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SMEs and Sustainable Practices: Identifying Key Factors from Spanish Evidence

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Abstract

Understanding the complex process of adopting sustainable practices in small and medium-sized enterprises (SMEs) is a challenging but necessary task, given the prevalence of these companies and the institutional pressure to move towards sustainability. Using a representative database of Spanish SMEs, we aim to show which factors help SMEs to embrace sustainability. The results show that organizational agility, internationalization, the academic background of the manager and size all exert a positive effect on sustainable practices. Our study provides meaningful insights to help SMEs overcome some of their deficiencies in sustainability commitment and the adoption of sustainable practices, which can be extended to other countries and broader areas such the European Union.

Keywords

SME, sustainability management, social issues in management, management, social sciences, organization agility, internationalization, size

Introduction

Small and medium-sized enterprises (SMEs) represent approximately 99.8% of all companies in the European Union (EU) and contribute 65% of its total employment (European Commission, 2022). In Spain, SMEs account for the same percentage of all companies and their contribution to employment is very similar (63.7%) (DGPYME, 2023).

The major contribution made by smaller companies to economic activity has given rise to different EU strategies aimed at SMEs, which, in turn, have yielded multiple measures. The SME Strategy for a Sustainable and Digital Europe (European Commission, 2020), one of the most important of these measures, aims to "unleash the power of Europe's SMEs of all kinds to lead the twin transitions" and "increase the number of SMEs engaging in sustainable business practices as well as the number of SMEs employing digital technologies." To that end, the measures proposed focus on three areas: easing regulatory pressure and market access, facilitating access to financing and promoting the shift to sustainability and digitalization.

However, the Commission (European Commission, 2020) recognises that many SMEs struggle to adopt new sustainable business models. This problem raises the question of how SMEs can become more sustainable. Put another way, what factors contribute to the adoption of sustainable measures in small companies?

The main barriers to sustainability in SMEs are financial (lack of public aid, cost of implementing sustainable development policies, and lack of financial and human resources), as reported in a study on sustainability and SMEs in Spain carried out in 2021 (COGITI, 2021). In this context, sustainability concerns may not be the priority for SMEs (Rubio-Andrés et al., 2023; Sikora, 2021). In the EU, other challenges to the adoption of sustainable transformation strategies (Rubio-Andrés et al., 2023; Singh et al., 2020) include the complex regulation

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process, the difficulty in implementing legislation, and the insufficient supply of required inputs (European Commission, 2021).

Although most academic studies on sustainability practices have focused on large companies (as is generally the case with CSR research), an increasing number of researchers are examining sustainable practices in SMEs. They explore different areas such as the level of understanding (Hoogendoorn et al., 2015; Hörisch et al., 2015; Ubrežiová et al., 2015; Vörösmarty & Dobos, 2020), barriers to acceptance (Côté et al., 2006; Simpson et al., 2004), benefits and costs (European Commission, 2020; Ilomäki & Melanen, 2001), regulation (Petts, 2000), the development of collaborative strategies (Lewis et al., 2015), links between sustainable performance and financial results (González-Benito & González-Benito, 2005), environmental standards (Biondi et al., 2000), the certification of environmental standards (Van & Hieu, 2018) or the role of management skills (W. T. Hsu et al., 2013).

Several theories have been employed in studies seeking to understand the sustainable behaviour of companies, with the Resource-Based View (RBV) being the most commonly adopted. This approach (Barney, 1991) holds that organizations can become competitive as a result of their unique set of available resources (Wernerfelt, 1984).

Viewed through the lens of the RBV, smaller companies, with fewer resources and capabilities, might be expected to be less committed to sustainability than larger ones. Various authors have made this argument, focusing on the lower availability of resources (human and financial) to address sustainability issues (Ammenberg & Hjelm, 2003; Bowen, 2002; Fitjar, 2011; Graafland et al., 2003; Halme & Korpela, 2014; Hillary, 2004; Khanna, 2001; Spence, 1999; Udayasankar, 2008) and on the lack of eco-literacy in SMEs (Gadenne et al., 2009; Halme & Korpela, 2014; Hörisch et al., 2015). Thus, we can find extensive evidence in the literature that shows a lower degree of commitment to sustainability management in SMEs than in larger companies (Bowen, 2002; Brammer et al., 2006; Galani et al., 2012; Gallo & Christensen, 2011; Graafland et al., 2003; Johnson, 2015; Lee, 2014; Revell et al., 2010; Tencati et al., 2004; Uhlaner et al., 2011) and, in general, firm size exerts a positive influence on commitment to sustainability (Aragón-Correa, 1998; Brammer & Millington, 2006; Darnall et al., 2010; Gallo & Christensen, 2011; Uhlaner et al., 2011).

However, SMEs' relatively simple and flexible structure and the fact that ownership and control are often linked in these companies enable them to be more dynamic and adopt sustainable business models. Several studies suggest that SMEs embrace sustainability actions as a dynamic response to external forces (Aragón-Correa et al., 2008; Brammer et al., 2012; Clemens, 2006; Darnall et al., 2010; Eikelenboom & de Jong, 2019).

Another approach that can be useful in explaining the sustainability performance of SMEs is the Dynamic Capability View (DCV) (Pisano & Teece, 1994), which emerged to address the limitations of the RBV in explaining how companies can create competitive advantages in a dynamic market (Priem & Butler, 2001). The pandemic of 2020 caused turbulence in most sectors and rendered many conventional competitive strategies ineffective (Al-Omoush et al., 2020). In such a context, an organization should develop internal and external competencies (Pisano & Teece, 1994). These dynamic capabilities are different from the "ordinary" (also called first-order) capabilities that form the basis of the RBV; rather, they are related to the organization's capacity for adaptation, absorption, and innovation (Grant, 1996; Pisano, 1994; C. L. Wang & Ahmed, 2007). Dynamic capabilities have been shown to be related to organizational performance (Danneels, 2002; Hung et al., 2010; Luo, 2000; Zott, 2003). SMEs' greater agility and ability to innovate more quickly, demonstrated by different studies (Bodlaj & Čater, 2019; Dibrell et al., 2008; Lichtenthaler, 2009; Pelham, 1999), means they can respond better to consumers (Meister, 2017; Street et al., 2017) than larger companies, which are often reluctant to engage in this type of innovation (Christensen, 2013).

The strategic business conversion model in Spain, based on the European Green Deal has not yet produced the expected results (Sánchez-Bayón, 2023). Spain also has a low level of sustainability-related disclosure (Marco-Fondevila et al., 2018) and lags behind other European countries in terms of the green skills needed to achieve a new sustainable economic model (Sikora, 2021; Sulich & Rutkowska, 2020). As such, there is a need to identify how SMEs can adopt sustainable transformation strategies given the current unsatisfactory uptake and the limited evidence on this issue in the literature (Abdel-Maksoud et al., 2021; Gök & Peker, 2017; Rubio-Andrés et al., 2023). We thus aim to add to the literature by revealing the factors that explain Spanish SMEs' embrace of sustainable transformation strategies. Moreover, as sustainable management in organizations relies on internal resources and capabilities (Biscotti et al., 2018), it is crucial to discover which factors would help SMEs to cope with the complexity of sustainability strategies (Boiral et al., 2014; Singh et al., 2020).

Some studies on sustainability in Spanish SMEs approach it as a component of corporate social responsibility (CSR), with the analysis of sustainability being only a minor aspect thereof (Ayuso et al., 2016; Madueno et al., 2016; Murillo & Lozano, 2006). Although there are no agreed definitions of the concepts of CSR and sustainability, the two terms are closely

related, as both encompass respect for natural environment; however, sustainability tends to be more focused at the institutional level and CSR at organization level (Fonseca & Ferro, 2016).

On the other hand, the studies by Martín-Tapia et al. (2010), Aguilera-Caracuel et al. (2012), Aragón-Correa et al. (2008), Ayuso and Navarrete-Báez (2018), and Rabal-Conesa et al. (2022) analyse the impact of different variables on the implementation of sustainable criteria in SMEs. With the exception of the last paper, which analyses a very specific dimension of sustainability (environmental understanding to aid product development), these studies are slightly dated and do not reflect the current context (for example, they do not take into account the influence of the Covid-19 crisis or the entry into force of the SME Strategy for a Sustainable and Digital Europe). Some of them were carried out in specific geographical contexts, such as Catalonia (Ayuso & Navarrete-Báez, 2018) and Southern Spain (Aragón-Correa et al., 2008), and others only analyse the determinants of sustainable performance in specific industries, such as the food industry (Aguilera-Caracuel et al., 2012; Martín-Tapia et al., 2010) or car repair industry (Aragón-Correa et al., 2008). Thus, current evidence on Spanish SMEs is rather narrow (geographically limited or industry specific), mostly outdated and offers inconclusive results.

The expected findings of our paper are aligned with the Global Goals of the 2030 Agenda for Sustainable Development. Since it is generally understood that SMEs influence GDP and employment, the call to the private sector to participate in the accomplishment of the 17 Sustainable Development Goals (SDGs) specifically references the SME business model. For instance, target 8.3 aims to "promote development-oriented policies that support productive activities, the creation of decent jobs, entrepreneurship, creativity and innovation, and to foster the formalization and growth of micro, small and medium-sized enterprises, including through access to financial services." Our research contributes to the state-of-the-art by presenting evidence on how a lagging country such as Spain can improve the sustainability of its SMEs. To that end, we conduct a comprehensive analysis of the SDGs that relate to SMEs (such as SDGs 3, 6, 7, 8, 9, 12, and 13), which are directly related to organizational processes and practices vital for the competitiveness and survival of SMEs.

With reference to the RBV (Barney, 1991) and DCV (Pisano & Teece, 1994), our study aims to explore how specific internal factors of Spanish SMEs (size, level of internationalization, academic background of the manager, and organizational agility) affect sustainability decisions and actions. We also draw on the RBV to explain how sustainable practices are implemented in SMEs.

These variables have been chosen because of their importance in both theories applied. As mentioned, resources and capabilities are linked to firm size, and they may be used for the adoption of sustainable practices, although previous studies have reached different conclusions regarding the role they play in sustainability. The manager's training is related to one of those capabilities, ecoliteracy (also known as environmental literacy and ecological literacy), a determinant of sustainability in SMEs. Traditionally, SME shareholders are expected to show low ecoliteracy standards (Tilley, 1999). An example of this is that they are usually ignorant of sustainability regulations (Gerrans & Hutchinson, 2017; Simpson et al., 2004). The EU recognises this problem, stating in its strategy for SMEs that "one-quarter of Small- and Medium-sized Enterprises (SMEs) consider the availability of skilled staff and experienced managers the most important problem." Another important variable under the RBV is internationalization, which, like the previous variable, is related to the knowledge necessary for the SME to be able to adopt sustainable practices (Aguilera-Caracuel et al., 2012; Bansal & Roth, 2000; Blomstermo et al., 2004; Li et al., 2004; Petersen et al., 2008). Finally, relating to the DCV, we analyse how SMEs achieve competitive advantages in the turbulent context in which they operate, with a focus on the influence of the dynamic capabilities underlying organizational agility (OA) on SMEs' sustainable practices.

We contribute to the literature in different ways. First, we apply the RBV and DCV to show which internal factors can help SMEs to address challenging sustainability transformation strategies (Boiral et al., 2014; Singh et al., 2020). Second, we comprehensively assess how businesses adopt sustainability, measuring different dimensions of sustainability transformation strategies, which are aligned with the SDGs. Third, our findings are based on a statistically representative database of Spanish SMEs, which strengthens our insights by addressing some of the limitations in the empirical literature based on samples that are not statistically representative (Boiral et al., 2014; Horváth & Szabó, 2019), or focused on small geographical areas or specific sectors.

The next section describes the literature and explains the hypotheses. Section "Data" then details the data. The methodology and the results are described in Section "Methodology and Results." Finally, the discussion and conclusion are presented in Section "Discussion and Conclusions."

Literature and Hypotheses

Organizational Agility

The idea of OA was originally presented in the early 1990s by researchers at the Iacocca Institute of Lehigh

University (USA) (Nejatian & Zarei, 2013). Walter (2021) proposes the following definition of OA: "Organizational Agility is a learned, permanently available dynamic capability that can be performed to a necessary degree in a quick and efficient fashion, and whenever needed in order to increase business performance in a volatile market context." It involves the capacity of a company to detect and react to alterations in an unpredictable and rapidly changing environment (Overby et al., 2006; Roberts & Grover, 2012; Sambamurthy et al., 2003). The ultimate goal of OA is to help the company gain and maintain a competitive advantage (Baškarada & Koronios, 2018). OA is based on two main concepts: adaptation and organizational flexibility (Nejatian & Zarei, 2013). The former, also referred to as adaptive agility (Ridwandono & Subriadi, 2019), is reactive in nature, and consists of the firm's capacity to detect and react to alterations in the environment, while the latter, also referred to as entrepreneurial agility, is defined as an organization's ability to anticipate and be proactive (Sambamurthy et al., 2007).

Regarding the different classifications of OA (Ridwandono & Subriadi, 2019), we focus on those that are directly connected to the effect of Covid-19 on SMEs (X. Chen & Siau, 2012; Dunlop-Hinkler et al., 2011; Krotov & Junglas, 2006; Mao & Quan, 2015; Rabal-Conesa et al., 2022; Tallon & Pinsonneault, 2011; Zaini & Masrek, 2013), such as customer agility and operational agility. The first is the capacity to detect customers' demands and react by developing new solutions, and the second is the capacity to streamline the firm's procedures and processes, such as logistics.

OA is a requirement for every business, but especially for SMEs, which suffer most from the turbulence caused by market changes or unexpected factors such as pandemics. SMEs usually show great agility and innovation capacity. They face lower costs for reconfiguring their operating model due to their leaner and flatter organizational structures and more easily modifiable processes (Neirotti et al., 2017), the greater open-mindedness of their managers when it comes to innovating and adapting their organizations (Levy & Powell, 1998, 2000), and their inclination to simplify routines (Arora et al., 2020).

OA has been analysed in different studies (Arsawan et al., 2022; Nejatian & Zarei, 2013; Razmi & Mohammad Ghasemi, 2015; Ridwandono & Subriadi, 2019) within the framework of dynamic capabilities; that is, based on the detection and management of threats arising from the turbulent contexts in which organizations currently operate. The greater dynamism and adaptability of SMEs is a strength that allows these companies to develop dynamic capabilities that contribute to the further development of sustainability activities. Accordingly, we argue that flexible SMEs would be able to adapt their organizations to meet customers' and markets' concerns about sustainable practices, and to increase customer satisfaction by embracing their responsiveness to changing sustainability requirements (Tiwari & Tiwari, 2020). This adoption of sustainable practices can increase SMEs' effectiveness and competitiveness (Heinonen & Strandvik, 2018).

Nevertheless, there is little research on the effect of OA on the development of sustainable practices, particularly in SMEs (Rabal-Conesa et al., 2022; Shahzad et al., 2020; Sun et al., 2022). Moreover, what little literature there is has focused on specific sectors and used small samples.

The first such study, carried out in Spain on a sample of 184 managers of industrial companies, showed that OA (measured on the basis of three dimensions) has a positive influence on green innovation. The second, carried out in Pakistan, also based on surveys of manufacturing company managers, analysed and demonstrated the significant effect of OA (captured through six items related to the capacity to adapt the organization to variations in demand) on green innovation, understood as "hardware and software innovation that is related to green products or processes, including the innovation in technologies that are involved in energy-saved, pollution-prevention, waste recycling, green product designs or corporate environmental management" (Y. S. Chen et al., 2006). Finally, the work by Sun et al. (2022) (also based on surveys of managers of manufacturing companies in Pakistan) showed that OA (operational, customer, and partnering agility) has a significant and positive effect on sustainable production and logistics processes.

These previous studies have been conducted in specific geographical settings and in different sectors, and do not focus exclusively on SMEs. All of them found a significant correlation between OA (assessed through various parameters) and the sustainability metrics examined in each study. Since SMEs tend to be more dynamic and adaptable than other organizations, it is reasonable to assume that an analysis of the relationship between OA and sustainable practices in the specific context of SMEs will yield similar results.

Given the above, we propose the following hypothesis:

H1: Organizational agility has a positive effect on the use of sustainable practices in SMEs.

Level of Internationalization

SMEs are currently facing growing pressure to expand their activities internationally. Factors such as the increase in domestic competition, the decline in domestic demand resulting from the Covid-19 pandemic and the

technological improvement of smaller companies have led to an increase in the internationalization of SMEs.

However, the process of SME internationalization can be complex, as there are obstacles that hinder the expansion of these companies, both internal (export strategy, managers' attitudes and perceptions, characteristics and competencies of the companies, lack of resources) and external (characteristics of the industry and the market; Leonidou, 2000; Zou & Stan, 1998). These barriers seem to be particularly notable in the Spanish context. Spanish exporting companies are smaller than their European counterparts, which may explain the lower monetary value of their exports. For example, French SMEs export 52% more than Spanish SMEs.

The debate within the RBV framework is about whether the SME internationalization process helps to create one of the capabilities that play a key role in generating competitive advantages and improving sustainability performance: namely, knowledge. The related literature supports this relationship (Aguilera-Caracuel et al., 2012; Bansal, 2005; Blomstermo et al., 2004; Li et al., 2004; Petersen et al., 2008). Bansal (2005) concludes that "dealing with environmental situations in foreign markets can lead firms to generate and develop a set of best sustainable practices guaranteeing entry to any market, no matter how environmentally regulated."Aguilera-Caracuel et al. (2012) come a similar conclusion when they argue that "export firms with a high organisational learning capability will be able to assimilate, integrate, and progressively exploit the environmental knowledge acquired in foreign markets" (…) "managers of export firms play a significant role in bringing the export firm into contact with tacit and complex knowledge and in using it to generate a more proactive environmental strategy via organisational learning."

In accordance with the RBV, internationalization provides access to new capabilities and knowledge (Attig et al., 2016) and can help build relationships with stakeholders and develop greater sensitivity about sustainability issues (Strike et al., 2006). In addition to generating a valuable source of resources, internationalization is also related to the institutional pressure that may compel SMEs to embrace sustainable practices due to a need to conform to international sustainability standards (Brammer et al., 2006) and to develop sustainable products and services (Laguir et al., 2016). International SMEs must meet host countries' sustainability standards to operate there. In some cases, they must exceed mere compliance to demonstrate creditable sustainability performance.

While the internationalization process as a determinant of sustainability transformation practices is in line with the RBV, it is also linked to the DCV. In this vein, the literature shows that "winners in the international market will be the firms that can demonstrate timely responsiveness and rapid flexibility" (Teece et al., 1997).

Effective internationalization is related to dynamic capabilities (Evers, 2011; Teece, 2014). For example, the knowledge mentioned above may become obsolete and less relevant to the success of the organization in a world of accelerated change (Schweizer et al., 2010), forcing companies (especially SMEs) to detect, evaluate and develop the dynamic capabilities necessary to survive. These dynamic capabilities are created intentionally and are costly (Mudalige et al., 2019; Pisano, 2015). Among these capabilities, those of an organizational nature stand out due to their influence on successful internationalization processes (Bruneel et al., 2010; Mudalige et al., 2019; Weerawardena et al., 2007).

The related literature on the relationship between SME internationalization and the development of sustainability strategies is limited, inconclusive and generally focused on the effect of internationalization on CSR. According to Stakeholder Theory, the function of a business is optimised when its actions reflect what is best for all stakeholders, including employees, suppliers, the community, partners, and shareholders. Thus, international companies are under pressure from different interest groups to engage in socially responsible behaviour (Bansal, 2005; Perrini et al., 2011) In this context, Ayuso et al. (2016) noted that SMEs with international experience can take advantage of the knowledge gained in different jurisdictions to develop better CSR practices and to adapt them to the local environment. Some studies have shown the positive influence of internationalization on firms' sustainable practices (Bansal, 2005; Kang, 2013; Strike et al., 2006). Ayuso and Navarrete-Báez (2018) found a positive effect of SME internationalization on sustainable development in Mexican companies, but not in Spanish ones, indicating the importance of factors such as institutional pressures in this relationship.

In summary, there is a lack of empirical research that demonstrates the relationship between SME internationalization and the development of sustainable practices. However, drawing on the RBV, DCV, and Stakeholder Theory, it is reasonable to formulate the following hypothesis:

H2: SMEs' internationalization process exerts a positive effect on the adoption of sustainable practices.

Level of Education

The relevance of top management in the adoption of sustainability in business has been recognised by many studies (Aguinis & Glavas, 2012; Godos-Díez et al., 2011; Hemingway & Maclagan, 2004; Murillo & Lozano, 2006; Quinn, 1997; Spencer & Rutherfoord, 2003;

Waldman & Siegel, 2008; Waldman et al., 2006). In SMEs, the organization is closely associated with the owner (Aragón-Correa et al., 2008; Coppa & Sriramesh, 2013; Fuller & Tian, 2006), with his/her values playing an important role in the different activities of the company, including sustainability-related ones. This relationship has been explored in studies such as the one by Chassé and Courrent (2018), who demonstrated a relationship between the manager's personal sustainable behaviour and the implementation of sustainable strategies by the company.

In the RBV framework, leadership is a strategic resource that can improve a company's competitive position and performance (Singh et al., 2019; Takeuchi et al., 2007). The related concept in the DCV is transformational leadership, a term coined by Burns (1978) to distinguish it from traditional (transactional) leadership. While the latter is based on rewards, transformational leadership is an action whereby "leaders and followers make each other advance to a higher level of morality and motivation" (Burns, 1978), helping to successfully stimulate innovative performance in organizations (Waldman & Bass, 1991). Its application to the field of sustainability has led to the emergence of the term "green transformational leadership," defined as "leader behaviours that motivate followers to achieve sustainable goals and inspire followers to perform beyond expected levels of sustainable performance" (Y. S. Chen & Chang, 2013). In a study of 254 companies in the electronics sector in Taiwan (most of them SMEs), these authors demonstrated that such leadership has a significant impact on green product innovation processes.

Among the different leadership characteristics, the level of education, which reflects the manager's knowledge and skills, is associated with his or her capacity to make strategic decisions in accordance with the context (Wiersema & Bantel, 1992). It is also related to his or her propensity to process information and absorb new ideas (W. T. Hsu et al., 2013) and to develop innovative solutions (Bantel & Jackson, 1989). It is even related to the level of productivity of the firm (Norburn & Birley, 1988). The relationship between business success and managers' education has also been demonstrated (Martin & Staines, 1994), with better educated managers found to achieve better performance.

Over the years, several studies on leadership have shown that some cognitive abilities are a key factor in determining how well a leader performs (Mumford et al., 2017) and it is the level of education that shapes the cognitive base (W. T. Hsu et al., 2013). Since the launch of the European Higher Education Area in 2010, European universities have been engaged in competency-based learning, in which cognitive skills play a very important role. It is therefore interesting to explore whether Spanish SME managers have acquired the skills to exercise effective leadership in sustainability, especially considering the facilitating influence of knowledge in sustainability management (Hörisch et al., 2015; Roy & Thérin, 2008). Furthermore, several studies have analysed and demonstrated the influence of managers' educational level on the company's CSR policy (Cera et al., 2022; J. L. Hsu & Cheng, 2012; López-Pérez et al., 2017; Rodríguez Bolívar et al., 2015).

Given the importance of knowledge, competences and abilities for transformational leadership, we argue that SMEs managers with a degree will be better able to embrace sustainability practices, as shown to be the case with CSR policies. Thus, we propose the following hypothesis:

H3: The adoption of sustainable practices is positively associated with the educational level of the manager.

Company Size

The link between commitment to sustainability and size found in larger companies also seems to hold in SMEs, as shown in the literature. Aguilera-Caracuel et al. (2012), when analysing Spanish exporting SMEs in the food industry, showed a direct relationship between company size and companies' development of sustainability strategies. Similar conclusions have been reached by other studies conducted in different geographical areas and sectors, in light of the RBV (Andries & Stephan, 2019; Dey et al., 2018; Dostatni et al., 2021; Hoogendoorn et al., 2015; Ubrežiová et al., 2015; Van & Hieu, 2018; Vörösmarty & Dobos, 2020; Younis & Sundarakani, 2020).

Despite the abovementioned evidence, further analysis is needed given other contradictory findings regarding the relationship between firm size and sustainability. For example, Hoogendoorn et al. (2015) showed that it depends on the type of sustainable practice. While they demonstrated a relationship between firm size and sustainable processes, the same relationship was not found between size and the supply of green services and products. Ubrežiová et al. (2015) reported a similar result: while the number of company employees does affect the development of sustainability strategies, does not show a statistically significant effect on the sustainable policy applied.

However, when analysing SMEs specifically, numerous studies employing the RBV have shown that SME size exerts a positive effect on certain dimensions of sustainability: green purchasing practices (Vörösmarty & Dobos, 2020), investments in resource efficiency and involvement in greening products and services (Hoogendoorn et al., 2015), achievement of

environmental standard certificates (Van & Hieu, 2018), green supply chain practices (Younis & Sundarakani, 2020), financial benefits from sustainable innovation (Andries & Stephan, 2019) or even, as in this paper, a set of sustainable practices (Dostatni et al., 2021).

We thus propose the following hypothesis:

H4: Sustainability practices are positively associated with the size of the SME.

Figure 1 shows our model and hypotheses.

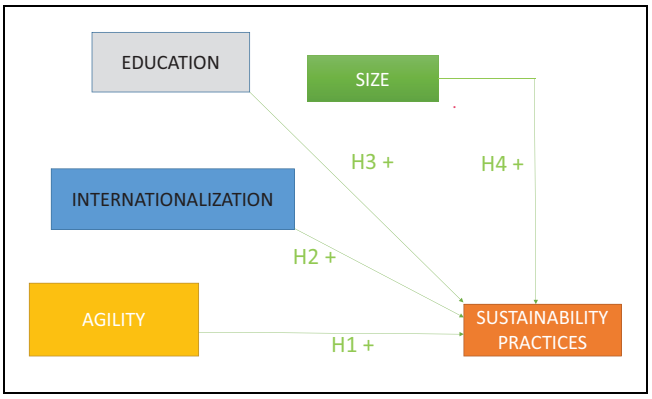

Figure 1. Model, hypotheses and expected relationships.

Data

Source

This study has been enabled by the "*SME* 2022 *report. Digitalization and sustainable development in SMEs – Spain*," produced by FAEDPYME (Foundation for the strategic analysis and development of small and medium-sized companies, by its initials in Spanish) in conjunction with the university network associated with the foundation. The data used in our sample were collected by means of telephone and online surveys administered to general managers of SMEs (with more than six employees) in Spain. Both data collection approaches were efficient in terms of the response rate and cost-effective in similar previous research conducted by FAEDPYME. We followed a stratified sampling approach for a finite population, considering the SME sectoral structure in Spain. To this end, the following strata were established: sector (industrial, construction, commerce, and services), size (micro, small and medium-sized enterprises), and Autonomous Community. We applied a simple random sampling procedure to each stratum. We obtained the population sizes from the Central Business Directory (DIRCE) edited by the National Institute of Statistics (INE). The closed questionnaire was administered in the period February–March 2022 to the general managers of the Spanish SMEs, since they are considered to be the key decision-makers (O'Regan & Sims, 2008). We obtained 1,044 correctly completed questionnaires, representing a global sampling error of 3.2% for a confidence level of 5%. Table 1 shows the distribution of the sample by sector and size.

We also conducted different tests to check for potential bias. First, employing Harman's one factor approach (Podsakoff et al., 2003), a principal component analysis of all the variables in our models showed that there was no dominant factor, and thus no common method bias. Second, we compared early and late respondents in our sample to check for potential non-response bias (Armstrong & Overton, 1977). The results show the absence of significant differences in size and industry dimensions as well as in the dependent and independent variables.

Variables

Dependent Variables

Sustainable Practices. The dependent variable represents a construct which stems from specific questions (answered on a 5-point Likert scale) in the questionnaire regarding sustainable practices used in the SMEs of our sample and their level of importance. These practices are essential to accomplish the SDGs that affect SMEs (UN Global Compact, 2016), and are thus key to enabling SMEs' organizational transformation towards a sustainable business model. Specifically, the sustainable practices relate to sustainability in the selection of suppliers, management of plastic packaging, design of processes (SDGs 8, 9, 12, and 13), energy management (SDG 7), water management (SDG 6), waste management and environmental certificates. Moreover, these practices have been analysed in related studies on sustainability and SMEs (Cantele & Zardini, 2020; Clemente-Almendros et al., 2025; Jansson et al., 2017; Ndubisi et al., 2021).

The factor analysis of those questions generated a construct derived from the first factor. Cronbach's Alpha is .849, the Kaiser–Meyer–Olkin measure (KMO) is .876, and Bartlett's test gives a p-value of .00. This single construct explains 54.073% of the variance. All the questions have a factor loading above 0.5.

Independent Variables

Organizational Agility (AGILITY). This independent variable is a construct generated from specific items in the questionnaire regarding the OA of the SMEs in our sample in comparison to their competitors. These questions

Table 1. Sample Distribution by Sector and Size.

Variable	Categories	Number of MSMEs	%
Sector	Industrial	324	31.0
	Construction	188	18.0
	Commerce	201	19.3
	Services	331	31.7
Size	Micro (6–9 employees)	218	20.9
	Small (10–49 employees)	683	65.4
	Medium (50–249 employees)	143	13.7
	Total sample	1,044	100.0

relate to efficiency in the production processes, speed of adaptation to changes in the market, speed of sales growth, and profitability. This construct has a Cronbach's Alpha of .829, a KMO of .774, a Bartlett *p*-value of .00, and a factor loading of 66.228. All the questions show a factor loading higher than 0.5.

We built this construct based on the OA literature (X. Chen & Siau, 2012; Dunlop-Hinkler et al., 2011; Krotov & Junglas, 2006; Mao & Quan, 2015; Rabal-Conesa et al., 2022; Tallon & Pinsonneault, 2011; Zaini & Masrek, 2013), and particularly the literature on OA in SMEs (Clemente-Almendros et al., 2025; Díaz-Pelaez et al., 2024; Duréndez et al., 2016; García-Pérez-de-Lema et al., 2016). Specifically, we measure organizational effects regarding customer and operational issues. Moreover, previous empirical evidence highlights the contextual nature of customer satisfaction and operations and the linkages to profitability (Chenhall & Langfield-Smith, 2007). By examining the position of an SME compared to its competitors, our construct captures the organization's relative OA performance (AECA, 1988), which is crucial for business success and competitiveness.

Level of Internationalization (INTERNATIONALIZATION). This variable is created from the question in the questionnaire that asks about the percentage of sales coming from international markets.

Level of Education (EDUCATION). From the questionnaire, this variable is a dichotomous variable that takes the value of 1 if the SME's general manager has a college degree, and 0 otherwise.

Company Size (SIZE). From the questionnaire, this variable takes the value of 1 if the SME is categorised as micro (6–9 employees), 2 if small (10–49 employees) and 3 if medium (50–249 employees).

Control Variables. We use the log of firm age (*AGE*) and sector dummies (*INDUSTRY*, *CONSTRUCTION*, *COMMERCE*, and *SERVICE*).

In addition, Table 2 shows the descriptive statistics, correlations and VIF (variance inflation factors) of our sample. The international sales in our sample are quite low, at 8.449%, and 57.5% of the general managers have a degree. Most of the SMEs in our sample are small companies, and the average age is 30 years (which is the value of the variable *AGE* without estimating the logarithm). There is no issue with collinearity in our data.

Methodology and Results

We test our hypotheses using Ordinary Least Squares (OLS) linear regression. We can state that our results are statistically robust since we confirm the statistical assumptions of regression analysis. First, we use robust standard errors to meet the assumption of homoscedasticity and ensure valid inferences (White, 1980). Second, the Durbin-Watson statistic is 1.806, meaning it lies between the recommended values of 1.5 and 2.5. Also, the mean of the residuals is zero. Third, we test the normality assumption in accordance with Jarque and Bera (1987), and Lumley et al. (2002). Fourth, we use different ways of measuring the main variables. In addition to the unstandardised variables, we use standardised variables along with robust standard errors. What is more, we generate alternative AGILITY and INTERNATIONALIZATION variables by totalling answers from the Likert scale questions (Ben-Amar et al., 2013; González-Cruz et al., 2021).

The expression below shows the OLS model specification:

$$SUSTAINABLE\ PRACTICES_i = \beta_0 + \beta_1 \cdot AGILITY_i + \beta_2 \cdot INTERNATIONALIZATION_i + + \beta_3 \cdot EDUCATION_i + \beta_4 \cdot SIZE_{it} + \beta_5 \cdot AGE_{it} + \beta_6 \cdot SECTORDUMMIES_i + \varepsilon_i$$

Table 3 presents the coefficients of the three models. As can be seen, the three estimations confirm the four hypotheses formulated. *AGILITY*, *INTERNATIONALIZATION*, *EDUCATION*, and *SIZE* yield positive and significant coefficients in the three models.

It is important to note that the variable AGE is not significant, meaning that SMEs' age does not influence the adoption of sustainable practices. Moreover, the various sector dummies variables used in our model differ in their significance, indicating varying influence by sector.

As an additional robustness check, we use nearest-neighbour matching. This matching procedure involves selecting observations to compare according to the

Table 2. Descriptive Statistics, Correlations, and VIF.

Variables	Obs.	Mean	*SD*	1	2	3	4	5	6
SUSTAINABLE PRACTICES	1,031	0.001	1.000	1.000					
AGILITY	1,034	0.001	1.000	0.224*** (0.000)	1.000				
INTERNACIONALIZATION	874	8.449	18.805	0.150*** (0.000)	0.073** (0.030)	1.000			
EDUCATION	1,031	0.575	0.494	0.145*** (0.000)	0.100*** (0.001)	0.083** (0.014)	1.000		
SIZE	1,044	1.765	0.601	0.165*** (0.000)	0.096*** (0.002)	0.159*** (0.000)	0.137*** (0.000)	1.000	
AGE	1,041	3.262	0.619	0.008 (0.799)	−0.058* (0.061)	0.009 (0.789)	0.047 (0.132)	0.122*** (0.000)	1.000
VIF					1.03	1.08	1.04	1.09	1.05

Note. Significance level in parentheses.
*$p < .10$. **$p < .05$. ***$p < .01$.

similarity of covariates (Abadie & Imbens, 2008). As a nonparametric procedure, it does not rely on assumptions about the distribution. We perform the matching process with replacement, and use more than one match, starting from four (since it is optimal) and going up to 10 matches (Abadie & Imbens, 2012; Hoque & Mu, 2019). Moreover, we use a bias correction since some of the control variables are continuous (Almeida et al., 2009). To apply this method, the independent variable must be a dichotomous variable. We have therefore created two new dichotomous variables for *AGILITY* and *INTERNATIONALIZATION*, which take the value of 1 if the average value of the observation is above the mean value of these variables in our sample, and 0 otherwise. The dichotomous *SIZE* variable created for the matching procedure takes the value of 1 if the company is categorised as micro, and 0 for small or medium. As an additional robustness check, we also use the propensity score matching method (Ampenberger et al., 2013). This approach involves computing the potential missing result for each participant by calculating the average of the results from similar participants, with the similarities between participants based on estimated treatment probabilities. The positive significant coefficients shown in Table 4 confirm the results from Table 3.

Discussion and Conclusions

While both large companies and SMEs have sustainability concerns (Imran et al., 2019), the characteristics of the latter limit their ability to actively respond to environmental challenges. Spanish SMEs are no strangers to this difficulty. The Strategic Framework for SME Policy 2030, in line with the SME Strategy for a Sustainable and Digital Europe (European Commission, 2020), shows that 73% of Spanish SMEs had undertaken some activity related to sustainability in the preceding 3 years. While this figure can be considered high, it is 12 points lower than the total for all companies. It is noteworthy that lack of knowledge and awareness are critical barriers to the adoption of sustainable practices.

It is against this backdrop that our study aims to understand factors that contribute to sustainable practices in SMEs. To that end, our study analyses the impact of several variables on SMEs' knowledge and application of a range of sustainable practices. By so doing, we aim to help overcome the limitations faced by SMEs in general, and Spanish SMEs in particular.

The research has been developed within the framework of two theoretical approaches: the RBV and the DCV. The first, which is the most commonly used theory in corporate sustainability research, focuses on an organization's endowment of resources and capabilities and their application to its efforts to implement sustainability

Table 3. Regression Coefficients.

Explanatory variables	Model I	Model II	Model III
AGILITY	0.231*** (0.034)	0.231*** (0.034)	0.574*** (0.082)
INTERNATIONALIZATION	0.003** (0.001)	0.074** (0.032)	0.004** (0.002)
EDUCATION	0.217*** (0.062)	0.107*** (0.030)	0.311*** (0.086)
SIZE	0.184*** (0.052)	0.111*** (0.031)	0.296*** (0.072)
AGE	−0.011 (0.052)	−0.006 (0.032)	−0.016 (0.073)
Constant	−0.512*** (0.195)	−0.065 (0.072)	−0.596 (0.374)
Observations	843	843	843
R^2	.140	.140	.140

Note. Robust regression coefficients. Robust standard errors in parentheses. Model I: unstandardised coefficients. Model II: standardised coefficients. Model III: adding scores. Sector dummy variables included in the three models (industry, construction, distribution, and service).
*$p < .10$. **$p < .05$. ***$p < .01$.

Table 4. Matching Procedures (Four Matches).

Variables	Nearest neighbour matching			Propensity score matching		
	Difference	Standard error	*Z* statistic	Difference	Standard error	*Z* statistic
AGILITY	0.607	0.064	9.400***	0.465	0.063	7.350***
INTERNATIONALIZATION	0.145	0.080	1.800*	0.134	0.078	1.710*
EDUCATION	0.160	0.063	2.540**	0.196	0.074	2.66***
SIZE	0.142	0.068	2.090**	0.143	0.085	1.690*

Note. Robust regression coefficients.
*$p < .10$. **$p < .05$. ***$p < .01$.

strategies. The second approach, derived from the first, holds that these resources alone do not guarantee the success of any strategy; companies need to identify and handle externals hazards and detect and seize the opportunities arising from the turbulent context in which they operate, by transforming their original resources and capabilities (static) into new ones (dynamic).

In this context, the research has been carried out by conducting 1,044 telephone and online surveys with SME managers from different sectors all over Spain (providing a statistically representative sample of SMEs in Spain), in order to analyse the impact of four variables (OA, internationalization, manager education, and size) on the use of sustainable practices such as supplier selection, plastic packaging management, process design, energy management, water management, waste management, and environmental certificates in Spanish SMEs. These four independent variables were chosen because they are all related to one or both of the theories employed in our research to understand the sustainability performance of SMEs. These sustainable practices are linked to the SDGs that affect SMEs, and thus to the organizational transformation that is crucial for the competitiveness of this type of company considering the Agenda for Sustainable Development and the European Green Deal. The results obtained show a significant effect of all the concepts analysed on the SMEs' sustainable practices.

OA was measured through three items: efficiency in the production processes, speed of adaptation to changes in the market, and speed of sales growth. These elements were chosen because they have been analysed in previous studies on OA (Rabal-Conesa et al., 2022; Sun et al., 2022) and because of their relationship with the categories of variables describing agility (customer agility and operational agility). The results show a significant relationship between these variables and the use of sustainable practices.

One of the principal contributions of our study has been to add to the limited evidence on the effect of OA on sustainability activities in SMEs. To the best of our knowledge, there are no similar studies that analyse OA in relation to sustainability transformation practices in SMEs. The only evidence found was from a study conducted in Spain, but it only analysed the effect of OA on one specific sustainable practice (Rabal-Conesa et al., 2022).

The results show that a company can integrate sustainable practices into its activities if it can achieve greater efficiency in its production processes, greater customer satisfaction and faster adaptation to market changes than its competitors. OA involves adapting a

company's processes, responding to external pressures, fostering business transformational changes and dealing with market dynamics. Given that SMEs lag in the implementation of sustainable practices (Singh et al., 2020), particularly in Spain (Sánchez-Bayón, 2023), our study provides guidance for SMEs about how adopting an OA approach can benefit sustainable practices. OA fosters organizational flexibility, facilitating the embracement of sustainable practices in the organization (Bi et al., 2018). It leverages specific SME characteristics to meet the challenge of adopting sustainable practices (Boiral et al., 2014). Since customers are increasingly aware of and vocal about sustainable practices, SMEs embracing OA can rapidly address that concern without compromising company's productivity (Tiwari & Tiwari, 2020). By so doing, SMEs can also increase their effectiveness and competitiveness (Heinonen & Strandvik, 2018).

Given the dynamic nature of these capabilities, it can be concluded that dynamism and adaptability are necessary qualities for SMEs to adopt sustainability strategies, in line with the DCV approach.

Internationalization has a favourable effect on the adoption of sustainable practices in SMEs. Under the RBV, internationalization is considered a strategy to access additional resources, such as knowledge and skills (Attig et al., 2016). When operating in foreign markets, SMEs can gain experience of building new relationships with customers, suppliers, and regulators, and develop greater awareness of and sensitivity to sustainability issues in a different context (Strike et al., 2006). Moreover, internationally focused SMEs would need to comply with international sustainability standards and provide sustainable products and services (Laguir et al., 2016). SMEs need to develop dynamic capabilities to adapt their organizations to these new frameworks. As such, internationalization can be considered an institutional and contextual force that influences decisions about sustainable practices (Brammer et al., 2006). Furthermore, internationalization requires dynamic capabilities such as the ones analysed here.

Our approach is coherent with previous research and reinforces the idea that companies that internationalise can more readily adopt sustainability strategies. It is possible that, as these studies suggest, the key to this relationship lies in international SMEs' need for greater knowledge of sustainability (for example, the local sustainability standards and regulations in the area where they operate). However, it may also be explained by their (presumably greater) dynamism and adaptability, and the dynamic capabilities that internationalization generates in response to a dynamic environment.

The manager's education level also positively affects the adoption of sustainable practices. The idea of knowledge as a catalyst of the company's sustainability management has been empirically demonstrated (Hörisch et al., 2015; Roy & Thérin, 2008), in line with the RBV approach and, more specifically, an extension of said theory, the knowledge-based view (KBV) (Kogut & Zander, 1992). In this context, a manager with a university education is likely to exhibit transformational leadership aimed at leading the organization towards sustainable practices. Higher education provides managers with the knowledge and skills necessary to develop innovative, transformational ideas in demanding circumstances (Hausman, 2005; G. Wang et al., 2016). The knowledge, competences and skills acquired may help them to embrace these types of transformational practices.

In line with the literature, SME size was also found to have a significant impact on the knowledge and importance attached to the implementation of sustainable practices in SMEs. The smaller size of companies in Spain compared to the European average (4.5 employees on average compared to 5.9 in the European Union, with this figure exceeding 10 in countries such as Germany and the United Kingdom) (IPyME, 2023), is one of the structural difficulties that Spanish SMEs face. In accordance with the RBV, our results suggest that growth-oriented SMEs have access to more resources, which favours a rapid and swift orientation towards sustainability. We extend the literature showing a positive relationship between SME size and transformational strategies (Wamba & Carter, 2016). We go beyond the debate comparing large companies and SMEs, by showing that size heterogeneity is also crucial (OECD, 2021): larger SMEs are more likely to invest in innovative strategies (Falahat et al., 2020). In addition to physical and financial resources, the size variable also relates to the availability of knowledge, expertise, and skills, which are key factors in these strategies.

Implications of the Study

Regarding OA, the study carried out here is novel in this field and has shown the impact of three indicators of this type of capability (process efficiency, customer satisfaction and adaptation to change) on engagement with sustainability. This study contributes to the literature by extending the RBV and DCV to sustainability strategy, showing how SMEs can benefit from OA. Our conclusions show SME managers the benefit of adopting an OA approach in their organizations to overcome specific SME limitations and achieve sustainability goals. Policymakers can support this process by designing programmes that help SMEs to become more flexible; for example, through investment support and regulations to

foster resource flexibility. For researchers, we reveal the importance of the different analysed factors for sustainability. For SME managers, an awareness of the importance of these indicators may lead to greater knowledge about and commitment to sustainable practices, and thus to the achievement of the SDGs.

Regarding SME internationalization, there are some important implications to be drawn from our study. We apply the RBV and DCV to the framework of sustainable SMEs and confirm the need for dynamic capabilities and resources as drivers of sustainable practices. For SMEs, our results show that the integration of knowledge and capabilities from international markets can strengthen organizational flexibility and sustainability awareness, facilitating engagement with sustainable practices. From a policy point of view, we show that policies encouraging and facilitating the internationalization process may increase sustainability and engagement with the SDGs in SMEs. Our findings are particularly relevant for Spanish SMEs. The limited export capacity of Spanish SMEs is one of their structural weaknesses, as identified in the Strategic Framework. It is therefore essential for national policymakers to continue developing internationalization policies, not only to meet the objective of improving internationalization, but also because of its multiplier effect on other objectives, such as facilitating the transition of SMEs to a sustainable economy.

Management training also contributes to the development of sustainable practices. The lack of ecoliteracy in SMEs, traditionally cited as an explanation of these companies' lower interest in sustainability (Sikora, 2021), can be remedied by the competences acquired by their managers through university studies. For managers, our findings highlight that SME professionalization, or the incorporation of formal higher education, will help these types of organizations engage in sustainable practices. For policymakers, our study shows what type of programmes are needed for SME to embrace the sustainability transformation. Actions such as those envisaged in the Strategic Framework for the promotion of entrepreneurship in the university environment, or the promotion of multidisciplinary degrees that analyse sustainability problems and the different models for achieving sustainable development, can contribute to an improved educational level of managers and increase sustainability measures in SMEs. We contribute to the literature that refers to the RBV to explain SMEs' sustainable practices. Knowledge is critical for SMEs in this type of strategy transformation, especially in Spain given the lack of "green" skills (Sulich & Rutkowska, 2020) and the low level of accountability (Marco-Fondevila et al., 2018).

Finally, the size of SMEs also positively influences their sustainability. Our paper encourages Spanish SME managers to adopt a growth orientation which can facilitate the embrace of sustainable practices and reduce the gap with European SMEs in terms of the European Green Deal and the SDGs. In this vein, policymakers must develop public policies to foster SME growth, such as investment and labour support programs. Finally, for researchers, we show evidence on the size heterogeneity within SMEs, which can help to understand SMEs' failure to adopt a sustainability orientation.

Limitations and Future Lines of Research

Given the limitation of the cross-sectional nature of our data, a longitudinal study would provide evidence on trends in our data, allowing us to confirm our results over time. Moreover, our study only focusses on one specific country, so similar studies in different countries would show the extent to which our results are affected by the institutional context (Fonseca, 2015). The current importance of digitalization in SMEs in conjunction with sustainable practices also makes it worth analysing the interactions between the two or the impact of digital policies on sustainable practices. What is more, it would be interesting to check for potential nonlinear relationships or other interaction effects. Other potential lines of research could be the role of external stakeholders in driving sustainability practices in SMEs, or the influence of additional dimensions of managerial attitudes, which is particularly important in the case of internationalization. Finally, although surveys are efficient for large-scale data collection, our study may be subject to self-report bias.

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Data Availability Statement

Data sharing not applicable to this article as no datasets were generated or analyzed during the current study.

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