Exploring the sustainability reporting practices: An Evaluation of Listed SME Companies' Readiness for ESRS-compliant Materiality Analyses

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Abstract

The European Financial Reporting Advisory Group (EFRAG) must consider the proportionality principle before drafting the European Sustainability Reporting Standards for Listed Small and Medium Sized Enterprises (LSME). That is, whether once the standards are adhered by SMEs, the SMEs will be able to provide information to large companies of sufficient relevance for these latter to report on SMEs when these form part of the larger company's value chain. Research on sustainability reporting has often focused on large companies, whereas there is a lack of knowledge regarding disclosure practices in SMEs, in particular their value chain. This paper addresses this gap, aiming to identify the current voluntary sustainability reporting practices of Spanish LSMEs, to cluster them and analyse their determinants.

This paper contributes to a better understanding of the extent to which SMEs are ready for the adoption of the new European regulations and to what degree they require institutional support and engagement from stakeholders. Based on hand-collected data, a voluntary sustainability disclosure index (VSDI) was created, and a cluster analysis was done. The results reveal diverse categories of sustainability reporting depending on the customer business model, the accounting rules adopted for financial reporting, size and profitability, among other factors. The paper offers meaningful insights on how essential the involvement of preparers, stakeholders and standard-setters is in supporting LSMEs in the adoption of mandatory standards in the future.

Keywords*:* Sustainability reporting; CSRD; ESRS; LSME; Materiality

1. Introduction

Sustainability reporting is not just at the level of operations within the control of the reporting entity itself, as defined by the traditional constraints of financial reporting (EFRAG, 2021). In fact, the proposed Corporate Sustainability Reporting Directive (CSRD), mandatory from 2024 onwards, to be applied to the 2025 annual reports, states that the value chain impacts should be covered by the sustainability report, given that activities carried out along the value chain may affect the activities of other entities. This is the indirect impact of the ESRS for large entities (undertakings) on listed Small and Medium-size entities (LSME) which are part of their own value chain. Additionally, the sustainability reporting regulation will have a direct impact on European LSME by means of a specific and proportionate version of the ESRS which is being prepared by EFRAG to be adopted in the future. In this scenario, the first challenge for the standard-setter is to set the definitions of value chain and SME based on the proportionality principle. Above all, the extent to which LSMEs are prepared to comply with sustainability reporting standards must be ascertained. This would allow for the identification of the disclosure aspects which require greater involvement from LSME annual reports preparers and institutions to effectively address future LSME ESRS. Nevertheless, the literature on sustainability has largely ignored the practice within organizations (Larrinaga and Adams, 2007; Gordon et al., 2019). Moreover, studies explicitly addressing sustainability reporting in SMEs are scarce (Jansson et al., 2017; Ortiz-Martínez, et al, 2023).

Therefore, given the limited research on the challenges faced by SMEs in the sustainability transition (EC, 2023), the main objectives of this paper are: (i) to analyse the level of voluntary sustainability disclosure practices by Spanish listed SMEs; (ii) to identify the business relationship and value creation profile and other LSME´s characteristics influencing the levels of voluntary sustainability disclosure.

As for the method to achieve these objectives, the definition of variables and their measurements is justified by the indirect and direct impacts of the European regulations on LSMEs. The indirect impact is that the undertakings are required to provide disclosure about overview of the methodologies (process) used, in order to identify the impacts on the environment and people connected to the undertakings' activities and value chain (ESRS 1, 49). Following the ESRS public consultation, held on 5th October 2022, the EFRAG Sustainability Reporting Board highlighted the importance of focusing on the key value chain to evaluate the quality of the materiality assessment process. The effect of the direct impact is that proportionate LSME ESRS will set a reference for undertakings such as banks, insurance companies and large corporate clients on the level of sustainability information that could reasonably be requested to SME suppliers and SME clients in their value chains (EFRAG, 2022a). On 27th January 2023, the EFRAG (LSME) Community Workshop discussed the issue of the value chain approach that the LSME should follow (EFRAG, 2023a): (a) a simplified reporting approach to the value chain focusing on more information disclosure on direct suppliers and less information on other stakeholders; (b) disclosures based on the materiality assessment results or outcome, that is to say, reporting on value chain for the most relevant sustainability matters resulting from the materiality assessment process as laid out in ESRS 2. Therefore, both the materiality assessment process and outcome seem to play a pivotal role in the definition of the value chain. Nevertheless, previous research shows the low quality of reporting in some organisations, which is partly due to their limited knowledge about materiality, a concept regarded as a management opinion rather than a mechanical one (Guix et al., 2017). In fact, concerns about the subjectivity of materiality analysis are fuelled by findings that companies disclose only a small amount of information related to their materiality analysis, and disclosure of approaches to identify stakeholders and materiality topics is limited (Edgley et al., 2014; Beske et al., 2019, Borial et al., 2019; Ball et al., 2000; Owen et al., 2000; Smith et al., 2011). Bello-Pintado et al. (2023), highlight the importance of the stakeholder approach in the study of sustainability

management. They found that different stakeholders play different roles in the adoption and implementation of different sustainability practices. However, according to Adams et al. (2021), poor disclosure of the process of identifying stakeholders and their engagement in identifying the material topics will continue while these disclosures are not mandatory and are not externally assured.

Given this, a voluntary sustainability disclosure index (VSDI) is scored by means of a content analysis. This index is based on the CSRD and ESRS disclosure requirements, and on the materiality perspective of the qualitative characteristic of relevance. The VSDI is made up of the three sustainability reporting areas - environmental, social and governance - plus the materiality assessment process, including the stakeholder engagement, as well as the materiality assessment result or outcome (cross-cutting ESRS 2). A cluster analysis allows us to identify distinct disclosure categories in the sample and, through an ANOVA test, we ascertain the determinants influencing these categories.

The originality of this study lies in the fact that it would appear to be the first time a close look is taken at the voluntary sustainability reporting practices in SMEs, based on both the three reporting areas and the materiality assessment, and the relationship between those practices and SMEs characteristics. Consequently, the findings may contribute to a deeper knowledge of the sustainability disclosure practices and characteristics of SMEs in the value chain of large undertakings to which the forthcoming ESRS will apply, which is one of the steps of the SMEs test proposed by the European Commission (EC, SME Test, 2021). Furthermore, this paper addresses both institutions and preparers of sustainability information, as it is expected that the disclosure areas requiring greater involvement from LSME annual reports and stakeholders' engagement to effectively address future LSME ESRS will be identified.

The paper is organised as follows. Section 2 outlines how the research questions were developed, based on a review of the literature and the institutional background. Section 3 deals with the methodology, focusing on sampling, variable design, and measurement, as well as data collection and statistical methodology. The latter sections present the research findings and the discussion of the main contributions of the paper, together with the conclusion, limitations of the study and proposals for future research.

2. Institutional background and literature review

2.1. The forthcoming sustainability reporting requirements for SMEs

CSRD and ESRS disclosure requirements

In Europe, since the approval of the Non-Financial Reporting Directive in February (NFRD) 2013, sustainability reporting has shifted, from being a voluntary activity based on non-regulatory standards like the Global Reporting Initiative (GRI) to a regulated activity for certain companies. In Spain, Law Nr. 11/2018 on non-financial information and diversity, transposed Directive 2014/95/EU. Although an increasingly 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 & 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 21 April 2021, the EC adopted a proposal for the CSRD, which was later modified by the 2022/2464 Directive (EU, 2022), aiming to improve the existing requirements of the NFRD 2013/34 (EU, 2013) and moving towards 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 financial year 2024, for reports to be published in 2025. The information should be reported in the management report, and mandatory assurance by a third party would be required. Subsidiaries would be exempted from publishing sustainability reports, if the sustainability reporting, in the parent´s consolidated management report, complies with EU sustainability reporting standards.
To specify requirements of reporting obligations under CSRD, the EFRAG published the first draft of the ESRS in November 2022. These standards would help achieve harmonisation of sustainability reporting, while considering EU Taxonomy Regulation, Sustainable Finance Disclosure Regulation (SFDR) and existing international frameworks, such as the Task Force on Climate-Related Financial Disclosures (TCFD), Sustainability Accounting Standards Board (SASB) and GRI. The architecture of the ESRS is based on a '3x3 structure': three reporting areas (sector-agnostic, sector-specific and entity-specific), three disclosure layers ((i) strategy, governance, and materiality assessment; (ii) implementation measures covering policies, targets, actions and action plans, and allocation of resources; (iii) specific set of performance metrics for all material topics, and three topics (ESG: environmental, social and governance). 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 will thus be able to report under a separate and appropriate standard which is being developed by EFRAG at this moment. This study is based on both the topical standards and the cross-cutting standards to measure the level of voluntary sustainability disclosures in LSMEs. In addition, focusing on the forthcoming sustainability reporting requirements for LSMEs, two key components of the overall framework of ESRS will be considered. These are materiality approach, as part of the fundamental characteristic of relevance, and value chain approach. The following sections focus on these two components.

The double materiality approach

Double materiality approach is necessary for undertakings to distinguish between material and non-material Impacts, Risks and Opportunities (IRO). An undertaking may define the importance of ESG issues to its organisation, 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).
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, P. and Chiappetta, 2017), which signifies a significant gap compared 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, 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 to what extent the LSMEs are prepared to address LSME ESRS (EFRAG, 2023b). According to Ortiz-Martínez et al. (2023, p.349), implementing policies to encourage CSR practices and sustainability strategies will create a better society, and positively impact SME performance. Therefore, with the purpose of identifying the specific support needed by Spanish LSME to implement the forthcoming ESRS LSMEs, we have formulated the following research question (RQ): RQ1. Is LSME reporting sustainability information in accordance with CSRD requirements?

Additionally, given the need of research on the level of sustainability reporting practices in LSME under CSRD (Ortiz-Martínez et al., 2023), we formulated a further research question focusing on a sample of Spanish LSME. This will allow us to discover which categories can be identified, based on the voluntary disclosures made about the three topical areas and the materiality assessment: RQ2 What categories of LSME can be identified based on the level of voluntary sustainability disclosure related to the topical ESG areas and the materiality assessment?

The expected contribution of these research questions is a ranking of LSME categories based on the level of sustainability information disclosure about the topical areas and the materiality assessment through the scoring of a VSDI whose composition and measures are detailed in Section 3.

2.2. The impact of ESRS on the SMEs

Regarding the direct impact of ESRS on SMEs, the proportionality principle is a key aspect for the preparation of specific standards for SMEs. According to the proportionality principle, 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." (EFRAG, 2022c, p. 3).

The indirect impact of the forthcoming ESRS on the SMEs can be easily identified in the [Draft] ESRS 2 when the Disclosure Requirements related to the key features of the undertakings' value chain are defined by the EFRAG (EFRAG, 2022b). Specifically, the required description shall provide a high-level overview of the key features of the value chain participants indicating their relative contribution to the undertaking's performance and position within the chain and explain how they contribute to the value creation of the undertaking. The undertaking shall describe the key characteristics of its business relationships with suppliers, customers, and distribution channels. This indirect impact of sustainability reporting standards on the SMEs is the first challenge that these companies must face. Implementation guidance for value chain (EFRAG SRB, August 2023) points out that ESRS shall not specify disclosures that would require undertakings to obtain information from SMEs in their value chain when such information would exceed the information to be disclosed pursuant to the ESRS for LSME. This limitation is often referred to as the 'LSME cap' and it aims at limiting the burden for SMEs and embed proportionality in the ESRS. In the ESRS LSME ED - Final Discussion Cover Note (EFRAG SRB, October 2023), the list of value chain cap datapoints had been identified and assessed against relevance

and user needs. Therefore, whenever possible, they have been simplified. For this reason, in this study we consider suppliers and customers as the key components of the undertakings' value chain.

Sustainability has been identified in previous literature. In many large companies, procurement is the starting point of every sustainable supply chain, and the disclosure of a 'sustainable' procurement statement has become a common practice to communicate engagement and approach to sourcing of goods and services (Kwok Hung et al. (2023). Empirical evidence has shown that socially responsible supplier development practices by SMEs has a significant and positive effect on sustainability-oriented innovations (Guo-Ciang, 2017). However, as a rule, SMEs are less able to manage their supply chain than larger companies, and do not share much information about them (Winter et al., 2023). SMEs want to satisfy customers and, at the same time, achieve their own production plans, because SMEs do not have enough resources or time to research supply chain management (Arend and Wisner, 2005). Thus, this study focuses on the suppliers and customers as key components of SMEs´ value chain and it takes into consideration both the nature of value provision and the approach to risk management. They are fundamental in the value chain architecture according to Holweg and Helo (2014).

Looking at the LSMEs customers, they could potentially embrace the B2B, B2C, or both business model categories, given the B2B and B2C firm's different unique characteristics enhanced by previous literature (Guangming and Weerawardena, 2023; Cawsey and Rowley, 2016; Habibi et al., 2015; Iankova et al., 2019; Koponen and Rytsy, 2020; Skare et al., 2023). With reference to the internationalization process of SMEs, Epede and Wang (2022) highlight the importance of defining and ensuring the execution of their international expansion strategy, while innovating and deciding the type of Global Value Chains (GVCs) they want to integrate given the fact that the integration of SMEs into GVCs, under some specific conditions is benefit for those firms. Learning opportunities improve performance and survival prospects (Eduardsen et al., 2022). Nevertheless, SMEs face several challenges and size-related barriers in their pursuit of international growth. An example is the lack of foreign market knowledge and experience, which can restrict their ability to recognize and exploit opportunities in foreign markets. Eduardsen et al. (2022) emphasize the significance of choosing alternative means for finding the resources they need for internationalization, such as institutional support or the affiliation with business group networks. Dabić et al. (2020) based on literature about the pathways of SME internationalization found that there is a heterogeneous nature of SME and entrepreneurship within countries, which helps explain outcomes at firm level (e.g., financial and export performance) and country level (e.g., economic growth), as well as antecedents at the country level (e.g., certain aspects of cultural differences). Hsieh et al. (2019) find that entrepreneurs' characteristics (international business experience, perception of foreign market opportunities, orientation towards differentiation and commitment to innovation strategies) influence different dimensions of SME internationalization speed.

Nevertheless, we are aware of the difficulty of obtaining information about the value chain. EFRAG (2022a) estimates that there are circumstances where the undertaking cannot gather information about the undertaking's upstream and downstream value chain. In these circumstances, the undertaking shall estimate the information to be reported by using all the reliable and justifiable information available to it, including sector – average data and other proxy sources. It is worth noting the effort that SMEs and other value chain entities that are not under the scope of the CSRD have to make on obtaining value chain information (EFRAG, 2022b).

Despite these difficulties, given the importance of the value chain definition and the proportionality principle for the fair and useful preparation of the specific sustainability reporting standards, we propose a related research question. This second research question intends to answer whether there is any relationship between LSMEs´ business relationships and value creation profile, and (1) topical disclosures (environmental, social and governance) and (2) voluntary materiality assessment (process

and outcome) disclosures. Additionally, we also take into consideration other factors which could be influencing the level of voluntary sustainability disclosure, such us general disclosure requirements (DR), accounting profile and other firm´s characteristics, Therefore, we formulate the following third research question: RQ3. What LSME´s characteristics are influencing the level of sustainability reporting?
The expected contribution of this RQ is the identification of the LSME's features influencing the level of sustainability reporting. The variables used to answer it are the voluntary sustainability disclosure index, the value chain profile, the general nature disclosure requirements, the accounting profile, and other SMEs' characteristics. Section 3 shows the definition of these variables and their measures.

3. Methodology

3.1. Sampling, variables, and data collection

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.
In selecting the population, the basis was the CSRD regarding sequential reporting in accordance with the ESRS. These regulations apply, starting in the following fiscal years: (a) 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; (b) from January 1st, 2025, for large entities not currently subject to the NFRD; (c) 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 takes into account 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 in order to ensure that, in a second phase, an average number of employees in the group was less than 250 and not to exclude 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, in those that were part of 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 will analyse the information disclosed in the consolidated annual reports. The descriptives of the sample (Appendix 1) show that, 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. The 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 year 2022 when the effects of the COVID-19 pandemic are still

strongly impacting businesses. 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.

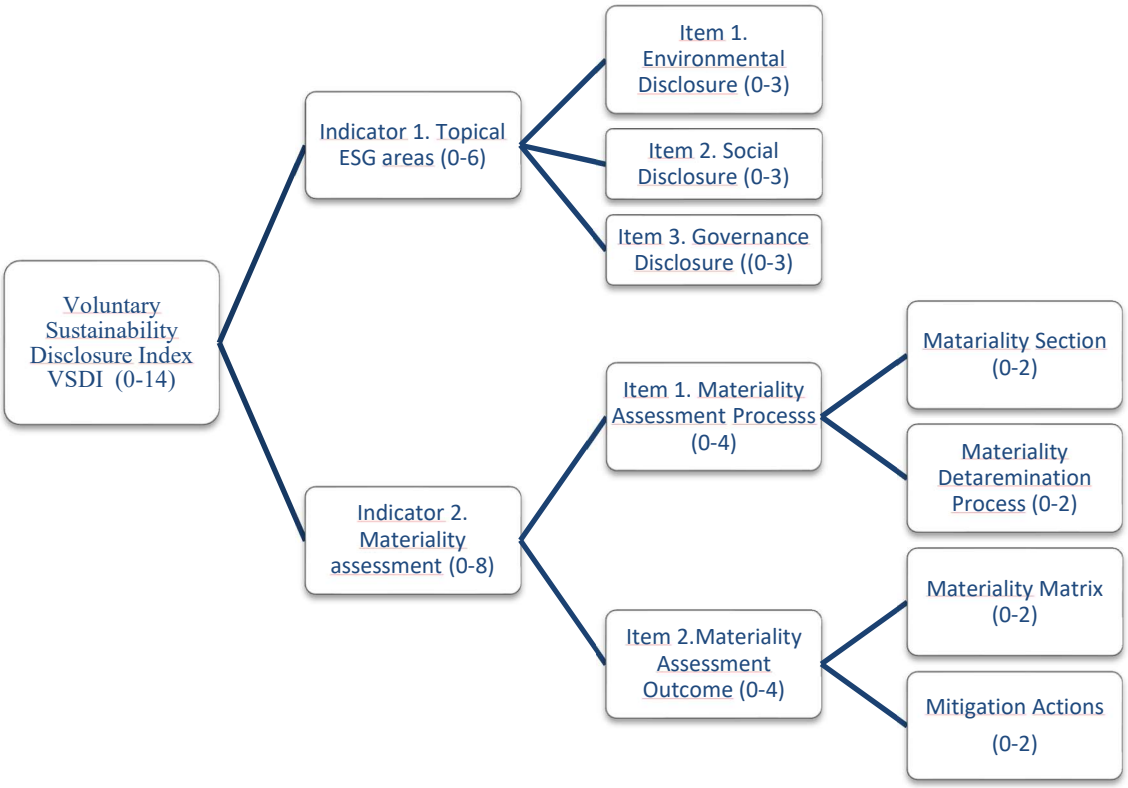
Concerning the variables and methodology, to address the first research question, we construct an original hand-collected index of disclosure, applying content analysis in accordance with Gerwnaski et.al (2021). It is applied an accurate several-steps content analysis to the audit report, annual accounts, and the website of the selected sample. We use both qualitative and multimodal content analysis methods for collecting the data. The index is a score of the voluntary sustainability disclosure (VSDI) in SMEs under CSRD and ESRS disclosure requirements 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: (a) environmental; (b) social; and (c) 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 and the materiality assessment outcome. The index and its indicators let us determine different levels of sustainability disclosures in SMEs using the cluster analysis methodology. To address the third research question, we conduct an ANOVA test which allows us to identify the value chain characteristics, the accounting profile and other firm characteristics influencing the formation of each cluster. To measure the business relationship and value creation profile, we analyse the level of disclosure on the value chain and other business relationship. 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: (a) related to suppliers and (b) 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 value chain of SMEs. Finally, we consider the LSME characteristics and some general disclosure requirements (DR) of the sustainability reporting, such as the presentation option for the sustainability statement and the sector of activity (EFRAG, 2022b).

3.2. The voluntary sustainability disclosure index score and other measures

Table 1 shows the possible values, the references, and the search criteria for each variable in the study. Concerning the VSD index (Panel A), it is made up of two indicators. One of them explains the amount of information searched within the sustainability reports related with the three main areas which ESRS focus on, environmental, social and governance 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 environmental, social, and governance 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, 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. 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.

Figure 1. VSD index composition.



Additionally, seven different variables (Panel B) have been designed to explain the business relationships and value creation profile of the companies under study (focusing on suppliers and customers profile), as well as some general nature disclosure requirements which listed SMEs must comply with (Panel C). Furthermore, several variables have been introduced to account for the accounting profile and other firms' characteristics (Panel D).

Table 1. Variables: categories, references and sources.

Panel A. Voluntary Sustainability Disclosure Index Composition (SME_VSDI)					
VARIABLE			**CATEGORY**	**REFERENCE**	**SOURCE**
Topical ESG areas Indicator (TOPIC I)	Voluntary Environmental Disclosure (VED)		0: No information 1: Vague information 2: Detailed information	CSRD Topical ESRSs	Web & 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	Guangming and Weerawardena (2023); Cawsey and Rowley (2016); Habibi et al. (2015); Iankova et al., (2019); Koponen and Rytsy, (2020); Skare et al. (2023); Winter (2023); Iranmanesh (2023); Holweg & Helo (2014); Dabié (2020); Dasí (2015); Eduardsen et al. (2022); Epede and Wang (2022); Hsieh et al. (2019): Skare et al. (2023); Cao and Weerawardena (2023); Majocchi (2005).	DIIM (BME Growth) or Notes or Web or SABI
SUPP_Type	0: Not a related party 1: A related party		
SUPP_Risk Diversification	0: Single supplier 1: Multiple suppliers		
CUST_Internaz	0: No export (national) 1: European 2: International		
CUST_ Business Model	0: B2C 1: B2B 2: Both		
CUST_Risk Diversification	0: Single customer 1: Multiple customers		
CUST_Type	0: Not related parties 1: National related parties 2: International related parties.		
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)	EFRAG (2022b)
ESRS SECTOR GROUP CONST, ENERGY, HEALTH_CARE, HOSP, MANUF, REAL_ESTA, SERV, TECH	0: No; 1: Yes	DR 2 – GR2 (ESRS 2)	EFRAG (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)	Percentiles	Annual Report
SIZE (ASSET)	Percentiles	Annual Report
LEVERAGE	Percentiles	Annual Report)
ROE	Percentiles	Annual Report
EBITDA	Percentiles	Annual Report

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 non-hierarchical 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, non-overlapping clusters, which let us interpret better the results. To predefine the number of groups to be determined and formed within the Quick Cluster, we employed the Ward hierarchical method. The results are detailed and discussed in the following section.

4. Discussion

The first research question (RQ1) was formulated to understand the extent to which LSME are prepared to address LSME ESRS. Appendix 2 describes the VSD index score achieved by Spanish LSMEs in the sample. The index measures the level of voluntary sustainability disclosures made by the companies. It 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. We have found that more than 50% of the companies do not disclose any information related to sustainability, being the average score obtained by the companies 1.86 out of 14 points. The majority of companies do not report any information or report vague information. These findings confirm the previous literature, namely that SME often 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). Therefore, we recommend 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. As regards to the small percentage of LSME disclosing relevant sustainability information on both the ESG areas and the materiality assessment, they should try to improve the materiality assessment outcome, reporting mitigation actions and other strategic decisions on the impact and risks identified in relation to the material topics composing their materiality matrices.

Research question RQ2 is related to the existing categories of Spanish LSME based on the level of voluntary sustainability information disclosure. The Ward method applied forms a tree-like structure (dendrogram) that represents the relationships between data points and clusters at various levels of granularity. It was observed that the hierarchical formation of case clusters based on quantitative variables corresponded to four clusters. Table 1 in Appendix 3 shows the number of cases in each, revealing a higher frequency of cases in clusters one and four among the 34 valid cases, with clusters two and three consisting of only three and two companies, respectively. Based on the disclosure level of each cluster regarding the three information areas and the materiality analysis, we have ranked and labelled the clusters as follow: High-level disclosers, Medium-level disclosers, Low-level disclosers and Non disclosers. The vast majority of LSMEs either do not disclose sustainability information (45%) or only disclose non-specific information on environment and social aspects (41%).

With reference to the Spanish LSMEs disclosing information on ESG areas, focusing on High, Medium, and Low-level reporting companies (55%, 19 LSME), only five LSME report on all three ESG areas, and only three, composing the High-Level disclosers cluster, do it with an equal level of detail for all three aspects. The Medium-level disclosers cluster, composed of two LSME, provides further information about environmental and social aspects but only provide non-specific information on governance. Therefore, greater commitment to disclosing information on this area is needed, even for the Medium-level disclosing Spanish LSME.

In the case of Spanish LSME disclosing relevant/material information, 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. 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 the vast majority of 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, 2004; 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, J., 2023), there is still a long way to go in terms of materiality analysis.

With reference to the research question RQ3 about the determinants of these categories, in light of the results of the Analysis of Variance (Table 2 of the Appendix 3), it is concluded that the four groups obtained are highly discriminant based on the level of compliance with sustainability disclosure requirements of both the topical and the cross-cutting ESRS for large companies. Therefore, this clusters show different levels of voluntary sustainability disclosures 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 behaviour 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.

About 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. The High and Medium-level disclosers cluster is composed of B2B LSMEs or both B2B and B2C. The Low-level and Non disclosers 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.

Summarising, General Nature Disclosure Requirements (DR), accounting profile of LSMEs, and other LSME's characteristics significantly influence LSME belonging to one category or another in the disclosure ranking. 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 disclosers clusters. SMEs in 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. High and Medium-Level disclosers apply the EU-IFRS, while Non disclosers and Low-Level disclosers adopt national GAAP. 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 (54%).

In regard to 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.

Table 3 of the Appendix 3 shows the mean value of each of the significant variables (determinants) per cluster, revealing the different profiles of Spanish LSME. Table 2 presents a summary of such characteristics that have proven to be significantly distinguishing for each ranked cluster: the level of sustainability information disclosure, the General Disclosure (GD) requirements, the accounting profile, the value chain profile and other firm's characteristics. Additionally, the detailed composition of each group is provided below:

High-Level disclosers

This cluster is composed of three Spanish LSMEs with a score of 11 out of 14 points on the VSD index. The disclosure indicator for environmental, social, and governance topics reaches the maximum value of 6 points, what means that these SMEs disclosure detailed information about the three areas. Nevertheless, the materiality analysis indicator reaches 6 out of 8 points. The item Materiality assessment process reaches the maximum value, 4 points, what means that the SMEs include a materiality section in the annual report and describe in detail the materiality determination process with the stakeholder interaction. Nevertheless, the item Materiality assessment outcome shows the presentation of a materiality matrix, ranked in most cases, but with only general or no information about the mitigation actions. In addition to these determining features of the sustainability information disclosure level, the main characteristics of the cluster are the following: Concerning the General Disclosure (GD) requirements, the presentation option for this sustainability information (Documental support) is a ESG or a Sustainability Report in a single (or several) separate section(s) of the management report. In relation with the accounting profile, the basis of presentation is IFRS adopted by the EC for application within the EU (EU-IFRS). The value chain profile is determined by both customer business models B2B and B2C. Regarding the size, this cluster encompasses the largest LSMEs in the sample based on average assets, but not in terms of the number of employees. It is also characterized by having the highest levels of leverage and EBITDA, surpassed only by the Medium Discloser cluster.

Medium-level disclosers

This cluster includes two Spanish LSME with a disclosure index of 4 out of 14 points. These four points are attributed to the disclosure indicator of information related to topics, but mainly to environmental and social areas, about which detailed information is disclosed. Nevertheless, only superficial information is disclosed concerning governance topic. In addition, no information about the materiality analysis is disclosed. The presentation option is a ESG or Sustainability Report in either a single or several separate sections of the management report. The basis of presentation is EU-IFRS, and the customer business model is B2C. These LSME are the largest in the sample in terms of average asset levels but not in terms of number of employees. Additionally, they exhibit the highest levels of leverage and EBITDA across the entire sample.

Low-level disclosers

In this cluster there are 14 LSME with a score of 1 out of 14 points on the VSD index. Only vague information is provided about environmental and social topics, and no information is disclosed about governance topic and much less about the materiality analysis. The documental support for this information is a brief Sustainability section on the website. This cluster concentrates LSME from the Manufacturing ESRS SG, which is the sector with the highest climate impact ([Draft] ESRS E1 Climate change Exposure Draft, April 2022). They apply Spanish GAAP, and their customer business model is B2B. These are the smallest LSME in the sample and those which show the lowest levels of leverage and EBITDA.

Non disclosers

This cluster is composed of 15 LSME with a disclosure index of 0 out of 14 points. Therefore, no information is provided at all on sustainability in any documental support. These LSME follow Spanish GAAP and their customer business model is B2B. The variable sector does not significantly differentiate this group from the others. Additionally, they are among the largest LSME based on the average asset level. Their level of leverage is high, and the EBITDA is not among the highest.

Table 2. Ranking of Spanish LSME according to VSD Index and the determinants of the disclosure level.

Clusters / Variables classification	High-level disclosers	Medium-level disclosers	Low-level disclosers	Non disclosers
VSD REQUIREMENTS				
ESG sustainability topics **Environmental** **Social** **Governance**	Detailed information disclosed. Detailed information disclosed. Detailed information disclosed.	Detailed information disclosed. Detailed information disclosed. Vague information disclosed.	Vague information disclosed. Vague information disclosed. No information on Governance.	No information disclosed. No information disclosed. No information disclosed.
MATERIALITY assessment **Materiality assessment process** **Materiality Matrix (outcome)** **Mitigation actions (outcome)**	Stakeholders' engagement detailed. Matrix frequently disclosed. Brief or no information disclosed	Not disclosed. Matrix not disclosed. Not disclosed.	Not disclosed. Matrix not disclosed. Not disclosed.	Not disclosed. Matrix not disclosed. Not disclosed.
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** **PROFITABILITY**	-Size: 4th quartile of TA. -EBITDA: 3rd-4th quartile.	-Size: 4th quartile of TA -EBITDA: 4th quartile.	-Size: 2nd quartile of TA -EBITDA: 2nd quartile.	-Size: 3rd quartile of TA -EBITDA: 3rd quartile.

Focusing on the mean values by cluster for the variables that have not proven to be significantly determinative in the formation of the four identified levels of disclosers, in summary, the findings show that the clusters share some characteristics with respect to the value chain and gender composition of employees but differ in terms of internationalization of their business relationships and financial performance, with medium-level disclosers and best disclosers outperforming other clusters in the latter aspect.

5. Conclusion

The key aspects of this research are how CSRD requirements for large public interest entities will apply ESRS in the fiscal years beginning on or after January 1st, 2024, and the subsequent indirect and direct impacts will have on listed SMEs. Based on both the institutional sustainability reporting background

and previous research, this paper has attempted to: (i) analyze the level of voluntary sustainability disclosure practices by Spanish LSME and identify their categories of reporting, and (ii) figure out the determinants of those reporting practices. Additionally, there are three research questions related to specific expected contributions. By means of a content analysis, we have designed a VSD Index, which is based on CSRD and ESRS architecture, and the qualitative characteristic of relevance (materiality). A cluster analysis identified the existing categories of LSME according to the level of VSD and an ANOVA test was performed to figure out the determinants of the clusters.

The findings were that the level of sustainability information disclosure is low. According to the VSD Index plus other indicators, we identified four categories of disclosure in the sample of Spanish LSMEs. There is documentary evidence which helped to categorize the level of the sustainability disclosures. Additional variables that mattered were the accounting rules used as basis for the presentation of annual reports, the customer business model, and the firm's size and profitability. The value chain profile of the analysed LSMEs highlight the indirect effect that ESRS will have on them, given that, in many cases, suppliers and customers are international and non-related parties. Moreover, customers are primarily B2B. Therefore, Spanish LSME do seem to be part of the undertaking value chain that will be mandatory in reports as per ESRS from 2024.

We present below the main theoretical and practical contributions of this research in the current scenario of the sustainability reporting, and the limitations and avenues for future research.

Theoretical contributions

The theoretical contributions of this research are closely related to the public consultation on the Exposure Draft ESRS for listed SMEs (ESRS LSME ED) launched by the EFRAG in February 2024. The Draft is designed to receive feedback on key aspects including ESRS LSME architecture and the relevance of the proposed disclosures among others.

Our main theoretical contribution is the construction of an original sustainability disclosure index as a tool which could be applied to different samples of large or small companies in other European countries. The proposed index is a score of the voluntary sustainability disclosure (VSDI) in SMEs under CSRD and ESRS disclosure requirements and architecture, and on the qualitative characteristic of relevance (materiality) (Cross-cutting ESRS 2). Therefore, we expect it can contribute to the analysis of disclosure practices by academic researchers in other contexts. It could shed light on sustainability reporting to the standard-setting process, what should become an important goal of accounting researchers (Gordon et al., 2019).

In addition, the purpose of the ESRS LSME ED is to set reporting requirements that are proportionate to the scale and complexity of the activities and to the capacities and characteristics of LSMEs. The call expects to receive feedback on the role of the LSME ED in setting the value chain cap for information to be reported by large undertakings. Therefore, we also expect that our proposal is useful to academia, institutions, and SMEs for the practical definition of the SME profile based on the four types of variables that we have designed to measure it, all of them closely related to the aspects that require greater knowledge according to EFRAG: Business relationships and value creation profile, General nature disclosure requirements (DR), Accounting profile, and Firm´s characteristics.

Practical contributions

Based on the above findings about the disclosure areas related to both, the three ESG topics and the materiality analysis, we can conclude that greater involvement is required from preparers, stakeholders, and standard-setters. Preparers should develop and disclose information about the "double materiality" assessment process focusing, first, on "impact materiality", related to the impact and risks of their

activities on people and environment. This is the first step before focusing on financial materiality. The identification and engagement of stakeholders have an important role in this step.
Moreover, preparers should build a materiality matrix based on the materiality assessment process, and the corresponding relevant information about every material topic: environmental, social and governance. For the disclosed information to be material and, therefore, relevant, this process also requires the involvement of stakeholders, who should actively participate in the materiality assessment process to provide crucial insights around their needs for information. Additionally, preparers should focus on the outcome of the materiality assessment analysis, defining the mitigation actions corresponding to every identified material risk and the strategic decisions related to every identified opportunity. Finally, more attention should be paid to governance, which has proven to be the area with the least disclosed information. In this regard, Thun and Zülch (2022), emphasize the importance of specifying which management position should be responsible for sustainability to improve reporting and the limitations of that decision.
Besides, the LSMEs need the involvement of standard-setters, who should consider the proportionality principle when preparing the LSME ESRS. They should also provide LSMEs with specific support for adopting the forthcoming LSME ESRS and facilitating the sequential and proportional adoption of these new requirements. As Lund-Thomsen and Nadvi (2010) assert, business associations could have an important function in formulating local collective action by SME to facilitate compliance with international CSR standards. Cheung et al. (2009) suggest that the use of voluntary agreement plus legislation complied with by businesses is the best way to obtain desirable results in corporate environmental management. However, in the case of SMEs, these initiatives should have the support of local governance structures in their creation, implementation, and financing, yet this has not been the subject of much debate in the CSR nor in development-oriented literature (Lund-Thomsen and Nadvi, 2010).

Limitations and avenues for future research
Finally, regarding the limitations and avenues for future research, some of the limitations identified in this research are the following: the descriptive nature of the study; the limitation of the study to a specific year, 2022; the subjectivity associated to the content analysis methodology; the difficulty of defining the sample accurately; the potential influence of the pandemic on financial data. As possible future research topics, we propose to replicate the study in other European countries and conducting a comparative analysis of sustainability information disclosed by European listed SMEs complementing the content analysis methodology with surveys to the managing directors. It could be of interest to focus on the Iberian Peninsula because Portugal and Spain are two complementary economies which constitute a good example of the importance that geographical proximity, mutual understanding, and infrastructure have on successfully overcoming several challenges (Myro and Solana, 2022).

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Appendix 1. Sample composition

	2	1	2,9	2,9	100,0
	Total	35	100,0	100,0	

DIRECTOR_GENDER

		Frequency	Percent	Percent Valid	Cumulative Percentage
Valid	0	31	88,6	88,6	88,6
	1	2	5,7	5,7	94,3
	2	2	5,7	5,7	100,0
	Total	35	100,0	100,0	

EMPLOY_GENDER

		Frequency	Percent	Percent Valid	Cumulative Percentage
Valid	0	19	54,3	55,9	55,9
	1	8	22,9	23,5	79,4
	2	7	20,0	20,6	100,0
	Total	34	97,1	100,0	
Missing	Sistema	1	2,9		
Total		35	100,0		

Appendix 2. Summary of the disclosures

Descriptives of the scored VSD Index

	N	Minim	MAxim	Mean	Standard Deviation
SME_VSD Index	35	0	13	1,86	3,237
TOPIC_Indicator	35	0	6	1,34	1,814
VEDI	35	0	2	,57	,698
VSDI	35	0	2	,54	,701
VGDI	35	0	2	,23	,547
MASS_Indicator	35	0	7	,51	1,704
MASS_PROCESS	35	0	4	,31	,993
MSect	35	0	2	,14	,494
MProcc	35	0	2	,17	,514
MASS_OUTCOME	35	0	3	,20	,719
Mmatrix	35	0	2	,14	,494
Mitigat	35	0	1	,06	,236

SME_VSDI

		Absolute Frequency	Relative Frequency	Valid Percentage	Accumulated Percentage
Valid	0	18	51,4	51,4	51,4
	1	3	8,6	8,6	60,0
	2	7	20,0	20,0	80,0
	3	3	8,6	8,6	88,6
	5	1	2,9	2,9	91,4
	9	1	2,9	2,9	94,3
	12	1	2,9	2,9	97,1
	13	1	2,9	2,9	100,0
	Total	35	100,0	100,0	

TOPIC_I

	Absolute Frequency	Relative Percentage	Valid Percentage	Accumulated Percentage

Valid	0	18	51,4	51,4	51,4
	1	3	8,6	8,6	60,0
	2	8	22,9	22,9	82,9
	3	2	5,7	5,7	88,6
	5	2	5,7	5,7	94,3
	6	2	5,7	5,7	100,0
	Total	35	100,0	100,0	

VEDI

		Absolute Frequency	**Relative Percentage**	**Valid Percentage**	**Accumulated Percentage**
Valid	0	19	54,3	54,3	54,3
	1	12	34,3	34,3	88,6
	2	4	11,4	11,4	100,0
	Total	35	100,0	100,0	

VSDI

		Absolute Frequency	**Relative Percentage**	**Valid Percentage**	**Accumulated Percentage**
Valid	0	20	57,1	57,1	57,1
	1	11	31,4	31,4	88,6
	2	4	11,4	11,4	100,0
	Total	35	100,0	100,0	

VGDI

		Absolute Frequency	**Relative Percentage**	**Valid Percentage**	**Accumulated Percentage**
Valid	0	29	82,9	82,9	82,9
	1	4	11,4	11,4	94,3
	2	2	5,7	5,7	100,0
	Total	35	100,0	100,0	

MASS_I

		Absolute Frequency	**Relative Percentage**	**Valid Percentage**	**Accumulated Percentage**
Valid	0	31	88,6	88,6	88,6
	1	1	2,9	2,9	91,4
	3	1	2,9	2,9	94,3
	7	2	5,7	5,7	100,0
	Total	35	100,0	100,0	

MASS_PROCESS

		Absolute Frequency	**Relative Percentage**	**Valid Percentage**	**Accumulated Percentage**
Valid	0	31	88,6	88,6	88,6
	1	1	2,9	2,9	91,4
	2	1	2,9	2,9	94,3
	4	2	5,7	5,7	100,0
	Total	35	100,0	100,0	

MSect

		Absolute Frequency	Relative Percentage	Valid Percentage	Accumulated Percentage
Valid	0	32	91,4	91,4	91,4
	1	1	2,9	2,9	94,3
	2	2	5,7	5,7	100,0
	Total	35	100,0	100,0	

MProcc

		Absolute Frequency	Relative Percentage	Valid Percentage	Accumulated Percentage
Valid	0	31	88,6	88,6	88,6
	1	2	5,7	5,7	94,3
	2	2	5,7	5,7	100,0
	Total	35	100,0	100,0	

MASS_OUTCOME

		Absolute Frequency	Relative Percentage	Valid Percentage	Accumulated Percentage
Valid	0	32	91,4	91,4	91,4
	1	1	2,9	2,9	94,3
	3	2	5,7	5,7	100,0
	Total	35	100,0	100,0	

Mmatrix

		Absolute Frequency	Relative Percentage	Valid Percentage	Accumulated Percentage
Valid	0	32	91,4	91,4	91,4
	1	1	2,9	2,9	94,3
	2	2	5,7	5,7	100,0
	Total	35	100,0	100,0	

Mitigat

		Frecuencia	Porcentaje	Porcentaje válido	Porcentaje acumulado
Válidos	0	33	94,3	94,3	94,3
	1	2	5,7	5,7	100,0
	Total	35	100,0	100,0	

Appendix 3. Bivariate analysis: Cluster and ANOVA

Table 1. Number of cases per cluster.

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

Table2. ANOVA.

	Cluster	Error	F	Sig.

	Quadratic mean	gl	Quadratic mean	gl		
SME_VSDI	106.640	3	1.094	30	97.494	.000
TOPIC_I	29.191	3	.749	30	38.995	.000
VEDI	3.596	3	.182	30	19.803	.000
VSDI	3.573	3	.189	30	18.934	.000
VGDI	2.841	3	.053	30	53.424	.000
MASS_I	28.958	3	.387	30	74.923	.000
SUPP_Internaz	1.426	3	.815	30	1.749	.178
SUPP_type	.082	3	.177	30	.460	.712
SUPP_Risk Diversification	.012	3	.031	30	.399	.755
CUST_Internaz	1.510	3	.768	30	1.967	.140
CUST_Business Model	1.138	3	.204	30	5.585	.004
CUST_Risk Diversification	.000	3	.067	30	.000	1.000
CUST_Type	.268	3	.244	30	1.098	.365
MANUF	.924	3	.175	30	5.273	.005
REAL_ESTA INVESTM	.476	3	.070	30	6.807	.001
SERV	.150	3	.048	30	3.133	.040
TECH	.145	3	.221	30	.657	.585
DOC_SUPPORT	3.646	3	.236	30	15.428	.000
ACCOUNTING RULES	.595	3	.199	30	2.982	.047
EMPLOY_GENDER	.550	3	.670	30	.821	.493
Discretized Nº Employees	5.589	3	.854	30	6.546	.002
Discretized Asset	6.413	3	.700	30	9.164	.000
Discretized_ROE	1.968	3	1.286	30	1.531	.227
Discretized Leverage	2.647	3	1.151	30	2.300	.097
Discretized_EBITDA	3.403	3	1.009	30	3.373	.031

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.

Table 3. Centers of the final clusters

	Cluster			
	C1 (14 co.)	**C2 (3 co.)**	**C3 (2 co.)**	**C4 (15 co)**
SME_VSDI	1	11	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 EMPLOY_GENDER	0 1	1 1	1 1	0 1
Recodificada Nº 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

Table 4. Centers of the final clusters

	Cluster			
	C1 (14 co.)	**C2 (3 co.)**	**C3 (2 co.)**	**C4 (15 co.)**
SME_VSDI* **	1	11	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 Nº 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

***** p<99%; *** p<95%; *** p<0.1%;**