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Microfoundations of dynamic capabilities enabling scaling pathways of sustainability-oriented innovation business models

Sepide Mehrabi[1] | Maral Mahdad[2] | Jos Bijman[3] | Celia Cholez[3] | Juan Carlos Perez Mesa[1] | Cynthia Giagnocavo[1,4,5]

[1]Department of Economics and Business, University of Almería, La Cañada, Almería, Spain

[2]Technology Entrepreneurship & Marketing, Eindhoven University of Technology, MB, Eindhoven, Netherlands

[3]Business Management and Organisation Group, Wageningen University, Wageningen, KN, Netherlands

[4]Cátedra COEXPHAL-UAL Horticulture, Cooperative Studies and Sustainable Development, Department of Economics and Business, University of Almería, La Cañada, Almería, Spain

[5]Centro de Investigación en Agrosistemas Intensivos Mediterráneos y Biotecnología Agroalimentaria (CIAMIBITAL), Edificio de Servicios Técnicos 2.13.0, University of Almería, La Cañada, Almería, Spain

Correspondence
Cynthia Giagnocavo, Department of Economics and Business, University of Almería, La Cañada, 04120 Almería, Spain.
Email: cgiagnocavo@ual.es

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Abstract

Using the lens of the microfoundations of dynamic capabilities, this article sheds light on the scaling pathways (scaling up, out, and deep) of sustainability-oriented innovation business models (SOI BMs). Empirical data from 20 small-sized agri-food organizations working on SOI as a core BM value proposition was collected and analyzed. We categorized microfoundations of dynamic capabilities of these organizations through multi-layered deductive and abductive coding and a two-level analysis and showed they are interconnected. Our results also highlight that specific microfoundations of dynamic capabilities mutually reinforce each other and collectively result in the realization of each scaling pathway. Our cross-case analysis shows interdependence amongst scaling pathways, where the success of one is a prerequisite for another. This research offers a framework to unpack scaling pathways and provides important insights into scaling strategies and practices for developing SOI BMs, benefiting researchers, practitioners, and policymakers.

KEYWORDS
agri-food, business model, microfoundations of dynamic capabilities, scaling, sustainability-oriented innovation, sustainable transition

1 | INTRODUCTION

This research explores how microfoundations of dynamic capabilities facilitate the scaling pathways of sustainability-oriented innovative business models (BMs) of small-sized agri-food organizations. The transition of current agri-food systems from one of the largest drivers of global environmental degradation and social deterioration (OECD, 2023) to being more sustainable requires a change in the way agri-food

Abbreviations: BMs, Business models; SME, Small and medium enterprises; SOIs, Sustainability-oriented innovations; SOI BMs, Sustainability-oriented innovations business models.

businesses operate. Given their significant role in global agri-food production (Giller et al., 2021), small-sized agri-food organizations play a pivotal role in addressing the sustainability transition (Fałkowski et al., 2016).

Agri-food systems are marked by continual changes in the market and regulatory environment and by the complexities of the sustainability transition. In responding to the challenges of such transition, agri-food organizations increasingly rely on sustainability-oriented innovations (SOIs) as part of their BMs and strategies (Testa et al., 2022). A BM perspective is imperative for understanding the creation and capture of value from SOI (Bocken et al., 2014; Testa et al., 2022). BMs that base their core value proposition on SOI (SOI BMs) assume that sustainability is not just a technical challenge but also a matter of organizational and behavioral change (Adams et al., 2016; Geels, 2019), for example, how innovations are used, who they involve, and how they impact the external environment (Testa et al., 2022). SOI BMs entail developing sustainable value propositions that integrate the economic purpose of the organization with the needs of diverse (value chain) stakeholders (Baldassarre et al., 2017; Ferlito & Faraci, 2022; Ulvenblad et al., 2019). They also provide a wider positive impact on the natural environment and society by virtue of change in the agri-food system (Adams et al., 2016; Geels, 2019; Testa et al., 2022). Under this assumption, the successful implementation and development of SOI BMs is a crucial step towards the sustainability transitions in the agri-food system.

The significance of BMs for successful SOI implementation and development has drawn scholarly attention to the growth potential or scalability of the BMs themselves (Ciulli et al., 2022; Palomares-Aguirre et al., 2018; Täuscher & Abdelkafi, 2018). However, the focus on BM growth often neglects the diversity of scaling pathways in the context of SOI development and implementation, and simply assumes broad deployment of standard solutions as the sole criterion for scalability (e.g., Wigboldus et al., 2021).

Understanding the importance of SOI BMs for social and environmental value creation, beyond economic value creation, necessitates the utilization of diverse scaling pathways. To incorporate this diversity and appreciate the nuances between growth, understood in economic and/or market terms, and other forms of scalability, we draw on the Moore et al. (2015) framework of scaling up, out, and deep, which integrates the influence of policy and culture as additional scaling pathways.

To deal with the complex challenges arising from the integration of economic, environmental, and social objectives into SOI BMs, businesses require appropriate dynamic capabilities (Buzzao & Rizzi, 2021; Ortiz-Avram et al., 2023). Building on the dynamic capabilities theory of Teece et al. (1997), dynamic capabilities for SOI can be defined as the enterprise's ability to sense, seize, and reconfigure competencies and resources to embed sustainability into developing, producing and distributing new products and services (Dangelico et al., 2017). In order to better understand how dynamic capabilities enable SOI BM scalability, we need to unpack specific competences, resources, processes, and organizational activities that are integrated in the SOI BM (Cortimiglia et al., 2016; Khan et al., 2020). The microfoundations of dynamic capabilities approach allow us to identify and analyze specific resources and capabilities and focus on "how to develop such capabilities" rather than simply identifying factors that lead to SOI (Buzzao & Rizzi, 2021; Khan et al., 2020). We achieve this by breaking down dynamic capabilities into their fundamental building blocks — microfoundations — which refer to the distinct skills, organizational processes and procedures, behavior and structures, and decision rules of the business (Teece, 2007).

Considering the importance of scaling SOI BMs in sustainability transitions, and given that scaling has been conceptualized in various ways in the literature, this paper focuses on the scaling pathways of SOI BMs. To understand these pathways, we used the lens of microfoundation of dynamic capabilities. Thus, we aim to answer the main research question of: "How do the microfoundations of dynamic capabilities enable scaling pathways of SOI BMs?" Using a multiple case-study approach, 20 case studies from eight different European countries were selected. Each case represented a small-sized agri-food business with one or more types of SOI as the core value proposition of the BM. Through multi-layer abductive and inductive coding and cross-case analysis, this paper highlights the essential role of specific microfoundations and demonstrates how they mutually reinforce each other and collectively facilitate each scaling pathway. Our results also show the interdependencies among scaling pathways, where certain pathway act as a microfoundation of dynamic capabilities necessary for other scaling pathways.

Our research contributes to the scientific literature on sustainable BMs by addressing several knowledge gaps recently identified. First, our results respond to the lack of empirical research on dynamic capabilities for sustainability (Buzzao & Rizzi, 2021; Ciulli et al., 2022; Khan et al., 2020; Ortiz-Avram et al., 2023). Second, by specifically directing our attention to the small-sized agri-food businesses, our study diverges from the prevailing emphasis on high-technological and large organizations in the business literature on dynamic capabilities (Cheah et al., 2018; Mousavi et al., 2019; Oliveira-Dias et al., 2022; Santoro & Usai, 2018). In the agri-food sector, the majority of businesses are of a small or even micro-size, having very different organizational characteristics compared to large companies. Third, we contribute to the literature on SOI and BM scalability (Hultberg & Pal, 2021; Moore et al., 2015; Sandberg & Hultberg, 2021), where previously scalability has been defined predominantly from a systemic perspective, often neglecting the organizational level of dynamic capabilities (Hultberg & Pal, 2021), and largely focusing on quantitative growth in only economic terms (André & Pache, 2016; Gupta et al., 2020; Lyon & Fernandez, 2012; Totin et al., 2020).

2 | THEORETICAL FRAMEWORK

2.1 | Scaling pathways of SOI BMs

SOI "involves making intentional changes to an organization's philosophy and values, as well as to its products, processes, or practices, to serve the specific purpose of creating and realizing social and environmental value in addition to economic returns" (Adams et al., 2016, p.181). This perspective incorporates SOI as an element of BMs by

proposing value not only from the products and services but also from the processes of the business (Rohrbeck & Schwarz, 2013). Sustainability research literature confirms that for lasting societal impact, BMs for sustainability must be scalable (França et al., 2017; Täuscher & Abdelkafi, 2018). Therefore, in studying the scalability of BMs, it is crucial to recognize the inherent inseparable characteristic of SOI within their BMs, as SOI serves as a core value proposition which is the main element of BM. A value proposition explains how a product or service solves a problem, provides benefits, or delivers value to various customers (Osterwalder et al., 2015). Thus, the subject of this study pertains to scaling pathways of SOI BM as a unified whole.

Scaling has been conceptualized in various ways within the scope of sustainability innovation and business studies. On the one hand, positioning scaling in sustainability innovation studies directs us towards a body of literature in sustainability transition studies using the term "scaling up" innovations from niche in order to change stable socio-technical regimes and ultimately change the system. Such a macro-level view of the entire system has been primarily seen as an expansion in the number of niche innovations collaborating together and amplifying the process (Geels, 2002; Lam et al., 2020). As raised by Wigboldus et al. (2021, 2022), this view led to studies that narrowly focus on large-scale implementation of standardized "innovative solutions," while specific means by which organizations can effectively scale their BM have not yet received much attention and empirical evidence on the scalability and growth of BMs remains scarce (Ciulli et al., 2022). In business studies, on the other hand, a scalable BM is defined as one that aims to optimize market entry and infrastructure costs while offering high margins that allow for rapid organizational growth and market expansion (Lund & Nielsen, 2018; Reuber et al., 2021). The current notion of BM scalability is limited to the perspective of organizational growth or increased turnover for economic gains. Thus, a broad range of scaling strategies for organizations have been introduced, using terms such as scaling "up," "across," "deep," and "out," whether emphasizing on expanding scope, geographic spread, or intensifying the concentration [e.g. (André & Pache, 2016; Gupta et al., 2020; Lyon & Fernandez, 2012; Totin et al., 2020)]. The aforementioned notions of scaling, although holding an organizational perspective, focus on quantitative growth in the narrow business sense, neglecting the interplay of various factors, such as policy, regulatory support, societal awareness, and culture, that also play crucial roles in driving a transition towards sustainability in agri-food systems.

Some wider evidence on scaling can be found in social entrepreneurship literature in terms of impacting social values (Bauwens et al., 2020; Bloom & Chatterji, 2009), emphasizing the need for shifting the perspective from quantitative business growth towards the various ways organizations enhance their outreach. In this regard, the model outlined by Moore et al. (2015) from social entrepreneurship literature has been adopted for this article. In this model described below, the terms of scale up, out, and deep distinguish policy and culture from traditional growth:

Scaling up refers to the extent the SOI BM may change the policy and regulation at the institutional level. Some instances of innovations that led to influencing laws to facilitate and promote SOI BM in agri-food sectors would be vertical farming (Petrovics & Giezen, 2022), or cannabis for recreational purposes (Caulkins et al., 2016), which required regulatory change to remove restrictions or support initiatives for scaling.

Scaling out is defined as "the organization attempting to affect more people and cover a larger geographic area" (Westley et al., 2014, p.237). This pathway is understood as a horizontal form of scaling and can refer to organizational growth in both the number of impacted segments and/or increasing financial turnover. Scaling out includes creating a supporting ecosystem for the diffusion and replication and capacity building to encourage more actors to engage in the innovation procedure (Totin et al., 2020).

Scaling deep refers to changing the culture and norms, or what Moore refers to as impacting "hearts and minds." It entails modifying cultural roots and beliefs within society and changing relationships (Nicol, 2020). It targets people's values and mindsets and revolves around acknowledging that "culture plays a powerful role in shifting problem-domains, and change must be deeply rooted in people, relationships, communities and cultures" (Moore et al., 2015,p. 77). Several examples of SOI BMs that have the potential to scale deep in agri-food value chains include community-supported agriculture, consumer engagement, local markets, and food education initiatives. These examples foster direct relationships between consumers and local farmers, promoting a sense of connection, trust, and shared responsibility, and shifting diets towards healthier and sustainable choices (Mehrabi et al., 2022).

Hultberg and Pal (2021, 2023) have suggested that BM scalability is highly relevant to BM dynamic capabilities. Considering organizations' need to integrate, build, and reconfigure organizational-level elements constituting their dynamic capabilities for scaling (Khan et al., 2020), distinguishing between the three pathways provides a valuable and comprehensive framework for purposefully creating, extending, or modifying resources based on the necessities of each scaling pathway (Sandberg & Hultberg, 2021).

2.2 | Microfoundations of dynamic capabilities for scaling SOI BMs

Organizational long-term value creation and capture and successful implementation of SOI BMs lie in the development and application of dynamic capabilities, continuously shaping, adapting, and renewing their BMs, and changing their components (Inigo et al., 2017). As mentioned by Testa et al. (2022), SOI goes beyond incremental improvements in product and procedure and requires profound organizational transformations and systemic shifts which require dynamic capabilities. Also, Buzzao and Rizzi (2021) raised the need for a distinction between traditional dynamic capabilities and sustainability-specific dynamic capabilities. Therefore, in recent years, some studies focused on specific dynamic capabilities that are required based on different types of SOI (e.g., Kabongo & Boiral, 2017; Yi & Demirel, 2023).

The dynamic capabilities approach goes further, by exploring various "microfoundations" of dynamic capabilities to gain deeper insight

into innovation and co-creation, how resources can be built, and how they should be deployed (Teece, 2014). Thus, recent years have seen a rise in empirical research on the microfoundation of dynamic capabilities (Santa-Maria et al., 2022), notably in the work of Fallon-Byrne and Harney (2017) and Mancuso et al. (2024). Furthermore, research by Khan et al. (2020) and Mousavi et al. (2019) focuses on specific microfoundation of dynamic capabilities required for circular economy and environmentally sustainable innovation, respectively. Lastly, and particularly relevant to our research, is the work of Sandberg and Hultberg (2021), focusing on the required microfoundations of dynamic capabilities based on specific scaling pathways of circular BMs in the fashion industry.

Thus, in the context of scaling SOI BM, the micro-foundation of dynamic capabilities is important since it entails examining complex social systems, where actions and interactions collectively shape organizational or societal outcomes. The microfoundations approach provides more granular understanding of the mechanisms through which dynamic capabilities are developed and sustained. As stated by Felin et al. (2012), the analysis of microfoundations of dynamic capabilities serves both to determine the origins of capabilities and the evolutionary process of dynamic capabilities. It provides insights into the organizational-level factors that enable an organization to sense and as potential business opportunities (McWilliams & Siegel, 2011). Seizing develops new organizational capabilities that were not in the organization before, such as revising BM components and mobilizing resources to address emerging [sustainability] opportunities and capture value from doing so (Teece, 2018). Reconfiguration is about organizational adaptation, flexibility, and continuous renewal of the organization's capabilities and tangible and intangible assets to implement new sustainable BMs and remain competitive (Bocken & Geradts, 2020; Schiavon et al., 2022).

Figure 1 shows the developed theoretical framework to unpack the process of scaling SOI BMs, connecting the theoretical concepts mentioned above. In this framework, the concepts of "scale up," "scale out," and "scale deep" represent pathways of scaling SOI BM. "Scale up" extends the influence of SOI BM to shape policy, "scale out" facilitates the growth of sustainable practices, and "scale deep" transforms cultures and norms. Microfoundations provide the essential building blocks of dynamic capabilities, which enable each scaling pathway. The dynamic capabilities of sensing, seizing, and reconfigurations allow enterprises to scale and to navigate the complexities the sustainability transition and respond effectively to changes in policies, cultural norms, and the evolving business landscape.

3 | RESEARCH METHODOLOGY

Our research context is the European fruit and vegetable sector. Data was collected within the framework of the CO-FRESH project, an innovation action research project, funded under the EU Horizon2020 program (www.co-fresh.eu).

An initial literature review on SOI BMs, scaling pathways, and microfoundations of dynamic capabilities provided the theoretical framework to support the analysis of the data. This framework informed the selection criteria for SOI BM cases, interview questions, data coding, categorization, and analysis. We applied a multiple-case study approach (Stake, 2013). We gathered data from 20 small-sized agri-food organizations with SOI as a core value proposition of their BM. Interview data was analyzed through multi-grounded theory (Goldkuhl & Cronholm, 2010). Figure 2 summarizes the process of case selection, data collection, coding, and analysis.

3.1 | Case selection

Initially, the SOI BM cases for interviews were selected from a database established under the CO-FRESH project. This database contains an inventory of 100+ EU agri-food value chains within which sustainable innovations are embedded, along with surveys to

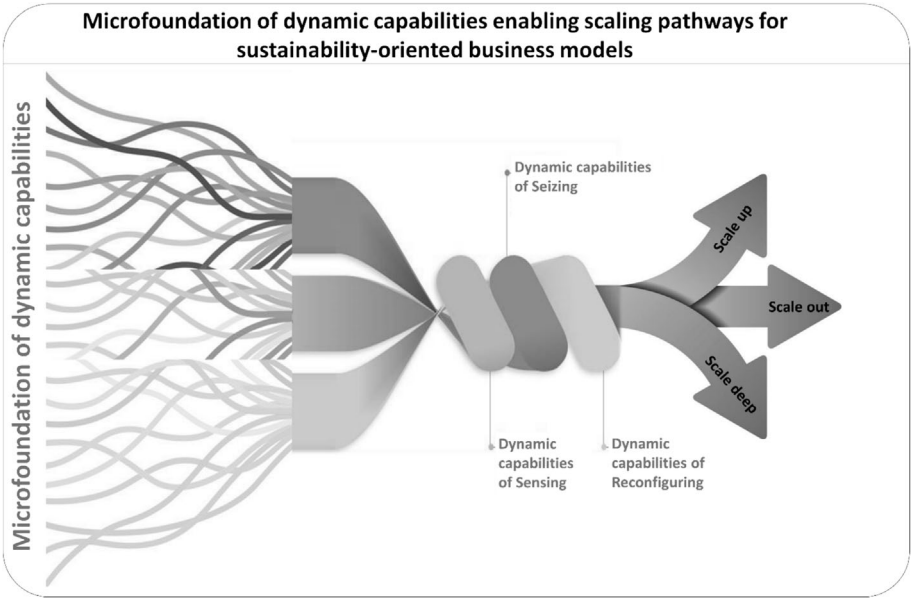

FIGURE 1 Theoretical framework (authors' elaboration).

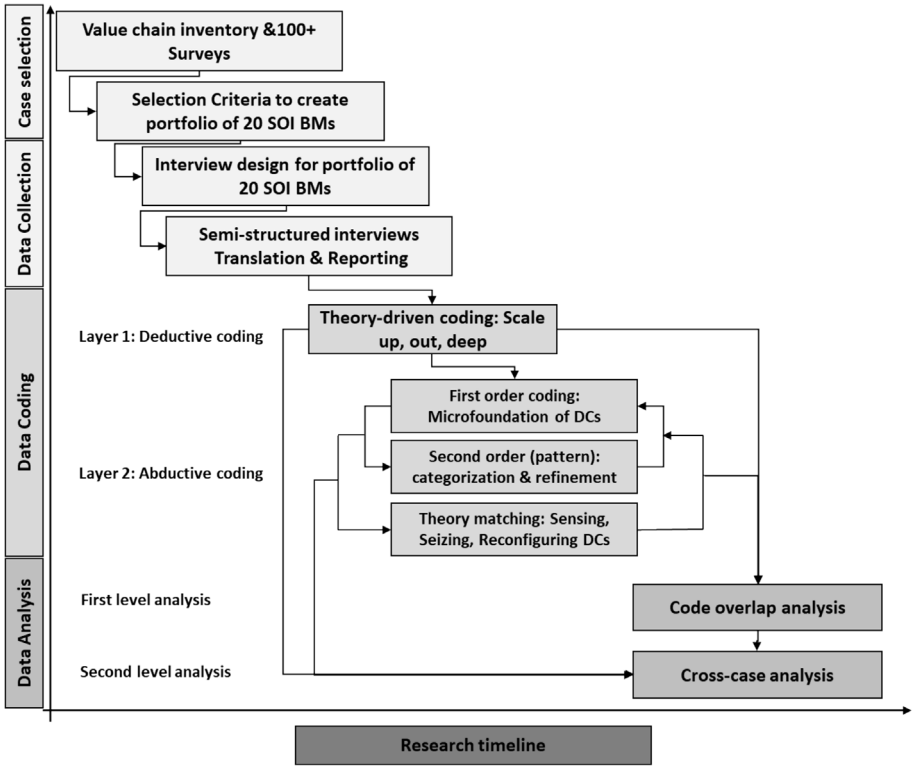

FIGURE 2 Different steps in the research process (authors' elaboration).

explore SOI processes and inter-organizational collaborations (see Cholez et al., 2023). Given CO-FRESH's objective to formulate and pilot innovative systemic approaches to agri-food value chains for scaling innovations through the integration of technological, social, organizational, managerial, and institutional innovations, the use of this database was relevant and in alignment with the research question in this article.

The criteria for selecting the portfolio of 20 SOI BMs were determined according to the SOI framework offered by Adams et al. (2016). According to Adams et al. (2016), SOI includes innovations in products, processes, practices, and adopting new norms and values, in addition to shaping new forms of collaborations. We operationalized this framework by ensuring that our selected cases represent diverse types of innovation (e.g., product, process, organizational, and institutional) and collaborative partners (e.g., inputs and technology providers, farmers and producers organizations, retailers, civil society and consumer cooperatives, public organizations and research institutes, non-governmental organizations, private consultancy, innovation brokers, and startup hubs). Moreover, to ensure diversity across other relevant variables, a divergent approach was adopted (Collier & Mahoney, 1996), first in the type of organization by focusing on small-sized organizations in the agri-food sector (small and medium-sized enterprises, small-sized farms, cooperatives owned by small producers/farmers/consumers, and small social enterprises/foundations), and second, in the geographic origin of cases (eight different EU countries). All selected cases represented SOI as a core value proposition of BMs. Appendix A summarizes the divergence of selection criteria for 20 cases and a short description of their SOI value proposition.

3.2 | Data collection

Data collection was based on interviews conducted between February and April 2022. In designing the interviews, a semi-structured approach was chosen, as advocated by (Qu & Dumay, 2011), to shape the conversation beyond predefined questions (Appendix B). Interviews involved at least one representative from each organization, with some instances of panel interviews comprising diverse actors. Respondents mostly held the position of innovation leader such as chief executive officer (CEO), founder, and co-founder. In other cases, interviewees were introduced by the CEO as key informants with the best information in each organization. Table 1 summarizes the cases. The interviews were translated by the interviewers and reported.

3.3 | Data coding and analysis

The coding layers on the interview reports were initially implemented by one consistent author and later discussed with other authors to reach a consensus.

In this article, a multi-grounded theory approach was employed, representing a dialectical synthesis between the pure inductive approach (traditional grounded theory) and the deductive approach (Goldkuhl & Cronholm, 2010). This approach allows for the incorporation of pre-existing frameworks, such as the microfoundation of dynamic capabilities and scaling pathways.

The first coding layer involved deductive coding guided by the scaling pathways outlined in the conceptual framework. The second layer followed abductive coding, where researchers "move back and

TABLE 1 Summary of 20 cases.

Code	Country	Interviewee	No. of employees	Type of F&V	Type of organization
A	Spain	CEO, project manager	>25	Various	Social foundation
B	Germany	CEO	Member owned	Various	Producer cooperative
C	Belgium	Founder	>5	Various	SME
D	Belgium	Co-founder	>5	Various	SME
E	Italy	Technico-cultural coordinator	>5	Citrus	SME
F	Netherlands	Owner-manager	>5	Grain legume	SME
G	Hungary	CEO	>5	Rosehip and oil seeds	SME
H	Spain	Marketing director	Member owned	Various	Farmer cooperative
I	Italy	CEO	>5	Grape	SME—a farm
J	Italy	Founder	>5	Various	SME—a farm
K	Hungary	Managing director	Member owned	Various	Social enterprise
L	Italy	Founder	Member owned	Various	Cooperative of consumers
M	Slovakia	Owner-manager	7	Pumpkin	SME—family farm
N	Slovakia	Member	Member owned	Various	Cooperative of farmers
O	Italy	Production manager	6	Almond	SME
P	Italy	Marketing manager	25	Grape	SME
Q	Italy	CEO	2	Spirulina	SME (micro)
R	Hungary	Member	Member owned	Various	Cooperative of producers
S	Greece	Co-founder	4	Olive	SME—family farm
T	Spain	CEO, advisor, partner	3	Acorn	SME

Abbreviations: CEO, chief executive officer; SME, small and medium-sized enterprises.

forth between data and theory iteratively" (Timmermans & Tavory, 2012, p. 168). First-order codes of microfoundations resulted from an open coding free of pre-categorizations. The second order was pattern coding (axial), which includes classification and categorization based on similarities and diverse themes of microfoundations (Gibbs, 2012; Williams & Moser, 2019). Finally, relevant excerpts were sorted and matched within sensing, seizing, and reconfiguring dynamic capabilities, in order to facilitate the analysis.

In the first level analysis, the overlap of scaling codes with first-order codes (microfoundations) was extracted using the "code relationship browser tool" and "code matrix browser visual tool" of MAXQDA. These tools provide the possibility to analyze the intersection of codes (microfoundations) in each segment (scaling). Extracted codes were categorized using the framework of dynamic capabilities of sensing, seizing, and reconfiguration. It is pertinent to note that the dynamic capabilities of sensing, seizing, and reconfiguration are not mutually exclusive, and they exhibit interconnection within an organization. The aim of this categorization was not to rigidly classify each microfoundation into a single category, but rather, to gain a deeper understanding of how they interact and contribute to dynamic capabilities needed for scaling SOI BMs. The outcomes of the categorization related to microfoundations are displayed in Figure 3.

In the second level of analysis, a cross-case analysis was developed. Firstly, the interviewed cases were qualitatively classified based on a spectrum from low to high degree of scaling. This analytical classification was approached from an interpretive standpoint (James, 2013), guided by our comprehension of the nuanced extent to which each entity progressed in its own scaling pathway. When examining the phenomenon of scaling up, the broader the organizational entity was able to affect policy and legislation beyond its regional area, the more commensurate it was with the higher degree of scaling up. Similarly, in the context of scaling out, the expansion of innovative initiatives from their inception to the present was evaluated alongside indicators such as annual turnover, and employee or membership count. Within the domain of scaling deep, it was discerned that a heightened emphasis on interactive educational and co-creative communications with actors co-related to a higher degree of scaling deep. Later, organizations with higher degrees of scaling were analyzed to find the relationship between different types of scaling. Figure 4 summarizes the classification of organizations based on their degree of scaling.

4 | RESULTS

4.1 | First level analysis: microfoundation of dynamic capabilities for scaling pathways

In the studied SOI BMs, a limited number of organizations exhibit instances of scaling up and exert influence on legal matters, primarily within regional and local policy spheres. All cases show various levels of scaling out. For scaling deep, organizations predominantly

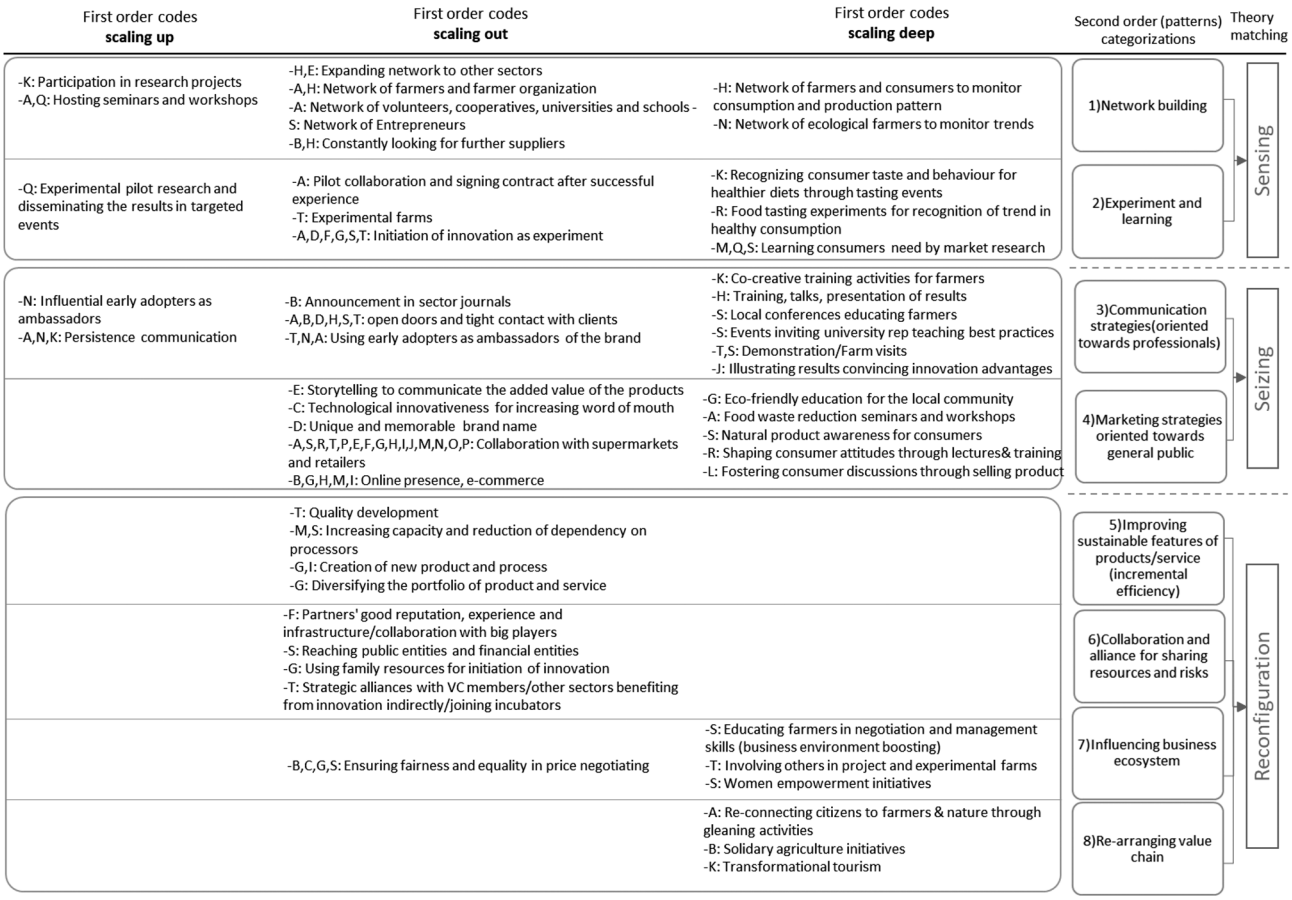

FIGURE 3 First- and second-order coding from microfoundation to categorization and theory match (authors' elaboration).

emphasize marketing and communications strategies for changing consumers' behavior and farmers' practices.

4.1.1 | Scale up

Microfoundation of sensing for scaling up: Sensing capabilities for scaling up of SOI BMs in agri-food systems require network building not only to identify key influential actors in the value chain such as decision makers or lawmakers but also to allow organizations to stay informed about public consultations or open forums related to legal changes such as research projects and experiments to provide their inputs directly to decision makers. For instance, case K, by participating in EU research and innovation action projects, and developing activities with professionals and legal experts participating in the project, was able to identify influential actors that could provide strategies about the most effective ways to frame arguments for legal changes and draft a proposal which could contribute to improving the legislation on social enterprises in Hungary.

> There is no legislation on social farms in Hungary, this legal concept is unknown, which limits the establishment of initiatives. Within the framework of the project, international professional, legal and practical activities are adapted, as well as the development of professional materials and the preparation of a motion to amend legislation. The experience of our company can contribute to improving the legislation on social enterprise and social economy in Hungary.

Another means by which studied cases were able to build a network was by hosting seminars and workshops. This proved to have two-fold advantages: it enabled organizations to organize educational campaigns to inform the public, lawmakers, and other stakeholders about the need for legal change, and at the same time, these seminars provided a platform to regularly monitor the external environment for shifts in regulations, policies, and societal trends related to sustainability and business practices. Networks were a mechanism to receive early alerts about regulatory developments, enabling the organization to respond proactively and adapt its strategies accordingly. For example, case A hosted seminars and workshops developed by their R&D department about food waste and loss, which led to developing their network with lawmakers and consequently reaching an agreement with the local administration to remove restrictive laws. Also, they were informed about legal changes and developed their initiatives accordingly.

> In some regional areas (such as Andalucia and Extremadura), gleaning activities were forbidden by the

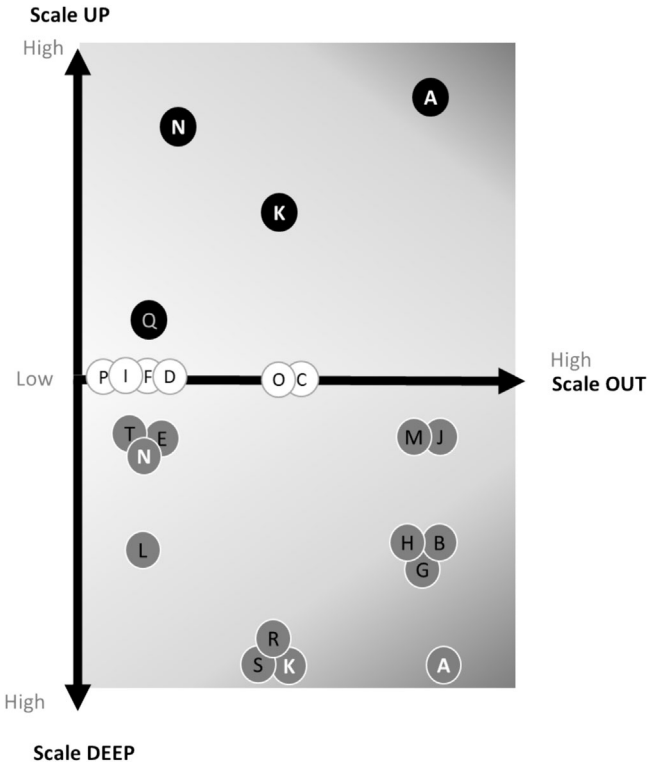

FIGURE 4 Cross-case analysis based on the degree of scaling (authors' elaboration).

> administration law. So, constant talking and negotiating [in our workshops] was the way to reach an agreement. Moreover, we got to know about legislation of the new law approved by the parliament that makes it obligatory for organizations in Catalonia to reduce food loss and obliges the company to prevent and donate food surplus. Consequently, demand surged for our workshops and seminars addressing food waste.

Experiments and learning are also prerequisites of sensing in scaling up, particularly when advocating for legal changes. The dissemination of the results of experiments or pilot methodology in related journals and presentations at conferences enables scaling up pathway. For instance, case Q was able to engage in direct advocacy and lobbying efforts supported by their outcomes and sustainable benefits of their pilot experiment and sought support for legal changes.

> We do several things - they can be lobbying for a specific law, or change in some of the regulation there is,[...] we do that with presenting a part of our work in a conference last year, at the X conference, we met the representative of European Y Organization, we discussed some advancements of what we do and then there was a daily communication with them.

Microfoundation of seizing for scaling up: Seizing capabilities for scaling up means acting upon sensed opportunities and threats for changing the law. In this regard, organizations can expand awareness using marketing strategies to amplify their voices and reach influential audiences. For instance, case N engaged influential early adopters, particularly regional social welfare facilities (such as schools, nursing, and retirement homes) to endorse and promote the SOI as innovation ambassadors, augmenting the organization's visibility in communicating the advantages of their SOI BMs. This contributed to influencing regional authorities including mayors, directors of social facilities, investors, and other interested parties. In addition, regional authorities agreed to supply their facilities.

> The process has been continuing now with meeting regional authorities, directors of schools, mayors, other consultants, investors (searching for crowdfunding), and other interested individuals or teams.

Finally, other means that facilitate scaling up are persistent communication, constant talking, negotiation, and daily interactions with influencing policymakers and decision-makers, which was emphasized by interviewees as a way of influencing and reaching an agreement (cases A, N, K, Q).

4.1.2 | Scale out

Microfoundation of sensing for scaling out: Network building is necessary for organizations to recognize and navigate the complexities of scaling out. Networking provides visibility to businesses but also enhances the organizational capability to perceive the external environment and identify opportunities, trends, and threats. This helps the organization identify new market segments, geographical areas, and communities where SOI can have a positive impact. The network of entrepreneurs, farmers and farmer associations, organic farmers, producer cooperatives, volunteers, women in agriculture, universities and public institutions, and business consultants held significant importance in the pathways of scaling out the SOI BM under study. For instance, cases S and D were able to enhance the organization's ability to scale out by joining different networks in order to improve their business and marketing plans.

> We consulted with specialist growers, and joined different programs and incubators including "Orange Grove", where through a network of entrepreneurs we made a business and marketing plan and combined traditional methods of cultivation with modern techniques to respect the sustainability of the ecosystem and differentiated our business model.

> Because of COVID, there were many leftovers from auctions, Mr. X from our network contacted us to find a solution together that would combat this food waste. So, they financially supported us as well to turn this food waste into final products and donate it for free to people in need. Then with this idea, we started a

> crowdfunding campaign, and it became so famous that the king also donated money to our company.

Building a network for scaling out was inevitable in some cases since their SOI BM was built upon creating value out of the network. Organizations may generate value by establishing a flow of information within diverse networks or by creating material flows between networks. For instance, case A acts as a hub of information between a network of farmers and researchers, creating value for both networks in a way that information needed for research studies can be obtained from the network of farmers. In return, the results of research and innovative sustainable methods can be easily transferred to farmers. Moreover, case E, by establishing the network of organizations, functioned as a hub for materials and by-products between these entities, creating value out of this network.

> Our business model is based on networking, in fact, we do not have infrastructures, nor a warehouse, we only have an office and everything related to production takes place within the partner facilities.

Scaling out by entering new markets and new geographical areas requires experimenting and organizational learning in the form of pilot experiments and a trial-and-error approach to mitigate risks and facilitate the dissemination of outcomes. Sensing capabilities help the organization identify and manage these risks, ensuring a smoother scaling-out pathway. For instance, cases A and T started their innovation by experimenting, and after gaining experience and a successful pilot, they proceeded with the expansion of their BM. The same occurred in initiating new partnerships and formalizing contracts.

> The initiation of collaboration was usually started as a pilot, and after the successful experience, we signed the agreements with stakeholders.

Microfoundation of seizing for scaling out: Seizing dynamic capabilities for scaling up requires taking action upon sensed opportunities by increasing awareness about SOI, echoing its messages, resonating with diverse audiences, and reaching a higher number of impacted people. Scaling out often requires tailoring marketing and communication strategies to expand awareness to different customer segments and geographic areas. Therefore, it is not surprising that targeted marketing channels including supermarkets, retailers, and e-shops were utilized by all interviewed cases for scaling out their BMs, alongside establishing an online presence through social media platforms and advertising in sector-specific journals.

> With e-shop, we are approaching a much broader group of consumers (mainly young families focused on healthy lifestyles). With sales contractors in shopping centres (small stands with local/regional food products), we have reached a target group that goes to shopping centres but prefers local products.

Using memorable brand names and technological innovation in sales also emerged as critical components in cultivating effective "word of mouth" dissemination for cases C and D.

> What made [our brand] unique compared with other initiatives was its name. Our brand name could transfer the message quickly and efficiently. Our brand succeeded in creating a strong link with our customers.

> We didn't publish anything, it just is a special technological concept. So people are talking about […]. Have you ever seen that special new shop? There is a shop in my neighbourhood [that] sensors detect what you take. It's easy to talk about …."

Microfoundation of reconfiguration for scaling out: For scaling out SOI BM, the organization needs to reconfigure its infrastructure, reallocate resources such as workforce and technology to accommodate a larger customer base, serve multiple geographic areas, and engage with more affected communities. Our findings indicate that improving sustainable attributes of products and services is one of the required reconfigurations for scaling out SOI BMs. This can be done through elevating capacity, improving quality, diversifying the portfolio of products, increasing efficiency, and offering new services. For instance, case G was able to scale out its business in terms of turnover and volume of production by improving the efficiency and sustainable attributes of its processing section, which also led to an increasing portfolio of products and services.

> We also had to adapt the processing of [oils extraction]. This leads to efficient processing [… and] also results in by-products (mud and pressed cake), […] this resulted in the creation of new processes and products, notably grapeseed flour, and a cosmetic ingredient rich in vitamin E. Since then, our business has grown both in terms of a portfolio of products and services offered and in the number of employees.

Collaboration and alliances for sharing resources and risks were also mentioned as important reconfiguration capabilities for scaling out. For example, in case F, by shifting collaboration from small hospitality/restaurants/cafes to public and financial entities such as Rabobank and Agrifirm, the company was able to harness the expertise and enthusiastic innovation managers of these partners for further developments. Furthermore, leveraging partners' resources such as knowledge, network, reputation, and capital for initiation of innovation played a crucial role in the inception and subsequent expansion of their SOI BMs.

> […] Now we sit around the table with the top managers, no longer with account managers

The exploration of such collaborations and alliances for sharing resources and risks can also extend to other sectors and encompass

diverse members of the value chain who could derive benefits from the innovation. For example, case T introduced a novel variety of acorn flour, possessing innovative properties that could serve as a human diet with considerable health advantages. Simultaneously, it could have applications as animal feed, significantly boosting production output. Hence, the pursuit of strategic collaborations within the pork industry, with the aim of sharing investments and costs, highlighted an essential approach for effectively scaling out this innovation.

Finally, another microfoundation by which studied cases were able to scale out was by influencing the business ecosystem as a dynamic capability of reconfiguration. This means these organizations were trying to improve the entire ecosystem around their business rather than merely thinking about immediate profit, by ensuring the fair distribution of benefits among diverse actors of the value chain. Fair benefit distribution fosters trust among stakeholders, which is fundamental for sustaining relationships, while also attracting more potential partners. Moreover, it encourages continuous engagement from stakeholders, which is crucial for scaling out as it provides stability and a foundation for expansion. In this regard, cases B, C, G, and S emphasized two-sided partnerships in a way that is profitable for everybody. These cases also mentioned that they do not put pressure on negotiation to reduce prices as much as possible.

> It's a two-sided partnership, when one side is not happy then we think about alternative ways.

> Our offered prices should be high enough so that all people in the value creation chain have their satisfying income.

4.1.3 | Scale deep

Microfoundation of sensing for scaling deep: Organizations need to build networks to sense the trends in behavior and norms of both consumers and farmers to be able to make changes in culture and beliefs. The flow of information in networks not only allows the organization to detect shifts in behavior, adjust its strategies quickly, and respond promptly but also provides the possibility for educating society.

> We built a community around food and put consumers in contact with producers. Interactions in this network wake up curious consumers that want to know where, how, and when the products are made.

For instance, case N was able to scale deep and educate consumers about the concept of an "ecology zone" using their networks to sense the market trend. They provided guidelines, consultations, and needed technology for small-sized family farms to build their own organic farm. The network built by the entrepreneur of the organization helped in sensing the opportunity in the times of Covid and war in Ukraine when locally produced healthy food became increasingly desirable.

> A broad variety of people being involved in our network (farmers, researchers, IT experts, … but also older and younger generations) makes the reaction to market change very quick and appropriate. Especially, in these times of COVID and war in Ukraine – locally produced healthy food (almost on your own) has become almost a must.

Moreover, organizations can scale deep by leveraging experiments and learning to gain insights into effective strategies for changing consumer and farmers' behavior. This capability enables the organization to adapt to evolving preferences and ultimately achieve meaningful and lasting behavior changes that benefit the organization and its stakeholders. It is therefore evident that market research activities are necessary to sense behavior and cultural norms. Food-tasting events can be also a good example of initiatives for both understanding consumers' tastes and preferences and receiving consumers' feedback.

Microfoundation of seizing for scaling deep: The organizations studied herein were able to scale deep by responding to sensed cultural and behavioral shifts. This response encompassed communicating persuasively the benefits of SOI, using marketing strategies for expanding awareness and making behavior changes. In this regard, the most frequently employed strategy for scaling deep was targeting either consumers or farmers to expand awareness and educate them about the sustainable consumption and production of food. These training activities encompassed a range of formats including seminars, conferences, workshops, study tours, and tasting events.

Regarding farmers, the focus of the training initiatives was on the dissemination of knowledge regarding eco-friendly and sustainable production methods, along with the transition from aggressive farming practices to more sustainable approaches. In specific cases, local social gathering locations like bars or cafes were repurposed to serve as venues for these training sessions. The involvement of university professors and farm advisors facilitated the explanation of best practices to farmers effectively in these training meetings. Moreover, farm visits and farm demonstrations were also other venues for educating farmers about the sustainability benefits of innovative techniques and practices.

> We struggled to make people understand that the plant obtained by this technique could provide a smaller plant and therefore less prone to risk. Unfortunately, there was a widespread idea that the size of the plant is synonymous with its quality, but the fewer leaves there are the less stress the plant has. Changing the opinion of a farmer needed a communication strategy that would best illustrate the product to develop our business.

Regarding consumers, the focus of the training was to educate them on healthy diets, natural aspects of food, and food waste reduction. Moreover, the origin of food and efforts of farmers in food production were also emphasized to have deep effects on consumers' behavior.

> Proximity is understood as fluid communication with the final consumer (transcending the intermediary) so that they know the efforts made by family farmers to improve the sustainability and taste of their product.

As for case S, consumer education aimed to break the stereotypes and misinformation surrounding healthy food preparation.

> We believe there is a need to educate consumers to have an "olive oil culture", on how to use it and where. For instance, people are afraid of cooking with extra virgin olive oil, while there are so many recipes to prepare a meal with this oil. So we created a channel of communication with our consumers to break all those stereotypes.

For cases G, L, and M, consumer education was part of organizational social responsibility in creating positive social impacts (externalities).

> Another important dimension is the creation of positive externalities for the community, not only a shop but a real social network. People start to know each other, they speak at the shop, start to discuss and improve by participating in general assembly groups. [Case L] creates a socialization culture through the pretext of selling products, and we also want to provide other services such as the library, etc.

> As a part of our social responsibility we are committed to an urban development and educational program to familiarize people living close to the company with eco-friendly living and environment protection.

Microfoundation of reconfiguring for scaling deep: Achieving deep scaling necessitates influencing the business ecosystem. This involves empowering competitors to evolve their practices within the local community and augmenting sectoral knowledge. Such an approach may encompass inviting fellow competitors to participate in funded research projects and experiments or providing direct training. For instance, case S took proactive steps by offering training in management, negotiation, and production methods to fellow competitor farmers, with a focus on women farmers, within its local area. This initiative aimed not only to elevate product quality but also to discourage the sale of low-priced bulk products, which directly impacts market prices.

> Some farmers do not have the economic situation to have machines to extract extra virgin olive oil, so they have to sell low-priced bulk products. So, these empowerment sessions aim to educate local farmers to produce in higher quality and negotiate to get a better price.

Another reconfiguring capability for achieving scaling deep involves rearranging the value chain in a manner that enables consumers' active participation in production and farming activities. This approach not only permits consumers to witness the endeavors undertaken by family farmers but also may reconnect them to nature, fostering a stronger sense of place and consequently a sense of responsibility towards it. This shift in perspective would ultimately alter people's mindsets. The same applies to transformative ecotourism, which plays a crucial role in raising awareness regarding seasonal products and cultivating sustainable consumption behavior.

> We are re-connecting citizens to nature through volunteering gleaning activities in farms. So not only do they become familiar with seasonal products and their benefits, they meet farmers and their situations to get more sense of their hard work.

4.2 | Second level analysis: Cross case

The second level analysis (Figure 4) shows that organizations A, K, S, and R exhibit a higher degree of scaling deep, characterized by more interactive educational and informative initiatives with the possibility of active interactions of their partners, leading to long-lasting behavioral impacts. Conversely, organizations M, J, T, E, and N demonstrate a lower degree of scaling deep.

As mentioned before, all organizations were able to scale out, with organizations A, M, J, H, B, and G showing a higher degree of scaling out based on their growth speed, turnover, and number of employees or members. Additionally, organizations A, K, N, and Q were able to scale up and trigger policy and law changes. Only three of the organizations studied (A, K, N) demonstrated instances of scaling up, out, and deep simultaneously.

Considering cases' organizational types, non-profit social enterprises and cooperatives of small family farms were more likely to scale in all aspects. Moreover, these types of organizations exhibit a higher degree of scaling deep; organizations A, K, R, B, H, and L, which have a higher degree of scaling deep, are all social enterprises and cooperative types. Only two SMEs had higher degrees of scaling deep and out (organizations S and G, respectively), indicating strong communication channels and tight interaction with their consumers, holding a holistic view towards their local society.

Figure 4 illustrates that most of the organizations are located in the lower vector of the image, indicating both scaling deep and scaling out. This illustrates the interdependency among different types of scaling pathways. In some cases, scaling deep intensifies scaling out, which means the ability of the organization to change the mindset and behavior has facilitated the growth of the SOI BMs. For instance, organizations T and J faced obstacles in scaling out due to farmer's lack of knowledge about the innovativeness of their technical solutions and older farmers' unfamiliarity with new technologies. Thus, scaling deep and educating to change the behavior and mindset of farmers was a necessary step for scaling out. Niche innovations can

pave the way for further changes by creating a more receptive socio-technical regime, which, in turn, is more open to advancing innovations. This factor is what Wigboldus et al. (2022) referred to as the "scaling readiness" of predominant regimes and current food system conditions to receive these niche SOIs.

On the other hand, in some cases, the more the organization scaled out, the more it created resources and capabilities to pursue cultural changes (scale deep). These organizations provided informative, educational, and co-creative environments for their partners in order to increase more sustainable knowledge and awareness for scaling deep. This was the case for organizations G, L, and M, where scaling deep was considered as providing positive externalities for society as a part of their corporate social responsibility. Particularly, educational events related to healthy diets, decommodification of their agricultural products, and differentiating their brand were part of their organizational objectives.

Scaling up was also shown to be related to scaling out and deep. For instance, organization A was able to develop its impacted geographic area by removing restrictive laws in other regions, thus developing its business across Spain. In this case, scaling up was a prerequisite for scaling out. Similarly, in case K, the lack of legislation on social farms in Hungary limited the establishment of their initiatives. However, their activities to advocate for legislation enabled them to be able to scale deeper and provide training activities for farmers, workshops for families, raise awareness of consumers in interactive sessions, promote healthy food consumption, and arrange events for transformational tourism. Thus, scaling up in this case facilitated scaling deep. Case N also by having agreements and support from regional authorities, mayors, and other influential policy actors were able to introduce the concept of the ecological zone in Slovakia, bringing related technology closer to the young generation (e.g., students).

5 | DISCUSSION

Our results discussed in Section 4.1 and illustrated in Figure 3 show that specific categories of microfoundation of dynamic capabilities remain consistent across all scaling pathways. For instance, categories 1, 2, and 3 are consistent in scaling up, out, and deep, and categories 4 and 7 are also consistent across both scaling out and scaling deep. However, some categories are pathway-specific. For example, categories 5 and 6 are unique for scaling out, while category 8 is unique for scaling deep.

As for categories 5 and 6, "improving sustainable features of products/service (incremental efficiency)" and "collaboration and alliance for sharing resources and risks" are specific to scaling out. Both aim at business growth whether by increasing efficiency, capacity, quality and diversified product portfolio, or by collaborating with strategic partners. These collaborations allow businesses to access wider resources like reputation, experience, funds, and knowledge, reducing risks associated with implementing innovations.

Category 8, "rearranging the value chain," is specific to the pathway of scaling deep. It shows that to create deep cultural changes, businesses should shift away from the traditional linear view of the value chain, particularly by giving a more active role to consumers and reconnecting them to farmers and nature.

We also found that those consistent categories (1, 2, 3, 4, 7) below, mutually reinforce and collectively facilitate scaling pathways; however, their specific objectives might vary, targeting different stakeholders such as policymakers, citizens, farmers, and value chain participants. This observation aligns with the findings of Rey-Garcia et al. (2021) that certain dynamic capabilities have the potential to become the microfoundation of another dynamic capability and contribute to the successful implementation of new SOI BM.

Category 1: Network building and organizational capability in using the potential of existing networks are not confined to expanding the number of consumers and solely growth. In scaling up, networking was oriented towards influential policymakers and administration actors, while in scaling out, networking with diverse actors of the value chain from input to consumers and supporting partners such as consultants and research organizations, and even actors of other sectors, was significant. In scaling deep, the use of the built network in educating and monitoring behavior and trends was mostly targeted. In some cases, due to the characteristics of SMEs and family farms, the organizational dynamic capability is very much dependent on the personal capability of the entrepreneur or the initiator of the innovation. Thus, the more the small-sized entrepreneur developed its network, the more the organization could benefit from it. These networks not only help in knowledge sharing, better environment sensing, and thus more informed decision-making but also provide the opportunity to share the cost and risks, particularly dealing with innovations.

Category 2: Experimentation and learning highlight the dynamic nature of the BM in adopting its resources and capabilities in favor of experimentation. Trial and error before decision-making reduced the risk for these organizations. It provided an opportunity to learn from best practices and show the credibility of the innovation while disseminating the result. It was also a means to attract investors to provide capital for the initiation of innovation and convince influential policymakers to support and facilitate it.

Categories 3 and 4: Different marketing strategies and tight communication with diverse types of stakeholders were the most significant seizing dynamic capabilities for higher degrees of scaling up, out, and deep. Marketing strategies were the objective of scaling out to change consumers' perception of value and stimulating willingness to pay a premium price, while in scaling up and deep, marketing was a tool for creating loops of feedback, discussion, and co-creation oriented towards farmers, professionals in the sector, and the general public.

Category 7: Finally, adopting a holistic approach to influence the business ecosystem was a recurring theme across organizations with higher degrees of scaling out and deep. While it is inherent to the core mission of social enterprises and cooperatives to enhance the business ecosystem in the direction of sustainability, it is interesting to note that SMEs and family farms also embraced this notion and contributed to the empowerment of their fellow competitors. This is also

in alignment with the concept of "co-opetition" rather than traditional competition, as discussed by Galdeano-Gómez et al. (2015), which highlights the significant role of both cooperatives and SMEs as agents of change within the ecosystem of agri-food. In the studied cases, the sustainability culture of the entrepreneurs (stemming from their educational background and working experience in sustainable culture) cascades through the entire organization and provides the driving force for their actions. Moreover, initiatives such as empowering socially marginalized individuals, women, or the elderly in agriculture also contributed to fostering a sense of motivation among employees, instilling a sense of participation in a positive endeavor for society.

6 | CONCLUSION

This study aims to answer the research question concerning the role of microfoundations of dynamic capabilities in enabling scaling pathways of SOI BMs for small agri-food organizations. In the first level analysis, instances of each scaling pathway and associated microfoundations enabling the pathway were identified for cases, and categorized based on dynamic capabilities of sensing, seizing, and reconfiguring. Our findings indicate that the microfoundations of dynamic capabilities are interconnected in a way that collectively results in the realization of each scaling pathway.

Our results show that the microfoundations of dynamic capabilities that enable scaling up are mainly concerned with network building through participation in research projects, hosting of seminars and workshops, and network expansion. Sandberg and Hultberg (2021) also highlighted network building as a critical microfoundation of dynamic capabilities for scaling up. Network building leads to identifying influential actors in the value chain, staying informed about legal changes, monitoring the external environment, and receiving early alerts about regulatory developments. Moreover, learning through experimental research projects and disseminating results in journals and conferences enhances the ability to advocate for regulatory change. Targeted communication towards influential decision-makers such as engaging influential regional authorities, as early adopters and persistent communication, negotiation, and daily interactions with policymakers and decision-makers are also essential microfoundations enabling scaling up.

Microfoundations of dynamic capabilities for scaling out involve network building to navigate complexities, enhancing visibility and perception of the external environment. Experiments and trial-and-error learning procedures mitigate risks, facilitating successful entry into new markets. Tailored communication strategies across diverse platforms increase awareness and resonate with stakeholders. Improvements in sustainable features of products and services such as capacity, quality, and diversity support scaling out in terms of turnover and volume. These microfoundations of dynamic capabilities align with the objectives of business growth emphasized in previous studies [e.g. (André & Pache, 2016; Gupta et al., 2020; Lyon & Fernandez, 2012; Totin et al., 2020)]. Finally, collaboration and forming strategic alliances with reputable partners, influencing the business ecosystem through fair benefit distribution and trust building, and encouraging continuous engagement, provide a stable foundation for further business expansions. These elements are crucial microfoundations for scaling out.

The microfoundations of dynamic capabilities that facilitate scaling deep predominantly revolve around marketing and communications strategies for changing consumers' behavior and farmers' practices. Sensing changes in consumer behavior is achieved through networks and experiments a point also emphasized in the study by Hultberg and Pal (2021). Empowering stakeholders and training competitors to enhance products and processes, as well as rearranging the value chain by reconnecting citizens with nature, encouraging consumer participation, and promoting transformative ecotourism, are identified as important microfoundations that enable pathways to scale deep.

Another finding of our research resulting from cross-case analysis revealed the interdependent nature of different scaling pathways, with one often serving as a prerequisite for the other. In addition, as progress is made toward a particular scaling pathway, it concurrently generates the necessary capabilities for another scaling pathway. Our results show the pathways of scaling up by removal of restrictions and the implementation of supportive legislation, lay the foundation for successful scaling out. As organizations scale out, they amass resources and capabilities crucial for prioritizing cultural and behavioral shifts, which leads to a higher degree of scaling deep. The higher degree of scaling deep leads, in turn, to a greater readiness of socio-technical regimes in accepting and receiving SOI. This enhances an organization's prospects for scaling up and out. Throughout this successive process, the acquired capabilities within certain scaling pathways serve as the microfoundation of dynamic capabilities for other scaling pathways, consistent with the findings of Rey-Garcia et al. (2021).

6.1 | Contribution to literature, policy, and industry

This paper contributes to the research field of SOI and BM scalability in the context of agri-food systems. However, the integrative framework used herein provides an opportunity to analyze the microfoundations of sensing, seizing, and reconfiguration dynamic capabilities that collectively facilitate scaling pathways of SOI BMs, beyond the agri-food context. This framework moves beyond a system perspective in scaling SOI (Geels, 2002; Lam et al., 2020) and the narrow business growth perspective in BM scalability literature (André & Pache, 2016; Gupta et al., 2020; Lyon & Fernandez, 2012; Totin et al., 2020; Wigboldus et al., 2021, 2022), providing us with a framework to discover methods (i.e., microfoundations of dynamic capabilities) through which organizations can effectively scale their BMs. Our framework bridges the gap identified in prior research concerning the importance of a comprehensive approach that connects firm-level dynamic capabilities with wider systemic factors such as culture and

policy (Hultberg & Pal, 2021). Moreover, it contributes to the work of Sandberg and Hultberg (2021) by employing the framework to analyze the degrees of scaling, facilitating a better understanding of system transition and the role played by small-sized organizations in the agri-food sector.

This article also addresses a notable gap in the empirical understanding of microfoundations of dynamic capabilities (Buzzao & Rizzi, 2021; Khan et al., 2020; Ortiz-Avram et al., 2023), particularly for small-sized organization within the agri-food industry, which contribute approximately one-third of the word's food supply (FAO, 2021). It also moves beyond merely focusing on scaling outcome and tackles the gap highlighted by Ciulli et al. (2022), showing some of the ways in which these organizations can experiment with and acquire microfoundations for scaling their BM and facilitating their SOI processes.

Considering that small-sized organizations across all sectors often face limited resources and capabilities (Trieu et al., 2023), the categorization of dynamic capabilities and microfoundations presented in Figure 3 provides examples that extend beyond the agri-food sector, benefiting small-sized organizations in various other sectors as well. By identifying such microfoundations of dynamic capabilities, managers could utilize them to prepare for scaling their SOI BMs.

Our findings also highlight the importance of co-creation in training sessions, collaborations in networking events, and experimenting and learning in research projects for increasing BM scalability. Therefore, policy frameworks could facilitate the development of dynamic capabilities for agri-food businesses in order to scale in their SOI initiatives, and should prioritize supporting such collaborative events and providing financial backing for network development, living labs, and farm demonstrations to create a positive environment conducive to scaling SOI BMs.

It may be noted that the framework of the three scaling pathways — up, out, and deep — by Moore et al. (2015) was developed in the social entrepreneurship context, which easily may explain higher degree of scaling deep and up in social enterprises and cooperative case studies in our research. However, we have also demonstrated instances of SMEs (for-profit organizations) that could also reach higher degrees of scaling deep. For scaling up, SMEs affiliated with cooperatives were able to advocate for policy change. Thus, our research demonstrates the relevance of this framework for for-profit entities as well.

6.2 | Future research and limitations

It is important to acknowledge that previous research has indicated that the sustainability performance of innovations may weaken once they reach the mass market in the scaling phase (Gruchmann et al., 2019). In other words, these innovations would be stabilized by socio-technical regimes, and due to the complex range of stakeholders' interests, the core sustainability values of the SOI BM may recede in favor of accommodating diverse stakeholder demands. This paper does not include the life cycle of the SOI BM after scaling and the extent to which it might maintain or modify the initial sustainability performance of the core value proposition. Although Giagnocavo et al. (2014) and Helfat and Peteraf (2009) utilize a lifecycle approach towards studying dynamic capabilities alongside a development pathway of innovation, scaling pathways of up, out, and deep were not included in their studies. Future research, using the same framework, could explore the role of dynamic capabilities throughout the lifecycle of the SOI BM in preventing the dilution or deterioration of the sustainability performance of innovations within each scaling pathway.

Additionally, our findings raise the potential relevance of organizational type (e.g., cooperative, social enterprises) in achieving a higher degree of scaling, considering core business value propositions, objectives, and characteristics of decision-making in diverse types of agri-food organizations. Future quantitative research would be of interest for studying the organizational type and its role in scaling SOI BMs. Increasingly, for-profit organizations are also concerned with sustainability and environmental, social and governance (ESG) goals; thus, the distinction between for-profit and non-profit may not necessarily be indicative of degrees of scaling. Further research is needed in this regard.

Lastly, our results and examples of microfoundations of dynamic capabilities are based on small-sized agri-food organizations in Europe. Although more collaboration and interactions with other value chain actors are motivated by scarcity of resources and capabilities in this context (Klewitz & Hansen, 2014), in other sectors with different market dynamics (e.g., telecommunications), different dynamic capabilities for scaling might be observed. Future quantitative research on the sector-specific microfoundation of dynamic capabilities for scaling, or SOI BMs in general (regardless of organization size or geographic area), would be necessary to ascertain whether the research results can be generalized to non-EU countries and other sectors.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

ORCID

Sepide Mehrabi https://orcid.org/0000-0003-1146-2019
Cynthia Giagnocavo https://orcid.org/0000-0001-9349-9581

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APPENDIX A

TABLE A1. Selection criteria, divergence of 20 cases and a short description of SOI as a core value proposition of their business model.

	Collaboration partner type							Innovation type				
Case code	Inputs and technology provider	Farmer and producer organization	Food industry and retailer	Consumers and civil society	Public agencies and research institute	NGO	PRIVATE CONSULTANCY, INNOVATION Brokers/hubs	Product	Process	Organizational incl. managerial	Institutional	Short description of SOI as core value proposition of BM
A	X	X	X		X	X				X	X	This organization solves the problem of food waste by conducting gleaning activities and workshops/seminars in the same area for corporates. It is a foundation that reconnects people (volunteers) with nature (through gleaning activities) and farmers. Institutional innovation involves changing the shape of the value chain, while social innovation involves hiring people at risk of social exclusion and donating fresh fruits and vegetables to food banks.
B		X		X						X	X	This cooperative of organic producers in Germany solves the problem of local organic producers reaching larger markets by directly connecting them with consumers in each region.
C		X	X					X		X		This organization solves the problem of local organic suppliers reaching the market by operating fully automated merchandising shops. These shops sell fruits and vegetables, dairy products, baked goods, beer, and more from 45 local suppliers, all with the aim of supporting the local community.
D		X	X	X	X	X		X		X		This social enterprise addresses the issues of food waste and access to healthy food. It creates an impact by employing vulnerable individuals in its business and providing healthy meals for children.

(Continued)

Case code	Collaboration partner type							Innovation type				Short description of SOI as core value proposition of BM
	Inputs and technology provider	Farmer and producer organization	Food industry and retailer	Consumers and civil society	Public agencies and research institute	NGO	PRIVATE CONSULTANCY, INNOVATION Brokers/hubs	Product	Process	Organizational incl. managerial	Institutional	
E		X	X					X		X	X	This organization solves the problem of food waste by creating natural drinks from fresh fruits and vegetables that would otherwise be wasted in the local area of Italy. It serves as a hub by establishing a network of local producers and processors.
F		X			X		X	X	X	X	X	This organization produces value-added soybean drinks and solves environmental problems through sustainable farming methods, such as CO_2 reduction and reduced energy use. It also creates a local short supply chain by involving regional plant-based dairy producers, ensuring a farm-to-fork approach.
G		X	X						X	X		This organization addresses the food waste problem by creating value from it, transforming the waste from other producers into oil products, and producing specialized oils for dermatological use.
H												This cooperative solves the marketing challenges faced by small local farmers in the Almeria province regarding their agricultural products.
I		X					X	X	X			This organization solves the problem of food waste by creating value in the form of innovative flour made from the waste of wine production.
J		X			X				X			This organization solves health problems associated with the spread of a bacterium through a patented micro-grafting process on seedlings created in the lab. Their service reduces plant growth waiting time and minimizes the risk of plants being attacked by bacteria.
K		X			X	X				X	X	

(Continues)

(Continued)

Case code	Collaboration partner type							Innovation type				Short description of SOI as core value proposition of BM
	Inputs and technology provider	Farmer and producer organization	Food industry and retailer	Consumers and civil society	Public agencies and research institute	NGO	PRIVATE CONSULTANCY, INNOVATION Brokers/hubs	Product	Process	Organizational incl. managerial	Institutional	
												This social enterprise addresses the social problem of inequity by providing equal access to public services and an open labor market for people with disabilities, allowing them to participate in daily life as equal citizens and valuable employees. They employ people with disabilities and produce processed food from organic fresh fruits, vegetables, and dairy using sustainable (and organic) farming methods.
L											X	This consumer-based cooperative addresses the problem of consumers needing active participation in food-purchasing decisions rather than merely being customers of a large retail business. It also supports local farmers and producers. Moreover, members are both the owners and customers of the cooperative's shop. In addition, customers contribute 3 h of their spare time to participate in managing the shop or other company activities and decisions.
M		X						X	X	X		This family farm addresses the problem of healthy food by producing nutritious snacks and oils (from pumpkin seeds, poppy seeds, and rapeseed). It also tackles environmental issues through sustainable innovations, including a farm-to-fork strategy and waste valorization.
N	X	X		X	X			X	X	X		This cooperative of small family organic farms solves environmental and social problems in its value chain by combining organic and circular technologies. It proposes a new patented concept called

(Continued)

Case code	Collaboration partner type							Innovation type				Short description of SOI as core value proposition of BM
	Inputs and technology provider	Farmer and producer organization	Food industry and retailer	Consumers and civil society	Public agencies and research institute	NGO	PRIVATE CONSULTANCY, INNOVATION Brokers/hubs	Product	Process	Organizational incl. managerial	Institutional	
												the ecology zone, which is less labor-intensive. This organization introduces a novel concept of a small, 100% organic vegetable farm built on innovative circular technologies (including cyber solutions) and comprehensive soil management processes (such as minimum tillage) and precision irrigation.
O		X	X					X	X			This organization produces organic olives and almonds using sustainable farming methods. It addresses environmental problems by investing in trees, having planted more than 10 thousand trees. It also avoids waste and polluting materials by eliminating plastic packaging, replacing it with cellulose pulp.
P		X						X	X	X		This organization is a community-based initiative with the aim of creating value for the community and its members. It also addresses consumers' problems of limited organic choices by providing a wide range of organic products to meet the needs of different types of customers.
Q	X	X				X		X	X			This organization offers innovative uses of microalgae and provides consulting services for microalgae producers internationally. It addresses the problem of a lack of spirulina producers in Italy, which is an alternative product with plant-based proteins, produced locally and with a high nutritional profile. It also facilitates its customers in passing organic audits and receiving organic certification.

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Case code	Collaboration partner type							Innovation type				Short description of SOI as core value proposition of BM
	Inputs and technology provider	Farmer and producer organization	Food industry and retailer	Consumers and civil society	Public agencies and research institute	NGO	PRIVATE CONSULTANCY, INNOVATION Brokers/hubs	Product	Process	Organizational incl. managerial	Institutional	
R		X		X		X				X		This organization is an association of small food producers in a rural area with a social and environmentally sustainable approach. It solves the problems of small food producers and strengthens their position in the region by providing legal, marketing, and business advice to small family businesses, facilitating the economic activities of association members, promoting the exchange of information and experience between members, product marketing and improving market bargaining positions, implementing new farming practices, developing market relations, starting to use common image and communication elements, helping members become local producers through consulting, encouraging and promoting village guest table activities, and shaping consumer attitudes.
S	X	X	X	X	X		X	X	X		X	This organization solves environmental and social challenges through sustainable farming, innovative packaging, and optimized distribution, such as waste-to-value initiatives, biodiversity preservation, agriculture conservation, refillable packaging, and calculated shipment and distribution channels. It benefits customers by offering eco-friendly, high-quality products while engaging in community education, including volunteering for local farmers' education and shaping a network of women in olive oil production in Greece, and by participating in research studies with universities, exchanging knowledge with NGOs and public institutions.

(Continued)

Case code	Collaboration partner type							Innovation type				Short description of SOI as core value proposition of BM
	Inputs and technology provider	Farmer and producer organization	Food industry and retailer	Consumers and civil society	Public agencies and research institute	NGO	PRIVATE CONSULTANCY, INNOVATION Brokers/hubs	Product	Process	Organizational incl. managerial	Institutional	
T												This organization solves the problem of producing digestible acorn flour for the human diet and develops faster-growing holm oak varieties. These new varieties, being more productive, generate higher acorn harvests that can be used in new business projects, creating new job opportunities in the area.

Abbreviation: NGOs, non-governmental organizations.

APPENDIX B

Interview guideline:

- Why should these customers/users buy this new sustainable product/service? (Could you explain the main strategies to win the competition?).
- Who are the customers/users of the new sustainable product/service that will be offered? Can you please describe how the sustainable innovations reached early adaptors?
- Could you describe the main difficulties encountered in adoption of sustainable innovation? How did you overcome these difficulties?
- Could you describe the main activities/processes characterizing your SOI business? (This question is aimed at understanding the main sustainable activities/processes that the entrepreneur follows to produce/deliver to the customers).
- What kind of tangible and intangible resources do you need to deliver this new sustainable product/service to the customers?
- How do you make sure your value-creation strategy benefits all stakeholders?
- You have mentioned in the survey that your organization also innovated in "X." Please describe why and how your company innovated in "X." [Repeat this for every innovation type that is mentioned in the survey].
- Did you align your business decisions with your partner? How did you come to an agreement? Could you tell me more about that? How were these agreements translated into your BM? How did these agreements influence your value proposition strategy?
- According to you, if there is a change in the market, how can you identify opportunities? How can you address these changes and adapt to new conditions?