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Spanish SME companies' readiness for European sustainability reporting standards compliance

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Abstract

Purpose – This paper aims to enhance the understanding of the readiness of listed small and medium-sized enterprises (LSMEs) for the adoption of the forthcoming European Sustainability Reporting Standards for LSMEs. To achieve this objective, the study examines the current level of voluntary disclosure among SMEs, categorizes them into clusters and identifies the factors influencing these practices within the framework of agency theory and the resource-based view.

Design/methodology/approach – Based on hand-collected data, a voluntary sustainability disclosure (VSDI) index was developed and scored, followed by a cluster analysis and an ANOVA test to identify the factors that significantly influence the level of voluntary disclosure in Spanish SMEs.

Findings – The results reveal a generally low level of voluntary sustainability reporting, particularly regarding materiality assessment disclosures and they are consistent with some of the recent research findings that seek to explain VSDI in SMEs within the framework of the same theories. Factors such as the client's business model, accounting standards adopted in financial reporting, as well as size and profitability contribute to the classification of the identified disclosure levels. Between the two analyzed periods, 2022 and 2023, a slight increase in the level of voluntary disclosures has been identified.

Originality/value – The originality of this study lies in the first-time use of a measure for the level of VSDIs in SMEs, which considers not only environmental, social and governance thematic sections but also the

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materiality assessment process and its outcomes. It is also a novelty, the introduction of the value chain profile as an agency characteristic, with the potential to influence the level of voluntary sustainability information disclosure. This study offers valuable insights into the reporting areas that require enhanced support, emphasizing the crucial role of preparers, stakeholders and standard setters in facilitating the future adoption of mandatory standards by LSMEs.

Keywords Sustainability reporting, Materiality, Small- and medium-sized enterprises, European sustainability reporting standards, Compliance

Paper type Research paper

1. Introduction

Small- and medium-sized enterprises (SMEs) are a fundamental pillar of economic and social development in the European Union (EU). With over 24 million SMEs – accounting for 99% of all businesses and using two-thirds of the private-sector workforce – these enterprises play a crucial role in local communities (EU Monitor, 2023; European Commission, EC, 2023). In Spain, their significance is even greater, with nearly three million SMEs (99.80% of all businesses) using approximately 60% of the workforce, or close to 10 million people (Ministry of Industry, Commerce and Tourism, MICT, 2024).

Given their economic and social relevance, SMEs are increasingly subject to evolving European sustainability regulations, particularly under the European Green Deal and the Action Plan on Financing Sustainable Growth. The European Union is expanding its corporate sustainability reporting requirements with the European Financial Reporting Advisory Group (EFRAG) Sustainability Reporting Board and its Technical Expert Group (SR TEG), currently refining the forthcoming European Sustainability Reporting Standards (ESRS) for SMEs. The final standards are expected by December 2024, with the basis for conclusions for Very Small Enterprises (VSMEs) scheduled for release in February 2025.

In this evolving regulatory context, a key concern for academics, practitioners and standard setters is identifying the critical aspects of sustainability disclosure that require enhanced engagement from preparers of annual reports and supporting institutions to ensure effective compliance with future LSME ESRS. Nevertheless, the broader literature on sustainability reporting has traditionally emphasized large corporations while overlooking the specific challenges faced by SMEs (Adams and Larrinaga, 2007; Benameur *et al.*, 2023; Guidi *et al.*, 2024). Studies explicitly examining sustainability disclosures in SMEs are still scarce (Jansson *et al.*, 2017; Ortiz-Martínez and Marín-Hernández., 2024; Pizzi and Coronella, 2024) and the exploration of why some SMEs choose to report when reporting is still voluntary, is considered a relevant issue within sustainability reporting research (Guerrero-Baena *et al.*, 2024).

The evolving regulatory landscape and the research gap in VSDIs among SMEs underscore the need for further investigation into the readiness LSMEs for the adoption of the forthcoming ESRS.

While studies on large corporations have traditionally been framed within legitimacy and stakeholder theories (Al Amosh and Khatib, 2025), recent research on SMEs has increasingly adopted agency theory and the resource-based view (RBV) to provide a more nuanced understanding of VSDI practices (Cardoni and Kileleva, 2024). Other studies, such as Pizzi and Coronella (2024), explore the sustainability reporting practice of LSME in the context of the Corporate Sustainability Reporting Directive (CSRD) using institutional theory as a framework.

This study aims to deepen the understanding of Spanish LSMEs' preparedness by assessing their current level of voluntary disclosure, categorizing them into clusters and identifying the key determinants influencing their reporting practices, focusing on the agency theory and the RBV to better explain SMEs' VSDI practices.

Methodologically, the recent literature on sustainability reporting in SMEs has primarily relied on case studies (Caccialanza and Torrelli, 2024; Galli *et al.*, 2024; Guidi *et al.*, 2024) and survey-based research (Appiah-Kubi, 2024). In this study, we use hand-collected data and develop and score a VSDI index. A cluster analysis enables the identification of different levels of VSDI practices, and an ANOVA test allows for the determination of the factors that significantly influence the level of voluntary disclosure among Spanish LSMEs.

This research contributes to existing literature in several ways. First, it introduces a novel and comprehensive measure of VSDIs in SMEs, extending beyond ESG thematic sections to incorporate both the materiality assessment process and its outcomes. In addition, this study aligns with recent research on voluntary sustainability reporting in SMEs while integrating an innovative perspective by incorporating the value chain approach as an agency-related characteristic and considering additional factors based on the proportionality principle applicable to SMEs.

The findings advance knowledge in sustainability reporting by identifying the primary challenge in SME sustainability disclosures: the lack of transparency regarding the materiality assessment process and, more critically, its outcomes. Addressing this gap is essential, as materiality assessment serves as the foundation for ensuring that disclosed environmental, social and governance (ESG) information meets the qualitative criterion of relevance under the materiality approach.

Accordingly, this study provides valuable insights into the key deficiencies in voluntary sustainability reporting practices that require enhanced support. It underscores the crucial role of preparers, stakeholders and standard setters in facilitating the future adoption of mandatory sustainability reporting standards by LSMEs.

The paper is structured as follows: Section 2 provides the theoretical framework and formulates the research questions, focusing on the double materiality approach (Section 2.1), the proportionality principle and the RBV (Section 2.2) and the value chain approach and agency theory (Section 2.3). Section 3 outlines the research methodology, including sample selection, data collection and variable definitions. Section 4 presents the results and Section 5 discusses the findings and concludes with implications for research and practice.

2. Theoretical background

In Europe, since the approval of the Non-Financial Reporting Directive in February 2013 (NFRD), sustainability reporting has shifted from being a voluntary activity based on nonregulatory standards like the Global Reporting Initiative (GRI) to a regulated activity for certain companies. In Spain, Law Nr. 11 / 2018 on nonfinancial information and diversity, transposed Directive 2014 / 95/EU. Although an increasing number of companies are required to disclose information about sustainability, especially large firms, there are still many enterprises that have so far not published sustainability information, mainly SMEs (Dinh *et al.*, 2021). While individually, SMEs may have relatively negligible social, environmental and financial impacts, cumulatively their impact is significant (Lawrence *et al.*, 2006). In fact, these SMEs could be a key productive layer of society for achieving sustainability transition with their commitments and actions (Chatzistamoulou and Tyllianakis, 2022). However, research discussing corporate social responsibility and related concepts has often focused on larger companies, sometimes neglecting the SMEs specificities (Jansson *et al.*, 2017; Ortiz-Martínez *et al.*, 2023).

On April 21, 2021, the EC adopted a proposal for the CSRD, which was later modified by the 2022 / 2464 Directive (European Union, EU, 2022), aiming to improve the existing requirements of the NFRD 2013 / 34 (EU, 2013) and moving toward an inclusive economic and financial system, in accordance with the European Green Deal and the Sustainable

Development Goals (SDG). The companies affected by this shall report information on sustainability metrics and assurance in the financial year 2024, for reports to be published in 2025. Listed SMEs get an extra three years to comply, being required to report from 2026 onwards, with the option to opt out voluntarily until 2028 and thus be able to report under a separate and appropriate standard, which is developed by EFRAG. In this context, an extremely impactful and relevant process is expected (Galli *et al.*, 2024).

The latest research has suggested that there is a lack of specific research addressing the overarching challenges faced by SMEs in the development of sustainability reports (Setyaningsih *et al.*, 2024). Sustainability reporting is becoming increasingly relevant for SMEs, underscoring the necessity for further research to explore their reporting practices and determine suitable reporting frameworks (Ortiz-Martínez *et al.*, 2023; Guidi *et al.*, 2024; Benameur *et al.*, 2023).

Within this framework, our study is founded on the materiality approach, as part of the sustainability reporting fundamental characteristic of relevance, to evaluate the extent of VSDIs in Spanish LSMEs. In addition, the RBV and agency theory provide a robust framework to identify the key factors influencing the level of voluntary sustainable disclosures in SMEs. The following sections focus on these three approaches.

2.1 The double materiality approach

Double materiality approach is necessary for undertakings to distinguish between material and nonmaterial impacts, risks and opportunities (IRO). An undertaking may define the importance of ESG issues to its organization, operations and performance by performing a materiality assessment (Garst *et al.*, 2022). The impact materiality is the entity's impact on the economy, the environment and people for the benefit of investors, employees, customers, suppliers and local communities (multiple stakeholders). A sustainability topic is material from an impact perspective if it is connected to significant impacts by the undertaking on people or the environment over the short-, medium- or long-term. This includes impacts directly caused or contributed to by the undertaking in its own operations, products or services and impacts which are otherwise directly linked to the undertaking's upstream and downstream value chain and is not limited to contractual relationships –ESRS 1, 49 (European Financial Reporting Advisory Group, EFRAG, 2022a, 2022b).

Existing research highlights significant deficiencies in sustainability reporting, particularly in the materiality assessment process. A key issue is the limited disclosure of materiality analyses, often due to a lack of understanding, with materiality perceived as a subjective managerial judgment rather than a standardized process (Guix *et al.*, 2017). This concern is further reinforced by findings that companies disclose minimal information about their materiality assessments, particularly regarding stakeholder engagement and the identification of material topics (Edgley *et al.*, 2015; Beske *et al.*, 2020; Borial *et al.*, 2019; Ball *et al.*, 2000; Owen *et al.*, 2000; Smith *et al.*, 2011). The stakeholder approach has been widely recognized as a crucial factor in sustainability management research, given that different stakeholders influence the adoption and implementation of sustainability practices (Bello-Pintado *et al.*, 2023). However, as Adams *et al.* (2021) argue, inadequate disclosure of stakeholder identification and engagement in materiality assessment is likely to persist as long as these disclosures remain voluntary and lack external assurance.

The materiality assessment serves as the foundation for sustainability reporting under the upcoming standards (European Financial Reporting Advisory Group, EFRAG, 2024), covering the three key reporting areas: ESG. With reference to previous research on SME's environmental and social commitment, we have found that due to intense competition and a lack of support from the regulatory authorities and customers, SMEs often prioritize economic aspects and place less emphasis on environmental and social initiatives. This can lead to a significant negative impact on the overall sustainability performance of the specific industrial supply chain and, in turn, on the entire region. Malesios *et al.* (2021) found that the association between economic practices and environmental/social performance is currently underexplored. Furthermore, most of the research emphasizes the correlation between environmental and social practices with economic and environmental performance in SMEs. However, the aspect of social performance is largely missing (Warasthe *et al.*, 2022; Camargo and Chiappetta, 2017), which highlights a significant gap in comparison to larger companies. In addition, despite the well-documented drawbacks of current ESG rating approaches, such as issues related to materiality, reliability, accuracy, comparability and timeliness, neither the literature nor practical applications have presented direct solutions or guidance (Ozkan *et al.*, 2023).

We consider the three reporting areas and the materiality assessment required by the CSRD and the ESRS when exploring the sustainability reporting practices of LSME. With the intention of contributing to a better understanding of the extent to which SME are prepared to address LSMEs ERS (European Financial Reporting Advisory Group, EFRAG, 2023a, 2023b), we formulate a research question related to the strengths and weaknesses of the current sustainability reporting in LSME. It tries to highlight the disclosure areas which require greater involvement from LSME annual report preparers and institutions to effectively address future LSME ESRS:

RQ1. Are Spanish LSME prepared to disclose sustainability information in compliance with the requirements of the CSRD and ESRS?

2.2 Theoretical foundations for voluntary sustainability disclosure: resource-based and agency perspectives

2.2.1 The proportionality principle and the resource-based view. The proportionality principle is essential in shaping specific sustainability reporting standards for SMEs. As outlined by the European Financial Reporting Advisory Group (European Financial Reporting Advisory Group, EFRAG, 2022a, 2022b, p. 3), this principle asserts that the ESRS standards "shall be proportionate and relevant to the scale and complexity of the activities, and to the capacities and characteristics of small and medium-sized undertakings." In the context of SMEs, this principle justifies the application of the RBV to understand the key factors influencing the level and quality of VSDI.

Given the resource constraints that SMEs typically face, the proportionality principle suggests that the extent of sustainability reporting should be commensurate with the company's size, resources and internal capacities. The RBV further supports this notion by emphasizing that SMEs need to balance their internal sustainability initiatives with the impact of their external disclosures. This means SMEs must manage both internal and external sustainability risks and opportunities in a manner that is resource-efficient.

The proportionality principle, therefore, provides a solid foundation for understanding why SMEs, constrained by limited resources, may opt to disclose sustainability information in a way that is practical, scalable and aligned with their capacities and strategic objectives. The limitations inherent to smaller firms – such as resource scarcity, difficulty in accessing specialized skills, lack of formal long-term strategies and limited internationalization – are central factors that influence their approach to sustainability reporting (Galli *et al.*, 2024).

Supporting this view, Setyaningsih *et al.* (2024) identify six key barriers SMEs face when attempting to produce sustainability reports: financial constraints, general attitudes, knowledge and technology gaps, organizational challenges, policies and regulations and socioenvironmental factors. Furthermore, Cardoni and Kileleva (2024) suggest that VSDIs can be explained by the RBV, with financial resources significantly affecting the quality of annual reports (using profitability as a proxy) and firm size influencing the availability of information on websites (using turnover as a proxy). In addition, Mio *et al.* (2020) find that company size, industry environmental sensitivity, board size and ownership structure are key determinants of sustainability information quality in EU SMEs.

This body of research reinforces the idea that the proportionality principle, when applied to SMEs, aligns with the RBV's focus on resources and capabilities, providing insights into the factors that drive the level and quality of sustainability disclosures within this sector.

Considering that the internal characteristics of firms (in terms of resources and capabilities) can have a significant impact on how SMEs manage and disclose sustainability information, particularly when considering the applicability of the proportionality principle and the RBV, we propose the following research question:

RQ2. Do firm size and financial resources influence voluntary sustainability disclosure in Spanish SMEs?

2.2.2 The value chain profile and other determinants grounded in agency theory. Agency theory offers valuable insights into understanding the determinants of VSDI in SMEs, particularly by focusing on reducing information asymmetry within the governance structure. Transparency, as facilitated by sustainability reporting, is essential for aligning the interests of managers and stakeholders. And this alignment becomes especially important when considering the broader impacts across the value chain. By disclosing sustainability risks and opportunities not only within the company but also across its supply chain, SMEs can demonstrate responsible governance and build trust with stakeholders.

The ESRS for large companies have an indirect impact on SMEs, as outlined in ESRS 2, which specifies disclosure requirements (DRs) related to the key features of an undertaking's value chain (European Financial Reporting Advisory Group, EFRAG, 2022a, 2022b). This includes providing a high-level overview of key value chain participants, describing their contributions to the company's performance and value creation and explaining their role within the chain. This requirement poses a significant challenge for SMEs as they must gather and disclose detailed information about their business relationships with suppliers, customers and distribution channels. However, the proportionality principle embedded in the ESRS acknowledges the resource limitations of SMEs and provides them with a simplified disclosure process through the "LSME cap" (European Financial Reporting Advisory Group, EFRAG, 2023a, 2023b). The cap aims to minimize the burden on SMEs while ensuring sufficient transparency.

Empirical evidence highlights the positive impact of socially responsible supplier development practices on sustainability-oriented innovations in SMEs (Guo-Ciang, 2017). However, SMEs face challenges in managing their supply chains, often due to limited resources and time (Arend and Wisner, 2005). These firms tend to share less information about their supply chains compared to larger companies (Winter *et al.*, 2023). For this reason, this study emphasizes suppliers and customers as key components of SMEs' value chains, focusing on both the nature of value provision and the approach to risk management. According to Holweg and Helo (2014), these elements are fundamental to the value chain architecture.

SMEs may engage in a variety of business models with their customers, including B2B, B2C or a combination of both. The unique characteristics of these models, as highlighted by previous research (Cao and Weerawardena, 2023; Cawsey and Rowley, 2016), may influence the approach SMEs take toward sustainability disclosures. In terms of internationalization, SMEs also face challenges in integrating into Global Value Chains (GVCs), with factors such as lack of market knowledge restricting their growth opportunities (Eduardsen *et al.*, 2022). Despite these challenges, SMEs benefit from the integration into GVCs, as it provides learning opportunities that can enhance performance and survival (Dabić *et al.*, 2020).

The complexity of obtaining information about the value chain is well recognized, with the ESRS allowing SMEs to estimate data when direct information is unavailable (European Financial Reporting Advisory Group, EFRAG, 2022a, 2022b). This highlights the importance of value chain information for sustainability reporting, while also acknowledging the difficulty SMEs face in collecting such data.

In addition to the characteristics of the value chain in SMEs, there are other agency characteristics that may help explain the determinants of VSDI in SMEs, particularly through the influence of governance mechanisms such as board gender, documentary support and accounting rules.

Cardoni and Kileleva (2024) find that agency characteristics such as board size have a relevant effect on the overall voluntary ESG disclosure score in SME. Al Amosh (2024a, 2024b) finds that the composition and diversity within governance structures of large companies influence decision-making processes and the oversight of ESG strategies.

Likewise, although the review of previous literature includes studies where the influence of gender on ESG information disclosure is not demonstrated (Jain and Jamali, 2016; Rao and Tilt, 2016), the fact is that a negative effect has not been demonstrated, with numerous references to studies demonstrating its positive effect. Jizi (2017), using companies included in the FTSE 350 Index, obtained results a positive influence of the gender diversity of the board of directors on this type of information. In their study, Nicolo *et al.* (2021) used a panel data analysis on a sample of 1392 listed European companies. The results of this study demonstrated the benefit of the presence of women on boards of directors in achieving better scores in ESG information disclosure. In a similar and more recent study on state-owned companies with an international scope, Nicolo and Andrades-Peña (2024) demonstrated the influence of gender diversity within the board of directors and ESG scores, both individual and overall. Thus, we believe that the employee gender can influence the level of VSDI in SMEs, as greater diversity can foster more inclusive and responsible decision-making, which could lead to increased transparency regarding the company's social and environmental impacts.

With reference to the documentary support for sustainability reporting, SMEs that produce dedicated ESG or sustainability reports, whether incorporated into their management reports or presented as separate sections, are likely to have access to more advanced resources and capabilities. According to the RBV, these firms are better equipped to allocate significant time, financial resources and specialized expertise toward sustainability initiatives.

Regarding the potential effect of the basis of presentation of financial reporting followed by Spanish SMEs (General Accounting Plan or the EU IFRS), from an Agency Theory perspective, SMEs that adopt IFRS are likely to disclose more sustainability information than those applying the Spanish General Accounting Plan (PGC). IFRS standards promote greater transparency and accountability, reducing information asymmetry between owners and managers. SMEs following IFRS also tend to have stronger strategic commitments and more resources to engage in sustainability practices and disclosure. In contrast, we consider that SMEs using the domestic GAP may face fewer incentives and limitations in terms of governance and resource allocation, which could result in less VSDI.

Based on this framework we formulate the following research question:

RQ3. Do value chain profile, documentary support, basis of presentation of financial reporting, or the gender diversity of employees, influence the level of voluntary sustainability disclosure in SMEs?

3. Research methodology

3.1 Sampling process

We decided to study the sustainability reporting practices of Spanish LSMEs, given the evolution of the Spanish regulatory framework on sustainability reporting and because, in recent years, large listed Spanish companies have demonstrated progress in their commitment to sustainability and the maturity of sustainability reporting, as reflected in the EY report (2023). However, there is a lack of awareness regarding voluntary sustainability reporting in SMEs. Furthermore, their annual reports are available on their websites, which is essential to apply the content analysis methodology.

The sample selection process was like that undertaken in the ICAC study (ICAC-ASEPUC, 2023) and reflects a comparable number of LSMEs. Specifically, in selecting the population, our basis was the CSRD regarding sequential reporting in accordance with the ESRS. These regulations apply, starting in the following fiscal years:

- from January 1st, 2024, for large public interest entities, as well as for banks and insurance companies, all of these being already subject to the NFRD;
- from January 1st, 2025, for large entities not currently subject to the NFRD; and
- from January 1st, 2026, for LSMEs, although LSMEs can choose not to adopt this until 2028.

To identify the population of Spanish LSME, this research thus considers the various compliance dates, which depend on the type of undertaking, present in both Directives, the NFRD and the CSRD. SME are not obliged to report under the ESRS until January 1st, 2026. SME affected are those listed on stock exchanges and SME that are parent companies of listed groups with an average number of employees not exceeding 250 on a consolidated basis.

Based on the above criteria, population was selected in two phases. In the first phase, primary data was obtained through SABI database, using the search criterion that at least two of the three size criteria of Directive 2013 / 34/EU (CSRD) were not exceeded. It was decided that one of the two criteria would be the number of employees, and it was not restricted to more than 10 to ensure that, in a second phase, the average number of employees in the group was less than 250 and not excluding groups that met the requirements despite being composed of SMEs with less than 10 employees. The total number of Spanish companies that met these criteria in SABI as of January 2023 was 90. Next, in the second phase, a content analysis of the annual reports of these companies was done to verify if, among those that were part of the groups, the average number of employees stated in the Notes was less than 250. Almost all Spanish companies were parent companies of a listed group, and the number of those belonging to groups with less than 250 employees was 35. Therefore, we analyze the information disclosed in the consolidated annual reports of these companies for the two most recent available periods, 2022 and 2023. BME Exchange market where they are listed is BME Growth in 25 LSMEs out of 34. The Spanish regions where they are placed are Madrid and Cataluña mainly; 63% has adopted national GAP and the other 37% IFRS-UE, and the Auditor is not one of the BIG 4 in 19 LSME out of 34. The sample is composed of companies from different sectors and sector groups (mainly manufacturing, technology and real state) and the data is related to the financial years 2022 and 2023. Regarding the value chain profile, both customer and suppliers are not related parties, diversification of risk is evident due to the presence of multiple suppliers and customers and most companies exhibit the presence of international suppliers and customers. The employee distribution by gender is characterized by a predominance of male employees, and the 85% of directors are men.

3.2 Dependent variable

Concerning the variables and methodology, (1) to address the first research question, we construct an original hand-collected index of disclosure, applying content analysis in accordance with Gerwanski *et al.* (2021). It is applied to an accurate several-steps content analysis to the audit report, annual accounts and the website of the selected sample. We use both qualitative and multimodal content analysis methods for collecting the data. This research methodology, content analysis, has been widely used to codify corporate social responsibility information on a qualitative scale in a systematic and objective way (Abbott and Monsen, 1979; Guthrie and Parker, 1990; Guthrie *et al.*, 2004). More recently, it was used by Nicolo *et al.* (2021) to measure the scope and type of intellectual capital disclosure for a sample of 123 Italian listed companies.

(2) To achieve the second of the proposed objectives and address the second and third research questions, we apply cluster analysis methodology. The index and its indicators, along with variables related to business relationships, general DRs and the firms' accounting profiles and characteristics, allow for the identification of different categories of sustainability disclosures in SMEs through the application of this methodology.

An ANOVA test allows us to identify which of this agency and the resource-based characteristics influence the formation of each cluster.

We propose an index that is a score of the VSDI in SMEs under CSRD and ESRS DRs and architecture, and on the qualitative characteristic of relevance (materiality) (Cross-cutting ESRS 2). The proposed index is composed of two indicators. The first indicator deals with the level of the voluntary sustainability disclosure about the topical issues and, therefore, it is composed of the three reporting areas: environmental, social and governance. In addition, following the ESRS architecture and based on the importance given to the materiality concept in the cross-cutting ESRS standards, the second indicator was added, a cross-cutting nature measuring the materiality assessment process. This second indicator, the materiality assessment indicator (SME_MASSI), is composed of two items related to the materiality assessment process, including the stakeholder engagement and the materiality assessment outcome. The index score obtained by the companies in the sample will reflect the extent of their disclosures across the three ESG reporting dimensions, as well as their materiality assessment, which is the first objective of this research.

Table 1 shows the possible values, the references and the search criteria for each variable in the study. Concerning the VSD index (Table 1 Panel A), designed to measure the level of disclosure of the companies in the sample, it is made up of two indicators. One of them explains the amount of information searched within the sustainability reports related to the three main areas, which ESRS focus on, ESG information. The other indicator deals with the level of information disclosed on the materiality assessment analysis, which is the first step to ensure that the disclosed information about ESG aspects meets the qualitative characteristic of relevance under the double materiality approach. In total, the index can achieve a value between 0 and 14. The value of the indicator related to the three reporting areas will be between 0 and 6 and the value of the indicator related to the materiality assessment will be between 0 and 8. The reason for giving greater weight to the indicator related to the second criterion is that materiality analysis determines the relevance of the disclosed information regarding social, environmental

Table 1. Variables: categories, references and sources

Variable	Category	Reference	Source
Panel A. Voluntary sustainability disclosure index composition (SME_VSDI)			
Topical ESG areas indicator (TOPIC I)			
Voluntary environmental disclosure (VED)	0: No information 1: Vague information 2: Detailed information	CSRD Topical ESRSs	Web and Notes
Voluntary social disclosure (VSD)	0: No information 1: Vague information 2: Detailed information		
Voluntary governance disclosure (VGD)	0: No information 1: Vague information 2: Detailed information		
Materiality assessment indicator (MASS I)			
MASS-PROCESS			
MSect	0: No materiality section 1: Materiality sect included 2: High importance of MSect	CSRD Cross-cutting ESRS	
MProcc	0: No Information 1: Vague information 2: Detailed information		
MASS-OUTCOME			
MMatrix	0: No information 1: MM presented 2: MM ranked		
Mitigat	0: No information 1: Vague information 2: Detailed information		
Panel B. Business relationships and value creation profile			
SUPP_Internaz	0: No import (national) 1: European 2: International	Cawsey and Rowley (2016); (Habibi *et al.*, 2015) ;	DIIM (BME growth) or
SUPP_Type	0: Not a related party 1: A related party	(Iankova *et al.*, 2019);	Notes or web or
SUPP_risk diversification	0: Single supplier 1: Multiple suppliers	(Koponen and Rytsy, 2020);	SABI
CUST_Internaz	0: No export (national) 1: European 2: International	Skare *et al.*, (2023); Winter *et al.* (2023); Holweg and Helo (2014);	
CUST_ business model	0: B2C 1: B2B 2: Both	Dabić (2020); Eduardsen *et al.* (2022);	
CUST_risk diversification	0: Single customer 1: Multiple customers	(Epede and Wang, 2022);	
CUST_Type	0: Not related parties 1: National related parties 2: International related parties	(Hsieh *et al.*, 2019): Cao and Weerawardena (2023);	

(*continued*)

Table 1. Continued

Variable	Category	Reference	Source
Panel C. General nature disclosure requirements (Dr)			
DOC_SUPPORT Presentation option for sustainability information	0: No sustainability information 1: Brief Sust. section on the website 2: ESG or Sust. Report in a single (or several) separate section(s) of the management report	DR 2 – GR 1 (ESRS 2)	European Financial Reporting Advisory Group, EFRAG (2022a, 2022b)
ESRS SECTOR GROUP CONST, ENERGY, HEALTH_CARE, HOSP, MANUF, REAL_ESTA, SERV, TECH	0: No; 1: Yes	DR 2 – GR2 (ESRS 2)	European Financial Reporting Advisory Group, EFRAG (2022a, 2022b); SABI (NACE) codified with SRS SEC 1 Sector classif

Panel D. Firm's accounting profile and firm's characteristics

Variable	Category	Source
MULTINATIONAL	0: No 1: With subsidiaries in different countries	Notes
ACCOUNTING RULES	0: SGAP 1: EU – IFRS	Notes
DIRECTOR_GENDER Managing director by gender	0: Male; 1: Female 2: Both at 50%	Annual rep. and corporate gover. Rep
EMPLOY_GENDER Employee by gender	0: >50% Male 1: >50% Female; 2: Both	Notes or DIIM
SIZE (No. EMPLOYEES)	Quartile	Annual report
SIZE_(ASSET)	Quartile	Annual report
LEVERAGE	Quartile	Annual report
ROE	Quartile	Annual report
EBITDA	Quartile	Annual report

Source(s): Authors' own work

and governance aspects and it is based on both, the materiality assessment process and the materiality assessment outcome, taking values from 0 to 4 each. Materiality assessment represents a core element of the conceptual framework that underpins sustainability reporting standards and, a key contribution of this study, in contrast to previous research, is its in-depth examination of disclosures related to the materiality assessment process.

The items composing the materiality assessment indicator (MASS-I) are materiality assessment process (MASS-PROCESS) and materiality assessment outcome (MASS-OUTCOME). The item MASS-PROCESS is composed of the variables MSect and MProcc. MSect takes value 0 if there is no materiality section, value 1 if a materiality section is included, and value 2 if high importance is given to materiality with a materiality section listed in the table of contents. MProcc takes value 0 if no information about the materiality determination process is disclosed; 1 if the identification process is mentioned; and 2, if the process is described in detail with information about the stakeholder interaction. The item MASS-OUTCOME is composed of the variables MMatrix and Mitigat. The MMatrix takes value 0 if there is no materiality matrix disclosed, 1 if the materiality matrix is presented but the material issues are not ordered according to their importance, and 2 if the materiality matrix is indicating how high or low each issue was ranked in terms of the significance of the issue for the organization (x-axis) and its significance to stakeholders (y-axis). Figure 1 shows the VSDI composition.

We constructed the disclosure score based on the requirements established in the CSRD and the ESRS, particularly concerning materiality assessment (cross-cutting ESRS) and the three reporting areas. To obtain the index values for each firm in the sample, we conducted a content analysis of the sustainability information disclosed on corporate websites, in sustainability reports, or within dedicated sections of management reports, as presented in the terms listed in Panel A of Table 1.

3.3 Independent variables

Once materiality is represented in the index, we use a set of variables to explain, within the framework of agency theory and the RBV, the decision-making process of Spanish LSMEs to voluntarily disclose sustainability information, particularly concerning the materiality assessment process and the three reporting areas.

Therefore, seven distinct variables (Table 1 Panel B) are designed to explain the business relationships and value creation profile of the companies under study, focusing on the profiles of suppliers and customers, as well as some general DRs that listed SMEs must

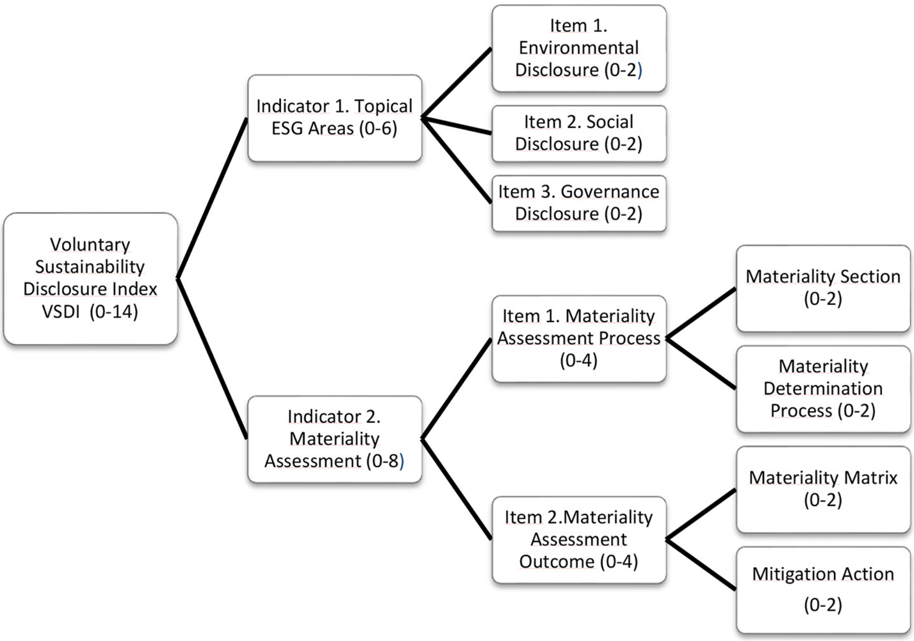

Figure 1. VSD index composition
Source: Authors' own work

comply with (Table 1 Panel C). Furthermore, several variables are introduced to account for the accounting profile and other characteristics of the firms (Table 1 Panel D).

To measure the business relationship and value creation profile, we analyze the level of disclosure on the value chain and other business relationships. We use a set of variables to measure what each company wants to focus on in terms of value creation following the Holweg and Helo (2014) framework for defining the value chain architecture at the firm level. We use two types of variables:

(1) related to suppliers; and

(2) related to customers.

We exclude the variables related to other stakeholders and business relationships because suppliers and customers have been selected by the EFRAG to explain the strategy in the value chain of SMEs. Finally, we consider the LSME characteristics and some general DRs of sustainability reporting, such as the presentation option for the sustainability statement and the sector of activity (European Financial Reporting Advisory Group, EFRAG, 2022a, 2022b).

3.4 Empirical models

In the following section, we answer the three research questions by scoring the VSDI for the sample of Spanish LSME, applying the cluster analysis technique and doing an ANOVA test. The cluster analysis groups the LSMEs into clusters where the values of the variables used are very similar for all cases and significantly different from those in the rest of the groups. The statistical package used was SPSS version 15.0. Initially, we proceed to apply nonhierarchical K-means cluster analysis (Quick Cluster), using both qualitative and qualitative variables which had been previously discretized. We use K-means because it produces well-defined, nonoverlapping clusters, which let us interpret better the results. To predefine the number of groups to be determined and formed within the Quick Cluster, we used the Ward hierarchical method. The results are detailed and discussed in the following section.

4. Results

4.1 Voluntary sustainability disclosure index score

Table 2 (Panels A-E) describes the VSD index score achieved by Spanish LSMEs in the sample. The index measures the level of VSDIs made by the companies in 2022 and 2023. Its scores range from 0 to 14, and it lets us identify the disclosure areas which require greater involvement from LSME annual reports preparers and institutions to effectively address future LSME ESRS. Therefore, these descriptive statistics shown in Table 2 allow us to answer the first research question (*RQ1*), that was formulated to understand the extent to which LSME are prepared to address LSME ESRS.

It was found that, in 2022, more than 50% (Table 2 Panel B) of the companies do not disclose any information related to sustainability, with the average score obtained by the companies being 1.86 out of 14 points (Panel A). Most companies either do not give any information or the information is vague. These findings confirm those of previous literature, namely that SME prioritize the economic aspect, and place less emphasis on environmental and social initiatives, perhaps due to intense competition and lack of support from regulatory authorities and consumers (Malesios *et al.*, 2021). This situation showed a slight improvement in 2023, as the percentage of companies that did not disclose any sustainability information decreased to 42.9%, while the average score obtained by companies on the index increased to 2.37 out of 14. Regardless, the level of voluntary disclosure remains very low. Therefore, we recommend

Table 2. Summary of the disclosures

	N	Minim	Maxim	Mean	SD
Panel A. Descriptive statistics of the scored voluntary sustainability disclosure index VSDI					
Voluntary sustainability disclosure index SME_VSD index	35	0	13	1.86	3.237
Topical indicator TOPIC_Indicator	35	0	6	1.34	1.814
Voluntary environmental disclosure item VEDI	35	0	2	0.57	0.698
Voluntary social disclosure item VSDI	35	0	2	0.54	0.701
Voluntary governance disclosure item VGDI	35	0	2	0.23	0.547
Materiality assessment indicator MASS_Indicator	35	0	7	0.51	1,704
Materiality assessment process MASS_PROCESS	35	0	4	0.31	0.993
Materiality section MSect	35	0	2	0.14	0.494
Materiality determination process MProcc	35	0	2	0.17	0.514
Materiality assessment outcome MASS_OUTCOME	35	0	3	0.20	0.719
Materiality matrix Mmatrix	35	0	2	0.14	0.494
Mitigation actions Mitigat	35	0	1	0.06	0.236

Panel B. Relative percentage of the index and the indicators

Voluntary sustainability disclosure indexSME_VSDI		Topical indicator TOPIC_I		Materiality assessment indicator MASS_I	
Valid	Relative %	Valid	Relative %	Valid	Relative %
0	51.4	0	51.4	0	88.6
1	8.6	1	8.6	1	2.9
2	20.0	2	22.9	3	2.9
3	8.6	3	5.7	7	5.7
5	2.9	5	5.7	–	–
9	2.9	6	5.7	–	–
12	2.9	–	–	–	–
13	2.9	–	–	–	–
Total	100.0	Total	100,0	Total	100.0

Panel C. Relative percentages of the items in the topical indicator

Topical indicator TOPIC_I		Voluntary environmental disclosure item VEDI		Voluntary social disclosure item VSDI		Voluntary governance disclosure item VGDI	
Valid	Relative %	Valid	Relative %	Valid	Relative %	Valid	Relative %
0	51.4	0	54.3	0	57.1	0	82.9
1	8.6	1	34.3	1	31.4	1	11.4
2	22.9	2	11.4	2	11.4	2	5.7
3	5.7	–		–		–	
5	5.7	–		–		–	
6	5.7	–		–		–	
Total	100.0	Total	100,0	Total	100,0	Total	100.0

(*continued*)

Table 2. Continued

Panel D. Relative percentages of the items in the materiality assessment indicator

Materiality assessment indicator MASS_I		Materiality assessment process MASS_PROCESS		Materiality assessment outcome MASS_OUTCOME	
Valid	Relative %	Valid	Relative %	Valid	Relative %
0	88.6	0	88.6	0	91.4
1	2.9	1	2.9	1	2.9
3	2.9	2	2.9	3	5.7
7	5.7	4	5.7	-	-
Total	100.0	Total	100.0	Total	100.0

Panel E. Relative percentages of the variables in the items of the materiality assessment indicator

Materiality assessment process MASS_PROCESS				Materiality assessment outcome MASS_OUTCOME			
Materiality section MSect		Materiality determination process MProcc		Materiality matrix Mmatrix		Mitigation actions Mitigat	
Valid	Relative %	Valid	Relative %	Valid	Relative %	Valid	Relative %
0	91.4	0	88.6	0	91.4	0	94.3
1	2.9	1	5.7	1	2.9	1	5.7
2	5.7	2	5.7	2	5.7	–	–
Total	100.0	Total	100.0	Total	100.0	Total	100.0

Source(s): Authors' own work

greater involvement of standard-setters and preparers to support SMEs in relation to sustainability reporting, since these LSME seem to be part of the undertaking's value chain. Focusing on the topical indicators of the index (Table 2 Panel C), approximately 30% of companies disclose environmental and social issues in a vague manner in 2022, while around 11% provide detailed information. In 2023, the percentage of companies disclosing vague information on environmental aspects increased to 40%, while disclosure on social aspects rose to 34.3%. In contrast, 82.9% of companies fail to disclose any information regarding governance in 2022, and this percentage remained similar in 2023. Only 11.4% disclose vague governance information and 5.7% provide detailed disclosures.

As regards the small percentage of LSME which do disclose relevant sustainability information on both the ESG areas and the materiality assessment (Table 2 Panels D and E), they should try to improve the materiality assessment outcome, reporting mitigation actions and other strategic decisions on the impact and risks identified relating to the material topics in their materiality matrices. Luque-Vílchez *et al.* (2023) highlight that although sustainability reporting has undergone a marked improvement in recent years, the lack of materiality is a key concept about which concerns exist. In this regard, the ICAC study identified a lack of reporting on certain issues, such as the identification of plans, actions and strategies (ICAC-ASEPUC, 2023).

It is worth noting that the slight improvement in the level of disclosure regarding materiality analysis is attributed to the sustainability report published in 2023 by a Spanish multinational LSME headquartered in Madrid and listed on the Madrid Stock Exchange. The company is audited by a Big 4 firm, has a financial profitability of 27%, and, despite being led by a male chairman, maintains a highly balanced gender distribution among employees. The company follows the Spanish GAAP (PGC) and had never previously disclosed any sustainability-related information, scoring zero on the index in 2022.

For this reason, we believe that, in anticipation of the imminent implementation of the LSME ESRSs, expected in 2026 or 2028, the company has decided to initiate sustainability disclosure. It has done so comprehensively, covering all areas and aspects related to materiality analysis, including both the process and the results. It would be interesting to analyze this exceptional case in future research.

4.2 Cluster analysis and ANOVA test

To identify the categories of Spanish LSMEs based on their level of voluntary sustainability information disclosure and the resource-based and agency characteristics influencing them (research questions *RQ2* and *RQ3*), we used the Ward method. This hierarchical clustering technique minimizes the variance within clusters, ensuring a more homogeneous grouping of firms. By applying this method, we aim to classify LSMEs according to their disclosure practices and the underlying organizational factors that drive them, providing a structured approach to understanding sustainability reporting behaviors in SMEs. The dendrogram was used to determine the optimal number of clusters by identifying significant jumps in fusion distances. A horizontal cut was made at a height where clusters remained compact and distinct. The analysis revealed that the hierarchical clustering of cases based on quantitative variables resulted in the formation of four distinct clusters for the two years under study. Table 3 presents the number of cases in each cluster, showing a higher frequency of cases in clusters one and two for both periods under study, 2022 and 2023.

Based on the disclosure level of each cluster regarding the three information areas and the materiality analysis (Table 5), we have ranked and labeled the clusters as follow: high-level disclosers, medium-level disclosers, low-level disclosers and nondisclosers. The vast majority of LSMEs are either low-level disclosers or non-disclosers. They either fail to provide sustainability information or offer only vague details concerning environmental and social aspects. Furthermore, they do not disclose any information related to the materiality assessment.

Regarding Spanish LSMEs disclosing information on ESG areas, with a focus on high, medium and low-level reporting companies (approximately half of the companies in the sample in both periods), only four-five LSMEs report on all three ESG areas in 2022, and among these, only three companies, which fall into the high-level disclosers cluster, provide an equal level of detail for all three aspects for the two periods under study. The medium-level disclosers cluster, consisting of two LSMEs in 2022, only offers detailed information on the environmental and social aspects and vague information on governance. Although in 2023 the information on social aspects appears more detailed, this is observed in only one company, the one comprising the medium-level disclosure cluster. Therefore, this indicates

Table 3. Number of cases per cluster

Cluster	1	14
	2	3
	3	2
	4	15
Valid		34
Missing*		1

Note(s): *Observation with incomplete cases
Source(s): Authors' own work

that even for the medium-level disclosing Spanish LSMEs, a stronger commitment to providing governance-related information is necessary.

In the case of Spanish LSME disclosing relevant/material information in 2022, only the three LSME composing the high-level disclosers category provide information on the materiality assessment. Nevertheless, this information is only disclosed in detail about the materiality assessment process but not about the materiality assessment outcome. These three LSME show a materiality section listed in the table of content of the ESG report where they disclose information on the materiality determination process, and the stakeholder interaction is described in detail. However, with respect to the materiality assessment outcome, they present a materiality matrix, but only vague or no information is disclosed about strategies or mitigation actions related to the material topics. Regarding 2023, only one of the analyzed companies presented, for the first time in 2023, a comprehensive sustainability report covering the three reporting areas in detail, along with information on the materiality analysis process, including stakeholder engagement and the materiality assessment outcome. The report also provides a materiality matrix, ranking material issues by relevance and detailed information on the mitigation actions to be implemented based on the identified risks for each material topic. Therefore, our recommendation is that LSME should go beyond the process of drafting the materiality matrix and they should make strategic decisions based on the identified risks and opportunities related to every identified material issue, and report on them. This recommendation also applies to many large companies. Previous research shows that disclosure of the process of determining material sustainability issues is inadequate, which brings into question the credibility of sustainability reports (Adams and Larrinaga, 2007; Guix *et al.*, 2017; Beske *et al.*, 2020; Edgley *et al.*, 2015). Although large companies have made significant progress in sustainability information disclosure since the year 2000, when sustainability disclosure was more the exception than the rule (Hales, 2023), there is still a long way to go in terms of materiality analysis.

The analysis of variance (Table 4) let us know the determinants of these categories. It is concluded that the four groups obtained are highly discriminant based on the level of compliance with sustainability DRs of both the topical and the cross-cutting ESRS for both periods. Therefore, these clusters show different levels of VSDI about the ESG topical issues (environmental, social and governance) and about the materiality assessment (process and outcome) as well. In addition, the four categories exhibit distinct behavior from each other regarding the documental support for the sustainability disclosures, the accounting rules used as basis for the presentation of annual reports, the customer business model and the firm's size and profitability, in 2022, with four years remaining before the end of the voluntary disclosure period, certain variables significantly differentiated the clusters. Therefore, in 2022, the level of VSDI can be explained by the variables included in the study, which are grounded in agency theory and the RBV. With respect to 2023, the number of companies disclosing environmental and social information increased slightly (by three), and one presented a comprehensive sustainability report, achieving the highest index score (14 points). While overall results remained largely unchanged, the significance of key determinants of voluntary disclosure shifted, likely due to the approaching mandatory reporting requirements for SMEs in 2026 or 2028.

Regarding the aspects of the value chain composition of LSMEs that significantly influence belonging to a certain category in the disclosure ranking, only the Customers Business Model influences this ranking in 2022. The high and medium-level disclosers cluster is composed of B2B LSMEs or both B2B and B2C. The low-level and nondisclosers are all B2B. The other variables related to the value chain profile do not influence the formation of the clusters and have similar values in the four groups.

Table 4. ANOVA test

	Cluster Quadratic mean	gl	Error Quadratic mean	gl	F	Sig.
SME_VSDI	106.640	3	1.094	30	97.494	0.000
TOPIC_I	29.191	3	0.749	30	38.995	0.000
VEDI	3.596	3	0.182	30	19.803	0.000
VSDI	3.573	3	0.189	30	18.934	0.000
VGDI	2.841	3	0.053	30	53.424	0.000
MASS_I	28.958	3	0.387	30	74.923	0.000
SUPP_Internaz	1.426	3	0.815	30	1.749	0.178
SUPP_type	0.082	3	0.177	30	0.460	0.712
SUPP_risk diversification	0.012	3	0.031	30	0.399	0.755
CUST_Internaz	1.510	3	0.768	30	1.967	0.140
CUST_business model	1.138	3	0.204	30	5.585	0.004
CUST_risk diversification	0.000	3	0.067	30	0.000	1.000
CUST_Type	0.268	3	0.244	30	1.098	0.365
MANUF	0.924	3	0.175	30	5.273	0.005
REAL_ESTA INVESTM	0.476	3	0.070	30	6.807	0.001
SERV	0.150	3	0.048	30	3.133	0.040
TECH	0.145	3	0.221	30	0.657	0.585
DOC_SUPPORT	3.646	3	0.236	30	15.428	0.000
ACCOUNTING RULES	0.595	3	0.199	30	2.982	0.047
EMPLOY_GENDER	0.550	3	0.670	30	0.821	0.493
Discretized N° employees	5.589	3	0.854	30	6.546	0.002
Discretized asset	6.413	3	0.700	30	9.164	0.000
Discretized_ROE	1.968	3	1.286	30	1.531	0.227
Discretized leverage	2.647	3	1.151	30	2.300	0.097
Discretized_EBITDA	3.403	3	1.009	30	3.373	0.031

Note(s): *F*-tests should only be used for descriptive purposes because the clusters have been chosen to maximize differences between cases in different clusters. Critical levels are not adjusted, so they cannot be interpreted as tests of the hypothesis that cluster centers are equal
Source(s): Authors' own work

Summarizing, General Nature DRs, accounting profile of LSMEs and other LSME's characteristics significantly influence LSME belonging to one category or another in the disclosure ranking of 2022. As expected, in high-level and medium-level disclosers categories, the documental support is an ESG or sustainability report in a single or several separate sections of the management report. On the other hand, low-level disclosers only include a general sustainability section on the website. Regarding sectors, SMEs belonging to the real estate investment sector are classified into the better and medium-level discloser clusters. SMEs in the manufacturing sector belong to low-level disclosers cluster and those in the services sector belong to the medium-level disclosers cluster. With reference to the accounting profile, it also significantly influences LSMEs categories in 2022: high and medium-level disclosers apply the EU-IFRS, while Non disclosers and low-level disclosers adopt national GAAP. Nevertheless, it is noteworthy that, in 2023, the company that initiated sustainability disclosure for the first time, achieving the highest score on the disclosure index, reports under national standards, specifically the Spanish General Accounting Plan. It is plausible that, as the mandatory sustainability disclosure period approaches, companies' voluntary initiatives may deviate from the criteria proposed in the literature and confirmed in this study for the 2022 period. Further analysis in future periods would be valuable to gain a deeper understanding of companies' behavior in this regard.

Regarding the type of auditor, Big 4 or not, has no significant influence on the composition of these clusters, since the majority of LSMEs are audited by a non-Big 4 company in 2022 and 2023.

About the influence of other LSME's characteristics on the LSME categories, size, proxied by the average total assets and EBITDA positively influence the SME ranking in 2022.

Table 5 shows the mean value of each of the significant variables (determinants) per cluster, revealing the different profiles of Spanish LSME. Table 6 presents a summary of such characteristics that have proven to be significantly distinguishing for each cluster: the level of sustainability information disclosure, the General Disclosure (GD) requirements, the accounting profile, the value chain profile and other firm's characteristics.

Focusing on the mean values by cluster for the variables that were not found to be significantly determinative in the formation of the four identified levels of disclosers in neither of the two periods under analysis (Table 5), the findings, in summary, indicate that the clusters share certain characteristics regarding the value chain and gender composition of employees. However, they differ in terms of the internationalization of their business relationships and financial performance, with medium-level and high-level disclosers outperforming the other clusters in the latter aspect.

Table 5. Centers of the final clusters

	Cluster			
	C1 (14 co.) Low-level disclosers	C2 (3 co.) High-level disclosers	C3 (2 co.) Medium-level disclosers	C4 (15 co.) Non disclosers
SME_VSDI***	1	12	4	0
TOPIC_I***	1	6	4	0
VEDI***	1	2	2	0
VSDI***	1	2	2	0
VGDI***	0	2	1	0
MASS_I***	0	6	0	0
SUPP_Internaz	1	1	0	1
SUPP_type	0	0	0	0
SUPP_risk diversification	1	1	1	1
CUST_Internaz	1	1	0	1
CUST_business model**	1	2	0	1
CUST_risk diversification	1	1	1	1
CUST_Type	0	0	0	0
MANUF**	1	0	0	0
REAL_ESTA INVESTM**	0	1	1	0
SERV**	0	0	1	0
DOC_SUPPORT**	1	2	2	0
ACCOUNTING RULES**	0	1	1	0
EMPLOY_GENDER	1	1	1	1
Discretized N° employees**	1.64	2.33	3.00	3.13
Discretized asset**	1.57	3.67	3.50	2.80
Discretized_ROE	2.50	2.67	4.00	2.20
Discretized leverage*	1.93	2.33	3.00	2.93
Discretized_EBITDA**	1.93	3.00	4.00	2.67

Note(s): *** $p < 99\%$; *** $p < 95\%$; *** $p < 0.1\%$
Source(s): Authors' own work

Table 6. Categories of spanish LSME according to VSD index and the determinants of the disclosure level

Clusters / Variable classification	High-level disclosers	Medium-level disclosers	Low-level disclosers	Non-disclosers
VSD REQUIREMENTS				
ESG sustainability topics	Detailed information	Detailed	Vague information	No information
Environmental	Detailed information	Detailed	Vague information	No information
Social	Detailed information	Vague	No information	No information
Governance	Stakeholders' engagement detailed	Not disclosed	Not disclosed	Not disclosed
MATERIALITY assessment	Matrix frequently disclosed	Matrix not disclosed	Matrix not disclosed	Matrix not disclosed
Materiality assessment process	Brief or no information disclosed	Not disclosed	Not disclosed	Not disclosed
Materiality Matrix (outcome)				
Mitigation actions (outcome)				
General nature disclosure requirements: Documental support	ESG or sustainability report in the management report	ESG or sustainability report in the management report	A brief sustainability section on the website	No ESG mention in any support
Accounting profile				
Basis for the presentation	EU-IFRS	EU-IFRS	Spanish GAAP	Spanish GAAP
Value chain profile:				
Customer business model	B2B or B2C	B2C	B2B	B2B
Firm characteristics:				
• Size	-Size: 4th quartile of TA	-Size: 4th quartile of TA	-Size: 2nd quartile of TA	-Size: 3rd quartile of TA
• PROFITABILITY	-EBITDA: 3rd–4th quartile	-EBITDA: 4th quartile	-EBITDA: 2nd quartile	-EBITDA: 3rd quartile

Source(s): Authors' own work

5. Discussion

Our findings confirm that the level of VSDI among Spanish LSMEs remains very low, with only a slight improvement observed between 2022 and 2023. More than half of the companies did not disclose any sustainability information, particularly regarding governance and materiality assessment, which aligns with previous studies highlighting SMEs' tendency to prioritize economic aspects over environmental and social concerns due to intense competition and limited regulatory or consumer pressure (Malesios *et al.*, 2021; Luque-Vílchez *et al.*, 2023).

The modest increase in disclosure levels over the two years is consistent with earlier research showing gradual progress in sustainability reporting by SMEs, albeit at a slow pace (Luque-Vílchez *et al.*, 2023; ICAC-ASEPUC, 2023). The limited reporting on materiality assessment is especially noteworthy and confirms concerns raised by Adams and Larrinaga (2007), Guix *et al.* (2017) and Beske *et al.* (2020) about the lack of detailed and credible materiality disclosures, which undermines the usefulness of sustainability reports. Similar conclusions were drawn by Edgley *et al.* (2015), who emphasize that inadequate materiality reporting questions the credibility of the information provided.

The exceptional case of a Spanish multinational LSME, which for the first time issued a comprehensive sustainability report including both the process and outcomes of the materiality assessment in 2023, suggests that firm-specific factors – such as profitability, stock exchange listing and gender balance – may influence sustainability disclosure practices. This finding is consistent with the literature, which indicates that better-resourced SMEs and those anticipating mandatory reporting are more likely to disclose sustainability information voluntarily (Malesios *et al.*, 2021; Luque-Vílchez *et al.*, 2023).

The cluster analysis corroborates the influence of resource-based and agency theory determinants on disclosure levels, with firm size, profitability, accounting standards and customer business model significantly differentiating the groups. These results agree with previous research highlighting the role of organizational and environmental factors in sustainability disclosure (Guix *et al.*, 2017; Beske *et al.*, 2020). However, in contrast to some studies, auditor type and gender diversity did not significantly influence disclosure levels, suggesting these may be less relevant for Spanish LSMEs in this context.

Overall, the low level of disclosure, particularly on governance and materiality topics, reflects a broader challenge in SME sustainability reporting identified in the literature (Adams, 2007; ICAC-ASEPUC, 2023). The findings underscore the need for enhanced involvement from standard-setters and institutional support to help LSMEs comply effectively with upcoming mandatory sustainability reporting standards expected by 2026 or 2028.

Future research should track the evolution of disclosure practices postimplementation of these standards to assess whether regulatory requirements lead to substantial improvements in transparency, as suggested by prior studies (Beske *et al.*, 2020).

6. Conclusion, contributions, limitations and future research

This study explores the VSDI practices of Spanish listed small and medium-sized enterprises, highlighting the main factors that shape their reporting behavior within the frameworks of the RBV and Agency Theory. The findings reveal that while awareness of sustainability issues is growing, the overall level of disclosure remains limited, particularly in critical areas such as materiality assessment and stakeholder engagement. This underreporting reflects both the constraints inherent to smaller firms and the complexity of aligning with emerging regulatory expectations.

A key insight from the analysis is the significant role of internal resources – particularly financial capacity – in shaping disclosure practices. Firms with greater resource availability are more likely to provide detailed sustainability information, supporting the RBV's emphasis on internal capabilities as enablers of strategic behavior. However, firm size alone does not appear to consistently predict higher levels of disclosure. This suggests that it is not merely scale, but rather the allocation and management of resources, that determines reporting intensity. These findings also lend support to the proportionality principle embedded in recent regulatory frameworks, which advocates for a tailored approach to sustainability reporting based on organizational capacity.

From the perspective of Agency Theory, the study underscores the relevance of information asymmetries in shaping the transparency of SMEs. Specific agency-related characteristics – such as engagement in B2B value chains, use of supporting documentation and the basis of financial reporting – emerge as relevant factors influencing disclosure. Firms involved in B2B networks appear more incentivized to meet the informational demands of stakeholders, while the use of international accounting standards (e.g. IFRS) is associated with more robust sustainability communication. Interestingly, while gender diversity among employees shows a positive correlation with disclosure, governance-level diversity (e.g. board composition) does not exhibit a significant influence in this sample.

The practical implications of these findings are considerable. Regulators and standard-setting bodies should account for the diverse capacities of LSMEs when designing sustainability reporting obligations, ensuring that compliance is achievable without imposing disproportionate burdens. Measures such as simplified reporting formats, targeted training and phased implementation strategies can support the gradual adoption of sustainability disclosure practices. For SMEs, these results emphasize the strategic value of early engagement with sustainability issues, particularly through stakeholder dialogue and materiality analysis, to prepare for forthcoming mandatory requirements.

Despite the insights provided, this study is subject to certain limitations. The focus on a single national context – Spain – may restrict the generalizability of the findings to other institutional environments. Moreover, although the study includes data from two reporting years, a longer temporal scope would better capture the dynamic nature of sustainability practices. In addition, the emergence of outlier cases – such as firms that significantly improved their disclosure in a short time span – suggests the need for qualitative research to understand the drivers of such behavior.

Future research should expand the geographical scope to include other European jurisdictions, enabling comparative assessments of the role of institutional and regulatory diversity. Longitudinal and case-based approaches could also shed light on the evolution of disclosure strategies over time, particularly in response to the phased implementation of the CSRD and the ESRS. Such research would contribute to a more nuanced understanding of how SMEs adapt to regulatory shifts in the sustainability landscape and could guide more effective policymaking and practice.

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