SMEs through three interconnected lenses: stakeholder incentives, sustainability reporting, and performance implications. Building on stakeholder theory, it develops an integrative framework showing how pressures from customers, suppliers, financiers, employees, communities, and regulators shape the adoption and disclosure of sustainable business practices.
Methods: The paper combines a conceptual literature synthesis with a structured bibliometric review. The stakeholder-incentive and reporting sections synthesize theoretical and regulatory literature, while the performance section relies on a structured Scopus-based review and keyword co-occurrence analysis using VOSviewer.
Results: The conceptual synthesis shows that stakeholder pressures and value-chain information demands are key drivers of SME sustainability transition. The review of reporting frameworks indicates that, for SMEs, the regulatory centre of gravity has shifted toward proportionate and largely voluntary reporting tools, especially the VSME framework in the EU. The bibliometric analysis identifies eight clusters that can be synthesized into four broader logics: operational and circular transformation; innovation and strategic competitiveness; stakeholder-, finance-, governance-, and reporting-related infrastructures; and socio-organizational and normative embedding, suggesting that sustainability transition in SMEs is a multidimensional capability-building process.
Conclusion: Sustainability transition in SMEs should be understood not only as a compliance issue but as a stakeholder-driven strategic process. For SMEs, transparent and proportionate reporting can support access to finance and value-chain integration, while sustainable practices can improve innovation, competitiveness, and long-term performance.

Keywords: Sustainability transition, Stakeholder incentives, Stakeholder theory, Sustainability reporting, Business performance, Innovation, Competitiveness

1 Introduction

The transition from a predominantly shareholder-centred view of the firm to a broader stakeholder-oriented conception of value creation has become a defining theme in contemporary sustainability research. The current evolution of business is frequently characterized as a transition from the previously dominant notion of maximizing shareholder value to a more stakeholder-centric framework that

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considers the interests of stakeholders, including employees, consumers, investors, communities, and the environment. By balancing the trade-offs between short-term and long-term performance and mapping the various manifestations of stakeholder interests, it becomes possible to understand how these interests may be aligned toward a broader governing objective (Jensen, 2002; Freeman & Reed, 1983). The ESG framework and metrics aim to capture this overarching demand for sustainability and play a crucial role in this transformation. ESG-oriented business practices encompass adopting sustainable practices, supporting social causes, and promoting ethical business conduct (Freeman, 1984; Donaldson & Preston, 1995). The business community is experiencing notable shifts in ESG priorities, influenced by pandemics and economic downturns, social and geopolitical unrest, and extreme weather events.

Although sustainability transition is often discussed through the practices of large corporations, SMEs are central to the broader transformation of business systems. Their importance stems not only from their numerical dominance, but also from their role in employment, local value creation, and supply-chain participation. At the same time, SMEs face specific constraints, including limited financial resources, lower formalization, and weaker reporting capacities, which makes their transition path different from that of large firms. For many SMEs, sustainability is increasingly becoming a condition of market access, financing, and value-chain participation rather than a purely discretionary initiative (Revell et al., 2010; Williams & Schaefer, 2013; Lesnikova & Schmidtova, 2020).

Academic research has examined SME sustainability from several angles, including energy efficiency, waste management, emission reduction, sustainable supply chains, sustainable business models, and employee engagement (Hillary, 2004; Revell et al., 2010; Lee, 2008b; Bocken et al., 2014; Spence et al., 2003; Jenkins, 2004; Brammer et al., 2015). However, this literature remains fragmented in at least three respects. First, stakeholder pressure, sustainability reporting, and performance outcomes are often analysed separately, although SMEs experience them as part of a single transition process. Second, the regulatory environment surrounding SME sustainability reporting has changed rapidly, especially in Europe, which makes earlier overviews quickly outdated. Third, the performance-related literature is dispersed across innovation, competitiveness, financial, and operational strands, which makes it difficult to derive an integrated perspective for SME managers and researchers.

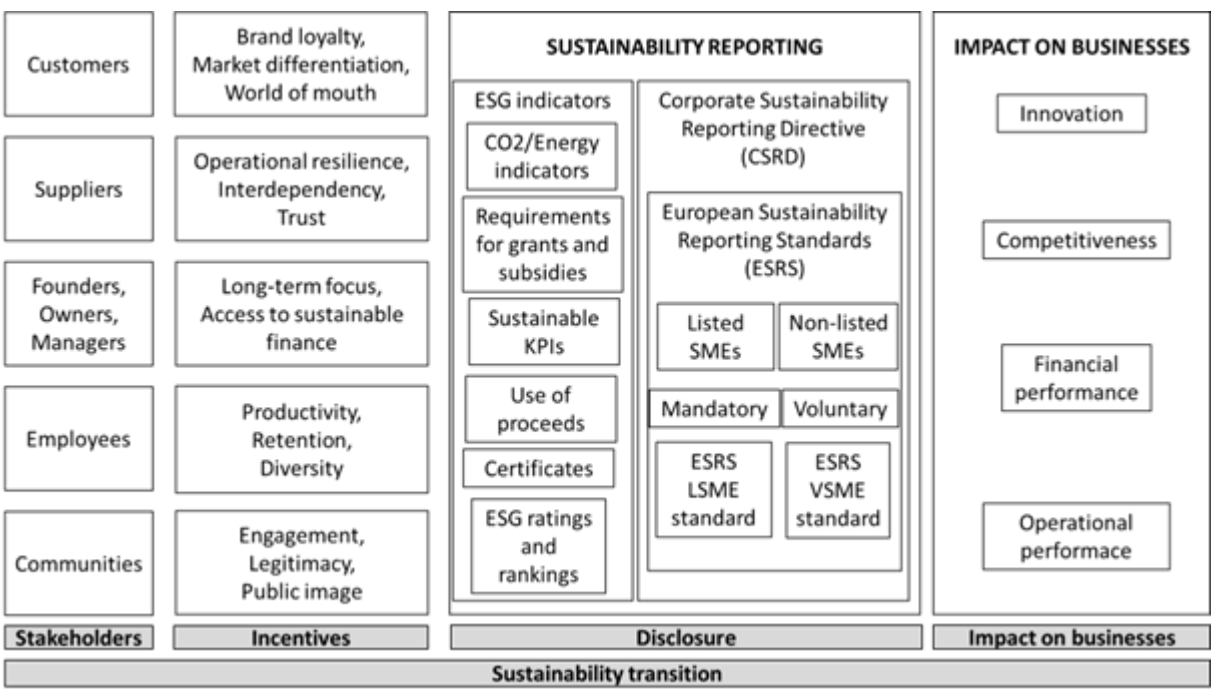

Figure 1: The conceptual model of the SME sustainability transition process
Source: Authors' own elaboration based on Freeman (1984), Mitchell et al. (1997), Fink Babič and Biloslavo (2012), Williams and Schaefer (2013), Porter and van der Linde (1995), Maletič et al. (2014), Kot et al. (2019), and Cheng et al. (2014).

This paper addresses these gaps by integrating stakeholder incentives, reporting frameworks, and performance implications into a single analytical framework. Building on stakeholder theory, it conceptualizes sustainability transition in SMEs as a process in which stakeholder demands shape the adoption of sustainable business practices, reporting mediates the communication of these practices, and performance implications emerge through several interconnected pathways. The paper does not test causal effects directly; rather, it systematizes theoretical arguments, regulatory developments, and empirical research streams relevant to the sustainability transition of SMEs.

The remainder of the paper is organized as follows. First, we develop a stakeholder-based conceptual model of sustainability transition in SMEs. Second, we review the reporting frameworks and regulatory developments most relevant to SMEs. Third, we present the methodology and bibliometric results concerning the performance implications of sustainability transition. Finally, we discuss the theoretical and practical contributions of the study, along with its limitations and future research avenues.

2 Conceptual background: stakeholder incentives and sustainability transition in SMEs

This paper develops a conceptual model of sustainability transition in SMEs from a stakeholder perspective. The model links three analytical dimensions: (1) stakeholder incentives that encourage or pressure SMEs to adopt sustainable practices; (2) reporting and disclosure mechanisms through which firms communicate those practices to external audiences; and (3) performance implications associated with innovation, competitiveness, financial outcomes, and operational improvement (Figure 1).

Figure 1 depicts a sequential but recursive process. Stakeholder incentives create pressures and opportunities that encourage SMEs to adopt sustainable business practices. Once such practices are introduced, firms increasingly need to disclose comparable sustainability information to financiers, customers, and value-chain partners. Reporting, in turn, can reinforce the transition by improving transparency, legitimacy, and access to finance. These mechanisms are expected to affect business performance through four main pathways highlighted in the literature: innovation, competitiveness, financial performance, and operational performance. The stakeholder categories are derived from Freeman's primary–secondary stakeholder typology, while the specific incentive channels synthesize recurring themes in the CSR, sustainability, and SME literature rather than reproducing a single prior framework (Freeman, 1984; Mitchell et al., 1997; Williams & Schaefer, 2013).

Engaging in sustainability practices and disclosing related information can be understood as complementary responses to stakeholder expectations for transparency and accountability (Hahn et al., 2014; Fink Babič & Biloslavo, 2012). In the SME context, these processes are particularly intertwined because external stakeholders often request not only action, but also proportionate evidence of action, especially in financing and supply-chain relationships. The following subsections therefore examine, first, how different stakeholder groups create incentives for sustainability transition and, second, how reporting frameworks structure the communication of sustainability-related information in SMEs (Williams & Schaefer, 2013; Porter & van der Linde, 1995; Cheng et al., 2014).

2.1 Stakeholder incentives

The concept of "stakeholder capitalism" highlights that to thrive in an innovative and ever-changing environment, businesses must prioritize the interests of multiple stakeholders and commit to ethical business practices (Hörisch et al., 2014; Freeman et al., 2004). A stakeholder is any collective or individual entity that can exert influence on or be affected by an organization's operations and outcomes (Freeman, 1984). Stakeholders encompass a range of individuals and entities, such as customers, suppliers, employees, creditors, managers, communities, the environment, and government actors. Stakeholder capitalism views businesses as economic actors aiming to maximize long-term value while considering the interests of all stakeholders, rather than prioritizing shareholders' interests. The stakeholder model proposed by Kay et al. (2020) comprehensively explains how stakeholder contributions directly impact a company's financial performance. Every company must strive to achieve a harmonious equilibrium between the long-term concerns of all stakeholders, including shareholders (Wheeler et al., 2003; Jones & Wicks, 1999).

According to Freeman (1984), stakeholders can be categorized into primary and secondary groups. Primary stakeholders are individuals or groups that have a direct impact on or can influence the organization's operations. The entities included in this category are customers, employees, suppliers, shareholders, and communities. Secondary stakeholders are individuals or groups that are not directly affected by an organization's actions but may still be influenced by them. Examples include the media, professional associations, and special interest groups.

From the customer perspective, sustainability-related incentives are primarily linked to product safety, environmental product footprint, ethical sourcing, and the credibility of firms' CSR commitments. These concerns shape willingness to buy, brand loyalty, and positive word of mouth, especially when firms communicate their sustainability efforts credibly and consistently (Sen & Bhattacha-

rya, 2001; Becker-Olsen et al., 2006; Peloza & Shang, 2011). According to Putzer and Posza (2024), ESG does not replace CSR; it complements CSR by adding environmental and governance dimensions. CSR initiatives and sustainability practices are critical differentiators in competitive markets, attracting consumers who are willing to pay a premium for products that are consistent with their values (Peloza & Shang, 2011; Beckmann & Langer, 2003; Auger et al., 2003; Mohr et al., 2001; Pomering & Dolnicar, 2009; Du et al., 2010). Positive word of mouth is also a substantial consequence of corporate social responsibility (CSR). Customers who are satisfied with a company's ethical practices are more likely to recommend the brand to others, thereby increasing its market share and reputation (Du et al., 2007). As highlighted before, consumers' confidence in a brand is frequently associated with its transparency in environmental and social governance (Becker-Olsen et al., 2006).

Successful supplier partnerships require ethical business practices and transparency (Andersen et al., 2009; Pagell & Wu, 2009; Hoejmose et al., 2013; Carter & Rogers, 2008; Foerstl et al., 2015; Gimenez et al., 2012; Wu & Pagell, 2011). Suppliers must establish successful partnerships by complying with sustainability standards, maintaining ethical business practices, and actively reducing environmental impacts. In addition to strengthening relationships with business partners, these sustainable supply chain practices are vital for satisfying the increasing expectations of regulators and consumers. Trust and cooperation between suppliers and customers are fostered by ethical business practices, adherence to sustainability standards, and long-term, mutually beneficial partnerships (Gimenez & Tachizawa, 2012). Companies are increasingly seeking partners who contribute to their sustainability objectives, and suppliers who actively strive to reduce their environmental impacts can enhance their competitive position in the marketplace (Carter & Rogers, 2008). Collective endeavors further enhance these benefits by establishing sustainable supply chain practices, such as industry-wide collaborations or partnerships with non-governmental organizations (NGOs), which foster innovation and raise standards throughout the supply chain (Seuring & Müller, 2008). In the supply chain, sustainable practices are linked to enhanced operational performance, such as cost reductions and efficiency gains, as suppliers that implement them frequently exhibit reduced waste and resource consumption (Pagell & Wu, 2009). Suppliers prioritizing sustainability in their purchasing decisions are more likely to access new markets and business opportunities (Porter & Kramer, 2011).

Founders, owners, and managers are particularly interested in the relationship between financial performance, risk management, long-term sustainability strategy, return on investment, and environmental, social, and governance (ESG) factors. Madrid-Guijarro and Duréndez (2024) argue that managerial commitment is necessary to overcome the barriers and pressures of engaging in sustainable business practices. Integrating ESG factors into business strategies is crucial to securing access to finance, enhancing competitiveness, and maintaining a long-term focus. Eccles et al. (2014) claim that organizations that demonstrate robust ESG performance are more successful at managing risks and capitalizing on opportunities, and are associated with stronger long-term value generation. This long-term focus is essential for competitiveness, as companies at the forefront of sustainability are frequently regarded more favourably by regulators, investors, and consumers, thereby strengthening their market position (Porter & Kramer, 2006). In addition, financial institutions and investors are increasingly prioritizing sustainability in their investment decisions, which is why companies with robust ESG practices tend to have easier access to capital on more favourable terms (Friede et al., 2015). A company's competitive advantage can be further solidified by a strong ESG focus, enhancing its capacity to innovate and adapt to changing market conditions (Lubin & Esty, 2010).

Employees prioritize job security, employee well-being, equitable labour practices, diversity and inclusion, and opportunities for training and development. Implementing these practices and taking corresponding actions results in increased employee satisfaction and loyalty (Kooij et al., 2010; Alfes et al., 2013; van De Voorde et al., 2012; Guest, 2017; Di Fabio & Kenny, 2016; Farndale et al., 2014). A sense of fairness and respect among workers is essential for cultivating fair labor practices and enhancing their loyalty and motivation (Hollensbe et al., 2008). This includes providing secure working conditions and fair wages. Promoting diversity and inclusion in the workplace is linked to increased employee engagement and innovation, as diverse teams contribute diverse perspectives that enhance decision-making (Hunt et al., 2015). Training and development opportunities are essential for employee satisfaction, as they enable employees to advance in their careers and feel appreciated by their employers, resulting in increased loyalty and a reduced likelihood of leaving the organization (Noe, 2017).

Communities are concerned with obtaining information regarding the environmental effects, involvement with the community, contributions to the local economy, and philanthropic activities (Husted & Allen, 2007; Bowen et al., 2010; Maignan & Ferrell, 2004; Lee, 2008a). Companies establish stronger relationships with the local community by actively engaging in and communicating their environmental initiatives. This, in turn, fosters positive public perceptions and increases public trust (Lindgreen et al., 2009). The company's social license to operate is strengthened by its participation in community activities and contributions to the local economy, which not only support community development but also legitimize its presence (Suchman, 1995). A corporation's status as a re-

sponsible corporate citizen is further solidified, its legitimacy is enhanced, and benevolence is promoted through philanthropic activities, including donations and volunteer programs (Porter & Kramer, 2002). These activities collectively foster a favourable public perception, which can lead to increased community support and long-term benefits for both the corporation and the community it serves (Campbell, 2007).

Having clarified why stakeholders demand sustainability-related information, the next subsection examines the reporting frameworks, standards, and regulatory developments that shape how firms disclose such information.

2.2 Sustainability reporting frameworks relevant to SMEs

Although non-listed SMEs are generally not subject to mandatory sustainability reporting, they increasingly face disclosure demands from customers, lenders, investors, and large corporate clients. Table 1 summarizes the most common types of requested ESG information in the SME context. According to Eurochambres (2023), requests most often concern CO2 and energy indicators, followed by information on the use of proceeds, eligibility for grants and subsidies, sustainability KPIs, and certificates. This pattern suggests that, for SMEs, sustainability reporting is still primarily shaped by financing and value-chain relationships rather than by public ESG ratings or capital-market pressure.

At the international level, sustainability reporting has become more structured in recent years (see Table 2). In June 2023, the International Sustainability Standards Board (ISSB) issued IFRS S1 and IFRS S2, two standards intended to provide a global, investor-oriented baseline for sustainability-related financial disclosure. IFRS S1 sets general requirements for reporting sustainability-related risks and opportunities, while IFRS S2 focuses specifically on climate-related disclosures. Together, they follow a governance–strategy–risk management–metrics structure and draw on earlier climate-disclosure recommendations as well as sector-specific guidance.

The European Union follows a broader approach. Its European Sustainability Reporting Standards (ESRS), adopted under the Corporate Sustainability Reporting Directive (CSRD), are based on double materiality. This means that firms must report not only how sustainability issues affect their financial position and future prospects, but also how their own activities affect people and the environment. In this respect, the European framework goes beyond an investor-only perspective and places greater emphasis on the wider social and environmental impacts of corporate activity (IFRS Foundation, 2023a, 2023b; European Commission, 2023).

The United States has taken a less settled path. The Securities and Exchange Commission (SEC) adopted climate-related disclosure rules in March 2024, but the rules were subsequently stayed during litigation, and in March 2025 the Commission voted to end its defense of them. By contrast, the European framework has remained more coherent institutionally, even though its scope and implementation timetable have been revised as part of the EU simplification agenda (Securities and Exchange Commission, 2024, 2025; European Commission, 2025a; European Union, 2025, 2026).

For SMEs, the most important change is that the earlier expectation of a broad mandatory reporting regime for listed SMEs has been fundamentally revised. First, Directive (EU) 2025/794 postponed by two years the sustainability-reporting requirements that were due to start for additional large undertakings and listed SMEs. Second, Directive (EU) 2026/470 narrowed the main mandatory reporting scope to undertakings that exceed both EUR 450 million in net turnover and an average of 1,000 employees during the financial year. As a result, listed SMEs are no longer at the centre of mandatory sustainability reporting in the EU. This has increased the practical relevance of proportionate, voluntary, and value-chain-oriented reporting tools for SMEs.

Table 1: ESG indicators for SMEs

Requested indicators	CO2/Energy indicators	Requirements for grants and subsidies	Use of Proceeds	Sustainability KPIs	Certificates	ESG ratings and rankings	Non-evaluable
	39.7%	17.2%	13.8%	8.6%	6.9%	1.7%	12.1%
Source of requests	Customers		Banks		Government agencies	Suppliers	Others
	41.7%		32%		9.9%	10.7%	5.7%

Source: Eurochambres (2023)

Table 2: Sustainability reporting regulation

<table>
<tr><th colspan="3">Sustainability reporting regulation</th></tr>
<tr><th>Region</th><th>Regulation</th><th>Target groups</th></tr>
<tr><td rowspan="5">European Union</td><td>Non-Financial Reporting Directive (NFRD)</td><td rowspan="3">Listed companies, banks, insurance companies, and other public-interest entities</td></tr>
<tr><td>Corporate Sustainability Reporting Directive (CSRD)</td></tr>
<tr><td>EU Taxonomy</td></tr>
<tr><td>Sustainable Finance Disclosure Regulation (SFDR)</td><td rowspan="3">Financial market participants</td></tr>
<tr><td rowspan="2">United States</td><td>SEC Climate Guidance</td></tr>
<tr><td>Nasdaq's Board Diversity Rules</td></tr>
</table>

Source: Authors' own compilation based on European Commission (2023, 2025a, 2025b), European Union (2025, 2026), IFRS Foundation (2023a, 2023b), and Securities and Exchange Commission (2024, 2025).

Table 3: Final VSME Standard

Module	Main disclosures
Basic Module	**B1** Basis for preparation; **B2** Practices, policies and future initiatives for transitioning towards a more sustainable economy; **B3** Energy and greenhouse gas emissions; **B4** Pollution of air, water and soil; **B5** Biodiversity; **B6** Water; **B7** Resource use, circular economy and waste management; **B8** Workforce – General characteristics; **B9** Workforce – Health and safety; **B10** Workforce – Remuneration, collective bargaining and training; **B11** Convictions and fines for corruption and bribery.
Comprehensive Module	**C1** Strategy: Business model and sustainability-related initiatives; **C2** Description of practices, policies and future initiatives for transitioning towards a more sustainable economy; **C3** GHG reduction targets and climate transition; **C4** Climate risks; **C5** Additional workforce characteristics; **C6** Additional own workforce information – Human rights policies and processes; **C7** Severe negative human rights incidents; **C8** Revenues from certain activities and exclusion from EU reference benchmarks; **C9** Gender diversity ratio in the governance body.

Source: Authors' own compilation based on European Commission (2025b), Annex I, and EFRAG (2024).

Within the evolving EU sustainability reporting architecture, the European Sustainability Reporting Standard for Listed Small and Medium-sized Enterprises (ESRS LSME) refers to the earlier draft standard intended for listed SMEs, whereas the Voluntary Sustainability Reporting Standard for non-listed micro-, small-, and medium-sized undertakings (VSME) now functions as the main proportionate voluntary reporting framework for SMEs outside the mandatory scope. A draft LSME standard was developed during an earlier phase of CSRD implementation; however, following the Omnibus proposals, the LSME standard was not taken forward and is no longer part of the current SME reporting architecture (EFRAG, 2025).

In this context, the VSME framework becomes the central SME reporting reference in the EU. EFRAG delivered the final VSME Standard to the European Commission in December 2024, and the Commission adopted it as Recommendation (EU) 2025/1710 in July 2025. The VSME is designed as a proportionate disclosure tool for non-listed micro-, small-, and medium-sized undertakings, particularly in contexts where sustainability information is requested by banks, investors, and corporate customers. Its role became even more important as the policy debate shifted away from mandatory reporting for listed SMEs toward proportionate, voluntary, and value-chain-oriented information requests (EFRAG, 2024; European Commission, 2025b).

The final VSME is structured into two modules: a Basic Module and a Comprehensive Module. The Basic Module constitutes the entry point and minimum reporting basis, while the Comprehensive Module adds datapoints typically requested by banks, investors, and business customers. The VSME can reduce duplication in ESG requests, support access to finance, and provide a common language for the exchange of sustainability information between SMEs and their stakeholders (European Commission, 2025b; EFRAG, 2024). Table 3 summarizes the final VSME architecture and highlights how the Basic and Comprehensive modules differ in scope and expected user needs.

Taken together, the stakeholder and reporting dimensions discussed in this section define the institutional and organizational context of sustainability transition in SMEs. Stakeholder pressures help explain why SMEs adopt and communicate sustainable practices, while proportionate reporting frameworks shape how these practices are translated into comparable sustainability information for external audiences. The remaining question is how the literature connects this transition to business performance. Rather than testing such relationships directly, the next section addresses this issue through bibliometric mapping and examines how prior research has linked sustainability transition in SMEs to performance-related themes such as innovation, competitiveness, operational improvement, and broader organizational outcomes.

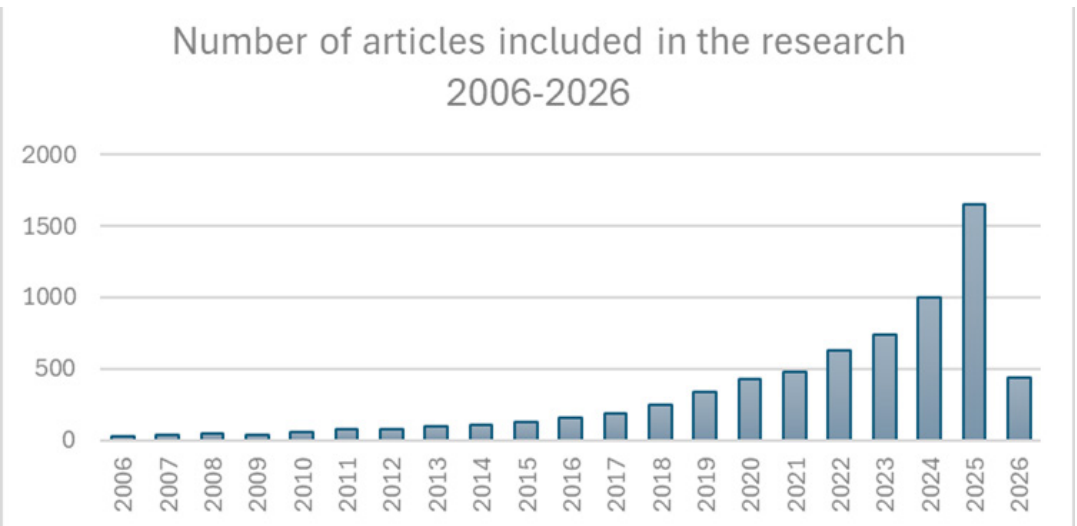

Figure 2: Annual distribution of articles included in the bibliometric dataset (2006–2026)
Source: Authors' own elaboration based on Scopus data

3 Research method

To assess the performance implications of sustainability transition in SMEs, this study combines a conceptual literature review with bibliometric mapping. The stakeholder-incentive and reporting sections rely on a focused narrative synthesis, whereas the performance section is based on a structured Scopus search and a keyword co-occurrence analysis using VOSviewer. In line with the paper's integrative objective, the final query included terms related not only to sustainability and SME context, but also to transition, disclosure, reporting, competitiveness, innovation, and performance. Following Zupic and Čater (2015) and Donthu et al. (2021), we searched Scopus using the following query: TITLE-ABS-KEY((sustainab* OR ESG OR "corporate social responsibility" OR CSR OR "circular economy" OR "green innovation" OR "sustainability reporting" OR "non-financial reporting") AND ("small and medium-sized enterprise*" OR SME* OR "small business*" OR "medium-sized enterprise*") AND (transition* OR adoption OR implementation OR integration OR reporting OR disclosure OR performance OR competitiv* OR innovat* OR "financial performance" OR "operational performance")). The search was limited to English-language journal articles published between 1994 and 2026 in the subject areas of Business, Management and Accounting, and Economics, Econometrics and Finance. Because the bibliometric dataset is limited to Scopus, the results should be interpreted as a structured representation of the field rather than as an exhaustive census of all relevant publications. This limitation is particularly relevant for transition-related research that may be indexed differently across databases. The process yielded 7,142 documents and 25,748 author keywords.

Figure 2 presents the annual distribution of the articles included in the bibliometric dataset, highlighting the strong increase in publication activity over time. Given that only 133 of the 7,142 retrieved articles (1.9%) were published before 2006, Figure 2 presents publication trends only for 2006–2026, as the earlier years account for a negligible share of the dataset and would reduce the visual clarity of the figure without changing the substantive interpretation of temporal dynamics.

The reporting of the literature identification and screening process follows the logic of transparent review reporting recommended by Page et al. (2021) (see Table 4). We then harmonized the keyword set by expanding acronyms, standardizing singular and plural forms, merging closely related terms, and excluding irrelevant items. A co-occurrence map was subsequently generated in VOSviewer, and a minimum occurrence threshold of 10 was retained in the final map to focus on the most salient concepts. The resulting network included 681 keywords grouped into 8 clusters. Because the bibliometric dataset is based on a single database, the results should be interpreted as a structured representation of the field rather than as an exhaustive census of all relevant studies (Zupic & Čater, 2015; Donthu et al., 2021).

Table 4: Main steps of the bibliometric literature review

Systematic literature review	**Sample identification**	Source: Scopus database Search criteria: sustainability-related terms AND SME-related terms AND performance-related terms	7,142 documents, 25,748 keywords
	Screening	Document type: English journal articles Subject area: Business, management and accounting, Economics, econometrics and finance Period: 1994-2025	
	Keyword standardization	Elimination acronyms Unification of singular to plural keywords Combination of closely related keywords Exclusion of irrelevant keywords Relevancy threshold of 5 occurrences	681 keywords, 8 clusters
	Keyword and co-occurrence analysis	Relevancy threshold of 10 occurrences Minimum cluster size of 5	

Source: Authors' own elaboration based on Page et al. (2021)

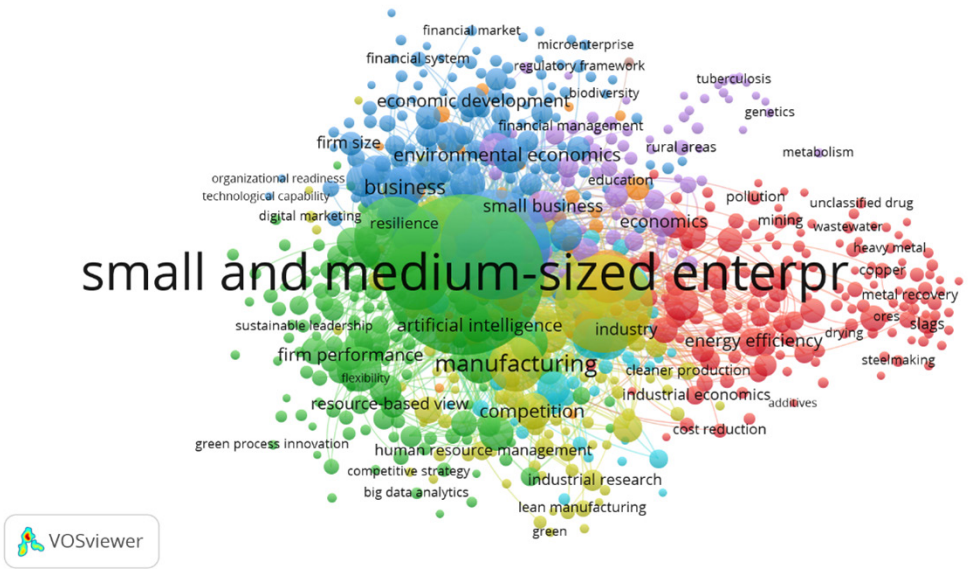

Figure 3: Co-occurrence network about the impact of sustainability transition on business performance
Source: Scopus and VOSviewer

Figure 3 presents the network visualization map of the keyword co-occurrence analysis. The size of the nodes indicates the number of occurrences, while the thickness of the links reflects the strength of relationships between the keywords. The network contains 681 nodes and 35,492 links, with a total link strength of 92,725, indicating a highly interconnected keyword structure within the SME sustainability-transition literature. Eight clusters emerge from the map, reflecting the multidimensional structure of the literature on sustainability transition in SMEs across operational, strategic, stakeholder-, reporting-, and socio-organizational dimensions.

The eight-cluster decomposition of the sustainability–performance nexus in SMEs provides a fine-grained structure. Clusters 2 and 4 primarily capture innovation and competitiveness mechanisms, Clusters 1 and 7 reflect operational and circular-economy transformation, Cluster 3 centers on stakeholder-, finance-, and governance-related incentives, Cluster 6 captures reporting and digitally enabled sustainability management, while Clusters 5 and 8 express the broader socio-organizational and normative context of the transition.

The first cluster highlights resource efficiency and industrial decarbonization as an operational foundation of sustainability transition. Although several terms in this cluster are sector-specific, the common logic is that sustainability improves performance by enabling firms to redesign processes, reduce waste, and lower emissions and energy intensity. Porter and van der Linde (1995) provide the classic argument that well-designed environmental pressures can stimulate innovation and productivity, while Aboelmaged (2018) shows that sustainable manufacturing practices strengthen competitive capabilities in SMEs. This cluster, therefore, supports the view that operational sustainability is not merely a compliance burden but a route to efficiency gains and process upgrading.

The second cluster captures innovation, digital transformation, and capability-based competitive advantage. Bos-Brouwers (2010) links sustainability-oriented SME behaviour to innovation and value creation, and Ardito et al. (2021) show that digital and environmental orientations jointly enhance innovation performance. Cantele and Zardini (2018) likewise find that sustainability can become a competitive advantage for small firms through mediating mechanisms such as innovation and reputation. Accordingly, innovation should be interpreted not only as an outcome of sustainability transition but also as a dynamic capability that enables SMEs to scale sustainable practices and convert them into superior performance.

The third cluster reflects the stakeholder–finance–governance interface of the transition. The co-occurrence of sustainability, stakeholders, finance, ESG, technology adoption, and policy-related terms indicates that SME sustainability is increasingly shaped by external expectations and market institutions. Cheng et al. (2014) show that stronger CSR performance is associated with better access to finance, while Friede et al. (2015) demonstrate in a large meta-synthesis that ESG is positively related to financial performance in the majority of empirical studies. Fatemi et al. (2018) further suggest that disclosure strengthens the value relevance of ESG performance. This cluster reflects that stakeholder incentives and disclosure demands are not

external to performance but are among its main transmission mechanisms.

The fourth cluster focuses on strategy, business models, entrepreneurship, and market-facing implementation. Bocken et al. (2014) show that sustainable business models reconfigure how firms create, deliver, and capture value, while Lee (2008b) argues that small suppliers enter green supply-chain initiatives when market pressures and internal capabilities are aligned. Together with Carter and Rogers (2008), this literature suggests that sustainability becomes performance-relevant when embedded in strategy, business model design, marketing, and interorganizational coordination rather than treated as a stand-alone CSR activity. For SMEs, the implication is that sustainability transition is most effective when linked to entrepreneurial strategy and market positioning.

The fifth cluster focuses on the socio-organizational context of the transition, including small businesses, government, employment, risk management, stakeholder engagement, and training. This cluster is more heterogeneous than the previous ones, but it is important because it shows that sustainability adoption depends on organizational routines, managerial commitment, and local embeddedness. Revell et al. (2010) and Williams and Schaefer (2013) both emphasize that SME engagement with sustainability is shaped by managerial values, perceived constraints, and limited organizational slack. Hence, sustainability policies aimed at SMEs should combine incentives with training, advisory support, and capability development rather than assuming that compliance pressure alone will generate performance improvements.

The sixth cluster centers on reporting, standards, and digitally enabled sustainability management. The prominence of environmental management, sustainable development goals, sustainability reporting, Industry 4.0, supply chain, and performance measurement indicates that transition is increasingly mediated by metrics, routines, and formal management systems. Adams (2002) shows that reporting quality depends on internal organizational factors, Kolk (2008) demonstrates that sustainability disclosure is closely related to governance and accountability structures, and Hillary (2004) underlines the specific implementation challenges faced by smaller firms in environmental management systems. This cluster directly supports the paper's reporting dimension by showing that proportionate disclosure and measurement systems are enabling infrastructures of sustainability transition, not merely communication add-ons.

The seventh cluster highlights circular economy, eco-innovation, environmental policy, and implementation drivers. Dey et al. (2020) and Dey et al. (2022) show that circular-economy adoption in SMEs depends on both internal capabilities and ecosystem-level enablers, while Seuring and Müller (2008) and Carter and Rogers (2008) demonstrate that sustainability gains in supply chains emerge from coordinated interorganizational practices rather than isolated firm action. Accordingly, this cluster strengthens the paper's policy implications: SMEs are more likely to realize operational and competitiveness gains when regulation, procurement, and value-chain governance reduce uncertainty and reward implementation.

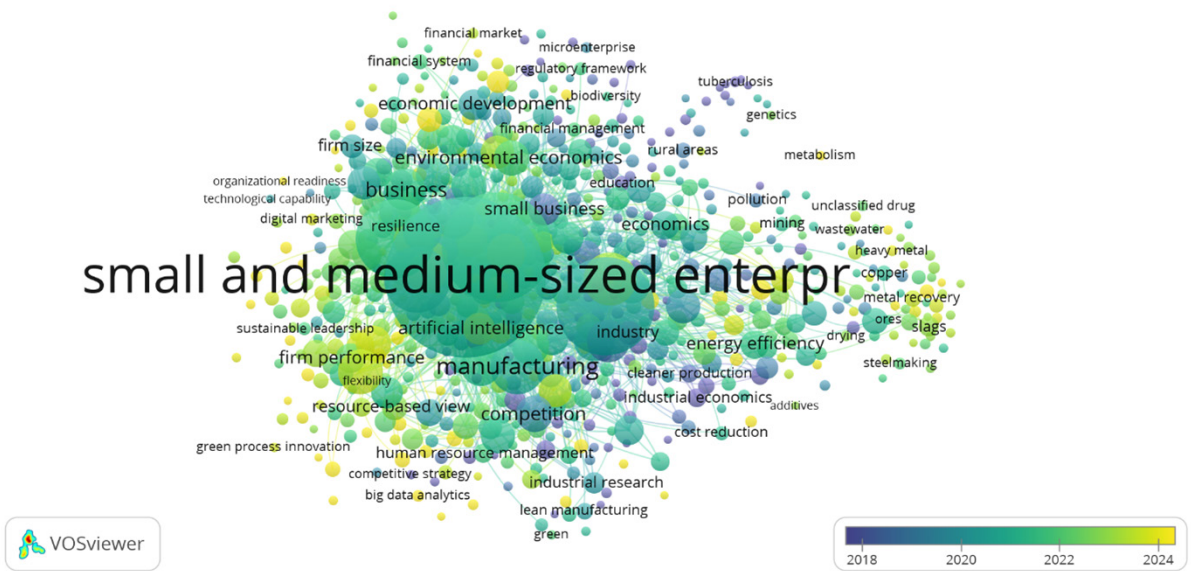

Figure 4: The overlay visualization of the co-occurrence network
Source: Scopus and VOSviewer

The eighth cluster, which is small and organized around environmental factors and environmental responsibility, should be interpreted as a residual but theoretically meaningful normative cluster. Its limited size suggests that environmental responsibility no longer appears as an isolated topic; instead, it has been absorbed into broader discussions of innovation, performance, reporting, and stakeholder management. This reading is consistent with the shift from a narrow ethics-versus-profit framing toward a more integrated view in which environmental responsibility is embedded in organizational processes and long-term value creation (Porter & van der Linde, 1995; Eccles et al., 2014; Fatemi et al., 2018).

Taken together, the eight clusters suggest a multi-level logic of sustainability transition in SMEs. Operational upgrading and circular practices improve resource efficiency; innovation, digital transformation, and business-model redesign strengthen competitiveness; stakeholder pressure, finance, and reporting shape legitimacy and access to resources; and organizational routines determine whether firms can implement sustainable practices at all. Interpreted in this way, the clusters are not isolated topics but mutually reinforcing pathways through which stakeholder incentives, reporting infrastructures, and performance outcomes become connected. Based on these findings, SME sustainability should be understood not as a marginal reporting burden, but as a capability-building process that can translate external pressure into innovation, resilience, and long-term value creation.

Appendix 1 summarizes the results of the keyword co-occurrence analysis by presenting the most frequent and conceptually most representative keywords, together with concise thematic descriptions of the eight identified clusters.

To explore emerging research directions, Figure 4 presents an overlay visualization of the co-occurrence network, where node colour indicates the average publication year for each keyword. The map shows that recent research increasingly focuses on artificial intelligence, digital transformation, digitalization, ESG, green finance, and sustainability-related performance, alongside decarbonization and energy transition themes. This pattern suggests that the sustainability-performance literature on SMEs is moving toward a more integrated view, in which environmental transition and digital capability development are closely connected research streams.

4 Discussion

This study develops an integrative framework for understanding sustainability transition in SMEs by linking stakeholder incentives, reporting frameworks, and performance implications. Rather than treating these dimensions as separate conversations, the paper argues that SMEs encounter them as interconnected elements of a single transition process. The conceptual model positions stakeholder pressure, information disclosure, and performance effects within a common analytical sequence, while the bibliometric analysis provides a more fine-grained map of the performance-related literature.

The bibliometric results refine rather than overturn the conceptual model's logic. The eight-cluster solution suggests that the performance implications of sustainability transition in SMEs are broader and more multidimensional than a simple innovation–competitiveness–financial performance–operational performance typology would imply. More specifically, Clusters 1 and 7 capture the operational and circular-economy foundations of the transition, highlighting resource efficiency, decarbonization, waste reduction, and implementation through supply-chain and policy-related mechanisms. Clusters 2 and 4 reflect innovation, digital transformation, business model adaptation, and strategic competitiveness, indicating that sustainability becomes performance-relevant when embedded in entrepreneurial strategy and dynamic capability development. Clusters 3 and 6 bring stakeholder-, finance-, governance-, and reporting-related concepts to the forefront, showing that disclosure, performance measurement, and access to finance are not peripheral to SME sustainability but are part of the infrastructure through which the sustainability transition is organized and legitimized. Finally, Clusters 5 and 8 point to the socio-organizational and normative embedding of the transition, emphasizing managerial commitment, training, stakeholder engagement, organizational routines, and the continued relevance of environmental responsibility as a background normative orientation.

Interpreted in this way, the bibliometric map supports three broader conclusions. First, sustainability transition in SMEs is not a narrow environmental management issue but a strategic and organizational transformation shaped by external stakeholder expectations and internal capability development. This interpretation is consistent with stakeholder theory, which suggests that long-term value creation depends on how firms manage the claims, expectations, and contributions of multiple stakeholder groups (Freeman, 1984; Donaldson & Preston, 1995; Hörisch et al., 2014). Second, the bibliometric structure shows that performance effects are rarely direct. Rather, they are mediated by innovation, business-model redesign, reporting routines, operational upgrading, and access-to-resource mechanisms. This finding also aligns with prior work arguing that sustainability-related practices influence performance through competitive advantage, organizational learning, and improved stakeholder relationships (Porter & van der Linde, 1995; Bos-Brouwers, 2010; Cantele & Zardini, 2018). Third, the presence of reporting, ESG, finance, and governance terms in the bibliometric map strengthens one of the central claims of this paper: for SMEs, sustainability reporting should not be interpreted

merely as a downstream communication exercise, but as a coordinating infrastructure that links stakeholder expectations, financing conditions, and strategic adaptation.

From a practical perspective, the findings suggest that SME managers should not approach sustainability transition as a stand-alone compliance task. The literature reviewed in this study indicates that the strongest performance benefits are most likely to emerge when sustainable practices are integrated into innovation activities, business model development, operational improvement, and stakeholder management. In this respect, reporting also has a practical function beyond formal disclosure. Proportionate reporting tools can reduce information asymmetries, support access to finance, and improve coordination with customers, suppliers, and other business partners. This is particularly relevant in the current European context, where the narrowing of the mandatory reporting scope has increased the importance of proportionate and voluntary reporting frameworks for SMEs (European Union, 2025, 2026; European Commission, 2025b).

5 Conclusion

This paper examined sustainability transition in SMEs through the combined lenses of stakeholder incentives, reporting frameworks, and performance implications. The analysis suggests that sustainability transition in SMEs should be understood as a stakeholder-driven strategic process in which external pressures, reporting requirements, and organizational capabilities interact rather than as a narrow compliance issue.

The paper makes three main contributions. First, it integrates stakeholder theory, sustainability reporting, and performance-related literature into a single framework for analysing the sustainability transition of SMEs. Second, it updates the reporting dimension of the debate by showing that, in the current European context, the practical importance of proportionate and voluntary frameworks has increased relative to earlier expectations of a broader mandatory reporting regime for SMEs. Third, the bibliometric analysis shows that the literature is structured into eight clusters, which can be synthesized into four broader logics: operational and circular transformation; innovation and strategic competitiveness; stakeholder-, finance-, governance-, and reporting-related infrastructures; and socio-organizational and normative embedding.

These findings suggest that the performance relevance of sustainability transition in SMEs is most plausible when sustainable practices are embedded in business-model adaptation, digital and organizational capability development, resource efficiency, and stakeholder coordination. Transparent and proportionate reporting can support this process by reducing information frictions, facilitating access to finance, and strengthening value-chain relationships. In this sense, sustainability transition should be seen not as an isolated reporting burden, but as a capability-building and coordination process that can contribute to innovation, resilience, and long-term value creation.

The study also has limitations. Because the bibliometric analysis is based on Scopus only and relies on keyword co-occurrence, the results should be interpreted as a structured representation of the field rather than as evidence of causal effects. Future research should therefore extend the database coverage, examine sector- and country-specific transition patterns, and test the causal links between sustainability practices, reporting intensity, and SME performance through longitudinal and mixed-method designs (Donthu et al., 2021; Page et al., 2021; Friede et al., 2015).

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Appendix 1

c	Keywords and frequencies	Short description
Resource efficiency and industrial decarbonization	environmental impact (152), energy efficiency (108), environmental protection (98), climate change (94), renewable energy (83), recycling (82), waste management (75), carbon emissions (68), environmental technology (66)	This cluster captures the operational decarbonization dimension of the literature. It suggests that sustainability transition in SMEs is frequently linked to energy efficiency, waste reduction, emissions management, and cleaner production, especially in manufacturing and industrial contexts.
Innovation and capability-based competitive advantage	small and medium-sized enterprises (3281), innovation (809), corporate social responsibility (563), green innovation (256), digital transformation (213), supply chain management (207), sustainable performance (164), competitive advantage (138), artificial intelligence (137), dynamic capabilities (103)	This cluster reflects the core capability-building pathway of sustainability transition. It indicates that CSR, innovation, green innovation, digital transformation, and dynamic capabilities help SMEs translate sustainability efforts into competitive advantage and improved firm performance.
Stakeholder, finance, and governance pressures	sustainability (1549), business (219), competitiveness (199), stakeholders (166), technology adoption (138), performance assessment (136), economic development (125), finance (89), policy making (77), ESG (67)	This cluster highlights the stakeholder- and institution-driven side of sustainability transition. It suggests that SME sustainability is shaped by external expectations, access to finance, governance pressures, and technology adoption, all of which influence competitiveness and performance outcomes.
Strategy, business models, and market implementation	sustainable development (1217), manufacturing (387), entrepreneurship (195), competition (170), commerce (137), supply chains (113), marketing (104), knowledge management (96), business models (87), strategy (59)	This cluster shows that sustainability becomes performance-relevant when it is embedded in business models, entrepreneurship, marketing, and strategic market implementation. It captures the market-facing and organizational mechanisms through which SMEs operationalize sustainability.
Socio-organizational resilience and SME context	covid-19 (139), small business (131), economics (105), government (61), risk assessment (55), risk management (53), employment (49), productivity (48), stakeholder engagement (32), training (32)	This cluster reflects the broader socio-organizational context of sustainability transition in SMEs. It emphasizes resilience, risk management, government support, and stakeholder engagement, suggesting that transition outcomes depend not only on strategy but also on organizational and contextual conditions.
Reporting, standards, and digital sustainability management	environmental management (236), decision-making (216), sustainable development goals (194), environmental sustainability (165), industry 4.0 (144), corporate sustainability (64), supply chain (62), sustainability reporting (59), sustainable manufacturing (48), internet of things (40)	This cluster captures the formal management, reporting, and digital monitoring infrastructure of sustainability transition. It indicates that environmental management systems, SDG-related framing, sustainability reporting, and Industry 4.0 technologies increasingly structure how SMEs manage and communicate sustainability.
Circular economy and policy-enabled transition	circular economy (371), barriers (81), eco-innovation (80), environmental policy (75), implementation process (40), market conditions (37), drivers (34), economic activity (30), environmental issues (28), governance (27)	This cluster represents the circular-economy and policy-enabled pathway of transition. It suggests that eco-innovation, environmental policy, governance, and implementation drivers play a central role in enabling SMEs to adopt circular and sustainability-oriented practices.
Environmental responsibility as a normative layer	environmental factors (30), environmental responsibility (14)	This small residual cluster reflects the normative foundation of the field. Rather than forming a large independent stream, environmental responsibility appears here as an overarching background principle that informs the broader strategic, operational, and reporting-related sustainability agenda.