Understanding strategic responses to the COVID-19 crisis by manufacturing SMEs: A cluster analysis

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Abstract

Manufacturing small- and medium-sized enterprises (SMEs), which play a decisive role in the Spanish and European economies, have been particularly affected by the disruption generated by the COVID-19 crisis, with their strategic decisions key to main-taining their competitiveness. This article explores the strategic priorities defined by CEOs of manufacturing SMEs to face COVID-19-related challenges. Data were collected from 167 manufacturing companies through an online questionnaire and exploited with factorial and cluster analyses. The results highlight the strategic importance of developing more advanced business models, boosting customer responsiveness and developing innovative value propositions for a proactive response to the COVID-19 crisis. The value of this exploratory research lies in its contribution to research on the impact of the COVID-19 crisis on the strategic management of manufacturing SMEs from a quantitative perspective.

Keywords

business strategy, cluster analysis; business model innovation; managerial practices; manufacturing companies; SMEs; COVID-19

1. Introduction

Small and medium-sized enterprises (SMEs) are vital for the development of the Spanish and European economies. Their importance is reflected in their total number in the EU, their impact on numbers employed and the fact that they account for half of European gross do.mestic product (GDP). SMEs are key to responding to economic, environmental and societal challenges and central to the major transformations of our economies and societies. The competitiveness and prosperity of Europe and its various nations depend to a large extent on SMEs.

In the case of companies in the Basque Country in Spain, many SMEs are manufacturing companies that respond to an economy related to the automotive, aeronautical and machine tool sectors through the manufacture of components, assemblies, products and systems and through industrial services.

These industrial SMEs operate in globalised markets where competition, supply chain management, technology deployment, talent management and innovation are key competitive issues requiring constant response and investment (Herbane, 2019). In this already complex and demanding context, the COVID-19 pandemic has caused one of the biggest disruptions in the global and European economies and societies, brutally impacting SMEs' activities and businesses and jeopardising much of the employment they generate and their very survival.

However, not all sectors in which SMEs operate have been affected in the same way. Some sectors have been identified that have increases (logistics, retail, and food companies), large losses (industrial companies among them), moderate losses (the energy sector, caused in many cases by the reduction of industrial activity), and others with very small decreases or increases in activity (related to information and communication companies, which supported many industrial companies' remote activities (Gorgels et al., 2022)).

Similarly, at the level of the Basque Country in Spain, one study (Retegi et al., 2020) found that 9 of the 33 sectors analysed will require priority attention to mitigate the effects of the crisis, with 3 sectors presenting a severe risk (hotels and catering; commerce; and transport equipment) and 6 sectors a high risk (metallurgy and metal products; rubber, plastics and other non-metallic products; construction; transport and storage; recreational and cultural activities; and education). These 9 sectors account for 57% of total employment in the Basque Country.

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In this context, and due to the nature of SMEs, which makes them especially vulnerable to economic ups and downs and the impacts of crises such as COVID-19 and its aftermath, the real impact has been twofold. SMEs, mostly in intermediate positions in the value chain, have been affected on the one hand by a reduction in demand and on the other hand by a reduction in supply, affecting both their supply costs and sales opportunities. This situation has led to these companies facing certain challenges, as attested by recent research (Adam and Alarifi, 2021). These challenges refer to measures associated with the workforce, economic and financial aspects, digitalisation, the supply chain and others. In many cases, these challenges are interrelated, generating exponential effects on SMEs.

Despite the publication of an increasing number of research papers on the impact of the COVID-19 crisis on firms' and SMEs' management decisions in this context, the literature has focused mainly on large firms and paid less attention to smaller firms. The relevance of this phenomenon is even more important if we consider that prior to the COVID-19 crisis, these companies were already experiencing a number of major changes in their competitiveness and challenges, stemming from market and industry changes (Iborra, Safón and Dolz, 2020), digital transformation (Priyono, Moin and Putri, 2020) and Industry 4.0 (Ibarra, Ganzarain and Igartua, 2018) .

Consequently, how SMEs vary their business strategies to cope with unexpected events remains a topic of high interest and topicality and an underexplored field of research that brings value to the field of strategic management in SMEs. In this context, it is important to understand the strategies of manufacturing SMEs and the role of business model innovation. Research underlines the fact that strategic decisions condition firms' organisational performance (George, Walker and Monster, 2019) and competitiveness (Mueller, Mone and Barker III, 2007).

This research focuses on the strategic priorities adopted by a sample of SMEs in Gipuzkoa (Spain) in relation to their response to the COVID-19 crisis. Specifically, this article analyses these priorities from a managerial perspective (Lorentz et al., 2016). The process of adaptation and response in the short, medium and long term that a crisis such as COVID-19 requires reflects an organisation's strategic choices. This situation accentuates the role of the leaders and managers of the organisation (e.g. the owner or manager of the SME) because it is they who, through their decisions, guide the internal and external management choices to be made based on their resources (Blackmore and Nesbitt, 2013). The importance of the role of leaders is consistent with previous studies that argue that leadership is an essential factor for the future of SMEs in both manufacturing (Achanga et al., 2006) and start-up SMEs (Muijs, 2011).

Given the scarcity of empirical evidence analysing the complexity of strategic decisions made by SMEs in the context of COVID-19, this research focuses on this type of firm, which makes it particularly relevant. This research poses the following question: What strategic responses did manufacturing SMEs set out to develop prior to the COVID-19 crisis?

The article is organised as follows. First, we outline a literature review in relation to strategic priorities and dimensions; second, we describe the research method and design and the data collection procedures. We then present the analyses conducted and the results generated. The next section focuses on the study's conclusions and highlights its theoretical contributions and managerial implications. Finally, the the study's limitations and future lines of research are outlined.

2. Literature review

2.1. Strategic priorities

Companies and their managers have sought to define and prioritise strategies to ensure the continuity and competitiveness of their businesses in the face of a global market, increasingly tough competition and an increasingly complex environment (Christopher, 1999). This activity has been further accentuated by different waves of crises and challenges, such as the one provoked by the COVID-19 pandemic. In this article, we refer to all the necessary strategies that an SME uses to ensure its sustainability by fulfilling its vision and mission. These decisions are responsible for SMEs' evolution and business performance and their success in achieving their objectives and lead to the prioritisation of actions to be taken (Kim, 2013; Lorentz et al., 2013).

Strategic priorities take into account the ranking of the organisation's strategic goals and objectives according to their importance for the company's competitive future (Lorentz et al., 2016; Conz, Denicolai and Zucchella, 2017; Rashidirad and Salimian, 2020). Strategic priorities are the basis for how the different functions will orient their activities and prioritise the organisation's resources and processes.

In this article, priorities, as strategically important objectives, are seen as comprising the key performance areas of the organisation's various key functions and capabilities. A basic framework of strategic priorities is set out that outlines the main performance areas where SME managers can direct their improvement efforts. The different ways in which a company chooses to become more competitive and face the challenges of the future (i.e. strategic priorities) is what some authors (Leong, Snyder and Ward, 1990; Ward and Duray, 2000; Dangayach and Deshmukh, 2001; Kharub, Mor and Rana, 2022) define as strategic preferences or

objectives. As expressed by different researchers (Lukito-Budi, Manik and Indarti, 2023), responding to the business challenges posed by the COVID-19 crisis requires, in many cases, the identification and establishment of specific strategic priorities.

The next sub-section sets out the strategic priorities highlighted in the literature, which served as the basis for the quantitative study presented in this article.

2.2. Strategic dimensions

The theoretical underpinnings of this research are based on resource and capability theory (Gebauer, 2011; Gebauer, Worch and Truffer, 2012) and supported by research that emphasises the role of context in strategy setting (Barney, 2001).

This research takes as its reference different capabilities that make up different strategic dimensions (Anand and Ward, 2004) that impact companies' competitiveness: organisational culture (Jardioui, Garengo and El Alami, 2020); strategy formalisation (Fréchet and Goy, 2017); customer orientation (Peillon, Dubruc and Mansour, 2018); value proposition development (Neuhüttler, Woyke and Ganz, 2018); value chain improvement and development (Noke and Hughes, 2010); people and talent management (Shipton et al., 2006); resource efficiency and flexibility (Leitner and Güldenberg, 2010); open innovation practices (Hossain and Kauranen, 2016); product and service innovation (Visnjic, Wiengarten and Neely, 2016); business model innovation (Foss and Saebi, 2017); and management maturity (Ongena and Ravesteyn, 2020).

For some authors, the interactions of this set of capabilities can predict firm performance (Christiansen et al., 2003). The prioritisation of these practices can also suggest patterns of strategy maturity, especially under conditions of major change (Ibarra et al., 2020).

2.2.1. Organisational culture

Much research highlights the crucial role of organisational culture in firm performance and business competitiveness (Su, Baird and Blair, 2009; Vecchi and Brennan, 2009; Alves and Alves, 2015). In addition, organisational culture plays an important role in the sustainability of business performance over time (Fey and Denison, 2003; Gregory et al., 2009; Zheng, Yang and McLean, 2010; Jardioui, Garengo and El Alami, 2020).

This observation implies that, being aware of this reality, managers and consulting firms seek to change the organisational culture of companies and develop innovative ways and methods of managing this culture. This influence on the importance of organisational culture in the decisions taken by company managers has been corroborated by studies (Allaire and Firsirotu, 1984; Fontaine and Richardson, 2003) that found that organisational culture has a significant influence on management practices.

Based on different authors (Schein, 1990; Deshpandé and Farley, 2004), we refer to organisational culture as the set of shared values and beliefs that help individuals to understand organisational functioning, as it‘provides them with the norms of behaviour in organisations. Organisational culture can thus be understood as a combination of shared values and ways of working that individuals adopt in organisations (Gallear and Ghobadian, 2004; Jardioui, Garengo and El Alami, 2020).

2.2.2. Strategy formalisation

Another strategic priority to be addressed by a company in response to crisis situations concerns the formalisation of strategy and the establishment of more or less open procedures to ensure the definition and development of such (Fasth et al., 2022). Different studies have shown that despite the existence of critical views and approaches that encourage unstructured models, the formalisation of strategy in the form of strategic planning or strategic challenges has a generally positive impact on organisational performance, both in large companies and SMEs (Delmar and Shane, 2003; Burke, Fraser and Greene, 2010). In the same line of work focusing on SMEs, researchers have argued that these firms also benefit from strategy formalisation (Song et al., 2011; Dibrell, Craig and Neubaum, 2014; Fréchet and Goy, 2017).

Other studies (Fasth et al., 2022) underline the importance of SMEs developing strategic processes based on information sharing to shape the firm’s responses and on clearly defined and structured formal planning. For these authors, companies need to develop formal strategy-setting procedures, incorporating elements of external analysis and influences to better respond to crisis situations such as that associated with the global COVID-19 pandemic.

2.2.3. Customer orientation

Companies develop their activities based on three fundamental resources: customers, the competences available to the organisation and the knowledge it possesses. By integrating them, companies base their competitiveness on having staff with different skills and knowledge, which supports the organisation’s activities and offers products and services to its customers (Peillon, Dubruc and Mansour, 2018). These integrated competences provide a total solution to customers. For industrial companies, the provision of increasingly advanced services requires them to have

intense relationships with their customers (Gebauer, Fleisch and Friedli, 2005). It is important for the development and delivery of more value-added services that manufacturing companies develop customer-centric behaviour (Peillon, Dubruc and Mansour, 2018). Customer orientation in manufacturing companies helps customer–supplier relationships to evolve, leading to the development of more proactive, flexible, personalised and long-term relationships.

2.2.4. Value proposition development

Many organisations, including industrial SMEs, need to rethink their value strategy and debate how more innovative practices could enable them to create greater value and ultimately improve their competitive position. This debate has been heightened because of the economic and competitive environment generated by COVID-19. In an environment subject to rapidly changing conditions, companies must adapt to the dynamic markets in which they operate, and active management of value propositions is key (Lusch and Nambisan, 2015; Green, Davies and Ng, 2017). This strategy is about companies developing new value propositions or evolving existing ones through processes that take customer contexts into account (Liu et al., 2020). One of the keys to developing more competitive value propositions relates to innovating and rethinking value creation processes, involving multiple stakeholders in the design and key activities and processes of organisations to achieve mutually beneficial impacts. This is a shift from previous approaches, which focused on the activities of adding or delivering value to customers and underlines the fact that value is only created when customers accept the value proposition (Baumann et al., 2017; Neuhüttler, Woyke and Ganz, 2018).

2.2.5. Value chain improvement and development

In today's fast-changing environment, SMEs have, more than ever, to reposition themselves quickly along their value chain to respond to rivals and meet market changes and challenges (Noke and Hughes, 2010). This means that the company must consider how to approach the upgrading and development of its value chain. The value chain (Porter, 1985, 1990) defines the set of activities carried out by a company. Through its analysis, organisations can propose actions for improvement and innovations that provide them with competitive advantages (Kaplinsky, 2000). According to some authors (Edwards, Battisti and Neely, 2004) the firm can propose three strategic options: increasing efficiency and effectiveness along value chain activities (by adopting better production practices); introducing innovations in the production process; or adopting a strategic change of position in the value chain.

2.2.6. People and talent management

Much research has studied the relationship between human resource management (HRM) practices and business performance (Bowen and Ostroff, 2004; Boselie, Dietz and Boon, 2005; Purcell and Hutchinson, 2007; Paauwe, 2009), with some studies also addressing the impact of HRM practices on organisational innovation (Shipton et al., 2006). According to some of this research, HR practices promote performance through mechanisms such as human resource planning, the development of profit-sharing models, performance appraisal mechanisms, employee attraction and selection processes, training and development plans, remuneration and other motivational mechanisms. Furthermore, these authors note the multiplier effect of the combination of these practices, which they consider to be greater in many cases if these practices are developed in a combined and interrelated way.

In relation to the role of people in organisational innovation, different research considers it key that people along company functions and departments play an important role in relation to innovation, either by proposing improvements themselves or by supporting others in the task of innovating (Laursen and Foss, 2003).

2.2.7. Resource efficiency and flexibility

The development of an adequate response in the short, medium and long term is considered by researchers as one of the keys in the transit of SMEs through different crises (Leitner and Güldenberg, 2010), such as that caused by COVID-19. Although overcoming the crisis involves different measures and great efforts, research emphasises the need to pay special attention to cost minimisation (Eggers and Kraus, 2011; Smallbone et al., 2012) and the development of other strategic priorities related to income generation through business model innovation (Macpherson, Herbane and Jones, 2015; Morrish and Jones, 2020), the development of advanced channels with stakeholders (Doern, Williams and Vorley, 2019; Doern, 2021; Mayr, Duller and Königstorfer, 2022) and dynamic and flexible resource management (Battisti et al., 2019; Osiyevskyy, Shirokova and Ritala, 2020; Pusceddu, Moi and Cabiddu, 2022). In addition to SMEs becoming more efficient, studies show the need for SMEs to be agile and to have plans in place to prevent undesirable outcomes of crises in a timely manner and respond immediately to environmental changes.

2.2.8. Open innovation practices

Open innovation is an innovation strategy that incorporates knowledge from both outside and inside firms

into the innovation process, enabling firms to exploit their own knowledge and explore the knowledge around them (Chesbrough, 2003; Bogers et al., 2019). For all firms, including SMEs (Hossain and Kauranen, 2016), open innovation is an approach of high interest that helps to break many of the limitations of this type of firm related to the availability of resources and access to knowledge, thus providing competitive advantages to those who adopt it (Carrasco-Carvajal, Castillo-Vergara and García-Pérez-de-Lema, 2023)

Some studies (Odriozola-Fernández and Berbegal-Mirabent, 2022) indicate different strategies that SMEs can follow in relation to open innovation (inbound, outbound and coupled), while highlighting the combined effect of open innovation on innovation performance and strategy, which have been found to determine firm performance.

2.2.9. Product and service innovation

Research has underlined the role of innovation in SMEs as a response to market challenges and crises (Visnjic, Wiengarten and Neely, 2016). Various studies note the positive relationship between innovation and business performance in SMEs (Gunday et al., 2011; Rosenbusch, Brinckmann and Bausch, 2011). Similarly, other researchers stress the importance for SMEs of developing innovation capabilities, as doing so impacts their performance (Calantone, Cavusgil and Zhao, 2002; Rajapathirana and Hui, 2018; Iddris, 2019; Bao et al., 2020; Saunila, 2020; Jin et al., 2022). Among the different practices in relation to innovation in SMEs, those related to the development of new products and services that respond to customer needs in a more competitive and profitable way than the existing ones stand out. This focus on the development of innovative products and services has been evidenced in studies related to SMEs' response to the COVID-19 crisis (Adam and Alarifi, 2021).

2.2.10. Business model innovation

Innovation in business models is a key driver of competitiveness and performance (Visnjic Kastalli and Van Looy, 2013; Heij, Volberda and Van Den Bosch, 2014; White et al., 2022), although it can be considered a newly emerging term (Foss and Saebi, 2017). Unlike product and service innovation, business model innovation refers to the new ways an organisation implements to create, deliver and capture value from its customers (Chesbrough, 2007; Amit and Zott, 2012; Casadesus-Masanell and Zhu, 2013; Kim and Min, 2015; Teece, 2018). Different studies have indicated that business model innovation is a key factor for SMEs' survival and superior performance (Anwar, 2018; Bouwman, Nikou and de Reuver, 2019; Gatautis, Vaiciukynaite and Tarute, 2019; Latifi, Nikou and Bouwman, 2021).

2.2.11. Management maturity

Processes, together with projects, are the backbone of any organisation, including SMEs. The management and improvement of these processes and the ability of a company to formally manage its organisation through processes allow it to be sustainable over time, to achieve higher levels of competitiveness and, ultimately, to obtain better returns (Ongena and Ravesteyn, 2020). Therefore, many organisations seek to improve their process by improving the maturity of their business process management (Jones and Linderman, 2014; Ling S., 2016).

For processes to be considered key competitive factors, SME managers must commit to the formal management of these processes (Zhang, Kang and Hu, 2020) and prioritise them, taking into account their interrelationships. Furthermore, to monitor and improve their processes, SMEs need to define the objectives of a process as well as appropriate performance indicators (Škrinjar and Trkman, 2013), while defining clear roles and responsibilities, using best practices and/or standards for process management (Jin et al., 2022).

Another key element related to advanced management has as its most important foundation the principle of continuous process improvement (Choi and Liker, 1995). Perseverance in improvement and the implementation of continuous improvement techniques, approaches and tools is what makes an organisation advance in its organisational and management maturity.

3. Objectives and methodology

3.1. Objectives

The aim of this research is twofold. First, it aims to investigate different groups of SMEs' strategic priorities; second, it aims to analyse the characteristics of the different groups. This exploratory study uses data collected through a structured questionnaire completed by the CEOs of SMEs participating in a COVID-19 crisis response initiative launched by the Department for Economic Promotion, Tourism and Rural Environment of the Provincial Council of Gipuzkoa in 2020. The sample comprised 167 manufacturing SMEs.

3.2. Measures

As discussed, the theoretical underpinnings of this research are based on resource and capability theory (Yeon et al., 2022) supported by research that emphasises the role of context in strategy setting (Barney, 2001). The survey

was developed taking into consideration the literature and elements described in the previous section and contextualised on the basis of reports on the impact of COVID-19 in the Basque context (Retegi et al., 2020) and bilateral discussions with the Department of Economic Promotion, Tourism and Rural Environment of the Provincial Council of Gipuzkoa and researchers from ORKESTRA (Basque Institute of Competitiveness). We created variable measures with representative items on a Likert scale reflecting strategic priority from 1 (not important) to 5 (very important). The questionnaire was accessible via a website, and the respondents accessed it online. A pilot with personal interviews was conducted to verify the survey. The survey was addressed to the CEOs of the companies.

3.3. Data collection and analysis

The data were collected through an online survey based on a 36-item questionnaire measuring the strategic relevance of practices on a 5-point Likert scale and explored through cluster analysis. Before performing the cluster analysis, an exploratory factor analysis (EFA) was carried out using the maximum likelihood method. Calculations of different statistics were previously carried out to determine whether the application of the factor analysis was justified. For the clustering, the log-likelihood distance measure and the Schwarz clustering criterion (BIC) were used. For each case, a clustering variable was created to develop the analyses shown in the following section. All analyses were performed using SPSS statistical software, version 28.0.

3.4. Sample selection and data analysis method

This research analysed the strategic priorities indicated by the CEOs of 167 manufacturing SMEs. These companies represent 100% of the manufacturing firms participating in an institutional support programme to alleviate the consequences of COVID-19 on companies in Gipuzkoa (Basque Country, Spain). Table 1 shows these SMEs' heterogeneous distribution according to the NACE - Statistical Classification of Economic Activities of the European Community (Eurostat, 2008), highlighting those companies related to the manufacture of fabricated metal products, except machinery and equipment. The firms could also be classified according to their technology intensity: 57.49% of the population were medium-high technology level companies, 39.52% were low technology firms and 2.99% were high technology companies. Regarding the size of the companies analysed, 47.90% of the companies had between 11 and 49 employees, 10.18% of the companies had more than 50 employees and 41.92% of the companies had 10 or fewer employees.

Table 1 Distribution of the sample by type of industry.

NACE 2 (Rev. 2)	Percentage
Manufacture of food products	5.39%
Manufacture of beverages	4.19%
Manufacture of wearing apparel	1.20%
Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials	3.59%
Manufacture of paper and paper products	3.59%
Printing and reproduction of recorded media	4.79%
Manufacture of chemicals and chemical products	2.99%
Manufacture of rubber and plastic products	7.19%
Manufacture of other non-metallic mineral products	2.40%
Manufacture of basic metals	2.40%
Manufacture of fabricated metal products, except machinery and equipment	35.93%
Manufacture of computer, electronic and optical products	2.99%
Manufacture of electrical equipment	2.99%
Manufacture of machinery and equipment not elsewhere classified	13.77%
Manufacture of other transport equipment	0.60%
Other manufacturing	1.20%
Repair and installation of machinery and equipment	4.79%
Total	**100.00%**

The database of manufacturing companies was developed as part of a research project carried out with the support of the Gipuzkoako Foru Aldundia - Diputación Foral de Gipuzkoa. The data were anonymised, and confidentiality was maintained.

4. Results

We used two-step cluster analysis (Lorentz et al., 2016) with prior descriptive statistical analysis to check the necessary conditions. Before proceeding to the cluster

analysis, we checked for multicollinearity by analysing the correlation between the cluster variables. The rotation converged in12 iterations, which allowed us to maintain the independence between the rotated factors to obtain a final structure of 9 factors with eigenvalues > 1, which together explain 62.76% of the variance.

To investigate the heterogeneity among the firms in identifying strategic responses, a two-stage cluster analysis was conducted based on the nine extracted factors:

- Advanced business models (BMI): Digital offer, revenue generation through new sources and channels, development of new business logics (pay-per-use, subscription, etc.) and reinvention of business logic (customers, activities, suppliers, resources, revenue model)
- Customer responsiveness (CUSTOMER): Risk assessment and management, adaptation to new environments and challenges, customer segmentation, understanding customer needs, transformation of customer relationships, agile validation of value propositions, rapid adaptation to new environments and challenges and customer engagement
- Value proposition innovation (Value INNO): Development of new value propositions and ideation of new products or services
- Value chain efficiency (EFFICIENCY): internal and external value chain transformation, new logistic approaches, changes in the value chain and cost-efficiency
- Roadmap (ROADMAP): Development of a roadmap for continuity and for transformation to face future challenges and have the resources, capabilities and key competences for the future
- New channels (CHANNEL): Development of distribution channels that respond to the needs of each customer segment and new integrated distribution channels
- Innovation culture (CULTURE): Encourage experimentation to seek out new opportunities and exploit them, exchange knowledge and approaches among people and participate actively in the company
- People (PEOPLE): People´s skills development and training, polyvalence of people, retaining and attracting talent and promoting and facilitating a co-responsible work–life conciliation
- Own products (Own PRODUCTS): Development of own products (goods, services) and marketing them directly.

The data analysis led to the creation of two clusters (Cluster 1 with 95 firms (56.9%) and Cluster 2 with 72 firms (43.1%) with fair quality (silhouette measure of cohesion and separation = 0.3) and a value above 0.0, suggesting validity of the within and between-cluster distances. T-test analysis confirmed the significance of the differences in the means of the nine factors between the two groups, with significantly higher values for all factors in the second group (Table 2).

Table 2 Mean differences for variables between clusters

Measure	Cluster 1	Cluster 2
	Mean ± SD	Mean ± SD
BMI	2.00 ± 0.86	3.34 ± 0.74
CUSTOMER	3.76 ± 0.60	4.55 ± 0.29
Value INNO	3.47 ± 1.02	4.61 ± 0.47
EFFICIENCY	2.94 ± 0.88	4.03 ± 0.76
ROADMAP	3.45 ± 0.90	4.26 ± 0.48
CHANNELS	1.76 ± 1.20	3.24 ± 1.64
CULTURE	3.68 ± 0.84	4.44 ± 0.55
PEOPLE	3.85 ± 1.05	4.55 ± 0.48
Own PRODUCTS	1.69 ± 1.43	4.44 ± 0.55

BMI (Business Model Innovation), followed by the CUSTOMER and Value INNO factors, were the most important predictors for cluster creation (Fig. 1).

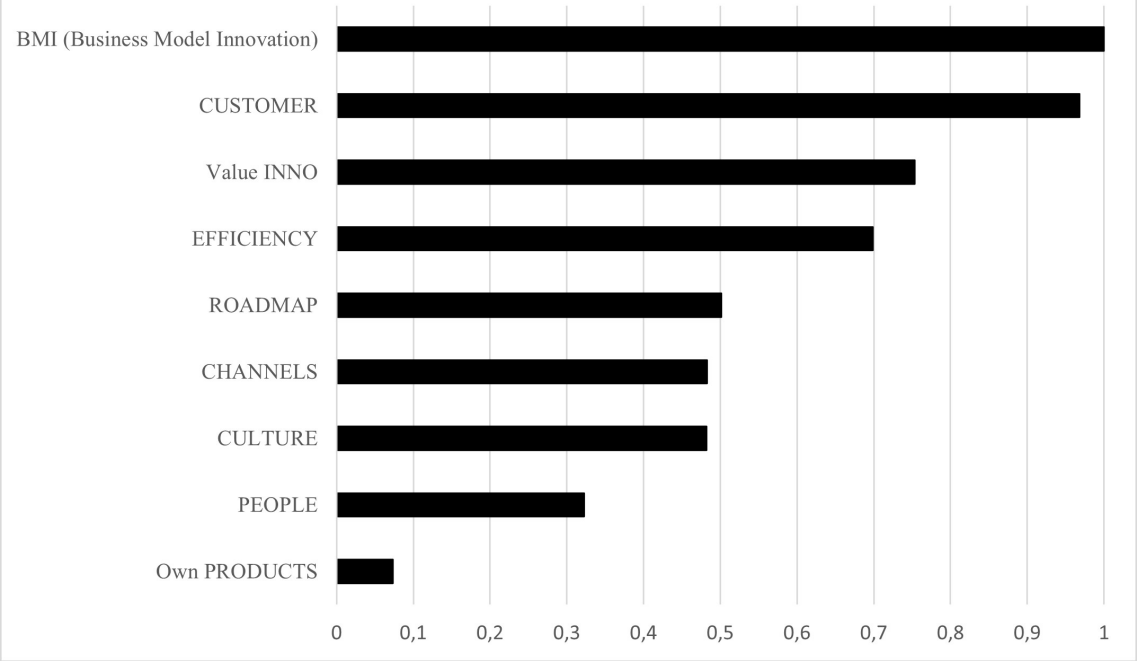

Figure 1 Cluster formation predictor importance

The two clusters reflect the different strategic priorities adopted by the industrial companies participating in the study in response to the COVID-19 crisis. In this sense, a crisis context, which is recognised as a determinant in the configuration of a company's strategies (Sirmon, Hitt and Ireland, 2007), resulted in the identification of two different ways of facing business challenges, such as those caused by COVID-19.

The companies in Cluster 1 (innovation-reactive) seem able to combine customer orientation with innovation in their value proposition, although without prioritising the configuration of an offer focused on the development of their own products (taking more of a subcontractor approach), development of new distribution channels and implementation of advanced business models. Furthermore, for the development of these strategic priorities, they believe it essential to respond to the changing needs of customers based on trained and versatile personnel to meet current and future challenges.

As for Cluster 2 (BM-innovative), these companies emphasise the development of innovative business models (BMI) based on promotion of a digital offer, generation of revenue through new sources and channels, development of new business logics (pay-per-use, subscription, etc.) and reinvention of the business logic (customers, activities, suppliers, resources and revenue model). This group of companies also emphasises strategy related to the commercialisation of its own product offer (goods and services) beyond an outsourcing approach. In addition, the companies in this cluster prioritise the development of distribution channels that respond to the needs of each of their customer segments.

The results generally support the idea that the group of SMEs participating in this study are seeking to set up response models aimed at ensuring the continuity of their activities while simultaneously seeking to transform their activities. One group of companies (the innovation-reactive cluster) that is still reacting to the situation do not place so much emphasis on prioritising strategies for the provision of resources, capacities and key competences for the future (ROADMAP) and the development of advanced business models. In contrast, another group of companies (the BM-innovative cluster) emphasises the strategy of having key resources, skills and competences for the future (ROADMAP) and development of innovative business models (BMI), thereby strategically prioritising the promotion of experimentation, the search for new opportunities and their exploitation and the exchange of knowledge and approaches between people and their active participation (CULTURE).

Analysing the level of management in which the companies consider themselves to be situated (management maturity), Table 3 shows the percentage distribution of the companies according to this variable in the two clusters. The companies that consider themselves a driver or advanced are mainly located in Cluster 2 (BM-innovative), and the companies that consider themselves reactive, initial or managed are in Cluster 1 (innovation-reactive).

Table 3 Distribution of companies by management maturity in each cluster.

Management maturity	Cluster 1	Cluster 2	Total
Driver	33.33%	66.67%	100.00%
Advanced	25.00%	75.00%	100.00%
Managed	69.41%	30.59%	100.00%
Reactive	94.44%	5.56%	100.00%
Initial	80.00%	20.00%	100.00%
Total	56.89%	43.11%	100.00%

5. Conclusions

Our empirical research results contribute to the field of strategic research in industrial SMEs with a series of contributions. First, although different research has been carried out on the impact of the COVID-19 crisis on different companies, the emphasis in this study was placed on SMEs and based on the theory of resources and capabilities, which emphasises the role of context in the establishment of strategies. The results of the two-stage cluster analysis suggest the existence of two strategic configurations of response to the COVID-19 crisis among the analysed manufacturing SMEs (Table 1). Specifically, those strongly committed to a proactive and agile response in relation to their customers, the development of advanced business models and innovations in the value proposition and those that adopt a more reactive stance in relation to these three main strategic practices.

Second, the research has identified predictors for cluster creation (Fig. 1). The strategic priorities related to business model innovation (BMI) based on driving a digital offer, generating revenue through new sources and channels, developing new business logics (pay-per-use, subscription, etc.) and reinvention of the business logic (customers, activities, suppliers, resources and revenue model), together with the strategies of rapid response and adaptation to customers (CUSTOMER) and those related to the development of new value propositions and the ideation of new products and services (Value INNO) are the main predictors of the configuration of clusters.

Third, and not least, our results seem to indicate that the strategic priority related to the degree of management maturity (Table 2) determined by a firm's ability to formally manage its organisation through processes and to continuously improve the management of these processes is somehow related to the positioning of firms in a particular cluster. The group of companies that is more proactive in strategic transformations (Cluster 2) towards responding to the COVID-19 crisis is the group that strategically prioritises a more mature management, as opposed to the more reactive group of companies (Cluster 1), which does not have such advanced strategies in relation to management maturity.

6. Theoretical and practical implications

Despite the limitations of this research, the results constitute an important input for managers and policymakers. For SME managers, a path to recovery is marked by a number of' strategic priorities that underline the importance of customer responsiveness and innovation as common elements for different manufacturing SMEs. Complementarily, the results also qualify the fact that the adoption of more advanced strategies aimed at BMI must go hand in hand with other more innovative changes in supply and distribution channels, all of which require a maturity in management without which it seems difficult to adopt such advanced approaches.

Finally, the research identifies priorities for action for policymakers and intermediary organisations supporting SMEs, as the analysis in this study underlines once again the importance of innovation and strategic focus as keys to the future recovery of companies in crisis situations and contexts, such as that caused by COVID-19, while showing the need for governments to develop support policies segmented in relation to their management maturity and more or less proactive or reactive strategic approaches.

7. Limitations and guidelines for future research

Although this research makes contributions in relation to the strategic priorities and practices of SMEs in crisis situations, such as that provoked by COVID-19, this study has some limitations. On the one hand, the sample of participating companies is relatively small due to the voluntary participation in the public initiative to support SMEs. Therefore, a control group not participating in the public initiative would help minimise this circumstance. On the other hand, the study is limited to a specific geographical territory in which other contextual factors may have influenced the results. More geographically extensive research could be developed. Finally, it should be noted that the strategies defined will probably have been influenced by the impacts of Covid-19 on the different types of industry, and future analyses could be developed in this regard.

Future research on the topic could also study other business sectors (e.g. trade), compare strategic priorities across sectors and develop corroborating longitudinal studies. In addition, the research design and methodology could be transferred to other regional contexts, markets and economic conditions.

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9. Ethical considerations

No personal data were collected for this research (anonymous responses). The authors confirm that they are not subject to any conflict of interest in relation to this research with any company or organisation that may benefit from this article, beyond their academic or professional positions.

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