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Article

Investigating the Research Trends on Strategic Ambidexterity, Agility, and Open Innovation in SMEs: Perceptions from Bibliometric Analysis

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Abstract: The unprecedented conditions of restrictive measures that were suddenly imposed in 2020 due to the outbreak of the COVID-19 pandemic affected business activity globally. To deal with the consequences that were caused by the pandemic, most SMEs had to adopt strategies which will enhance their development and footprint in the business arena. With this study, we aim to propose a theoretical approach, via bibliometric analysis, of a new business model innovation that will be based on the triple-win formula of strategic agility, ambidexterity, and open innovation. Open innovation can help SMEs develop their ambidexterity and agility capacity and become more efficient, which can contribute to gaining competitive advantage. To approach this issue, a bibliometric analysis was conducted based on 606 articles that were published in the timespan of 2008–2021. The bibliometric analysis used various indicators such as the scientific production in the studied field, h-Index, co-occurrence collaboration, Multiple Correspondence Analysis (MCA), keyword analysis, and thematic mapping. Biblioshiny and VOSviewer were used to process the data, and contributed to the visualization of the results. Of the 476 sources that were analyzed, most of the articles were published by *Journal of Business Research*; British scholars are those with the highest number of citations on the topic. This research provides insights related to the state of the art of the study area under analysis and highlights the gaps, which contributed to the building of a new business model innovation that will integrate not only ambidexterity and strategic agility, but open innovation, too. The new business model can help SMEs quickly adapt in the new business environment created by the past successive series of crises, such as the most recent financial crisis and the COVID-19 pandemic.

Keywords: ambidexterity; agility; SMEs; accounting outcomes; strategy; competitive advantage; open innovation; business model innovation



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1. Introduction

Small and medium-sized enterprises (SMEs) can be characterized as the driving force of both the national and international economy; they contribute significantly to the creation of new job positions, the production of added value, and the enhancement of GDP. SMEs also play an important role in boosting employment, competitiveness, and innovation, while ensuring social stability. However, their survival is a major challenge in today's competitive world. Continuous modernization in production and management processes, innovative services and products, access to relevant information and financing, adoption of previous technologies, data utilization, and networking and collaborations are required.

The COVID-19 pandemic affected SMEs in different ways. SMEs were faced with significant challenges and sudden constraints, operating in a peculiar “lockdown” regime as well as in an environment of rapid demand restraint, combined with a situation of disrupted international supply chains [1]. In addition, SMEs have experienced decreases in sales, and their wider operation in terms of their production capacity and liquidity adequacy were

affected in various ways. At the same time, SMEs have been the recipients of extended stimuli, because of which they are looking for ways to adapt and transform their activities to maintain their business continuity by securing jobs and to actively contribute to the fight against the crisis.

However, SMEs were found weakened in tackling the above multidimensional challenges. In this light, the development of a hybrid set of strategies can be an important springboard for SMEs to improve their productivity and enhance their efficiency [2]. Ambidexterity is widely used in the literature of business management and is a key strategy through which businesses can seek to explore and exploit activities simultaneously. This type of hybrid strategy refers to the organizational potential of both exploiting existing skills and exploring new opportunities [1–3]. The concept of ambidexterity has a metaphorical meaning and is used to characterize organisms/businesses that can exploit and explore at the same time. In short, this definition implies the achievement of conflicting goals: efficiency versus flexibility, stability versus adaptation, and short-term profits versus long-term growth [4,5]. Among the types of ambidexterity, organizational ambivalence is the most widely used and concerns an important research model in the theory of organizational innovation. The term organizational ambidexterity was first used by Duncan (1976), but March (1991) was the one who gave the impetus for the development of the concept, as it was the determining factor in intense research activity [6,7].

However, in addition to ambidexterity, agile methods can contribute to the creation of a hybrid company. Agile management strategies have become popular in recent years since they offer the ability to execute tasks more easily and in a more anthropocentric way. Moreover, this type of strategy represents a rising set of project development methodologies based on the principles of adaptability and flexibility [8,9]. Agile strategies attempt to both improve and address the problem areas of the so-called traditional strategies and are based on a completely different approach, which usually has the following characteristics: (i) requires cooperation with the client who is essentially involved in the implementation of the entire project and (ii) has the ability to adapt, i.e., to make changes at any stage of project creation [10].

In addition, more open innovation means more agility and ambidexterity for a company. Open innovation expresses not only the need of SMEs to explore their environment, but their need to adopt new ideas. The next important step for SMEs is to manage these ideas properly, with the main goal to turn these ideas into successful products or services that are marketed and help increase the revenue and profitability of the companies. This business capacity is significantly linked to both business agility and ambidexterity.

The scope of this paper is threefold. We sought to (i) to examine the relationship between ambidexterity, agility, and open innovation; (ii) to investigate the role of ambidexterity, agile practices, and open innovation in the development of a hybrid set of strategies for SMEs; and (iii) to highlight the key trends and characteristics of this new hybrid strategic model [11,12]. There are few studies that analyze this issue, and they often refer to large companies. Only a smattering of studies discuss the relationship between ambidexterity, agility, and open innovation in SMEs in the post-pandemic period. To approach the above issues, Bibliometrix analysis with R package was applied. Consequently, in this paper, we provide a bibliometric approach to the development of a hybrid model of strategies for SMEs by integrating ambidexterity, agility, and open innovation strategies [11,13]. Moreover, the bibliometric analysis highlights the state of the art of this research field and indicates the key trends and other relevant indicators by examining articles published on the Scopus database. Lastly, the content analysis with R package and the use of Biblioshiny and VOSviewer software led to the identification of gaps and opportunities for SMEs through the adoption of a hybrid strategic model with ambidexterity and agility [14,15].

The paper is structured as follows. Section 2 defines the concepts of ambidexterity, agility, and open innovation strategies and the importance of the integration of these practices in the business strategy of SMEs as an ideal way to mitigate the effects of a crisis and adjust promptly to the new needs of the market. Section 3 describes the methodology

that was applied. Section 4 presents the results which were visualized by Biblioshiny and VOSviewer software, both based on R package. Section 5 discusses the findings and future research proposals for the field, and Section 6 concludes the paper.

2. Literature Review

An ambidextrous organization or business is one that is distinguished by its ability (i) to align and be effective in managing current business requirements and (ii) to adapt to changes in its environment (internal and external). Organizational ambidexterity is widely recognized as an important research model in the theory of organizational innovation [16,17]. The basic idea of ambidexterity is that businesses, independently of their size or activity, are called upon to face often conflicting and interrelated demands in their daily operations. Those that manage to achieve the coexistence of these two factors are then considered as successful. Organizational ambidexterity is an emerging issue in the field of management and emphasizes that companies that can coordinate and integrate conflicting activities and can achieve their goals and business continuity. The term organizational ambidexterity was first used by Duncan (1976), who can be considered as the “father” of the study of this knowledge field [6].

To achieve business ambidexterity is to balance exploration and exploitation. This will allow companies to be creative and adaptable, while continuing to rely on traditional and proven methods [18]. Based on that, March suggested that exploration includes search, risk-taking, differentiation, flexibility, experimentation, play, discovery, and innovation, while exploitation includes selection, production, improvement, efficiency, implementation, and execution [7,10]. Exploration and exploitation are necessary but conflicting activities that organizations must undertake to survive and prosper in the long run [19]. While previous research has questioned the ability of organizations to address exploration and exploitation simultaneously and effectively, considered as incompatible activities, March’s argument that successful businesses are ambivalent has contributed to shifting research from compromise to a paradoxical way of thinking [20]. Specifically, March (1991) argued that businesses should be aligned in both exploitation and exploration. Companies that focus only on the dimension of exploration run the risk of wasting resources on ideas that may not be useful or manage to grow. On the other hand, companies that focus only on the dimension of exploitation may understand the current situation and improve their performance in the short term but may not achieve optimal levels of success, as they may not be able to respond to changes in the environment [16,21].

In today’s economic environment, a company’s success depends to a large extent on its ability to evolve and adopt organizational models that allow for faster assimilation of developments and innovation. In this context, new, more flexible, and effective management approaches have emerged in recent years, such as agile and open innovation strategies [9,22]. Agile strategies can be characterized as a new alternative set of strategies that make a difference in leadership by leaving behind stereotypes of the past in relation to hierarchy, while focusing on individual initiative and responsibility, but also on the most effective networking between the various businesses’ functions and departments. Agile management strategies offer teams the freedom to make decisions that in the past should have been approved by the “hierarchy”. Agile methods also encourage people to collaborate, participate, cultivate new skills, and grow in an environment of flexibility. In addition, the new management model pushes companies to think and act not only differently, but also faster [23]. It allows them to use their time more efficiently and effectively, improving not only their internal functions, but also their collaborations with all stakeholders. It essentially contributes to the transition of companies from simple relationship management to “co-creation” and the search for innovative solutions, which add value to their customers and society [9].

However, in the 21st century, businesses are under tremendous pressure due to the continuously changing environment. In a world of VUCA (Volatility, Uncertainty, Complexity, and Ambiguity), businesses are in the process of developing new dynamic strategies

to transform and enhance their level of innovation. This transitional period requires a redefinition of the leadership and the cooperation model. Businesses, in combination with human resources, must have more willingness to change, flexibility, and a strong capacity for self-organization and self-management. Therefore, concepts such as ambidexterity and agility are important for achieving the above objectives. The role of open innovation is also crucial. Open innovation is an emerging strategy adopted by businesses, based on the assumption that "valuable ideas can enter or leave the company and can be marketed within or outside it." Through an open innovation model, businesses can become more extroverted and collaborative. A more simplistic view of open innovation can be that it is a distributed process of innovation based on managing the flow of knowledge throughout an organization, using monetary and non-monetary mechanisms, in line with the business model of the organization [24,25]. This term highlights that open innovation is not only in the core of the business but also includes co-creating with customers or suppliers as well as innovative user communities. For SMEs, open innovation is a way to overcome the challenges they face daily and to expand their technical skills by gaining knowledge from their external environment. Most SMEs face a lack of resources for the implementation of their business activities. This is the reason that the development of partnerships with external organizations helps SMEs to manage the level of innovation with less bureaucracy, increased willingness to take risks, and an improved ability to react and adapt immediately to new needs imposed by the market [11].

Usually, scholars focus only on one of the above approaches. Few investigate the relationship between open innovation, agility, and ambidexterity. The combination of these concepts can lead businesses on the path of digital transformation and the development of a culture that will allow them to respond directly to any business challenge. In essence, the combination further enhances open communication and cooperation between businesses and stakeholders. Open innovation offers a variety of tools and services in an agile work environment. The new proposed hybrid model of ambidexterity, agility, and open innovation needs a multi-skilled manager who can deal with diverse problems under different circumstances effectively, successfully, and rapidly in the internal environment as much as the external environment. In the current external environment, CEOs around the world are increasingly concerned about how unstable, unpredictable, and dangerous the world has become. In addition, they realize that political reality and business are closely linked. Therefore, a company must look beyond the market in which it operates and consider the political and social reality, as these can play a key role in its success [16]. In the internal environment, executives face different challenges every day, such as the combination of different resources and especially different people, different characters, and different moods. The goal of the leaders is to unite workers and create teams with different personalities. So, with all this complexity inside and outside a business, can one really imagine a one-party, assertive, right-wing leader facing a multifaceted situation? The answer is no. That is why the issue of a multi-skilled manager, ambidextrous and agile, is indeed more relevant than ever [26].

3. Materials and Methods

Bibliometric analysis is a popular research method and has been approved by many scholars globally [12,27,28]. Its admiration is based on a series of characteristics such as the development, usage, and availability of a wide range of bibliometric software such as VOSviewer and Biblioshiny and scientific resources such as Scopus and Web of Science. Moreover, bibliometric analysis gives academics and researchers the opportunity to handle large volumes of data and to generate significant research impacts [29]. The aim of this method is to provide a categorization of the published documents in a research field, based on a series of criteria to analyze and classify the publications.

In this paper, the analyzed data were retrieved from the Scopus database in April 2022. Scopus was created in 2004 by Elsevier and is an interdisciplinary source of reports. It is one of the largest "peer reviewed" databases in the world, covering more than 24,000 active

titles of academic journals in multiple fields of high research interest, such as life, social, and health sciences. In addition, Scopus includes more than 230,000 book titles and more than 10,000,000 conference papers [30,31]. Compared to other academic research databases (such as Google Scholar or Web of Science), Scopus is the one with the fewest “inconsistencies” in terms of verification and quality of their content. Google Scholar and Web of Science offer accurate information, but they contain duplicate or, in some cases, triplicate citations. As a result, the total number of reports includes the same items and therefore produces inaccurate data. In addition, Scopus provides its users with online tools for bibliometric analysis of their publications, calculating a variety of bibliometric indicators such as the h-index and statistical analysis tools such as frequency charts of publications as a function of time, etc.

Our search in the Scopus database for the terms “ambidexterity”, “agility”, and “SMEs” gave a return of 1946 results. A purification of the terms through selected criteria resulted in 606 results with the final formula: [(“ambidexterity” OR “ambidextrous” OR “strategic ambidexterity”) AND (“agile” OR “agility” OR “agile management”) AND “open innovation” AND (“small enterprises” OR “medium enterprises”) AND “competitive advantage”]. As for the usage of the Boolean operators, they were applied to separate the findings. Moreover, to increase the clarity and quality of the findings, we considered only original papers for analysis, whereas other forms of publications such as book chapters, conference proceedings, and white papers were excluded. Regarding the language used, this search was based on English since it is one of the fastest growing languages in the modern world and the one that dominates globally. The selected papers that were included in the analysis were restricted within the timespan 2008–2021. The data from the bibliometric search were extracted in an Excel file, which integrated the following information: (i) the title of the paper, (ii) the date of publication, (iii) principal details of the author (name/s and affiliation/s), (iv) the title of the article, (v) authors’ keywords, (vi) the abstract, and (vii) the citation count. To analyze and visualize the data, the Biblioshiny package in RStudio and VOSviewer software were used. Both tools provide diagrams and maps such as thematic maps, country collaboration maps, and network visualization, which illustrates the research situation, and the dynamics of the new hybrid management model of SMEs, which is based on the concepts of ambidexterity and agility. Moreover, Multiple Correspondence Analysis (MCA) was integrated in the methodology. MCA contributes to the drawing of the conceptual framework of the studied field, helping us to identify clusters of documents and highlight the research gaps.

Figure 1 presents the methodological process of this study.

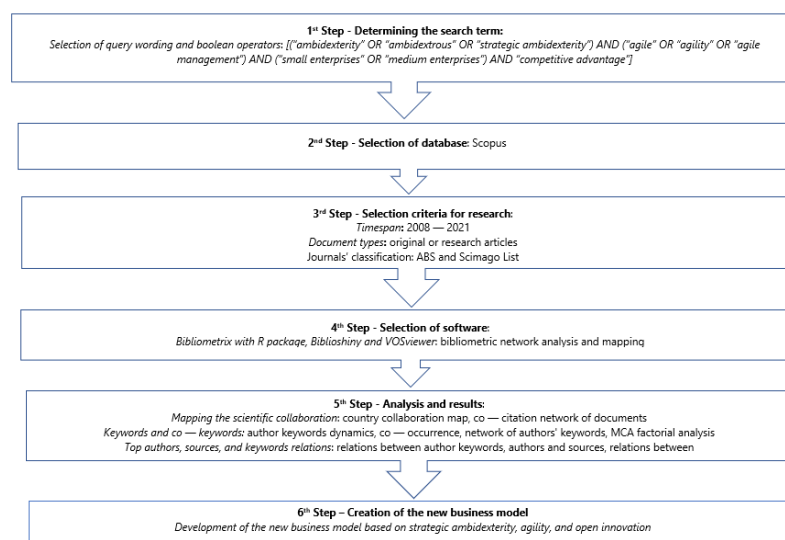


Figure 1. Methodological flow. Source: Own elaboration.

4. Results

4.1. Evolution of the Number of Articles

In the current study, a total of 476 published original articles within the timespan 2008–2021 were analyzed. Figure 2 presents the annual scientific production for the research field of ambidexterity and agility in SMEs. The sharp increase in 2021 can be characterized as the peak year of publications in the research field.

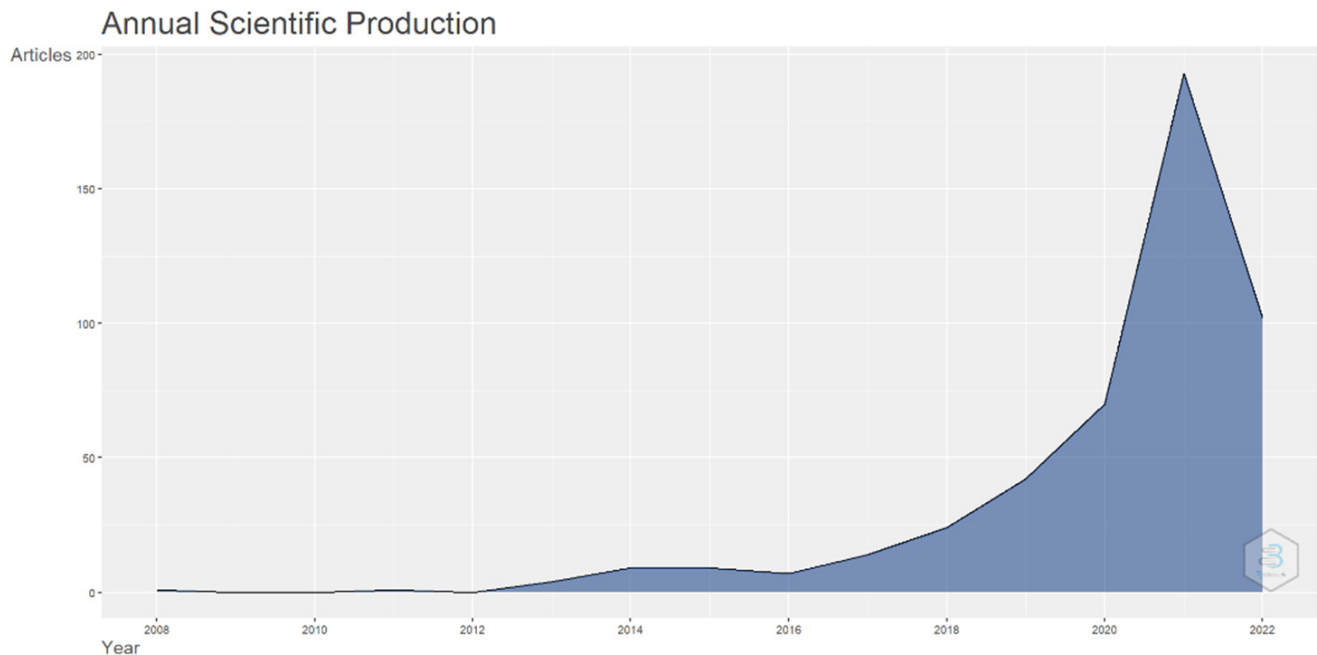


Figure 2. Annual scientific production of publications in ambidexterity and agility in SMEs. Source: Scopus/Biblioshiny.

This growth is due to the new conditions in the management field created by the pandemic. In particular, the imposition of protection measures against the transmission of COVID-19 and the new business environment created due to these measures highlighted the need for SMEs to adopt a hybrid management model. This new model will allow SMEs to align and be effective in managing current business requirements, while also permit them to adapt directly to the changes in their environment. Moreover, this new business model can be characterized as an important research model in the theory of open innovation. Essentially, it allows businesses to be creative and adaptable to the new circumstances, by combining traditional and new methods of ambidexterity and agility, respectively. The combination of the two methods will push SMEs to take risks, differentiate themselves from competitors, and make them more flexible, innovative, and collaborative, while at the same time contribute to the improvement of their efficiency.

The journals with the most published articles in the field of strategic ambidexterity and agility within the timespan 2008–2021 are presented in Table 1. *Journal of Business Research* was the journal with the highest number of published articles on strategic ambidexterity and agility (27 articles) during that period. Both *Sustainability* and *Technological Forecasting and Social Change* ranked second with 21 articles each. *Journal of Social Management* published 13 articles, while *Benchmarking* published nine articles. Overall, the journals covered plenty of research areas, with implications for businesses and management, such as strategy and management, business and management, and international management. Furthermore, many papers appeared in more than one research areas, which reveals the need for SMEs to integrate the new hybrid model, based on ambidexterity and agility, in different processes such as the development of their strategy or decision making. In addition, all these most-cited and relevant journals in the studied field are indexed by Scopus and Scimago,

as well as by the ABS list. As for the h-index, the average is close to 93, which indicates that the published research articles in the studied field receive more than 93 citations each. This is a satisfactory metric which highlights the importance, significance, and broad impact of research on strategic ambidexterity and agility for SMEs.

Table 1. Most relevant publications in the field of ambidexterity and agility.

Sources	Subject Area	Number of Publications	h-Index	Ranking by ABS	Ranking by Scimago
<i>Journal of Business Research</i>	Business, Management and Accounting	27	195	3 ***	Q1
<i>Sustainability (Switzerland)</i>	Management, Monitoring, Policy and Law	21	85		Q1
<i>Technological Forecasting and Social Change</i>	Management of Technology and Innovation	21	117		Q1
<i>Journal of Knowledge Management</i>	Strategy and Management	13	113	2 **	Q1
<i>Benchmarking</i>	Strategy and Management	9	61	1 *	Q2
<i>European Journal of Innovation Management</i>	Management of Technology and Innovation	9	63	1 *	Q2
<i>International Journal of Production Economics</i>	Business, Management and Accounting	8	185	3 ***	Q1
<i>Management Decision</i>	Management Science and Operations Research	7	98	2 **	Q1
<i>Business Process Management Journal</i>	Business, Management and Accounting	6	81	2 **	Q1
<i>International Journal of Information Management</i>	Decision Sciences	6	114	2 **	Q1
<i>Journal of Enterprise Information Management</i>	Management of Technology and Innovation	6	61	2 **	Q1
<i>International Journal of Innovation Management</i>	Strategy and Management	5	44	2 **	Q2
<i>International Journal of Management Reviews</i>	Management of Technology and Innovation	5	107	3 ***	Q1
<i>International Journal of Productivity and Performance Management</i>	Strategy and Management	5	61	1 *	Q2
<i>Journal of Business and Industrial Marketing</i>	Business and International Management	5	67	2 **	Q1
<i>Journal of Strategic Information Systems</i>	Business and International Management	5	88	4 ****	Q1
<i>Production Planning and Control</i>	Strategy and Management	5	76	3 ***	Q1
<i>Supply Chain Management</i>	Strategy and Management	5	115	3 ***	Q1
<i>Academy of Strategic Management Journal</i>	Strategy and Management	4	17		Q3
<i>European Management Journal</i>	Strategy and Management	4	102	2 **	Q1

Source: Scopus/Biblioshiny. Asterisks indicate the ranking of the journal according to the ABS list.

4.2. Geographical Collaboration Analysis

Table 2 presents the scientific production of research papers per country in the field of strategic ambidexterity, agility, and the integration of open innovation in SMEs. The common characteristic among the countries is the low level of citations. The more a paper is cited, the more ground is covered. However, the goal of this paper is to highlight the new hybrid business model that has emerged in recent years to help SMEs to survive and be flexible, ambidextrous, agile, and innovative during the COVID-19 pandemic. Thus, since the new hybrid business model is a relatively new subject in the management research field, citation levels are low.

Table 2. Scientific production of the main countries related to the smart and precision farming.

Country	Total Citations	Average Article Citations per Year
United Kingdom	513	15.09
Italy	484	14.67
Spain	355	25.36
China	300	6.67
Germany	273	11.38
The Netherlands	271	54.20
USA	268	20.62
India	244	7.39
Sweden	236	47.20
Cyprus	193	27.57
Australia	128	9.85
Portugal	120	24.00
France	113	22.60
Indonesia	112	6.22
Pakistan	94	10.44
Ireland	77	25.67
Korea	72	12.00
Austria	69	13.80
Iran	65	6.50
Malaysia	47	6.71

Source: Scopus/Biblioshiny.

The United Kingdom (U.K.) holds the first position globally with a total of 513 citations. The U.K. can be characterized as a magnet for many businesses worldwide, with London being the world's most international and connected financial hub, providing unrivaled access to global markets. As the U.K.'s financial hub, it has gained an international perspective and is open to talent, investment, and collaboration from around the world [32]. Moreover, the U.K. is becoming particularly attractive to workers from all over the world, who create a mix of financial and professional service experts. Due to the intense activity of the U.K. in the business arena, some of the most well-known business research centers globally are located there, such as the Centre for Business Research of the University of Cambridge [32,33]. This situation allows British researchers who study business management and strategy to be one step ahead in identifying new trends in those subject areas. Agile strategies as a tool for businesses to mitigate the effects of a crisis have been introduced in the research area by British experts in the field prior to the manifestation of the pandemic. Concretely, Rigby, Sutherland, and Takeuchi (2016) in their paper "Embracing Agile" published by Harvard Business Review discuss the importance of agile practices in businesses, presenting the benefits of these practices in a wide range of industries [34]. It is noteworthy that the paper highlights the weakness of executives in understanding the dynamics of agile practices and their contribution to their organizations. Thus, this paper was structured to highlight the following issues: (i) how agile practices really work, (ii) understanding when agile methods are appropriate in a business, (iii) allowing teams that have mastered the process to customize their practices, (iv) practicing agility at the top, and (v) mitigating corporate barriers to agile behaviors.

The average article citations per year of Dutch research in the field of ambidexterity and agile in businesses (54.2 citations per year) is also worth noting. The Netherlands is the eighth-most competitive economy globally and the sixth-largest in Europe. More than 11% of the working population in the country are entrepreneurs. This percentage is very high and positions the country in third place, followed by Australia and Canada. The heart of the Dutch economy beats in Rotterdam. Europe's largest port is transformed into an area with a high-quality business climate. It no longer serves only trade and transport, but its facilities, due to its strategic location, attract plenty of new and innovative companies—especially in the field of sustainable energy—and a great number of research institutes [35]. This has led local municipalities and university institutions and even

multinational companies to welcome youthful and innovative entrepreneurship, with the central ambition to create companies that will have a leading role in the future. Innovation in entrepreneurship can be the ideal solution for a successful recovery during a crisis period. Thus, Dutch experts in the business research area assert that, during a crisis, businesses should improve and adapt their business models to be more competitive by pursuing innovation. Agility and ambidexterity can be described as the right path for businesses to follow to achieve flexibility, sustainability, and entrepreneurial mentality. Dutch startups, which have a positive effect on the Dutch economy, appear to be among the most agile and ambidextrous businesses, as they are able to make decisions quickly and their processes can be reproduced for each new team without having to restart from scratch [36].

Figure 3 presents the geographical collaboration of the authors in the field of strategic ambidexterity and agility. The visualization of the findings in regard to the scientific collaboration in the studied field was actualized using the Biblioshiny software. The aim of analyzing collaboration among academics is to illustrate the social structure of the research community in the field of ambidexterity and agility. In the figure, the blue color intensity on the map represents the number of publications, while the red lines illustrate the degree of collaboration among academics. The United States presents an intense collaboration with European countries and especially with The Netherlands, the United Kingdom, and Scandinavian countries. In addition, there is frequent cooperation between European countries and Asian countries. It is worth noting that the collaboration is more intense between Europe and China, which proves that the concepts of strategic agility and ambidexterity are not only rife in the Western community. The proposed hybrid business model of ambidexterity and agility can suit the Chinese business environment, as the Chinese, from their early childhood, are taught in how to make rapid decisions. By taking this aspect into consideration, the new hybrid business model can work well under specific circumstances, such as in situations where managers want their human resources to work in an agile and ambidextrous environment and employees also want to adopt and use the proposed agile and ambidextrous methods [37].

Country Collaboration Map

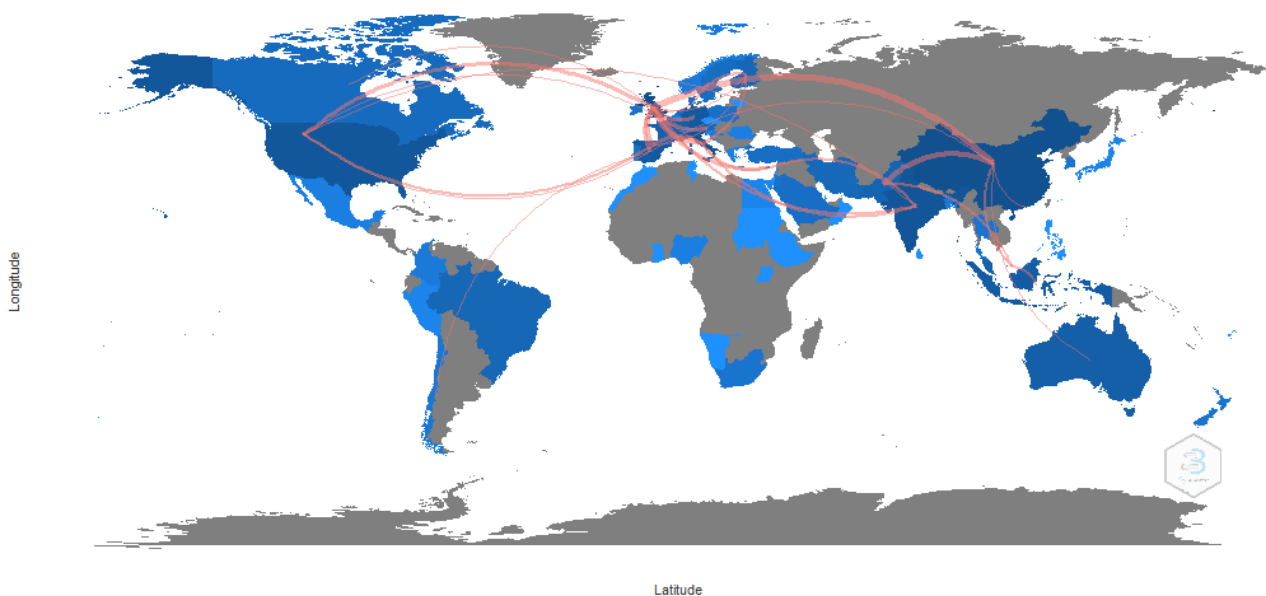


Figure 3. International research collaborations map on strategic ambidexterity and agility. Source: Scopus/Biblioshiny.

4.3. Keyword Analysis

The aim of the keyword analysis is to highlight the direction and the key trends of the new hybrid business model based on ambidexterity and agility. Figure 4 presents the network visualization based on the co-occurrence of authors' keywords. To visualize the co-occurrence of authors' keywords, the VOSviewer tool was used [27,38]. In Figure 4, the size of each circle highlights the occurrence of the keywords. The bigger the size of the circle, the greater the frequency of authors' keywords. The similar color of the circles indicates the cluster of the keywords, and the lines between the circles show the link between the keywords [15]. A total of 35 keywords were selected and divided into five clusters, and each cluster is represented by a different color. The yellow cluster highlights open innovation and its relationship with organizational agility and dynamic capabilities. Open innovation is a set of processes, while dynamic capabilities framework is a systematic theory of strategic management that includes not only processes but also corporate governance, management decision making, and sources of competitive advantage. The green cluster represents the strong link between innovation and absorptive capacity. Absorptive capacity is the ability of a company to recognize, assimilate, transform, and use the knowledge that comes from the external environment. In other words, absorptive capacity is the tool that a company uses to learn how to integrate this knowledge in a more scientific way. As for the blue cluster, this illustrates the dynamic presence of dynamic capabilities in businesses' strategies. Moreover, the red cluster represents the concept of ambidexterity and shows how it relates to the strategies of SMEs to gain competitive advantage. Moreover, the purple cluster highlights the new business model innovation, which is based on the triple-win formula of ambidexterity, agility, and open innovation. This cluster indicates that this new business model can be ideal to be adopted by SMEs, helping them adapt to the new needs that emerge in the market. Particularly, the new business model will contribute to the prompt identification of new desires of consumers by companies, and this can help them to react quickly by creating products and services that will satisfy consumers. In sum, the visualization of the co-occurrence of authors' keywords presents with clarity the new business model that emerges, based on strategic ambidexterity, agility, and open innovation, which can contribute to SMEs' competitive advantage enforcement and sustainability in a turbulent period.

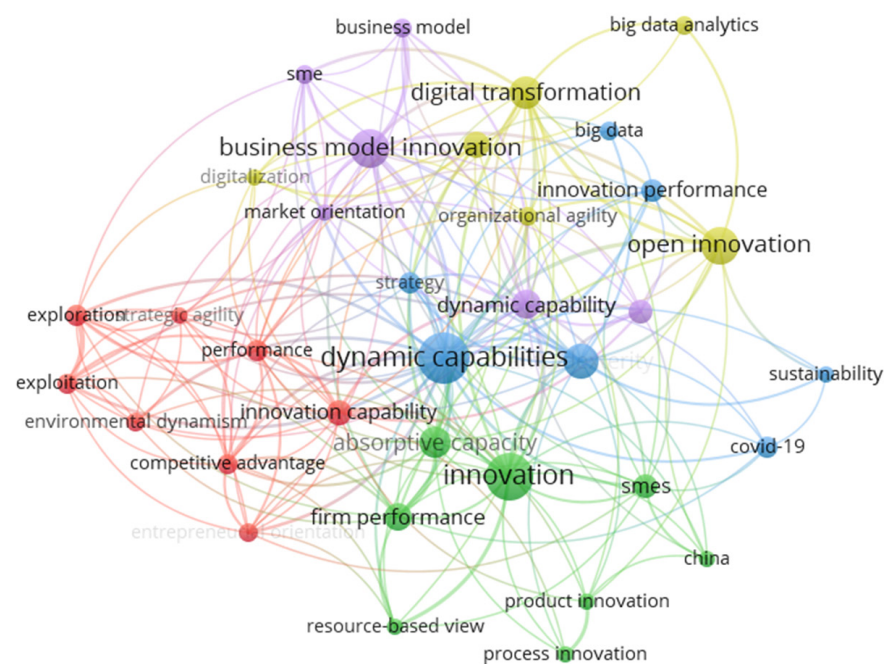


Figure 4. Network visualization—co-occurrence of author keywords. Source: Scopus/VOSviewer.

Although the concepts of strategic ambidexterity, agility, and open innovation constitute the new business model for mitigating the effects of a crisis and gaining competitive advantage, digital transformation has also emerged as a crucial aspect. Figure 5, which is the thematic map of authors' keywords, describes the above. This figure illustrates the research themes which are obtained from the conceptual structure of the documents included in the Bibliometrix analysis. The clusters in the graph indicate the themes of the research, while the size of the clusters highlights the proportion to the number of keywords. The quadrant in the upper-right position indicates the motor themes, which can be characterized by both high density and centrality, while the quadrant in the bottom-right position highlights the basic themes that are defined from high centrality but low density. The quadrant in the upper-left position shows the niche themes of the studied field, and the themes in the bottom-left quadrant are characterized as the emerging themes, with low centrality and density [30,39,40]. Digital transformation and digitalization are dominated in the quadrant of the emerging themes of the thematic map. In a turbulent environment, businesses need to enhance their competitive advantage. By integrating digitalization, they can achieve this goal and adapt to the new conditions easily [41]. This means that the more agile a company is, the more it can accomplish its aims. Digital agility is another type of strategic/business agility and refers to the ability of a business to quickly adopt new processes that will increase its value. For SMEs, digital transformation combined with agility can help companies set new goals and make decisions in a timely manner and at a lower cost.

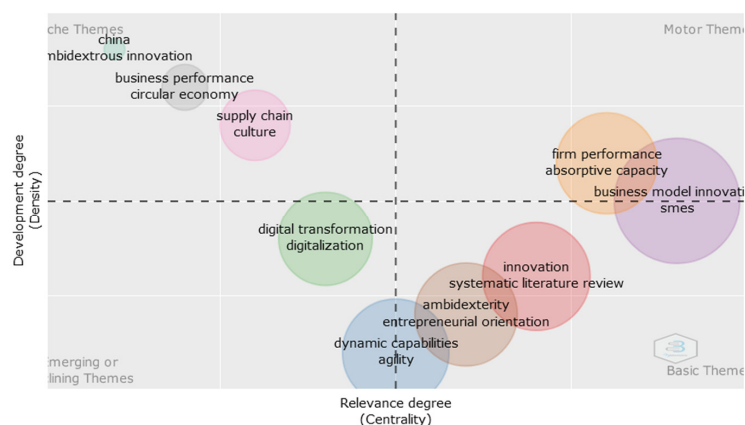


Figure 5. Thematic map of authors' keywords. Source: Scopus/Biblioshiny.

Niche themes highlight the concept of circular economy and link it with the new business model innovation based on strategic ambidexterity and agility. This can be achieved through eco-innovation. Eco-innovation refers to all forms of innovation—both technological and non-technological—that occur in business activities and benefit the environment by using resources rationally [42]. In simple terms, the concept of eco-innovation is inextricably linked to the way businesses use their natural resources for their production process, and this form of business encourages the shift in product manufacturing from solutions taken at the end-of-pipe process to closed-loop approaches that minimize material and energy leaks through product and method switching, thus offering competitive advantage. Both ambidexterity and agility have a dynamic view in the context of eco-innovation, since they facilitate businesses in building a sustainable environment by decreasing their environmental footprint [43]. Thus, businesses can increase their competitiveness and gain competitive advantage. The above analysis indicates a dynamic and novel business model that can guide businesses, especially SMEs, to transform their strategy, to be unscathed in a future crisis.

Figure 6, which is called a Sankey diagram, confirms the need of SMEs to transform their business model. Each node in Figure 7 represents a set of different topics, which is indicated by the keyword with the highest frequency. The size of the node is proportional

to the number of keywords for the corresponding topic. The flow between the nodes illustrates the evolutionary direction of the thematic complexes. The width of the edge is proportional to the index of inclusion between two connected threads. Therefore, the number of links between topics increases over time. Some topics have steadily evolved and developed, while others gain importance and appear only in the last subperiod [44]. Figure 7 indicates that there are many themes that are involved in the research on the need for a new business model innovation for SMEs. Moreover, the research focus was not static but changed dynamically over time. As time passed, “market orientation”, “innovation”, and “ambidexterity” remained popular research topics. However, the study focus changed from “innovation” to “open innovation” and emerging issues, including “knowledge management”, “digital transformation”, “innovation capacity”, and “dynamic capabilities” of the business model. Furthermore, it can be deduced that the above research topics have potential to continue to develop in the future.

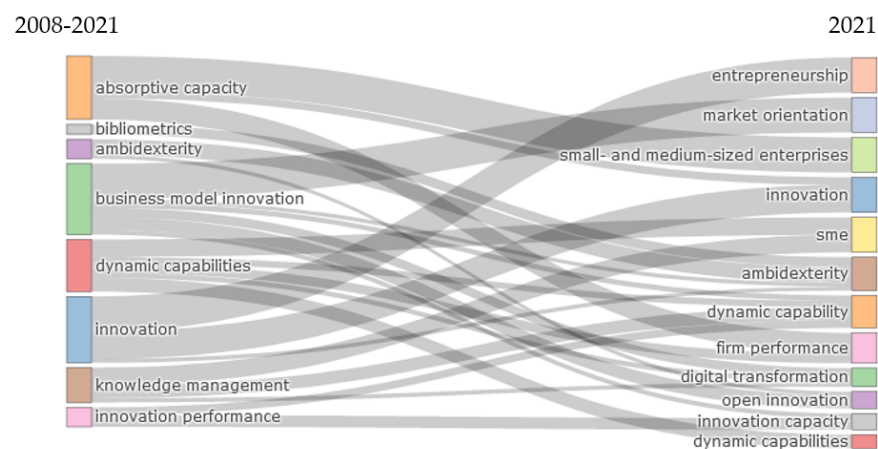


Figure 6. Thematic evolution. Source: Scopus/Biblioshiny.

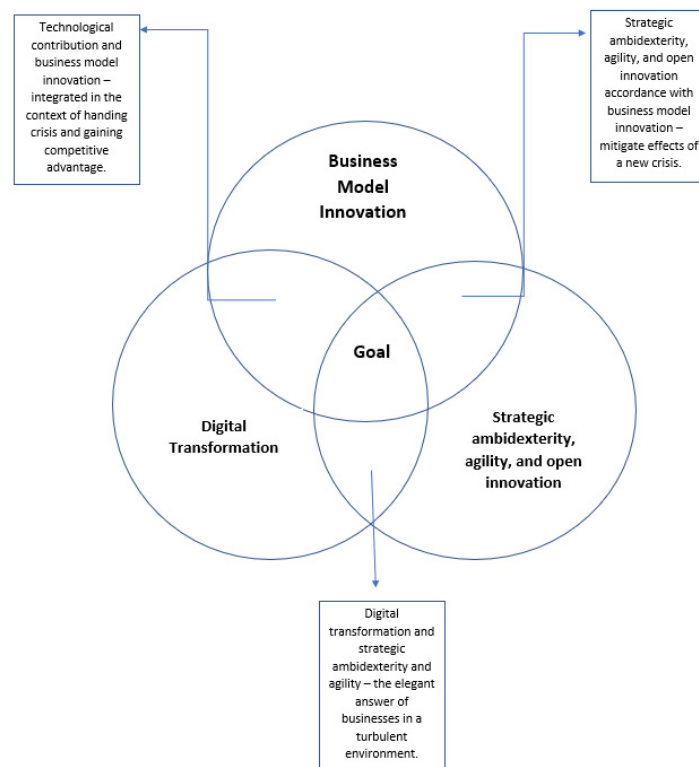


Figure 7. New business model innovation for SMEs. Source: Own elaboration.

In sum, the findings of the analysis indicate the need for the development of a new business model for SMEs that will be based on the triple-win formula of strategic ambidexterity, agility, and open innovation. Figure 7 describes the synthesis of the proposed business model.

5. Discussion

Business models describe the way a company creates and delivers value. In a broad sense, value is not used just as an economic quantity, but also as a social or other type of value. Based on the literature, business models can be characterized as the blueprint of the way a company “operates”, describing the entirety of how the company selects its customers; identifies and differentiates its products and services; identifies the objects that it deals with; shapes its resources; and promotes its image to stakeholders to become more attractive and improve profit. Essentially, the essence of a business model is to help businesses be better organized to meet the needs of their customers and at the same time profit from the products or services they offer.

However, the unprecedented conditions caused by the COVID-19 pandemic made it imperative for businesses to adapt immediately to the new environment in order to emerge unscathed from the crisis. Emphasis was given to the adoption of appropriate measures and the search for innovative solutions for ensuring the business continuity and the simultaneous safety of employees. During the pandemic, many companies embarked on practices such as remote work, e-training, and the use of collaboration tools such as agile management tools. Such practices promise the development of a new business model that will help companies adjust to the new circumstances. Our bibliometric analysis indicated the triple-win formula of strategic ambidexterity, agility, and open innovation, as an ideal way for businesses, especially for SMEs, to react to the conditions set by the pandemic.

Although scholars have noticed the importance of ambidexterity in SMEs as a main component of gaining competitive advantage, there is limited research with respect to the combination of strategic agility, ambidexterity, and open innovation to mitigate the negative effects of a crisis. Along these lines, our bibliometric analysis underlines the crucial role of the above strategic concepts in the development and adoption of a new business model innovation by SMEs. Factorial analysis based on the MCA method (Figure 8) reveals that agility, in combination with ambidexterity, fulfils the new business model innovation for SMEs in times of crisis, as proposed in this research work. Agility is an important requirement in businesses that are faced with new challenges and pressures [45]. Therefore, continuous developments and the behavior of competitors push businesses, especially SMEs, towards a philosophy of readiness and strategic agility. A prerequisite for a successful culture of agility is the recognition and defense of the core competencies of the business, as these capabilities and individual strengths of an organization should not be altered during an agile transformation. In addition, being an agile business does not mean being spasmodic or following chaotic survival efforts, but integrating the principles of strategic agility into all procedures throughout the various hierarchical levels of the company [9,34].

In addition, an open innovation system emerged as the answer of SMEs to the negative effects of the pandemic. Open innovation is a process that combines knowledge from different perspectives, such as participants from different disciplines, with different experiences and responsibilities. An important benefit for businesses through the implementation of open innovation systems is the change in culture within the organization. Open innovation actions with the right preparation create the conditions for the transition of SMEs towards a more flexible, adaptable, and up-to-date direction. Initially, executives of SMEs may express resistance to the absorption of the concepts of open innovation, such as lean startup and design thinking. However, as some success stories are created in the market because of the adoption of these practices, executives will begin to be more familiar with this and start participating more actively in the actions of open innovation.

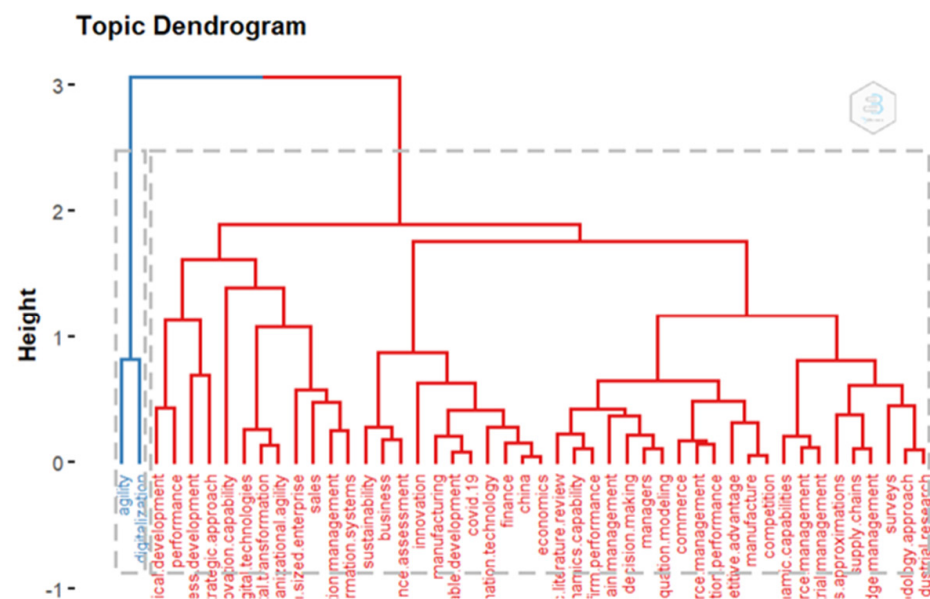


Figure 8. Factorial analysis based on MCA method. Source: Scopus/Biblioshiny.

Along with the triple-win formula of strategic ambidexterity, agility, and open innovation, digital transformation emerges as another important factor that can be included and synthesized in the theoretical part of the proposed business model innovation. Digitalization includes all the changes SMEs adopt to take advantage of internet, digital media, and emerging technologies to ensure business continuity. Among the main digital transformation strategies that have been adopted recently are those of teleworking, as well as the integration of emerging technologies in various business functions and processes, such as information or communication processing, work organization, decision making, human resource management, accounting and other administrative functions, organization of processes or external relations, and production of goods and services [46]. Based on the above analysis, a new business model innovation is proposed by the authors, which could enhance SMEs' competitive advantage and create value for them in the future [2]. The proposed new business model stands out with agility and ambidexterity and provides SMEs the ability to adapt and redefine their position in the market. Changing the way that a business operates is not an easy process and should only be pursued when necessary. However, it is now the time for SMEs to implement this new business model, which allows for changes with the least possible collateral loss, helping them to speed up processes and organize their transition to a more sustainable and resilient future.

As described in the above sections, the goal of this research work was to propose the theoretical component of a new business model innovation, which consists of an exterior and interior part. The next step of this research is the empirical application of the proposed business model in a focus group of executives of European SMEs. We decided to use focus group research because it is a technique that collects data through the group's interaction on a subject identified by the researcher or similar focus groups and it is a qualitative technique that allows "the explicit use of the interaction to data and ideas that would be less accessible without the interaction that takes place within the group" [47,48]. In other words, the researcher, by shaping a group of people and motivating a topic of discussion about the collective attitudes and perceptions of the participants, observes the birth and dynamic transmission of ideas which in turn will yield new and meaningful answers and information. Questionnaires will be structured and distributed online to the executives of SMEs. Hence, a future direction for our research is to apply the proposed business model innovation and extract the appropriate results. Some of the limitations that can emerge include the lack of control over the honesty of the answers and the subjectivity of the respondents in understanding the questions.

Moreover, the proposed business model innovation can lead to another transformation of SMEs—one of green transformation [49,50]. The results illustrated by the thematic map indicate that eco-innovation and circular economy are in the niche themes of this topic and are strongly connected to the new business model innovation, as well. More specifically, the new business model replaces the old business practices and contributes to radical eco-innovation, which is more effective for SMEs. As a result, our proposal for future research could include further studies on the relationship between eco-innovation and new business model innovation based on strategic agility, ambidexterity, and digital transformation. The output of this future research can be the development of a new type of business model that will combine all the above characteristics. Lastly, future research can focus on the investigation of the impact of the new proposed business model innovation on the accounting outcomes. Similarly, scholars have not yet studied the effect of strategic ambidexterity and agility on the financial performance of SMEs.

6. Conclusions

Small and medium-sized enterprises (SMEs) are the driving force of the global economy and contribute significantly to (i) the creation of new jobs, (ii) value-added production, and (iii) GDP [3,4,51]. SMEs play an important role in boosting employment, competitiveness, and innovation, while ensuring social stability. However, their survival is not an issue that can be managed easily, given today's competitive business arena, especially nowadays, as humanity is facing an unusual, multifaceted crisis. The COVID-19 pandemic and the subsequent economic impact have led to an unprecedented recession for society and the business world, which is now sailing in "uncharted waters". Thus, new business models should be developed and adopted by SMEs, which will allow them to be more flexible and sustainable.

The aim of this research work was to present the theoretical part of a new proposed business model innovation. Our proposed business model innovation combines strategic agility, ambidexterity, open innovation, and digital transformation and can be an ideal solution for SMEs to secure their business continuity in an uncertain environment. In the past decade, small and medium-sized enterprises have been exposed to the negative effects of both global financial crises and the pandemic [52]. However, the effects of each crisis have highlighted the many weaknesses and chronic problems of SMEs. Even though several SMEs have managed to survive, they continue to have problems in their operation. Protection and support measures from the government are cannot ensure the survival and prospects of SMEs. Rather, substantial interventions from the companies themselves, new perceptions and attitudes, and, above all, mechanisms that will protect their future are needed. In this context, SMEs need a new business model [51,52]. The proposed business model innovation is a tool that not only protects and shields the business, but enables them to generate value in a new business environment.

Moreover, noteworthy is the strong connection of the parts of the proposed business model with the concepts of circular economy and eco-innovation, which constitutes one of the most important findings of the current analysis and invites future research proposals. This connection illustrates that the pandemic is not the only issue that SMEs need to address [42,43]. Environmental challenges such as pollution, climate change, and the unsustainable use of water and natural resources pose additional threats to SMEs. Therefore, the development of a business model that will integrate the dimension of circular economy will be of particular importance to businesses to adapt to new needs and circumstances.

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