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- Innovation within tradition in small family firms
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INNOVATION IN SMALL FAMILY FIRMS

EDITORIAL

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Abstract

Research on innovation in family firms has flourished in the last decades. Nevertheless, most of the current understanding has been developed by studying large organizations, leaving the specific challenges and opportunities of innovating in small family firms still untapped. This introductory article summarizes the studies included in the special issue and integrates their contributions by uncovering four types of innovation that allow small family firms to overcome the liability of smallness. Finally, we suggest directions for future research.

1. Introduction

Family firms are organizations "governed and/or managed with the intention to shape and pursue the vision of the business held by a dominant coalition controlled by members of the same family or a small number of families in a manner that is potentially sustainable across generations of the family or families" (Chua, Chrisman and Sharma, 1999, pp. 25). Scholars have been strongly debating about whether family firms are more or less innovative than their non-family counterparts and the elements that characterize their innovation initiatives (De Massis, Frattini and Lichtenthaler, 2013). Although considered less innovative and more reluctant to change, evidence shows that the majority of the most innovative firms worldwide are actually family firms (Calabrò, Vecchiarini, Gast, Campopiano and De Massis, 2018; Duran et al., 2016).

Despite the increasing understanding developed on family firm innovation, research has mainly focused on large and listed firms with few studies highlighting contingencies to the applicability of such general findings to small-sized firms (e.g. Sciascia, Nordqvist, Mazzola and De Massis, 2015). However, the vast majority of the business worldwide are small and family owned and/or managed, therefore it is paramount to understand the specificity of innovation in small family businesses (De Massis, Kotlar, Frattini, Chrisman and Nordqvist, 2016).

While both family businesses and small firms have idiosyncratic characteristics in relation to innovation (De Massis and Rovelli, 2019), when turning to small family firms the specificities of small firms overlap with those of the presence of the family in the business increasing the degrees of complexity. The liability of smallness (Freeman, Carroll and Hannan 1983) constrains small family firms to search for novel technologies and ideas in areas that enable them to build upon their established resource base (Stuart and Podolny, 1996). Indeed, small family firms are more likely to engage in local search – geographically and technologically (Rosenkopf and Almeida, 2003) – by relying on the results of past searches as starting point for initiating new searches (Nelson and Winter, 1982). Nevertheless, the specificity of competences and skills developed through this approach toward innovation allow them to develop hard to imitate resources that become sources of competitive advantage. Small family businesses are also more flexible to quickly adapt to a fast-changing environment and the strong embeddedness within family relationships, local communities and business networks are crucial in shaping their innovation activities (e.g. Classen, Carree, Van Gils and Peters, 2014), for instance through network brokerage (Kwon, Rondi, Levin, De Massis and Brass, 2020).

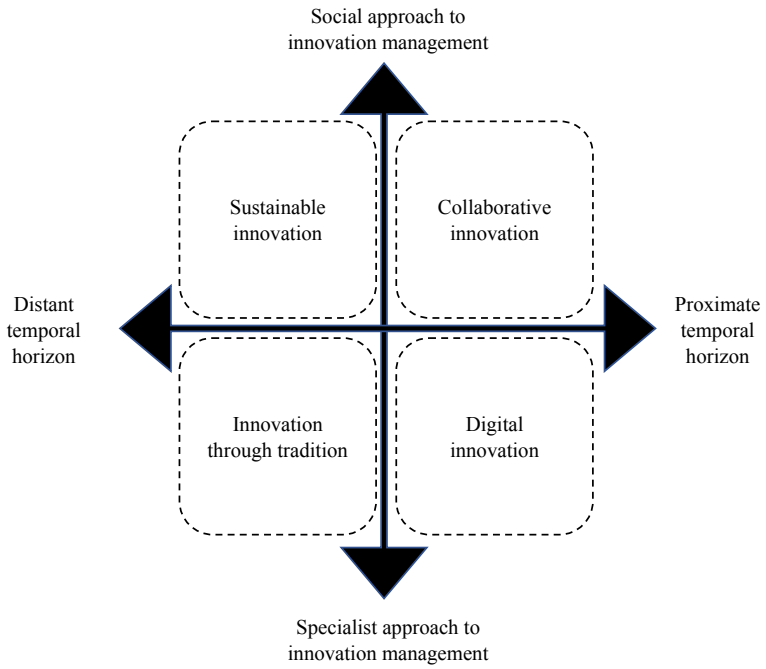
The articles included in this issue contribute to development of a deeper understanding of the types of innovation that small family firms may im-

plement, thereby overcoming their liability of smallness, and allow us to outline interesting directions for future research.

2. Four types of innovation in small family firms

The articles in this special issue illuminate our understanding on the types of innovation that small family firms can implement. Specifically, from the articles four types of innovation emerge, that we classify according to two dimensions: the temporal horizon and the approach to innovation management. When engaging in innovation, small family firms can adopt a temporally distant or a proximate horizon, and draw on a social or specialist approach to innovation management. From the combination of these two dimensions it emerges a 2x2 matrix with a configuration of four innovation types (see Figure 1).

Fig. 1: Four types of innovation in small family firms



First, the long-run mindset that may characterize small family firms (De Massis, Audretsch, Uhlaner and Kammerlander, 2017) may spur them to forward-looking toward distant future with a social approach to innovation management. In this case, small family firms are prone to implement *sustainable innovation* – innovation that improves sustainability performance,

including ecological, economic, and social criteria (Carillo-Hermosilla, Rio and Könnölä, 2010) - with a distant time horizon that spans multiple generations aiming at creating values for the society to come. Second, with a similar distant temporal horizon toward the past but focusing on specialist approach to innovation management, small family firms might engage in *innovation through tradition (*De Massis, Frattini, Kotlar, Petruzzelli, and Wright, 2016; pp. 94) by searching in their historical roots and emotional attachment to tradition ideas and resources, whose recombination with new technologies or new meanings leads to unique innovations that can generate value also for future generations of family members (e.g., Rondi et al., 2019; Erdogan, Rondi and De Massis, 2020). Third, the adoption of a proximate temporal horizon combined with a specialist approach to innovation management spurs family firms to engage in *digital innovation* – "the creation of (and consequent change in) market offerings, business processes, or models that result from the use of digital technology" (Nambisian, Lyytinen, Majchrzak and Song, 2017, p.224). Fourth, concentrating on the present by relying on the adoption of a social approach to innovation management, small family firm can engage in *collaborative innovation* – "a form of inter-firm relationship that involves the exchange and sharing of information, knowledge, technology, and resources with external parties in order to achieve innovation" (Feranita, Kotlar and De Massis, 2017, pp. 138) – thereby undertaking initiatives together with partners that allow the firm to rely on resources that are not directly possessed but can be mobilized through social ties to generate value.

It is important to highlight that the four types of innovation are not mutually exclusive, but in undertaking innovation initiatives small family firms can combine them in different configurations and levels, for example by engaging in digital innovation through collaborations, developing sustainable innovation by getting inspirations and resources from their tradition. In the next section we present the contributions of the articles in this issue by exploring the empirical investigation of the innovation types identified.

3. Articles in the special issue

In addition to the present editorial article, this special issue includes four studies (see Table 1). They represent a balanced portfolio of studies also in methodological terms, with two papers based on a quantitative methodology and the other two based on case studies. Each article explores a specific type of innovation yet also provides hints about how small family firms can combine the different innovation types to overcome the challenges and thrive.

Tab. 1: Articles in this special issue

Authors	Title	Type of innovation	Methodology	Empirical setting	Findings
Barbaritano and Savelli	Design and sustainability for innovation in family firms. A case study from the Italian furniture sector	Sustainable innovation	Qualitative	Single case study in the Italian furniture industry	Environmental sustainability is a driver of product and process innovation.
Floris, Dettori and Dessì	Innovation within tradition: Interesting insights from two small family bakeries	Innovation through tradition	Qualitative	Two case study in the Italian bakery industry	A model of the relationship among target market, local legitimization and innovation strategies is proposed.
Überbacher, Brozzi and Matt	Innovation in craft family SMEs in the digitalization era	Digital innovation	Quantitative	100 South Tyrolean craft firms	High willingness towards digital innovation is coupled with severe challenges. A taxonomy of craft family SMEs is proposed.
Gjergji, Lazzarotti, Visconti and Garcia-Marco	Innovation performance and technological collaboration with business partners in family firms	Collaborative innovation	Quantitative	1,750 Spanish firms	The effectiveness of business-partner collaboration is hampered by the family nature of the firm. Within small family firms, the effectiveness is hampered by family involvement in management.

In the first article, Barbaritano and Savelli (2020) investigate to what extent environmental practices and eco-design methods drive sustainable innovation to satisfy consumers' expectations in terms of aesthetic, functionality and environmental saving. They analyze the case of a small Italian family firm operating in the furniture industry to provide empirical evi-

dence that environmental sustainability is a driver of product and process innovation.

In the second one, Floris, Dettori, and Dessì (2020) investigate how small family firms innovate when embedded in traditional industries and closed contexts. Building on the embeddedness perspective, the authors analyze two exemplary cases of small family bakeries and propose a model to highlight the role that local legitimization and target market play in innovation strategies. Innovation within tradition expresses four main kinds of strategies: radical innovations, embodiment of tradition, reinterpretations of tradition and retro-innovations.

In the third study, Überbacher, Brozzi and Matt (2020) scrutinize the digitalization level of family small and medium enterprises (SMEs). Data from 100 craft firms were collected in the Italian northernmost Region of South-Tyrol. A taxonomy of four types of craft family SMEs is proposed based on the digitalization level accomplished. The four types of firm include the digital leader, the digital oriented, the digital surrendered and the digital steady state. Results show a relatively high willingness towards digital innovation, coupled with severe challenges hampering the craft family SMEs adoption of new digital technologies.

Last, Gjergji, Lazzarotti, Visconti and Garcia-Marco (2020) examine how the relationship between business-partner collaboration and innovation performance is moderated by the family nature of the business. Leveraging data on Spanish manufacturing firms, the authors show that the effectiveness of business-partner collaboration is hampered by the family nature of the firm. In addition, within small family firms, the effectiveness of business-partner collaboration is hampered by family involvement in management.

4. Opportunities for advancing the understanding of innovation in small family firms

The articles in this special issue contribute to develop a fine-grained understanding of the specific challenges and opportunities that characterize innovation in small family firms and offer the chance to identify interesting directions for future research. First, since small family firms rely more on local search and suffer from the liability of smallness, we acknowledge the need for further theoretical and empirical research of the role that the family and its resources, functioning and structure (Jaskiewicz, Combs, Shanine and Kacmar, 2017) play in the innovation of this type of small firms. The influence of family dynamics in small family firms is more prominent, due to the higher overlap between the family and business systems, reciprocally influencing each other (Sciascia, Clinton, Nason, James and Rivera-Algar-

in, 2013). Oftentimes, family members not formally involved in the business become source of information, contacts and skills that are crucial for the innovation of these firms. For instance, how does family interactions and relationships among family members influence the development of innovation in small family firms? How different forms of family involvement affect the process of innovation in small family firms? Understanding how innovation decisions of small family firms may vary depending on their reliance on formal and informal institutions (Brinkerink and Rondi, 2020) is another promising direction for future research that might depend on the role that the family as institution plays in the society wherein the firm operates.

In addition, stemming from the articles in this issue, we have identified four types of innovation that can help small family firms overcome the challenges related to their dimension by leveraging local strengths, within and outside the firm. Promising research questions on the distinctive characteristics of small family firms engaging in the four types of innovation emerge. As regarding sustainable innovation, small family firms with the aim of enduring over generations might be equipped with tacit competences, particularly if operating in craftmanship, that allow them to master unique resources. Nevertheless, small family firms are called to preserve their tradition over time in order to allow heritage to not be forgotten. However, differently from large family firms, they might lack the resources to invest in codifying the tacit knowledge creating for example museums, formal accounts of the family history but can also rely on a smaller family nucleus where this type of knowledge is shared more informally and tacitly.

Scholars could investigate these dynamics in small family firms to explore how they affect innovation, exploring how small family firms preserve or recover their tradition in order to leverage it to innovate and whether the lower turnover of employees that characterizes small family firms become an enabler of innovation through tradition instead of being an obstacle to innovation.

Third, digital innovation provides the opportunity to small family firms to evolve by engaging in the transformation of their products, processes and even business models. Scholars could examine whether digital opportunities can unlock the innovation potential of small family firms and how the tensions that might emerge in the transformation between digital and non-digital tools might hamper small family firms' innovation. Finally, research has found families to prefer using internal knowledge, thereby adopting a close approach to innovation (Kotlar, De Massis, Frattini, Bianchi and Fang, 2013). Nevertheless, by searching locally, small family firms can establish partnerships and collaborations among their connections, overcoming the presence of limited resources. Scholars could explore

the role of family ties in the development of collaborations in the emergence of cross-organizational innovation initiatives among small family firms as well as the role played by social capital in the identification of novel ideas that boost innovation.

5. Conclusions

The articles in this special issue start illuminating the specific challenges and opportunities for innovation in small family firms by identifying four types of innovation (sustainable innovation, innovation through tradition, digital innovation and collaborative innovation) that may allow such firms to overcome their liability of smallness and thrive in the competitive environment.

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DESIGN AND SUSTAINABILITY FOR INNOVATION IN FAMILY FIRMS. A CASE STUDY FROM THE ITALIAN FURNITURE SECTOR

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Abstract

The increasingly competitive environment requires a continuous innovation for both survival and competitiveness of firms, including FFs. This study aims at investigating to what extent environmental practices and eco-design methods can be included into innovation, in order to develop new products that satisfy consumers' expectations in terms of both aesthetic and functionality and environmental saving. The case of an Italian FF operating in the furniture industry has been deeply analysed. By focusing on a recent innovation project, the study provides empirical evidence that environmental sustainability can be actually considered as an innovative force generating new products and processes.

1. Introduction

In a hyper-competitive environment, innovation is compelling for both survival and competitiveness of firms (D'Aveni, 1995; D'Aveni et al., 2010; Duran et al., 2016; Marklund et al., 2009; McNamara et al., 2003) and several innovation opportunities emerge in light of the increasing globalization, technology changes and new lifestyles and consumer patterns (Bowonder et al., 2010; Pisano, 2015). Notably, environmental challenges occurring over the last decades imposed increasing environmental responsibilities on companies, thus raising the importance of sustainable innovation (Dai et al., 2015).

Eco-design can be seen as a possible response to this situation (Olkowicz and Grzegorzewska, 2014), as it combines environmental responsibility with creativity from the earliest stages of product innovation process (Karlsson and Luttropp, 2006; Plouffe et al., 2011).

This competitive and changing scenario potentially concerns all companies, regardless of type, size and activity, including family firms (FFs) that are usually defined as organizations owned and/or controlled by members of a family or kinship group (Neubauer and Lank, 1998). Given their contribution to the global economy (Amit and Villalonga, 2009; AUB Observatory, 2018[1]), FFs have attracted large attention in recent decades. Nevertheless, prior literature on family business often resulted in inconclusive or contradictory results with respect to both innovation (Calabrò et al., 2019) and environmental practices (Dangelico, 2017; LeBreton-Miller and Miller, 2016).

Thus, the objective of this paper is to go deep in the relationship between FFs and innovation by analysing how environmental strategies can be included into innovative processes, thus leading to the development of new products aimed at satisfying consumers' expectations in terms of both aesthetic and functionality and environmental saving.

With regard to innovation, some scholars described FFs as conservative (Habbershon et al., 2003), risk averse (Morris, 1998), and unwilling to invest in innovative projects (Block et al., 2013). Others, on the contrary, demonstrated their ability to successfully completing innovation projects (Chrisman et al., 2015), owing to their long-term orientation, involvement of multiple generations and family culture (e.g. Craig and Dibrell 2006; Llach and Nordquist 2010; Zahra et al., 2004). Prior research also emphasized the role of the ownership structure in affecting the innovation behaviour of FFs (De Massis et al., 2013). A number of studies agree on the existence of a negative relationship between family involvement and investments in R&D (e.g., Bloch, 2012; Chrisman and Patel, 2012; Munari et al., 2010),

[1] https://www.aidaf.it/wp-content/uploads/2019/11/26/Report-AUB-XI-edizione_25_novembre.pdf (late access: 24/11/2019).

while more conflicting results concern the impact of family involvement of innovation outputs, with respect to which scholars found both positive (e.g., Craig and Dibrell, 2006) and negative (e.g. Czarnitzki and Kraft, 2009) relationships. Such contradictory findings suggest the need for advanced understandings on FFs' innovation (Calabrò et al., 2019; Magistretti et al., 2019), especially focusing on how innovation is carried out within this context and how the owner's involvement can influence its implementation. Prior research, indeed, is quite limited (De Massis et al., 2013), being focused primarily on the analysis of both antecedents and outcomes of innovation processes rather than their execution (Calabrò et al., 2019; De Massis et al., 2013; Roed, 2016).

Inconclusive results also emerge concerning to FFs' adoption of eco-design methods. Extant literature suggests that FFs are more likely to engage in environmental practices than those that are non-family (Craig and Dibrell 2006; Núñez-Cacho et al., 2018). Possible explanations lie on three main characteristics of family businesses, namely prominence, continuity and enrichment (Debicki et al., 2016), which make FFs more willing to risk the uncertainty of economic outcomes related to undertaking environmental strategies (Berrone et al., 2010; Sharma and Sharma, 2011). Yet, how FFs act in the adoption of eco-design practices when developing new products has been overlooked by the literature, as major attention has been focused on large companies and non-family businesses (Núñez-Cacho et al., 2018). Moreover, although prior researches highlighted the high propensity of FFs to adopt proactive environmental strategies (Delmas and Gergaud, 2014; Sharma and Sharma, 2011), to the best of our knowledge, few to no studies deal with the analysis of environmentally friendly products' development process in a family setting. Thus, research on this topic advocates for further investigations.

Starting from these gaps, two main research questions operationalize the purpose of this study:

H1): How do FFs manage the innovation process? In particular, what is the role of the owner/s in the different steps of the product innovation process?

H2): How can eco-design practices generate new environmentally friendly products in FFs? In particular, what factors can enhance or hinder the implementation of eco-design in FFs?

Given the scarcity of prior research on the topics investigated, the study is explorative in nature, based on a qualitative single case study carried out on a design-intensive FF operating in the Italian furniture sector.

The research contributes to the body of literature on FFs' innovation in different ways. First, it investigates how innovation takes place and is managed in a family setting and contributes to the conversation regarding whether founder/owner involvement can be advantageous or not for im-

portant innovation outcomes (Jayaraman et al., 2000). Second, by focusing on the eco-design concept, the study goes deep into the development of environmentally driven innovation in FFs, which has been scarcely investigated until now (Huang et al., 2009; Scott-Young, 2013). Further contributions derive from the specific context of analysis, which is worthy of attention and investigation. The furniture sector is very important from an environmental standpoint (Azizi et al., 2016) and furniture companies are highly involved in design innovation, especially within the Italian context (Vickery et al., 1997). In addition, this research focuses on a design-intensive setting, which has been slightly overlooked by prior research on family business innovation (Magistretti et al., 2019), although it seems to be very interesting for analysing the relationship between innovation and family involvement (Dalpiaz et al., 2014).

The rest of the paper is organized as follows; section 2 focuses on the concept of innovation and eco-design, with specific attention to FFs. The research method is described in the third section, while the fourth section provides the case study analysis. Section 5 discusses the results along with their theoretical and managerial implications. The last section provides conclusions and suggestions for further research.

2. Theoretical background

2.1. Innovation in FFs

Literature on family business innovation has rapidly developed over the last decades (Calabrò et al., 2019). Scholars adopted different approaches and methodologies. A number of theoretical perspectives were applied. Starting from the behavioral agency theory, some authors (e.g., Roessl et al., 2010; Wright, 2017) suggested that FFs typically underinvest in innovation, while others (e.g., Konig et al., 2013) underlined their great ability to adopt discontinuous technologies and innovations. The social-capital theory and the social system theory were also used to explain both advantages (e.g., Andrade et al., 2011) and limitations (e.g., De Clercq and Belausteguigoitia, 2015) of FFs related to innovation practices. According to the social system theory, for instance, researchers found that the familiness of the firm can play a different role, depending on contextual factors such as performance hazards, type of family involvement, and generational effects (Roed, 2016). Hence, conceptual studies – while producing interesting findings – did not provide a comprehensive and shared framework of FFs' factors affecting innovation, both positively or negatively.

Empirical research findings were often contradictory too. While some scholars demonstrated a positive association existing between innovation

and FFs (Kim et al., 2008; Llach and Nordqvist, 2010), others found negative ones (Block, 2012; Chen and Hsu, 2009; Chrisman and Patel, 2012; Munari et al., 2010). An important stream of contemporary research concerns the role of the family involvement in ownership, government and management, which can result in unique resources that may affect the family business innovation. In this respect, a number of studies is consistent in pointing out the negative relationship between family involvement and R&D expenditures (e.g., Block, 2012; Chen and Hsu, 2009; Munari et al., 2010), while contradictory results emerged concerning the impact of family involvement on innovation output. For example, Gudmundson and colleagues (2003) found a positive association between family ownership and the firm's ability to introduce new products and services. On the contrary, Chin et al. (2009) demonstrated that family involvement negatively affects both the quantity and the quality of the patents received, while Berrone et al. (2010) also highlighted the negative influence of FFs owner's aspirations to self-government on their willingness toward innovative collaborations with other firms.

Hence, the topic of innovation in FFs - despite its relevance (De Massis et al., 2013) - is still controversial and worthy of investigations for both theoretical advances and practical applications (Diaz Moriana et al., 2018). This is where the present study takes up its work.

2.2. Eco-design methods for FFs' innovation

Growing environmental issues and related consequences are affecting the way people do business all around the world (Dai et al., 2015). Governments, consumers, investors and other actors involved in the global value chain are more likely to interact with organisations environmentally responsible (Jansson, 2011).

As introduced earlier in this paper, the way FFs relate to environmental issues still represents a debated topic in the literature. Because of their long-term orientation, intergenerational aspirations and confidence in the reputation (Berrone et al., 2010; Brigham et al., 2014; Cretu and Brodie, 2007), family businesses are often depicted as much likely to engage in environmental practices. However, Le Breton-Miller and Miller (2016) underlined a number of FFs' characteristics that may work against environmental practices, such as conflicts occurring when family members fail to get along or socioemotional restrictions, which may reduce the family motivations towards environmental investments. Anyway, the environmental issue cannot be undervalued by FFs, since the aesthetic and functional values of products cannot be long considered as tools of differentiation and competitiveness (Hertenstein et al., 2013) without considering their environmental and social sustainability.

Thus, the concept of eco-design becomes critical for firms' growth and long-term survival (Plouffe et al., 2011). This has been variously defined by prior researches; Bovea and Pérez-Belis (2012) describe eco-design as an activity focusing on the integration of environmental issues into product development. van Hemel and Cramer (2002) define it as the systematic effort of a firm to improve the environmental profile of product(s) in all stages of the product life cycle. Sometimes eco-design has been also referred to as Design for Environment (DfE), "an umbrella term describing techniques used to incorporate an environmental component into products and services before they enter the production phase" (Olkowicz and Grzegorzewska, 2014: 206). The common core of such definitions is captured by Marques and colleagues (2017) who define eco-design as a process including all activities along the value chain, such as the creation, distribution, consumption, disposal and re-entry of a product into the market, carried out with sustainability principles in mind.

Concerning the furniture sector, on which this study focuses, eco-design can encourage remove sustainable forest management, by taking care of the lands' biodiversity and regeneration capacity remove and preventing illegal woodcutting. In designing and conceptualizing new products, eco-design enhances the limited use of raw materials by creating, for example, furnishing objects whose components are readily separable at the time of their disposal. Additionally, the use of raw materials easier to recycle than wood – such as aluminium and glass – could be improved in this step. In the production phase, eco-design could suggest the increasing use of water paints, instead of chemical ones, both to improve the workplaces' healthiness and to reduce gas emissions. During the assembly and product finishing, eco-design can promote the use of machinery with high energy efficiency, the adoption of glues containing no-toxic elements, and the re-use of production wastes. Finally, concerning the distribution activity, eco-design could suggest the optimization of products' storage, to enable a better use of spaces and to reduce the number of trips, with related advantages in terms of fuel consumption and gas emissions.

Notwithstanding an increasing recognition of the strategic relevance of eco-design (e.g., dos Santos et al., 2019; Krotova et al., 2016), the topic has received little attention within the FFs context. A recent study of Olkowicz and Grzegorzewska (2014) highlighted that using a method of eco-design and implementing environmental innovation can be successful, even though resources are limited and firms are controlled by family owners. However, empirical evidence from Deutz et al. (2013) suggested that large companies seem to be more likely to include the environmental principles at all stages of the design process than small and FFs. Hence, research findings are rather contradictory.

Certainly, several requirements are needed for implementing an eco-

design strategy, which sometimes can make it difficult for a family business. Among others, Olkowicz and Grzegorzewska (2014) pointed out the importance of (i) using certified woods, (ii) monitoring data about environmental pollution emissions and waste materials from the manufacturing process, (iii) obtaining certifications from the eco-labels institutions. Above all, the authors highlight the family's intention of establishing a competitive advantage from the eco-design, without which its success is very difficult to reach.

All this suggests that there is space for additional research, in order to understand how eco-design can be implemented by FFs and what conditions can affect its adoption. Advancements on this topic are critical since eco-design could help FFs to discover new technological opportunities and solutions with a positive environmental impact (Ghisetti and Montresor, 2018), thus enhancing their transition towards environmentally friendly productions (Mulder, 2007).

3. Research method and data collection

This research was based on an in-depth analysis of a single case study carried out within the Italian furniture sector. This method has been selected because it reveals its usefulness for understanding "how" and "why" certain events occurred. Moreover, it is suitable for studying new topics, as well as for developing emerging theories (Bonoma, 1985; Yin, 1981). Indeed, the concepts of innovations and eco-design, here investigated, are very complex in nature. They require a careful and thorough analysis in order to explore how and why innovation is managed and eco-design practices are implemented along different stages of the value chain. Several prior studies related to these topics are qualitative in nature and are based on a similar approach (e.g., Cerdan et al., 2009; Ghisetti and Montresor, 2018; Kammerlander et al., 2015).

Despite the single case study method could reduce the generalizability of the results and increase observer bias (Vissak, 2010), it allows to retain the depth of the study (Piekkari et al., 2009) and the richness of results (Dubois and Gadde, 2002). Therefore, it was properly fitting with the explorative purpose of the current research.

In selecting the case study, Eisenhardt and Graebner (2007) suggest that qualitative samples should be purposive rather than random, meaning that participants should be chosen according to some criteria guided by the study purposes. Following prior research about FFs based on case studies (Casprini et al., 2017), we selected a FF that promised to provide a rich and detailed description of the phenomenon under investigation, as recommended by the "intensity sampling strategy" of Miles and Hurberman

(1994). The case study firm is Fiam Italia Srl (Fiam), a furniture company based in Pesaro, in the Marche Region. Fiam has been selected for various reasons. First, it classifies as a FF as it is entirely owned by the family and all members occupy managerial positions. Vittorio Livi is the founder of FIAM, while his sons, Daniele and Francesco, respectively play the role of CEO and Export Area Manager of the company. Second, the company operates in the furniture sector, more specifically in the subsector of furniture and furnishing accessories (such as mirrors, tables, coffee tables, chairs, shelves, display cases, magazine racks, umbrella holders and other accessories). This industry is of paramount importance as there is a growing concern about the environmental effects related to goods production, use, and final disposal at the end of their life cycle (González-García et al, 2012). Third, Fiam is a design-intensive firm, as it heavily relies on the creativity and innovativeness of designers for the development of its new products (Dell'Era and Verganti, 2010). As prior research noted, in this kind of organisation, "the role and involvement of the founding and controlling family in product innovation and their interest in preserving the family name and identity across generations of new products are of paramount importance" (Magistretti et al., 2019: 1122). Fourth, the company is very well known for its innovativeness. Since its beginning in 1973, Fiam focuses on innovation as the main driver competitiveness, as evidenced by a number of successful products - such as "Ghost", the first chair produced from a single sheet of glass and recognized worldwide as a design icon - and prestigious Awards for innovation, e.g. the Leonardo Quality Award (2015) and the Compasso d'Oro Awards (2001). Finally, Fiam is clearly involved in environmental practices. Since its foundation, the company has been working with glass, which is one of the raw materials, entirely recyclable, with the lowest environmental impact in the furniture sector. Moreover, the company adopts process certifications and stands out for the continuous research of new products and processes aimed at reducing the environmental impact of its activity. Notably, in recent times, the company has improved its efforts to move towards a circular business model, by introducing the eco-design principles into its processes, in order to put the environmental issues at the early stages of the product innovation (Karlsson and Luttropp, 2006).

Thus, the Fiam case study provides a good opportunity to address our research questions, as it offers the "rare and extreme" qualities requested to observe the phenomenon under investigation (Eisenhardt and Graebner, 2007).

Multiple interviews were conducted during 2018, to collect information concerning the overall approach of Fiam towards environmental issues and to provide a deep investigation of how the company manages the new product development process. Moving from our research questions, a good example of eco-design innovation has been considered, in order to

understand both the role of the owners in the new product development process and factors affecting its implementation and success.

Each interview was based on a semi-structured and open-ended questionnaire which lasted for approximately two hours. To improve the quality of the information gathered through the interviews we identified people, within the firm, who would be most able to inform us on our main research question and "are willing to share their knowledge" (Patton, 2015: 284). All the interviews were conducted in Italian, recorded, transcribed and translated into English. Additional questions were asked, when necessary. The respondents were encouraged to give any kind of additional feedbacks. Moreover, the final reports of each interview were sent to the respondents for possible changes, in order to improve the validity of this study. For data triangulation, we collected information from other sources, such as the firm's website, its profiles on different social networks and other documents provided by the managers interviewed. The use of such tools allowed us to reduce the likelihood of misinterpretation and to consider multiple viewpoints (Ghauri, 2004).

4. The case study analysis

4.1.Company profile

Fiam produces and sells manufacturing furnishing items in curved glass, since 1973. From the beginning, the company has been fully owned and controlled by the entrepreneur's family, more specifically by the founder Vittorio Livi and, in recent years, by his two sons Daniele and Francesco Livi. Actually, Fiam involves about 50 employees, with an annual turnover of approximately €9 million. About 30% of annual turnover comes from the Italian market, about 35% from EU Countries, and about 35% from extra-EU markets. Hence, despite the company concentrates mostly on the European market, it is experiencing an interesting growth in international countries, especially in Asia.

Furnishing items include tables, chairs, consoles, libraries, shelves, and other glass accessories, such as mirrors, lamps, coat-hangers, valets and magazine racks. All products are realized in curved glass and aim at transforming both home and office environments into stimulating spaces to be lived in and admired. Each product represents a perfect mix of quality, art and design. Notably, the type of glass used by Fiam is called "float", industrially produced by the multinational AGC, of which qualitative standard allows the company to realize products perfectly flat, which preserve over the time the purity of transparency and an almost total absence of defects in the vitreous mass.

As for the distribution system, the company relies on different agents, who refer to the various sales managers, according to specific geographical markets criteria. Every year, the sales managers define the reference budgets for each agent, in line with the results of the past year and the future development prospects of each area. The agents deal with the intermediate customers, e.g. the retailers, and help them throughout the overall processes of purchasing and management of the relationship with the company. The retailer then sells to the final customers, also providing them with additional services, such as pre- and after-sales assistance.

4.2. Innovation within Fiam

Fiam has always been recognized for its innovativeness, being the first company that produces furnishing items in curved glass. Starting from the first table "Onda pouf" that was entirely designed by the company's founder, Fiam constantly developed new products. In 1984, a revolutionary project was achieved by producing the first single-block table, namely "Ragno", while in 1987 was created the first curved glass armchair, "Ghost", which is a monolithic chair in 12 mm-thick glass. In 1997, for the first time, the curved glass was combined with a mirror for producing "Caadre", designed by Philippe Starck, while recently, in 2012, Fiam launched "Macramè", a collection of coffee tables comprising hand-interwoven spun glass base.

Design and technology are the main drivers of innovation within Fiam.

A critical role is played by the designers. The company's founder, Vittorio Livi designed several products for Fiam, from its beginning to recent years. Moreover, the company developed a very rich and prestigious portfolio in terms of collaborations with world-renowned designers, including Philippe Starck, Marcel Wanders, Daniel Libeskind, Cini Boeri and Vico Magistretti, which enabled it to successfully compete on a global scale. Thanks to these partnerships, FIAM created and launched increasingly innovative products by integrating new forms and materials. Some of these products have been exhibited in 25 international museums, among which the Museum of Modern Art (MoMA) in New York.

Fiam accepts a wide concept of design, which involves both aesthetic and functional features of the product. As the company CEO said:

"We have experienced the effectiveness of conceiving the product of design as a dynamic and versatile object, which permits the customers to become co-authors of a unique work".

Several custom-made products, designed by world-famous, are born to be adapted to demanding and evolved clients. For example, "Rialto", "Rialto L" and "Luxor", offer various possibility of transformation of measure and structure, and each piece can be customized using chest of drawers,

choosing different sizes, shapes and finishes. Hence, innovation in Fiam uses design with an overall effort for integrating the search for beauty with the attention to customers' needs.

Fiam's's innovation is also driven by technology and process innovation. Technological research is very important for the final result of Fiam products:

"We have a high level of craftsmanship in fusion with high technology - explains the CEO during a past interview[2] *- we have an instrument that controls the ovens and the success of the glass bending. We are not improvised; it is the result of forty years of experience".*

What is important is not only the use of high technology but also its continuous innovation. To carry out some projects, indeed, the company has even created "ad hoc" technologies. As in 1982, when Massimo Morozzi proposed the design of the "Hydra" table whose realization required the invention of an exclusive water-jet process.

The success of innovation in Fiam results from different factors, as emerged during the interviews. First, there is the high attention to each phase of the production process, from the initial melting phase of the glass up to the stress tests carried out in the final perfection checks. The new product development passes through a series of controls and must ensure compliance with certain production and process standards before it can be concluded. Some tests, such as the impact with a metallic sphere, certify the quality of the production process, in which each processing phase involves careful checks and verifications to guarantee the perfection of the finished product. Moreover, a critical role is played by human craft skills. The process of glass bending, for example, requires different attitudes. It is necessary to pilot and impress the right temperature in the various points of the slab; to move correctly the mold; to shape the glass, where necessary, by using various tools; to maintain the conditions of a balance of the glass between the solid and liquid state.

"Passion is not enough – says the CEO - manual skill demands a high sensitivity! The intervention of the master bender and his ability to work in harmony with his colleagues working in front of the oven, are essential elements for the quality and success of the new product".

According to the CEO, another factor influencing the success of innovation in Fiam concerns the direct involvement of the family in the innovation activity. The founder, as a designer, created several products for Fiam. Hence, he directly authored the development of new products, providing his original idea as well as driving the overall process of new product development. In order to realize the designer's idea, indeed, a strong collabo-

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[2] http://www.primarete.it/it/articolo/intervista-a-daniele-livi-amministratore-delegato-fiam-italia-spa (late access: 29/11/2019).

ration is needed between the designer and all people involved in the different stages of the new product processing. Therefore, the founder not only plays a supervisory role in the innovation process, but also interacts continuously with the various company employees involved in the project. This involvement of the founder and the other family owners also occurs when the new product is proposed by an external designer. Moreover, innovation is often encouraged by the family as it always participates in national and international events from which they inspire their innovativeness.

Finally, the management of innovation within Fiam largely benefits from external contributions. The company collaborates with great names of Italian and international design landscape. Moreover, it has important collaborations with other firms operating in the same geographic area (central Italy), as a single unit of an Italian Furniture District. Owing to these partnerships, such as with Biesse Group, it gained several advantages both in terms of economic growth and, most important, in terms of product and process innovations.

4.3. Fiam's approach towards environmental issues

Over the years, Fiam showed increasing attention towards environmental issues.

Glass is the main raw material used by Fiam, since its origins. As noted by the company's founder:

"Glass is nature, as it consists mainly of sand and lime. It is aseptic, non-toxic and does not release any harmful substances. Glass is eternal and can be recycled endlessly, without waste. For all these reasons, it has always been the soul of Fiam and the main reason why we try to valorise all its virtues through production processes carried out in line with environmental and social standards".

Despite the use of other materials (like steel and wood), which have been gradually introduced to accomplish the designers' proposals, Fiam has always been focused on glass, in order to sustain its leadership in this specialized sector, as well as to minimize the environmental impact of its production processes. As stated by Daniele Livi:

"Fiam is actively re-using leftover production raw materials to manufacture other innovative and unique products, and the introduction of the DV Glass® represents a good (and rare) example of the company's commitment towards environmental issues".

Furthermore, the company is planning the adoption of renewable energies for the near future and it is involved in reprocessing activities concerning waste and garbage.

Fiam clearly declared to adopt such practices mainly for reducing the environmental impact of its activities. Meanwhile, the company also stressed the possibility of increasing the total amount of product sales, especial-

ly among consumers who are increasingly aware of sustainability and related issues. Finally, economic motivations linked to costs reduction and increased revenues have also emerged among the main motivations pushing Fiam towards the adoption of environmental practices.

The company has indicated fiscal and economic incentives for investments in R&D, as well as in waste collection systems and renewable energies plants, as crucial factors supporting the implementation of sustainable and environmental practices.

By contrast, as pointed out by the CEO:

"Problems related to the reconversion of final products into new ones represent clear examples of factors which can hinder the adoption of such practices".

At an operational level, the sustainable approach of Fiam reveals itself through the adoption of the UNI EN ISO 9001 certification concerning the adoption of a quality system aimed at achieving a zero-defect product objective and providing quality management practices to customers and business counterparts. Further evidence derives from the packaging policies. Most products are currently packed in recycled wood boxes that are marked according to FAO guidelines. All the wooden packages undergo a special treatment, consisting of an 80° sterilization process, in order to obtain a material absolutely free from the presence of bacteria that could be harmful to both products and the environment.

Within this framework, it is important to highlight that the implementation of such practices allowed Fiam not only to reduce the total amount of raw materials, energies and waste produced - with positive impacts on its overall efficiency - but also to realise new furniture items characterised by both design-content and quality and environmental sustainability, as the DV Glass® demonstrates.

4.4. How environmental sustainability drives innovation in Fiam: the case of DV Glass®

DV Glass® has been designed by the firm's founder Vittorio Livi and his son Daniele: this is where the acronym DV Glass® comes from. As the CEO pointed out:

"Our father, Vittorio, always works alongside us. Together, we designed the DV Glass® sheet, which allows us to realise products with different colours and thicknesses, never seen before[3]*".*

Born in 2012 with a project titled "Polychromy", the original idea was that of reinventing glass through the optimization of all stages of the production process, from procurement to consumption, by fully embracing

[3] https://www.pressreader.com/italy/l-economia/20181210/282187947102650 (late access: 26/11/2019).

the principles of environmental sustainability. DV Glass® is an innovative reassembled block of glass stripes, which are juxtaposed and transformed into a structural monolithic one, thanks to a high-temperature melting process. In detail, during the manufacturing process, the scraps from sheets of glass are cut into several pieces and are then assembled into a new sheet, whose thickness matches the width of the band. Later, the new surface undergoes a high-temperature treatment, more specifically a thermal process with temperatures of about 900°C, that allows melting the coloured strips previously selected to be recycled. This innovative manufacturing process leads to a melted glass, masterfully hand-crafted, which perfectly matches with a wide technological research, thus resulting in planned or completely random combinations of colours and thicknesses (until 30mm).

As noted by the CEO:

"It is important to highlight that this process entirely occurs within the company and results in less cheap products as it limits the use of external waste disposal systems."

The contribution of the company's founder and his son was critical for the development of DV Glass®. Both their creativity and entrepreneurial foresight have been important for inspiring the *initial* idea, as well as for driving all the company's departments towards its following implementation. They have been working, for months, alongside their skilled artisans who, day after day, have engaged in the fusion, bending and assembly of pieces of waste glass, until they have merged.

Fiam has carried out several investments and technical attempts for implementing this innovative product. More specifically, after proposing the initial idea, Fiam left designers a high degree of freedom in developing their ideas and projects based on DV Glass®. Several meetings and discussions with engineers, designers, marketers and other specialists, allowed FIAM to involve different skills around the DV Glass® project, with the aim to understand and evaluate its economic and technical feasibility, as well as its potential appreciation from the demand side. Hence, the values of creativity, entrepreneurship and environmental responsibility combined with the family's orientation towards innovation and technology advancements, revealed their importance in defining the company's long-term strategy by acting as a filter of ideas in Fiam's selection projects.

The high-quality of DV Glass® is assured by a rigid quality control system, which allows creating products in accordance with the international standard UNI EN ISO 9001. The uniqueness of outputs is due to the non-repetition of the DV Glass® process execution: the high variability of the melting process, in addition to the strong craftsmanship of the preassembly phase, implies that each new slab is completely different from the previous one, and never identical to the next one. Moreover, this new material allows several variations in measures and colours, which impro-

ves the originality of the final product. Thus, the use of DV Glass® allowed the introduction of new furnishing accessories, characterized by high-quality, uniqueness, and environmental sustainability. With DV Glass®, as the company's founder says:

"The glass enters a new era: it goes together with men's life but also it transforms with elegance and prestige the interior design of our homes, since glass evolves from glacial, minimal and cold material into a warm, elegant and technological one."

Owing to DV Glass®, Fiam is now able to reach a public that requires both high-quality and custom-made glass products. Meanwhile, the use of DV Glass® has strengthened the company's ability to reach a public that highly appreciates additional benefits linked to ethical and environmental values.

The collaborations with designers have revealed their relevance, particularly with new young designers, which are more likely to understand consumers' needs and current expectations. Keynote designers, already working with Fiam from different times, have shown great interest in DV Glass®, and were deeply involved in the production of new ideas and manufacturing products based on the new material.

A critical factor influencing the success of DV Glass® has been recognized in the company's ability to adequately communicate its innovation and the relative new collections to the market. It has been firstly presented at the *Salone del mobile 2018*, thus strengthening the innovativeness of Fiam within the furniture sector and its overall environmental-saving orientation. The founder and his family continuously disclose their values and ideas in press releases and other forms of communication. Several interviews with designers were also organised during the last edition of the *Salone del Mobile 2019,* with the aim to reveal how the creative idea was born, how the relationships between the company and designers have evolved and how it could be exploited in new products for the future. These interviews have been also shared with the company's social media official channels, in order to improve their visibility.

As concerning the difficulties that Fiam had to face during the development of DV Glass®, the owners interviewed pointed out some technical issues related to the composition of the raw material, which requires an appropriate industrial equipment to work with. Thus, technical investments have had to be made, requiring important financial supports as well as training activities aimed at informing and educating the existing staff.

5. Discussion and Implications

This qualitative study identifies unexplored dimensions of FFs' innovation by considering how environmental issues can be adopted for developing new products and how the product innovation can take place in a family business. By doing so, this study adds different improvements to prior literature on FFs' innovation, while suggesting also practical implications for FFs' managers. From a theoretical standpoint, three main contributions arise from this study. First, it investigates how innovation is carried out by FFs, instead of analysing only antecedents and outcomes of the innovation process (Calabrò et al., 2019; De Massis et al., 2013; Roed, 2016). By observing the development of the DV Glass®, the research goes deep into this process, analysing the main steps and figures involved. In this regard, the case study reveals its value in enriching the theoretical debate on the role of the ownership in affecting the innovative behaviour of a FF (De Massis et al., 2013) and confirms the existence of a positive relationship between family involvement and innovation outputs. Consistent with prior studies (e.g., Miller and Le Breton-Miller, 2005; Sirmon and Hitt, 2003), indeed, our findings show that the founder and his sons' involvement represents a critical factor for innovation. With respect to DV Glass®, they inspired the original idea, thus moving the innovation process, and further provided financial, managerial, as well as technical and operational supports to its realization. Second, this study contributes to the theoretical discussion concerning the relationship between FFs and environmental issues. Our findings are in line with previous researches highlighting that FFs are often engaged in environmental practices (Craig and Dibrell, 2006; Núñez-Cacho et al., 2018). Fiam, in fact, has always paid great attention to environmental sustainability, basing its core business on glass processing. Moreover, it gradually improved the adoption of environmental certifications and practices aimed at enhancing its ecological efficiency. As the DV Glass® project demonstrates, the company has enhanced its ability to integrate environmental practices into product design elements. Following the eco-design principles, Fiam has involved all stages of the value chain, in order to realize a new product that is both innovative and environmentally sustainable. Therefore, the Fiam case study provides an insightful example of how the implementation of eco-design practices could result in the realisation of innovative design-based products within a FFs setting, which has been scarcely investigated by previous research (Núñez-Cacho et al., 2018). Furthermore, by considering the concept of eco-design as one of the pillars on which the circular economy is based (European Commission, 2015; European Environmental Bureau, 2015; Ellen Macarthur Foundation, 2013), this study provides evidence that also FFs can move towards a circular business model, by exploiting the potential benefits that are linked to

reduce, reuse and recycle practises (Barbaritano et al., 2019).

The third contribution of this study concerns the theoretical debate on FFs and the execution of open innovation (Casprini et al, 2017). Despite prior studies (e.g.: Classen et al., 2012) suggested that FFs often prefer a closed approach to innovation, by using internal knowledge, our analysis reveals that Fiam is a very "open" firm. It collaborates with a number of national and international designers as well as with other companies operating in different industries, such as wood. These collaborations improve the company's innovativeness and its ability to successfully compete with increasingly innovative products, incorporating new materials and technologies.

As concerning the practical implications, various suggestions can be drawn from this study. In line with previous researches (e.g., De Massis et al, 2013; Llach and Nordqvist, 2010), entrepreneurial inventiveness emerged as critical for affecting FFs' willingness to innovate, as well as to integrate environmental issues within innovative processes and products. If the owner/s strongly believe in the potential that can arise from the implementation of environmental practices, a considerable involvement within the company, like in this case, can facilitate the management of the innovation process by transmitting common values and goals through more personal relationships, not only working ones. Managers, employees, and workers thus recognize in the owner/s a critical role, and this could also result in better company's performances, as they all feel belonging to a unique entity. However, as the analysis of Fiam suggests, a slender and functional organisation should be developed to encourage and enhance collaborations, both within the company, and with external actors and stakeholders. Inside the company, Fiam highlights that an adequate communication, along with informal and planned meetings between family members and between them and employees are helpful for stimulating and managing the innovation, sharing new ideas and enriching the personnel involvement in environmental projects and practices. Outside the company, this study strengthens the importance of industry clusters based on strategic partnerships between actors and stakeholders (Schuler and Buehlmann, 2003). Fiam declared to be involved in several partnerships within the furniture district where it operates, which reveal their importance for managing environmental practices and related innovations. Again, the role of the family owner emerges as critical, since its relationship networks are essential for involving financial, technology and innovation resources, as well as commercial capabilities, such as communication and/or sales skills. Another suggestion concerns the economic limitations and the lack of investments in R&D that sometimes characterize family businesses like Fiam (Terziovski, 2010). The case study confirms their importance, since they could limit the practical implementation of sustainable inno-

vative practices. The development and subsequent monitoring of the DV Glass® project have required appropriate equipment, as well as several investments in R&D, technology and marketing. They were fundamental to carry out some experiments and were hard to deal with, but without them DVGlass® would never have been developed. Here, the possible role of Governments and public institutions occurs, as it could be critical to provide economic and financial incentives and measures that support the family companies' efforts towards environmentally sustainable innovation.

Additionally, an adequate level of consumers' awareness about environmental issues has shown its importance in this study, as it can motivate FFs' efforts to innovate. Fiam clearly believed, and declared, that innovation should be able to satisfy consumers' expectations both in terms of environmental sustainability and design. Therefore, innovation should always be oriented towards the the market demand. Thus, the crucial role of marketing is highlighted, as it can enhance the internal communication and the sharing of the consumer culture across different company's departments (Srivastava et al., 2001). In this regard, functions with customer-facing responsibilities (such as sales, customer service, product/service delivery, etc.) should be in the best position to ensure that customers' needs are listened and translated by the FF into new products. Finally, external communication was found to be another critical area for the success of innovation. Fiam was very effective in communicating the DV Glass® innovation and related collections. The communication strategy was deeply based on relational and direct activities, such as the participation in sectoral fairs by family members and exhibitions at museums, which provide customers the opportunity to learn more about the company and its offerings (Millán and Díaz, 2014). This kind of communication could be recommended since it engages and enhances collaborations with consumers, as well as to develop brand-attachment and to share the brand values. Thus, it should be preferred for communicating exclusive brands, which are design-intensive, meanwhile they integrate some ethical values like environmental compatibility. In this regard, as suggested by Fiam, also the use of social media platforms could be considered as a powerful and flexible tool, as well as the personal communication developed by the retail system, which can contribute to reveal the innovative skills of the company in a way than is better that the conventional communication.

6. Conclusions, limits and future research direction

This study provides empirical evidence that environmental sustainability can be considered among the innovative and powerful forces generating new products and processes within FFs (Dai et al., 2015).

Starting from one of the main principles of the circular economy, namely *recycle*, Fiam recently developed the idea of recycling waste arising from manufacturing processes in order to realize innovative products, while preserving their design and quality. This resulted in a new type of glass, never seen before for its depth and colours, introduced in the market in 2018 (i.e. DV Glass®). It helped Fiam in achieving interesting economic results, especially in the current scenario, where an increase in consumers' awareness towards these topics has been observed.

Undoubtedly, the single case study approach presents some limitations mainly related to the results' generalizability, as well as to the subjectivity of the researchers' interpretation (Grant and Verona, 2015; Vissak, 2010). Such limitations, combined with the inconclusiveness of prior research investigating the relationship between FFs, innovation and environmental practices, certainly call for future studies in this area.

Further qualitative analysis with explorative purposes could be drawn using a cross-case comparison. Multiple case studies, indeed, while being particularly suited to address "how" and "why" questions (Einsenhardt and Graebner, 2007), also allow the identification of similarities and differences among different cases (Yin, 1981), thus improving the comprehension of the phenomenon.

This could be particularly useful given the heterogeneity of FFs, resulting from different structural and organisational conditions. Future research could focus on such peculiarities, including age, generation level, degree of family involvement in ownership, internationalization, with the aim to provide further evidence of their effects on FFs' behaviour during the implementation of innovative processes and, more generally, on their propensity toward environmental innovation. This could provide novel perspectives to understand the innovation dynamics and activities within FFs. Given the critical role of the family involvement in the innovation process, another suggestion for future research concerns the development of a longitudinal study aimed at investigating how innovation and eco-design adoption can evolve over the time if the family ownership changes during succession processes or is diluted through an equity sale or new equity issuance. Finally, starting from contradictory findings emerged in prior research concerning open innovation in FFs (Feranita et al., 2017), and given the success of the Fiam's open approach that was found in this study, it is in our future intentions to explore how specific FFs' attributes can facilitate or hinder open innovation, by investigating the role of some factors, such as non-economic goals and/or type of ownership.

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INNOVATION WITHIN TRADITION: INTERESTING INSIGHTS FROM TWO SMALL FAMILY BAKERIES

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Abstract

The paper investigates how small family firms that are embedded in traditional industries and closed context adopt innovation. Building on the embeddedness construct and analysing two exemplary cases of small family bakeries, a model is proposed to highlight the role that target market and local legitimisation play in innovation strategies. Our findings contribute to academia and practitioners showing some interesting insights.

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1. Introduction

Family businesses show a contradictory proclivity towards innovation (Zahra, 2012). On one hand, family firms are resistant to innovation; on the other hand, they often appear to be highly innovative. The reason for this contradiction is found in family firm heterogeneity (De Massis, Wang, and Chua, 2019; Sciascia, Mazzola, and Chirico, 2013) in terms of human and financial resources (De Massis, Frattini, Kotlar, Petruzzelli and Wright, 2016; König, Kammerlander and Enders, 2013); goals and objectives (Diaz-Moriana, Clinton, Kammerlander, Lumpkin and Craig, 2020) and governance and ownership (Sciascia, Nordqvist, Mazzola and De Massis, 2015).

For family firms, being innovative means to increase the chances of flourishing across generations (Jaskiewicz, Combs and Rau, 2015), even if, at the same time, their long-standing duration is frequently tied to their protection of the tradition. Indeed, long-running family firms possess several beliefs and abilities that contribute to generating their solid tradition (Erdogan, Rondi and De Massis, 2019). This apparent condition of antithetical state describes a paradoxical tension between tradition and innovation (Ingram, Lewis, Barton and Gartner, 2016) that traces the following challenge for family businesses: innovate or stay faithful to your past. However, innovation does not necessarily mean betraying the tradition. Likewise, although it may be strange to sustain it, innovation may even strengthen the family tradition. Recently, scholars have argued that family firms can sustain their competitive advantages, following a new product innovation strategy labelled 'innovation *through* tradition' (De Massis et al., 2016), further highlighting the relevant role played by tradition in family firms and encouraging scholars to study this apparently contradictory aspect.

Aiming to contribute to this stimulating debate, this paper proposes a novel perspective—innovation *within* tradition-to describe how small family firms approach innovation without ignoring their tradition. Specifically, this study builds around the curiosity generated by the innovative ambivalent behaviour of family businesses that operate in traditional local industries characterised by a marked territorial rooting and a reduced cognitive distance among local actors (competitors, customers, suppliers and citizens) (Nooteboom, Van Haverbeke, Duysters, Gilsing and Van den Oord, 2007). In such a context, the relevance of cultural roots, sharing of knowledge and transmission of values from generations to generations activate a process of the creation of consolidated practices that are difficult to modify. However, innovation is crucial to compete and survive successfully in the market. Therefore, following the problematisation perspective suggested by Alvesson and Sandsberg (2011) and building on the embeddedness construct (Granovetter, 1985), this paper seeks to answer the following research question: How do small family firms in traditional indus-

tries approach innovation? To explore this unfamiliar topic, the present study focuses on two exemplary Sardinian small family bakeries that approach innovation differently. Choosing the bakery industry contemporarily evinces its strong local and regional embeddedness—that originated in Sardinia since the Nuragic era (1800 BC)—and its need for product innovation to meet the emerging food trends. In other words, small family firms in the baking industry have to conjugate the continued tension between tradition and innovation proclivity.

The findings show that as a result of the mediating role of the target market and local firm legitimisation, these firms approach innovation differently.

The paper contributes two-fold to existent theories. First, the results extend the studies on innovation and heterogeneity in family firms. Second, the findings extend research efforts based on the perspective of embeddedness. For practitioners, our findings are a reasonable point of departure for family owners, consultants and policy makers who wish to innovate (or encourage innovation) within traditional contexts.

2. Literature background

2.1 Innovation and tradition in family firms

Innovation in family businesses describes a pervasive paradox (Erdogan et al., 2019) that stresses the contemporaneous presence of tradition and innovation.

Innovation can be defined as 'an idea, practice, or object perceived as new by an individual or other unit of adoption' (Rogers, 1995, p. 35), and in family businesses, it depicts the ability to alter past methods and develop something that is 'new to the firm' (Hage, 1999).

Tradition represents values, beliefs and skills that are transferred across generations (Dacin, Dacin, and Kent, 2019) by ancestors (Stinchcombe, 1965); in family businesses, tradition can be shared through narratives (Kammerlander, Dessì, Bird, Floris and Murru, 2015), routines and rituals (Fiese et al., 2002).

Initially, the two concepts seem contradictory and coincide in delineating a fragmented framework where, when faced with change, resistant family firms (Sharma and Manikutty, 2005) are influenced by the founder's imprint (Kammerlander et al., 2015). Others experience innovation in different ways during their lifecycle (De Massis, Chirico, Kotlar and Naldi, 2014), at times becoming more innovative than their non-family counterpart due to the possession of unique resources (Llach and Nordqvist, 2010).

Therefore, the balance between tradition and innovation represents a challenge for family businesses, especially micro-sized businesses, that are

seen as entities adhering to traditions and past methods (Zahra, Hayton, Neubaum, Dibrell and Craig, 2008), often displaying inertia and difficulties in facing competitors (Jaskiewicz et al., 2015).

However, from a strategic viewpoint, tradition may represent a force majeure that confers, upon the concept of innovation in family businesses, a mysterious and fascinating meaning that is able to develop innovation through tradition (De Massis et al., 2016) and tradition through innovation (Erdogan et al., 2019), shedding light on new ways to manage the apparent paradox.

Nevertheless, the situation's complexity is increased when family firms are embedded in traditional industries and in closed local contexts where culture and tradition often hinder the adoption of innovation (Ucbasaran, Westhead, and Wright, 2001; Zahra and Wright, 2011). This happens because, as emphasised by Hayton, George and Zahra (2002), firms reflect their nearby industry and context and seek to gain and maintain context legitimacy to survive, as well as earn local recognition, appreciation and support. Hence, analysing innovation in family firms from the perspective of embeddedness helps to investigate innovation *within* tradition.

2.2 Innovation and the perspective of embeddedness

Family members are the driving force of family firms. Their personal capabilities represent the foundation of innovation proclivity (Joardar and Wu, 2011) and affect the perception of opportunities stemming from the context wherein family firms operate (Behrens and Patzelt, 2016). Scholars have stated that family members' interpretation of contextual factors is the cornerstone of innovation in family firms (Zahra, 1991), especially in very small entities (Wiklund, 1998).

There is consensus about the fact that local embeddedness offers firms the 'unique' potential to create long-term relations with local stakeholders, to transmit a perception of trust and credibility, to preserve the family reputation and to ensure a competitive advantage (Upton, Teal, and Felan, 2001). According to Granovetter (1985), the embeddedness perspective delineates a reciprocal influence on intertwined social relations and economic behaviours of social local actors. These are held together by trust, information exchange (Uzzi, 1997) and a small cognitive distance (Nooteboom et al., 2007) that concur to create development trajectories of inertial character (Zucchella, 2006). This can be caused by 'the building of long-term and trust-based business relations stemmed from personal ties and deep interpersonal knowledge' (Zucchella, 2006, p. 24). According to this perspective, because 'family businesses are more embedded […] than their non-family counterparts' (Bird and Wennberg, 2014, p. 424), family firms can be considered as the result of their local context and its history, which

transforms a geographical area into a social space with its values, languages, beliefs, culture and tradition (Granovetter, 1985; Zucchella, 2006). In such social spaces, economic ties are not merely pushed by the aim of pursuing effective and efficient economic and financial performances but also embody mutual trust, knowledge sharing and positive results for all local actors in terms of legitimisation, friendship and social inclusion, with regard to social and geographical proximity (Boschma, 2005; Letaifa and Rabeau, 2013). Moreover, the pervasive role of the family pushes family firms to make 'in tandem' decisions with local contexts wherein families are embedded (Wallace, 2002), and family business strategies may often appear as the outcome of the local will (Alsos, Carter and Ljunggren, 2014) because they are habitually aligned to social and local expectations.

In this sense, embeddedness can inhibit innovation pressure and proclivity, leading firms to a general state of conformity towards local desires and expectations. In fact, innovation requires the adoption of behaviours that are disembedded and misaligned from established norms, practices, routines and traditions of the local context (Berglund, Gaddefors, and Lindgren, 2016). In other words, innovation stresses the continued tension between change and stasis (Müller and Korsgaard, 2018) up to the point of altering the local context through disruptive effects.

Therefore, the perspective of embeddedness helps in understanding the paradoxical behaviour that family businesses display for what concerns innovation adoption and loyalty to tradition. This is especially the case in those contexts and industries wherein adhering to tradition means being legitimatised by their local stakeholders. Here, innovating may be seen as escaping from the habits of the local context and as an effective and unavoidable answer to a global competitive pressure (Zucchella, 2006).

3. Methodology

3.1 Research context

Our research context comprises the artisanal bakery, a traditional industry historically significant in Sardinia, Italy. This region possesses a long heritage of knowledge and tradition concerning bread-making; bread is considered a crucial part of Sardinian culture and embodies the culture of the entire region. In fact, in Sardinia, the production of bread and the use of ovens date back to 1800 BC. Archaeological excavations have unearthed evidence of the processing of bread in wood-fired ovens in the Nuragic era. In Sardinia, wheat cultivation is also found to be an ancient practice; the Romans considered Sardinia the 'barn' of Italy (Pani & Piras, 2004). Traditionally, bread was produced inside homes, and the yeast was

completely natural. During this time, no introduction of chemical additives was needed to enhance the yield or reduce proofing. Additionally, bread has embodied a sacred and religious value, especially during sacred events (De Cumis, 2015). The anthropologist Alberto Cirese (1994) stated that bread represents a real art that is not only 'good to eat' but is also 'good to communicate', i.e. capable of conveying images and meanings that represent the people's history and its regional connection. Bread is a symbol of history and culture transferred across generations, in particular, from women's hands and minds. The bread makers jealously protect and share knowledge orally from generation to generation within families. Families share a dense and endless network of narratives and centuries of history to bring bread to their tables.

Today, making bread at home is no longer the norm, although many people continue this tradition, particularly, in some areas of the island.

The oral tradition and unique output denote the importance of transgenerational shift, moving baking from homes to an entrepreneurial market activity.

In Sardinia, the main bakery companies are family-owned and intergenerational. These small entities use a traditional production process and mainly sell their products locally. However, some small family firms have started to introduce innovative production methods and products themselves to intercept and satisfy new food trends. Each bakery preserves its aromas, flavours, rites and symbols. This evocative and personal sense embodied by bread stimulates reflection, especially when referring to the role of innovation in such a traditional sector.

3.2 Research design and sample

A qualitative methodology for this research was chosen and executed through the analysis of two case studies (Eisenhardt, 1989; Yin, 1994). Family firms represent a fertile ground for qualitative analysis (Litz, 1997; McCollom, 1990) and are particularly appropriate for this study because of the focus on innovation in family businesses, a debatable topic with conflicting findings (Suddaby, Bruton and Si, 2015). This research aligns with recent qualitative studies that have analysed the 'traditional' way of promoting innovation (Bouette and Magee, 2015; Kuhn and Galloway, 2015; Pret and Cogan, 2018; Ramadani, Hisrich, Dana, Palalic and Panthi, 2017). Moreover, the use of case studies allows for an analysis of real, unique phenomena, observing the particular scenario and its interactions within the boundaries of the context wherein they develop and act (Patton, 1990; Yin, 2008). It represents a form of qualified investigation aimed at seeking the 'meaning' of reality in the experiential life of people and organisations (Eisenhardt, 1989; Eisenhardt and Graebner, 2007; Patton, 1990; Yin, 2008).

A comparison of two case studies is particularly useful in this research to highlight innovative behaviours in two exemplary small family firms embedded in the same territory. The choice of the sampled firms is in line with Patton's (1990) recommendation that underlined that the 'logic and power of purposeful sampling lies in selecting information-rich cases for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research' (Patton, 1990, p. 169). Additionally, the selected small family firms are innovative and representative as described by Howorth, Rose and Hamilton (2006). Their owners can be labelled as 'heroes' (Welter, Baker, Audretsch, and Gartner, 2017) as they manage 'everyday firms' characterised by a blooming heterogeneity. They operate under resource constraints and conditions of adversity (Bradley, 2015; Powell and Baker, 2014) and need to implement innovation strategies to survive in their markets.

More precisely, to build our sample, we first investigated the bakery industry through online research via official websites and found that there are more than 1,400 bakeries in the region. Then, we retrieved press articles and reports to select relevant bakeries that have won prizes and achieved important recognitions. We obtained a list of 100 bakeries and refined the list to further exclude non-family bakeries, selecting only family firms at least at the second generation, and only choosing firms that were considered as first movers. Finally, we selected two exemplary pioneering small family bakeries; their relevant aspects are described in Table 1. Each of them represents a unique and very enlightening case. Firm 'A' is a first mover because it is the first to have sold the 'carasau bread'[1] in the international market. This firm is the leader in the international market and, actually, is interested in expanding its business locally where it is not particularly present. Firm 'B' is a first mover because it is the first to have introduced radical innovations in the carasau bread recipe, creating the 'black carasau',[2] by modifying the flours and components. This was as a result of the firm's interest in intercepting the new global food trend. This firm obtained international recognition and awards, whereas it had not been appreciated in the local context and, therefore, decided to change its strategies by dismantling this new method carasau production and returning to its traditional recipe.

[1] The carasau bread is a thin crunchy flatbread of Sardinia, made from the durum wheat flour, salt, yeast and water. The name is derived from the Sardinian word 'carasare', meaning the crust of the bread.

[2] The basic recipe of the black carasau bread is the same as that of the traditional carasau, except with the addition of charcoal powder.

Tab. 1: Relevant aspects of the firms

	Firm A	Firm B
Foundation date	1954	2005
Generation	II	II
Active family members	9	4
Revenue trends in the last three years	+11.61%	+20.98%
Target market	75% national and international 25% local and regional	90% local and regional 10% national
Mission	Selling carasau all over the world through reinterpretation of the tradition	Preserving and consolidating the ancient tradition of the carasau bread to reinforce local legitimisation

Source: Author's elaboration

3.3 Data gathering

To collect data, we focused on firm narratives (Dawson and Hjorth, 2012; Gartner, 2007) to observe people in the process of generating and transferring knowledge (Lyotard, 1984) and to understand human behaviour (Cope, 2005), inspired by other seminal studies on family firm innovation that used this approach (Hamilton, 2006a, 2006b; Hjorth and Steyaert, 2004; Johansson, 2004; Kammerlander et al., 2015; Larty and Hamilton, 2011). The narratives capture the link between events and behaviour (Czarniawska, 1997b) and allow participation in the social dynamics of relational constructs, such as roles, resources, projects, organisations and objectives, as well as verifying how the family owner defines the company's development paths in relation to the family's history and local context (Labaki, Bernhard and Cailluet, 2019).

To gather the narratives, we involved the owners (the second generation) of the two bakeries that were contacted by e-mail for their consent and upon confirming their participation in the narration of their history. With a prior understanding of the demographical data of each firm, two interviews were planned with each family-owner representative of the second generation; these were conducted in person, using an interview protocol. The first interview (average duration: 60 minutes) comprised unstructured questions to gain an understanding of the firm's history and the owner's opinions. The second interview (average duration: 40 minutes) comprised semi-structured questions to refine the information about the firm's tradition and innovation strategies. Each conversation was recorded for a total of 200 minutes of interviews and transcribed verbatim into 38 pages short-

ly after the interviews. The missing information was supplemented by additional sources for data triangulation (Jick, 1979; Jonsen andJehn 2009), such as follow-up phone calls and further secondary information that comprised several official Internet pages, and three additional interviews with experts that operated in the bread industry. These experts helped us familiarise ourselves with the long-term bread tradition in Sardinia and to understand ancient production processes and receipts.

3.4 Data analysis

To analyse the data, we applied a two-step process (Mayring, 2008). The first step was to analyse the cases separately, to synthesise the firm history, isolate the key actors, identify the main events, as suggested by Czarniawska (1997a), and understand innovation proclivity, the posture towards tradition and local context, as well as to answer the research question. Thus, we created an articulated document per firm. Additionally, three coders read the transcribed interviews and the additional materials independently so as to identify emergent themes that appeared to be relevant to investigate innovation *within* tradition. We found that the mediating role of the 'target market' and 'local legitimisation' were the main aspects able to delineate how small family bakeries approach innovation in their traditional industry. In particular, concerning innovation, owners' responses were the most important source for understanding the role and types of introduced innovation.

In the second step, we conducted a cross-case analysis to understand how the two above-mentioned aspects affected family firm innovations that were the common patterns between the two small bakeries. Table 2 provides some exemplary quotes that describe the two aspects.

Throughout the analysis, we iteratively shifted between qualitative evidences and theories to use extant insights (i.e. the embeddedness construct) to extend the theory on how small family firms approach innovation in traditional industry and context.

4. Findings

This study aimed to investigate innovation *within* tradition by answering the following question: How do small family firms in traditional industries approach innovation? To do this, we focused on two exemplary bakeries whose main aspects are presented in Table 1.

4.1 The stories

Firm A was founded in 1954 when its owner was 19 and decided to take over a bakery. Starting with the production of daily fresh bread to sell to the surrounding areas, the owner's entrepreneurial spirit manifested, producing and selling the typical 'carasau bread' in its original packaging.

According to the growing demand, the owner and his family decided to develop new product lines and diversify the production, intending to expand their market.

These strategies represented the first turning point in the firm's history: from a strictly local market, it moved to a wider market, involving the entire family. With the second generation, the firm started a new era, full of innovation and new strategy implementation. In particular, one of the sons represented the heart of the firm's revolution. Owing to the participation in international and national fairs, he created an important network with the giants of organised distribution, and the product started to be appreciated overseas. *"For us, it was an opportunity for comparison with the rest of the world, and it launched the start for a rapid growth"*, the interviewee stated. Their success implied a long series of production innovation, with the introduction of modern equipment and high technology machinery.

The generational shift represented a milestone in Firm A's history. The small family firm showed an innovative spirit owing to the owner and his wife's charisma, but the new generation impressed the real change for the firm: from a local firm, to an international firm. Firm A is the first mover in selling the carasau breads all over the world. In fact, during the last two decades, Firm A has considerably strengthened its presence in both the national and international markets, increasing production lines, promoting diversification and, above all, reinterpreting the traditional bread in innovative ways to meet international tastes.

Firm A's history is characterised by a progressive and constant orientation towards the future and the desire to go beyond the local boundaries encouraged by the new generation. Unexpectedly, Firm A is moving to change its strategy, as the interviewee argued: *"[…] actually we are also interested in serving our regional market. It needs more of our attention. Here, we are not particularly appreciated because of our decisions to adopt innovation to enhance our typical product has not been well received. For this reason, we intend*

to reinforce our presence in the region. We think that our product represents Sardinia around the world, and then it is also important for it to have its strong local legitimisation".

Firm B was founded in 2005 when the founder was unemployed. To provide a source of income for his family, the founder decided to take advantage of the wood-fired oven built by his ancestors in the basement of their home. With his wife, he created the basis for a new activity—the production of the carasau bread for friends and neighbours. Starting this initiative without employees, the founder immediately involved his children. After school and in their free time, they helped out their parents by already learning the meaning of hard work, commitment and, above all, the knowledge and skills necessary to make carasau bread. After completing his studies, the first son, joined the family business and the founder progressively reduced his time in the bakery. Thus, the first son ran the firm, taking on the responsibilities as the business owner. This young boy, enthusiastic and creative, had clear ideas and stated, *"I don't want a bakery like our competitors, oriented exclusively toward distributing bread outside the territory. I'm convinced that the first goal is to obtain strong legitimacy first in our territory, and we will work right away to gain the appreciation of our product in our homeland"*.

To understand the improvements that were needed, he began to study local competition and concluded that processes that were usually based on excessive automation and an industrial approach (to reduce time and rationalise production costs) affected the purely artisanal aspect of the product and the characteristics of a qualitative nature. *"The craftsmanship art of the product is the key to capture local customers' attention and preserve the quality of our traditional product"*, said the interviewee. Thus, he preserved the use of the wood-fired oven and engaged in careful selection of raw materials of unquestionable quality; all the processing aspects followed the traditions of making carasau. When the second son was involved in the firm, as the market was growing slowly, he encouraged introducing innovation. He introduced machineries for specific stages of the production process while being careful to preserve the artisanal process.

For a few months, at the request of another bakery, they experimented with the production of *"black carasau"*, winning important international awards and creating a new niche in the international market. However, this idea was soon abandoned to prevent the firm from losing its identity, which was built with difficulty over time, by selling the traditional carasau. The interviewee argued *"When customers were beginning to associate the black carasau with us, we were disappointed because this did not correspond truly to our image, and now, fortunately, we only make carasau bread in Sardinia to sell it in Sardinia. We take care of our narrowed-down market that is our realm"*.

From the foregoing stories and on the basis of the patterns identified in

our analyses partially shown in Table 2, we propose an interpretive model (see Fig. 1) founded on a set of four propositions that focus on the relevance of both the target market and local legitimisation.

Tab. 2: Exemplary quotes

	Firm A Informant: representative of 2nd generation, son, owner	Firm B Informant: representative of 2nd generation, son, owner
Innovation and target market	A few years ago, we started to challenge international markets with our products. […] I think that being the first to have sold such a traditional product as the carasau bread abroad represents an important record for a firm […] especially for us, a micro reality embedded in a very poor and closed context. However, to do this, we have studied our target market and have introduced innovations. Innovating is necessary to survive in an international market. Our mission is to sell our tradition in innovative ways, without changing our roots dramatically.	[…] we have obtained an important international recognition thanks to a radical innovation that we adopted for our carasau, changing the original recipe. We are proud of that, but we have left the production immediately because our aim is to stay here and be appreciated by our local consumers. Our market is local and we are not interested in going overseas […]. […] we have preferred to conceive new lines of product. This has allowed us to introduce simple changes, adhering to our tradition, to better intercepting of the need of our local market. […] Innovating can be a risk for firm who prefers to stay local. […] Notwithstanding, raw materials, receipts and process of production continue to stem from tradition. […] we have introduced machineries only to alleviate the manual hard work and not to increase the production to enlarge our bakery markets. Our goal is preserving the artisanal nature of the process.

Innovation and local legitimisation	Local market doesn't recognise our product as traditional. […] however, our product valorises the tradition, even if it embodies little incremental innovation concerning, for example, packaging, shapes, and tastes. We export our isle and our tradition. All innovations are built on our tradition. Our next goal is conquering our isle [laugh]. […] To do this, we know that we have to come back to tradition. Our local market requires only traditional products that strictly answer to what people know for generations. […] we are aware that our production will be divided into two branches: traditional and 'outside of the scheme'.	[…] honestly, we disagree with whoever alters the very traditional nature of our carasau, introducing innovation that radically changes it […]. Sardinian people protect traditional products and we have to nurture this important identity element to respect our roots and have a positively established reputation in our local context, to be accepted by our local customers. When we conceived the new carasau, the 'black carasau', we experienced a form of customer disappointment. We noted that new customers showed interest in selling our innovative carasau. […] but loyal clients disliked it. […] so, to reinforce our liability, we decided to interrupt the production. Our goal is being appreciated in our local context. This is our mission.

Source: Author's elaboration

4.2 The relevance of the target market

Our first observation was that the target market plays a relevant role in firm innovation proclivity for both of the family firms that we investigated. In fact, a local market orientation implies a lower level of innovation than that of an international market orientation. However, in this last case, innovation is not radical but is based on the reinterpretation of tradition. The following quotes illustrate the concept in the words of the family owners:

"Our main market is the entire world. We are the first to have proposed our traditional product overseas. But now, other competitors are doing this, and for this reason we are convinced that innovation is the key to stay competitive. […] this doesn't mean that we have rejected our origin and our roots. It's the exact contrary! We innovate basing our new ideas on tradition. We are ambassadors of our region. Then we propose our traditional product in innovative ways to meet international preferences and expectations, but the heart of our bread is adherent to tradition". (Firm A)

"[…] obviously, when we obtained one of the most important international recognitions for the bread industry, we were happy. However, we immediately noted a sort of disappointment in our habitual customers. The new product represented

a very revolutionary bread and our clients rejected it. Additionally, other clients come from other areas, started to identify our bakeries with the new product. This was a mystification. For this reason, we deleted that production and once again became the safeguard of our tradition. Our mission is preserving tradition and serving our narrowed local market". (Firm B)

4.3 The relevance of local legitimisation

When we investigated patterns across the two exemplary cases, we noted that the innovation posture of the firms was different even with regard to local legitimisation. Specifically, sustaining local legitimisation meant adopting a low level of innovation or, sometimes, reintroducing old methods to make bread and traditional raw materials. The following quotes help explain this concept better:

"Our market, as I already told you, is mainly international. However, our dream is also being appreciated in our land. To do this, we are aware that we have to offer the traditional product, in traditional packaging, in traditional forms, with traditional taste and receipts. In other words, we have to make the original carasau able to speak the same language of the local people, share the same memories, see the same horizons, and experience the same feelings. This is not going back, for us, but reinforcing our presence in our lovely land". (Firm A)

"We are appreciated by our local customers. […] our main objective was to obtain high local legitimisation because we are profoundly convinced that the real success for a firm, especially for a small family firm like ours, is meeting the smiles of elderly men and women every day and listening out for their fascinating stories. […] when they buy our carasau, they say that its smell and taste remind them of their youth. For us, receiving their positive comments has a significance that is more important than that we confer upon revenues derived from international customers. Face-to-face meetings are more emotional than shipping overseas". (Firm B)

4.4 The moderating role of the target market and the local legitimisation on innovation proclivity

In an effort to identify potential explanations of how target market and local legitimisation interact and affect innovation proclivity, we searched for other patterns in our qualitative dataset. We recognised that the two firms experienced both high and low levels of innovation because of their market and local legitimisation. Specifically, Firm A, internationally oriented, shows a low level of local legitimisation and a high innovation proclivity. However, the aim of increasing its presence in the local market implies obtaining high local legitimisation and this means returning to tradition. On the contrary, Firm B, locally oriented, shows a high level of local legitimisation and a low innovation proclivity. However, when it proposed a

high innovative product, the international market was interested in it, but the low level of local legitimisation spurred the firm to be strictly adherent to the past methods, embodying tradition in the product.

The following quotes explain the concept.

"Innovation is a must to survive in the international market. But it's a double-edged sword in the bakery sector because the risk is losing local appreciation above all in our context—too closed and traditional'. (Firm A)

"When we proposed our new product, we received international orders, but the local customers disagreed with our new "black carasau". So, we asked ourselves what our real dream was […]: staying local". (Firm B)

Because of our qualitative observations, we make the following propositions, also expressed in the interpretive model showed in Fig. 1.

P1.

The more the small family firm operating in traditional industries is locally oriented and experiences low local legitimisation, the more it adopts strategies based on radical innovations.

P2.

The more the small family firm operating in traditional industries is locally oriented and experiences high local legitimisation, the more it adopts strategies based on the embodiment of tradition.

P3.

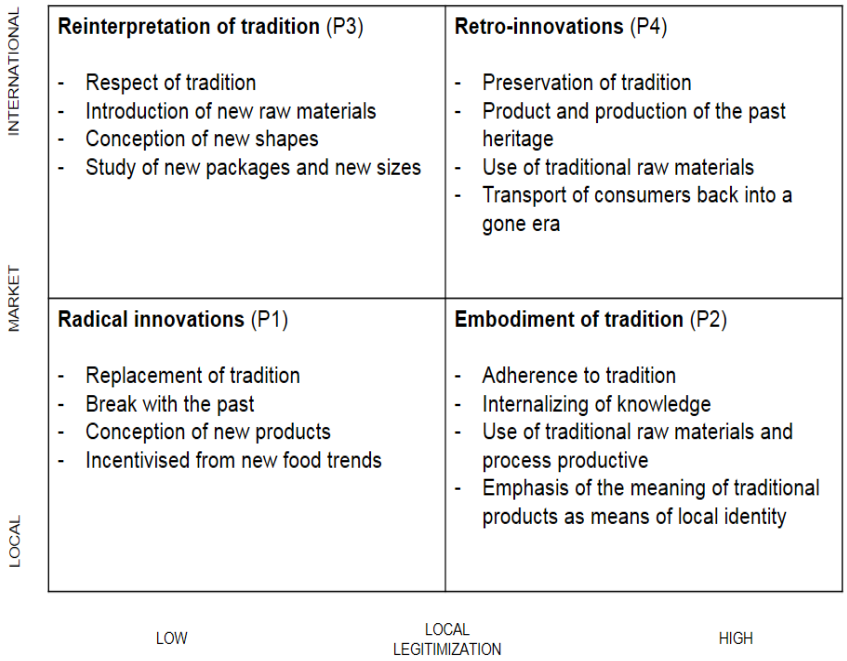
The more the small family firm operating in traditional industries is internationally oriented and experiences low local legitimisation, the more it adopts strategies based on the reinterpretation of tradition.

P4.

The more the small family firm operating in traditional industries is internationally oriented and experiences high local legitimisation, the more it adopts strategies based on retro-innovation.

Figure 1 explains the above-mentioned propositions by focusing on the type of innovation strategies adopted.

Fig. 1: Model of the relation among target market, local legitimisation and i



Source: Author's elaboration

From the model, it is found that innovation *within* tradition expresses four main kinds of strategies: 1. Radical innovations; 2. Embodiment of tradition; 3. Reinterpretation of tradition and 4. Retro-innovations.

In the underlined innovation strategies, innovation is managed in different ways because of the target market and local legitimisation. Innovation is radical (first strategy) when tradition is completely replaced and supplanted by revolutionary products and production methods. Innovation embodies tradition (second strategy) when the firm adheres to tradition, internalising the knowledge and meaning of traditional products as a means of enhancing local identity. Innovation is based on the reinterpretation of tradition (third strategy) when the latter is respected and improved under innovative keys. Finally, as already investigated by several scholars in their studies (i.e. Laberecht, 2013; Stuiver, 2006; Kaplan, 2006), when tradition is preserved through products that adhere to the past and shift consumers back into a bygone era, innovation is transformed into retro-innovation (fourth strategy).

5. Discussion

In our exploratory study, we aimed to elucidate how small family firms operating in traditional industries approach innovation. On the basis of the observed patterns, we propose that the target market and local legitimisation play a vital role in innovation proclivity and, consequently, in the adoption of innovation strategies. We propose that local market orientation is negatively related to innovation propensity, while international market is positively related to it. Moreover, we argue that high local legitimisation is negatively related to innovation propensity, while a low local legitimisation is positively related to it. We further propose an interpretive model that showed four different innovation strategies that small family firms adopt within traditional industries and closed contexts.

On the basis of the perspective of embeddedness (Granovetter, 1985; Nooteboom et al., 2007) and further elaborations (Alsos et al., 2014; Bird and Wennberg, 2014; Boschma, 2005; Wallace, 2002; Zucchella, 2006), we thus conclude that the target market and local legitimisation can serve as a moderator of innovation in traditional contexts, stimulating or inhibiting small family firms from sticking to or deviating from tradition.

Our study contributes to the theories in two directions: 1) to innovation studies in family business and 2) to the perspective of embeddedness.

5.1 Contribution to innovation and heterogeneity studies

The results are an extension of previous studies on innovation and heterogeneity in family firms in several ways. We contribute to the debate around the paradoxical tension between tradition and innovation in family firms (Erdogan et al., 2019) by investigating innovation *within* tradition. In this sense, we opened quite a new niche of research, drawing a great deal of attention to those industries that are traditional and adherent to past knowledge and local culture. In fact, our findings show that small family firms engaging in such contexts conjugate tradition and innovation in unique ways that derive four kinds of innovation strategies (radical innovations, embodiment of tradition, reinterpretation of tradition and retro-innovations). These strategies explain differences in family firms' approach to innovation, rather than focus on dichotomous differences between family and non-family businesses and propose other categories and taxonomies highlighted in previous studies (Cassia, De Massis and Pizzurno, 2012; De Massis et al., 2016; Kammerlander and Ganter, 2015; Pittino and Visintin, 2009). Moreover, our findings show that the target market and local legitimisation represent mediums to incentivise or dissuade family firms from adopting innovations within traditional industries. This concept allows an in-depth investigation of what Hayton et al. (2002), Zahra

and Wright (2011) and Ucbasaran et al. (2001) have argued. These authors have held that firms reflect their industry and context, and from these, they have to earn their appreciation. Our study found that local legitimisation affects innovation proclivity and can be high or low as a result of the target market of the firm. This suggests that local legitimisation appears to be most important for firms that are locally oriented than for those that are internationally oriented and then influences innovation, especially in firms operating in a narrowed and local market.

5.2 Contribution to embeddedness studies

In addition to our contributions to the family firm innovation literature, our findings are an extension of pertinent studies in the literature and are built on the perspective of embeddedness. Specifically, our findings extend Zucchella's contribution (2007) by proposing internationally served markets as strong and incentivising reasons to innovate. Zucchella (2007), focusing on Italian industrial districts, found that innovation was spurred by global competition, to react actively to global competitors. Our results show that the family firm market orientation mediates the innovation proclivity. For instance, the intention to internationalise represents a positive opportunity to promote innovations, while the local orientation inhibits innovations. Moreover, our findings adds to other research efforts (Alsos et al., 2014; Bird and Wennberg, 2014) by highlighting that family businesses engaged in traditional contexts define their innovation strategies to be in line with the demand of their territories but in different ways because of the target market. Therefore, our findings reveal that locally oriented small family firms appear to be less innovative than internationally oriented small family firms and this reinforces what Boshma (2005) and Letaifa and Rabeu (2013) have argued, emphasising that local firms are more sensitive to guarantee benefits to their narrowed contexts than they are sensitive to increasing revenues by adopting innovations.

5.3 Contribution to practice

Our findings also carry relevant implications for practitioners. Given the important role of target market and local legitimisation, family members and, in particular, younger generations involved in the firm's growth and survival should be aware of the effect that the aforementioned aspects have on innovation proclivity. In fact, the family business owner's will to be the leader in the local or international market represents one of the most important drivers of innovative behaviours and innovation introduction. Additionally, a consultant could support family owners who operate in a very traditional industry by suggesting the internationalising of traditional

products through the innovative reinterpretation of tradition. Finally, for policy makers, our results could suggest new ways to stimulate local firms towards innovation by promoting internationalisation initiatives of traditional products.

5.4 Limitations and future research

As in any empirical research, our study shows drawbacks that offer interesting areas for future studies. The primary drawback is related to the exploratory character of the study and to the small sample. Scholars are invited to replicate this research by enlarging the sample and conducting cross-case analysis, longitudinal analysis and cross-sectional studies. Further, the proposed model is merely qualitative. Future studies could identify a set of indicators to scrutinise the causality of the propositions. Overall, we hope to have introduced an interesting discussion around the theme of innovation *within* tradition.

6. Conclusion

This study aimed to answer the question 'How do small family firms in traditional industries approach innovation?' Building on the innovation literature and grounded on the perspective of embeddedness, we drew illuminating insights from an in-depth analysis of two exemplary small family bakeries. We found that these firms approached innovation in four different ways, namely, radical innovation, embodiment of tradition, reinterpretation of tradition and retro-innovations, because of their target market (local or international) and their local legitimisation (high or low). The proposed interpretive model has shed new light on innovation in small family firms. It is hoped that this model will help practitioners sustain innovation within traditional contexts.

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INNOVATION IN CRAFT FAMILY SMES IN THE DIGITALIZATION ERA

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Abstract

Digitalization is radically changing production chains in all sectors and the dynamics among producers, suppliers, and end-users. Large as well as small and medium enterprises (SMEs) operating in the craft industry are witnessing a fundamental transition toward digitalization. In Italy, craft SMEs are mostly family managed and owned, and these firms are finding themselves under severe innovation pressure. Through an online self-assessment tool (DigiCheck), this study investigates the current and expected level of digitalization in 100 craft family SMEs in South-Tyrol (Italy). The study offers insights into their attitude towards digitalization, and the opportunities and challenges they face. Four types of digital craft family SMEs emerge: Digital Leader, Digital Oriented, Digital Surrendered, Digital Steady-State. While the results indicate a relatively high willingness to innovate, major challenges prevail that hamper craft SMEs in adopting Industry 4.0 technologies and solutions.

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1. Introduction

The current fast-moving trends of Industry 4.0 and digitalization are fundamentally changing the value chains across industries (Schwab, 2017). In particular, small and medium enterprises (SMEs) must ensure their technological and organizational readiness to implement Industry 4.0 solutions (Matt and Rauch, 2014). The benefits of advanced automation and digitalization will ultimately depend on adopting such technologies, especially in industrial societies worldwide where SMEs are the backbone of many production systems (Andulkar *et al*., 2018). Moreover, craft SMEs are among those that may profit from the Industry 4.0 paradigm (Deutsche Telekom, 2016). Indeed, many are increasingly digitizing their planning, purchasing, production, and logistics (Barthel and Weiss, 2014). In confirmation, the German Central Craftsmanship Association considers digitalization a strategic priority, particularly for craft SMEs (Zentralverband des Deutschen Handwerks, 2018). Compared to large companies, craft SMEs face several challenges in implementing Industry 4.0 concepts in their production context, such as the timely recognition of relevant technological trends (Salatino, 2015), the lack of a clear strategic vision (Schröder, 2017; Rudtsch *et al*., 2014), their limited investment capacity (Dassisti *et al*., 2017), scant IT and technical knowledge (Cerchione and Esposito, 2017; Koska *et al*., 2017), and scarce employee qualifications (Matt *et al*., 2020; Karre *et al*., 2017; Gabriel and Pessl, 2016). Systematic approaches, such as strategic roadmaps, may facilitate craft SMEs in planning their activities to tackle the specific challenges of digitalization (Pessl *et al*., 2017). For this reason, assessing the current and expected digital readiness of firms is essential – prior to any technological implementation and strategic restructuring – to define feasible objectives in line with their current level of digitalization (Rauch *et al*., 2019; Unterhofer *et al*., 2018).

In this sense, the South-Tyrol region in northern Italy is an interesting research setting to assess the digitalization maturity of craft SMEs. Contrary to the declining trend in the total number of craft SMEs registered in Italy, South-Tyrol saw an increase of 2.2% in craft SMEs between 2009 to 2017, and a further increase of 0.7% between 2016 and 2017 (Centro Studi CNA, 2018). In addition, more than 90% of SMEs in South-Tyrol are family enterprises. Family SMEs have particular characteristics in terms of their goals, resources, and power structure, which may result in unique management challenges in relation to digitalization, especially in very traditional and conventional industries such as craftsmanship. Hence, the present research aims to answer the following question: What is the current and expected digitalization level of craft family SMEs in South Tyrol?

The remainder of the paper is structured as follows. First, we provide a comprehensive literature review of family business innovation and digita-

lization. We then present the methodology and our findings. Last, we discuss the implications for both theory and practice, and outline the study's limitations and some future research directions.

2. Literature review

2.1 Family SME characteristics and craftsmanship

In the field of family business, scholars agree that the participation of one or more families in a firm makes the business organization unique (Chua *et al*., 1999; Kotlar *et al*., 2020). In small family enterprises, the overlap between the family system and the business system is particularly high (Sciascia *et al*., 2013). Family firms are generally defined as small or medium sized firms that are owned and controlled by one or a group of families (De Massis *et al*., 2018a). They are further characterized as heterogeneous (Chua *et al*., 2012; Kotlar *et al*., 2014; Wright *et al*., 2014), risk-averse (Duran *et al*., 2016; De Massis *et al*., 2020) and with limited resources (De Massis *et al*., 2018a). In addition, family enterprises are typically long-term oriented (Lumpkin *et al*., 2010) and driven by both financial and non-financial goals (Chrisman *et al*., 2010). Moreover, the firm's survival over generations distinguishes this form of business organization, and the willingness of managers to pass on their knowledge, expertise, and values across generations plays a crucial role (Kotlar and De Massis, 2013).

The quest for a universal definition of craftsmanship in the literature is as demanding as it is fruitless. The Italian Encyclopedia of Science and Arts offers a valuable cue, also referring to the family dimension, defining craftsmanship as "Activities, both artistic and collective, for the production of goods and services, organized mainly on an individual or family basis" (Treccani, 2019). Various data sources regarding different craft SMEs show that in Germany, approximately 17% of businesses can be considered as craft (Deutsche Telekom, 2016). Similarly, in Spain and Italy, craft enterprises account for approximately 20% of national businesses (Deutsche Bank Research, 2014; Camera di Commercio di Piacenza, 2016), and an even larger share of around 50% of all businesses registered in Austria (Austrian Federal Ministry of Science Research and Economy, 2017). Considering the number of employees and the level of turnover, the majority of craft enterprises are SMEs according to the European Commission (2019) definition. Moreover, other aspects that characterize craft SMEs include the predominant local structure of operations, limited technological production endowments, and inseparable ownership and management structure (Craftsman Project, 2011), i.e. the owners are simultaneously leaders of the firm. Moreover, family SMEs are the world's oldest and most common form

of business organization, constituting two-thirds of all businesses globally (De Massis *et al*., 2018b), contributing extensively to economic growth worldwide, and ranking amongst the most innovative firms (De Massis *et al*., 2013; 2018b; Urbinati *et al*., 2017). Although they typically have a lower willingness to engage in innovation, they are paradoxically associated with a greater ability to do so (Chrisman *et al*., 2015).

2.2 Innovation in family SMEs

Although there is increasing academic interest in family firm innovation, current research is still inconsistent, and the relationship between family business and innovation remains unclear (De Massis *et al*., 2013; Duran *et al*., 2016; Rondi *et al*., 2019; Migliori *et al*., 2020). Scholars show that family enterprises are associated with lower innovation inputs (Sciascia *et al*., 2015; Miroshnychenko *et al*., 2019), and thus lower innovation outputs (De Massis *et al*., 2013; Calabrò *et al*., 2018). However, they have a higher ability to convert these limited inputs into higher outputs. Thus, family enterprises are associated with higher levels of innovation (De Massis *et al*., 2013; Urbinati *et al*., 2017). Indeed, their unique family enterprise characteristics – e.g. long-term orientation, non-financial goals, and emotional ties – have a strong effect on how they manage technological innovations (König *et al*., 2013; De Massis *et al*., 2016). De Massis *et al*. (2015a) refer to this as the dual nature of innovation in family firms, as some are more innovative than others. Family SMEs find themselves under severe pressure to innovate. Their liability of smallness (Freeman *et al*., 1983) and resource-related weaknesses (De Massis *et al*., 2018a) make it even more challenging to cope with the emerging digital economy (Loebbecke and Picot 2015; Archibugi, 2017; Schwab, 2017). Yet, many family SMEs are among the most innovative in the world (De Massis *et al*., 2013, 2018a; Urbinati *et al*., 2017; Muñoz-Bullon *et al*., 2019). Their flexibility and fast decision-making allow them to quickly adapt to the ever-faster changing environment but also their long-lasting legacy and tradition shape their innovation (Erdogan *et al*., 2020). Furthermore, their regional embeddedness and strong local relationships are essential to fostering innovation activities (e.g. Classen *et al*., 2014), especially in times of digitalization. The literature also indicates that the family plays a pivotal role in introducing technological innovation in the firm (Bruque and Moyano, 2007; De Massis *et al*., 2013), with an impact on innovation and technology management (De Massis *et al*., 2016). This may help them achieve a competitive advantage and superior innovation capacity compared to their non-family counterparts (Souder *et al*., 2017; De Massis *et al*., 2015b).

2.3 Digitalization in family SMEs

Digitalization combines different technologies (e.g. cloud, sensors, big data, 3D printing) considered a subset of a wider range of technological innovations (Rachinger *et al*., 2018; Nambisan *et al*., 2017; Schmidt *et al*., 2015) including digitalizing processes, products, and business models (Porter & Heppelmann, 2014, 2015; Teece and Linden, 2017). Therefore, digitalization is often considered a paradigm shift that fundamentally changes business environments around the world at an as yet unknown speed and scope (Bounfour, 2016; Rindfleisch *et al*., 2017; Schwab, 2017). Family SMEs have to adapt their processes to remain competitive in this increasingly digital business environment. However, there are strong theoretical reasons to expect that family SMEs may encounter greater difficulties in responding to digitalization (König *et al*., 2013). Family SMEs are constrained by their unique traits, such as smallness, generational involvement, and emotional ties between the family and the business, which may have a significant impact on how family SMEs manage technological innovation and especially digitalization (König *et al*., 2013; De Massis *et al*., 2016).

3. Methodology

3.1 Research setting and approach

The subject of this study is the digitalization of craft family SMEs in South Tyrol. The research setting is appropriate for the purposes of this study for several reasons. First, SMEs represent the overwhelming majority (99.8%) of enterprises in Europe, and particularly in Italy, Portugal, and Spain (EUROSTAT, 2011). Second, craftsmanship is currently facing the greatest transformation in terms of digitalization (Dassisti *et al*., 2017), as new technologies threaten their daily business (Sommer, 2015). Third, more than 90% of craft SMEs in South Tyrol are family firms (WIFO, 2016). The literature indicates that these firms have particular characteristics in terms of their goals, resources, and power structure, which may result in unique management challenges in relation to digitalization, especially in very traditional and conventional industries such as craftsmanship. To examine the intersection between digitalization and family SMEs in craftsmanship, two of the authors of the present research developed (and hold all rights to) an online self-assessment tool (DigiCheck) enabling craft family SMEs to assess their current and expected level of digitalization. This tool was built considering the challenges that craft SMEs face in digitalization and the need to scale existing self-assessment tools to the requirements of SMEs (Brozzi *et al*., 2018). DigiCheck is composed of 23 questions, presented in

the present analysis across five main dimensions, namely D1) Process; D2) Internet connection and data security; D3) Industry 4.0; D4) Collaborators; and D5) Cooperation and support (Table 1).

Tab. 1: DigiCheck structure

Label	Dimension	Question	Typology
D1	Process	Use of digital devices in the company	Likert
		Importance of new technologies	Likert
		Use of technologies related to I4.0	Likert
		Typology of sales channels	Likert
		Flexibility of products/services	Likert
		Degree of digitalization of processes	Likert
		Expected impact of I4.0 (company organisation)	Likert
		Expected impact of I4.0 (competition, market demand)	Likert
		Use of software to analyse and collect data	Likert
		Importance and utilization of collected data	Likert
D2	Internet connection and data security	Purpose to use the internet	Likert
		Quality of internet connection	Likert
		Data security	Likert
D3	Industry 4.0	Perception of digitalisation	Likert
		Level of knowledge regarding I4.0	Likert
		Importance of I4.0 for the company	Likert
		Allocated resources for digitalization (EUR)	Numerical
		Perceived advantages of I4.0	Multiple choice
		Perceived challenges of I4.0	Multiple choice
D4	Collaborators	Adequacy of skills of employees	Likert
D5	Cooperation and support	Collaboration with other institutions on I4.0 projects	Likert
		Support provided by craftmanship association	Multiple choice
		Fields in which support to SMEs is required	Multiple choice

D1 shows the average digitalization level of craft family SMEs in terms of processes. It comprises all the activities to acquire new technologies and implement them in the production system, the digital commerce channels used for selling products and offering services, how digitalized the management of processes is, and the extent to which firms use, collect, and analyze data for business purposes. D2 describes the internet connection and how important data security is for firms, indicating how often they use the internet, how important it is for the business, and whether it is used for different activities, also in relation to the production or distribution of goods, and not only administration. D3 concerns the Industry 4.0 topic, capturing the firm's conceptualization of digitalization and what they already know about this topic. It also describes the level of importance of Industry 4.0 for craft SMEs and how the challenges and opportunities influence their adoption of Industry 4.0 devices and methods. D4 depicts the level of adequacy

of the knowledge and skills of employees on the topic of 4.0 digitalization and crafts. Finally, D5 describes the level of cooperation with other firms, organizations, associations, or research institutes with regard to the Industry 4.0 topic. The rating system is distributed along a five-level Likert-type scale, which enables respondents to assess the perceived current (today) and expected (in five years) digitalization level with respect to a specific question. The 5-year timespan fits well with the present research, as any time point further in the future might not be assessed accurately today given the ever changing digital environment. Descriptions of the lowest and highest rankings are provided through specific examples to facilitate compiling the firm's current and expected digitalization level (Table 2).

Tab. 2: Examples ranking the current and expected digitalization level

Question: To what extent are production processes digitalized?
Level 1: Most of the processes are paper-based.
Level 5: Resource planning, customer management, and other tasks are completely digitalized.

The scale of possible responses ranges from 1 to 5, with 1 indicating a low level and 5 a high level of digitalization. The combination of mean values ($\bar{x}$) of the current and target digitalization level enables identifying patterns referring to the overall position of craft family SMEs with respect to the digitalization topics.

3.2 Data collection and sample

The data collection was conducted through the online DigiCheck tool developed on behalf of the South Tyrolean Craftsman Association (lvh.apa) according to Brozzi *et al*. (2018) to map the digitalization level of craft businesses in South Tyrol. It was launched on 7 May 2018 and distributed via an email newsletter and traditional means (e.g. information events, press releases, newspaper articles) on 23 May 2018. Of the 209 craft family SMEs that showed willingness to take part in the survey,100 completed it, resulting in a response rate of 47.85%. Thus, the final sample consists of 100 South Tyrolean craft family SMEs operating in different sectors and adhering to the following criterion: privately owned SMEs controlled by one family or group of families (De Massis *et al*., 2018b). All firms in our sample are located in South Tyrol, a mainly German speaking minority in Italy. Due to its central position in Europe and similar historical background to Austria, Germany, and Switzerland in terms of culture, language, and business routines, the sample bears resemblance to typical so-called German Mittelstand firms, that is a "subset of owner-managed small- and medium-sized enterprises (SMEs) in Germany" (De Massis *et al*., 2018a, p. 126;

Matt *et al.*, 2016). The sampling method for this study was random, since the firms completed the DigiCheck survey on their own initiative following the announcement. Table 3 shows the distribution of the sample firms among the different sectors.

Tab. 3: Structure of the sample

Sector	Frequency	Percent
Timber	31	31%
Construction	19	19%
Installation	19	19%
Metal	12	12%
Media	8	8%
Food	3	3%
Textile	3	3%
Transport	3	3%
Arts	2	2%

3.3 Data analysis

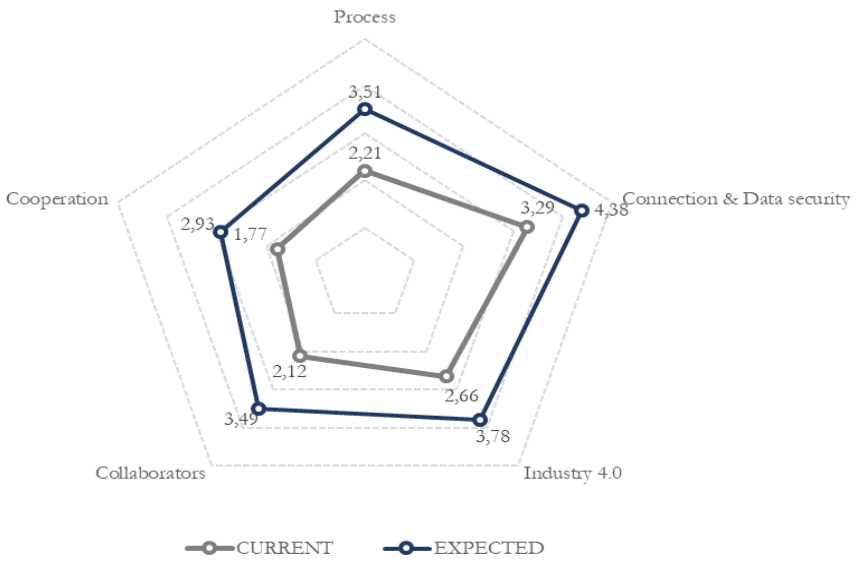
Our dependent variable is measured by the average value of the firm's expected level of digitalization. We constructed this measure by taking first the mean of all values in 5 years. We measured our independent variable by computing the average of the firm's current level of digitalization or the digital status quo. For the data analysis, we used the statistical software STATA 14.0 to compute both the current and expected mean values for each observation (i.e. for each firm), transformed from discrete into continuous variables. Hence, we created and used the two variables 'current' and 'expected' level of digitalization for the linear regression model. Since we are interested in identifying both the current and expected digitalization level of family SMEs operating in the craftsmanship sector in South Tyrol, we analyzed the average current values over the average expected values in relation to the DigiCheck questions. Therefore, the basic model describes the relationship between the average expected and the average current level of digitalization.

4. Findings

4.1 Aggregate level

A first analysis shows how the current and expected digitalization levels are distributed across the 5 considered dimensions for the entire sample. The general trend indicates that respondents expect a higher digitalization level in the future compared to the firm's current level (Fig. 1). Relatively lower average values in the perception of the current digitalization level are signaled in the degree of cooperation ($\bar{x}$=1.77) and digital skills of the workforce ($\bar{x}$=2.12). Conversely, respondents rated the quality of the internet connection and data security ($\bar{x}$=3.29) with higher values.

Fig. 1: Results: aggregated level



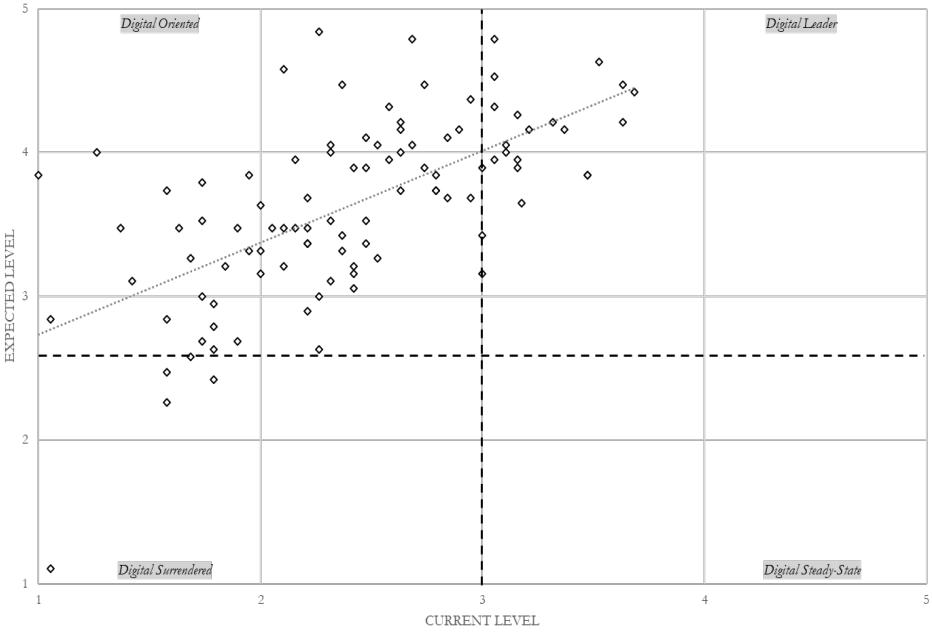
The main dimensions considered pivotal to increasing the future digitalization level are internet connection and data security ($\bar{x}$=4.38), Industry 4.0 ($\bar{x}$=3.78), production and organizational processes ($\bar{x}$=3.51). Instead, increasing the degree of cooperation in the future ($\bar{x}$=2.93) is not deemed a dimension to be strengthened. The analysis of the questions offered valuable insights for the interpretation of the results in terms of increasing the expected level of digitalization of the various dimensions. With respect to internet connection and data security, 50% of respondents rate their data security as weak. Limited investment capacity (15.92%), security and data protection (15.02%), competences and qualifications of employees (13.21%) are considered the main challenges in the introduction

of Industry 4.0. Conversely, respondents do not perceive the degree of interest of customers in digital applications as an obstacle to digitalization. In general, 60% of respondents consider Industry 4.0 highly relevant in the future. In this regard, the most frequently indicated advantages are time saving (21.15%), better work organization (15.63%), improved logistics and storage (12.87%). More efficient productivity (12.41%) and higher quality of goods and services are also indicated as important advantages of digitalization for craft family SMEs. A further analysis across the entire sample of respondents underlines that firms require greater assistance in terms of research and development (16.77%) and in the adoption of new technologies (13.66%). Cyber security (12.11%), data analytics (11.80%), and cloud technologies (11.49%) are also issues where firms indicated the need for stronger support from local stakeholders, such as, for instance, the South-Tyrolean craftsmanship organization. From a general viewpoint, a noticeable difference in all dimensions between the average current and expected level of digitalization is found. Almost all the surveyed firms expect further developments in all 5 digitalization dimensions, while only a few expect to remain at the same level.

4.2 Individual level

To map each craft family SME individually and analyze their digitalization attitude, we created a two-axis diagram (Fig. 2), where the horizontal and vertical axis identify the current and expected level of each craft family SME in our sample. The graph shows a positive correlation between the average of questions regarding the current and expected level of digitalization. As the average for the firm's current level increases, the average for the expected level increases, but at a descending rate (less than proportional). In the future perception, the entire sample is willing to increase the level of digitalization. From the results, we developed a taxonomy in which we classify the craft family SMEs into four different types. Firms positioned in quadrant I (upper-right) have on average a relatively high digitalization level and are willing to at least maintain such level in the short-term. Accordingly, these firms have a current average level of digitalization higher than or equal to 3, and an expected average level of digitalization higher than or equal to 2.5. Thus, companies in this quadrant can be considered Digital Leaders.

Fig. 2: Four types of digital craft family SMEs: Digital Leader, Digital Oriented, Digital Surrendered, Digital Steady-State.



Quadrant II (upper-left) identifies those firms with a relatively low current level of digitalization (below 3), but expecting to increase the level in the future to higher than or equal to 2.5. Such firms acknowledge their relatively low current level of digitalization, and are aware of the need to increase it in the future, thus classified as Digital Oriented.

Conversely, companies in quadrant III (bottom-left) exhibit a general low level of digitalization considering both the current and expected level, indicating an actual average level of digitalization below 3 and an expected level of digitalization below 2.5. Therefore, firms positioning in this quadrant are considered Digital Surrendered, namely with a relatively low current level of digitalization but not highly interested in increasing it in the future.

The final group of companies in quadrant IV (bottom-right) have relatively high and low measures in terms of current and expected levels of digitalization respectively. Companies in this quadrant have a present level of digitalization above 3 and an expected average level of digitalization below 2.5, thus classified as Digital Steady-State firms, since their digitalization status is deemed high and they consider future digitalization upgrades as not strictly necessary in terms of their production and organization. None of the firms in our sample are in this Digital Steady-State quadrant, meaning that all firms are motivated to further improve and invest in digitalization and Industry 4.0.

The Digital Surrendered category includes four firms that still operate in analogue mode, and do not plan to improve much in the future. Hence, they have a wait-and-see attitude and do not see many advantages in digitalization, they fear new technologies, see their employees' competencies as lacking, and claim that the costs of investing in digitalization are too high. The Digital Leader category includes 22 family SMEs in our sample. These firms have a good level of digitalization and are very ambitious, hence with a proactive attitude. The main advantages of digitalization mentioned by these firms are better communication and sense of togetherness (50%), cooperation advantages (50%), higher customer benefits (50%), fewer employees (50%), fewer misunderstandings (77%), better logistics and storage organization (77%), lower costs (45%), low environmental impact (27%), higher productivity and physical relief (59%), higher quality (77%), real time and physical proximity (5%), more regulated and controlled processes (5%), time saving (100%), and better work organization (82%). They also mentioned some disadvantages of digitalization: bad internet connection (45%), lack of employee competencies (45%), fear of new technologies (36%), high investment costs (50%), lack of experience (23%), lack of organizational skills (18%), lack of technical skills (14%), IT-security and data protection (45%). The Digital Oriented category is divided into two subgroups: analogue craftsmen with an expectant attitude, and digital novices with a proactive attitude. Analogue craftsmen (22 firms of the sample) have a lower current level of digitalization but intend to improve in the near future. Digital novices (52 firms of the sample) have a higher current level of digitalization and a proactive attitude regarding future investments in digitalization.

5. Discussion

Given our contextual research setting, this study has implications for both theory and practice.

The findings of our study show that the digitalization of South Tyrolean craft family SMEs has gained momentum, and investments in Industry 4.0 will increase dramatically over the next years. Building on our findings, we first contribute to research on digitalization (e.g. Nambisan *et al*., 2017; Schwab, 2017). Through the implementation of the DigiCheck tool, our analysis offers insights into five different dimensions of digitalization: (D1) process, (D2) internet connection and data security, (D3) industry 4.0, (D4) collaborators, (D5) and cooperation and support. Indeed, these five dimensions are essential for firms to assess their status quo but also to evaluate in which dimensions they are ready to compete and in which they are lagging behind. In addition, to our best knowledge, this is the first study to inves-

tigate digitalization in craft family SMEs by clustering their digitalization level into four types: Digital Leader, Digital Oriented, Digital Surrendered, Digital Steady-State. We investigate the four different digital profiles that emerge in the course of digitalization and shed light on the challenges that family SMEs face today, thus offering a better understanding of these firms' specific efforts to overcome such challenges for a bright digital future. Research on digitalization has thus far largely focused on the technical aspect of specific technologies and the related effects on society and economic development. However, the digitalization of processes and operations in firms is far from clear from a management perspective, especially in the context of family business, where digitalization is no longer solely an IT topic but concerns the entire firm and requires management adaptation.

A second contribution relates to the family business literature. We observe that family SMEs are generally innovative (De Massis *et al*., 2013; Urbinati *et al*., 2017; Rondi *et al*., 2019). Furthermore, we show that at the current level, two innovation approaches prevail (De Massis *et al*., 2015a): some family SMEs are already highly innovative and digital, whereas others are still more conservative with a wait-and-see attitude. However, our entire sample is willing to increase the level of digitalization and innovation in the near future. We show that family SMEs can be highly innovative, and that the two innovation approaches (De Massis *et al*., 2015a) will become increasingly blurred. Furthermore, speculating on our findings, South Tyrolean craft family SMEs show a high willingness to invest in digitalization in the near future. While some indicate a low level, others show a relatively high level of digitalization in relation to the status quo depending on several internal and external factors. Some highly digitalized firms admit that digitalization is not an easy path, entailing a great deal of time, money, testing, and errors before digital devices and software are implemented in a satisfactory way. Other less digitalized firms expressed their awareness that digitalization is unavoidable in the future and implies significant challenges, including resource constraints, lack of skills and knowledge, and requiring some support in identifying the appropriate technologies and their implementation. Current research on family firm innovation shows that family firms tend to have a lower willingness to engage in innovation projects, since these are associated with potential risks and could thus threaten their wealth, which is highly concentrated in the family business – from both a financial and emotional perspective (De Massis *et al*., 2013). Paradoxically, family firms are associated with a greater ability to engage in innovation, since the outcome of innovation projects is relatively higher than in non-family firms (De Massis *et al*., 2013). This ability and willingness paradox following Chrisman *et al*. (2015) is especially observed in the scope of discontinuous technological innovation, which typically involves fundamentally new processes, new product or service features, or even

new business models (König *et al*., 2013). However, contrary to this paradox, our sample of firms shows a high willingness to invest in digitalization, albeit a lesser ability to do so due to idiosyncratic family SME characteristics, such as resource constrains, smallness, and lack of skills. We also believe that this could be due to the sector under study, namely craftsmanship, which is very traditional, conventional, and highly dependent on products. However, future digitalization expectations indicate substantial improvements and changes in relation to Craft 4.0, imperative for the survival of this form of business organization.

Third, we contribute to the innovation literature by combining the digital innovation spirit of family SMEs with their idiosyncratic characteristics especially in craftsmanship, which is of great importance for economies world-wide. Indeed, craftsmanship is currently seeing its greatest innovation transformation (Dassisti *et al*., 2017) with new technologies threatening their daily business (Sommer, 2015), requiring especially craft SMEs to boost their readiness to adopt Industry 4.0 concepts (Matt *et al*., 2020). According to Zentralverband des Deutschen Handwerks (2018), digitalization is a critical topic for SMEs. Our findings provide insights into how South Tyrolean craft family SMEs cope with game-changing innovation such as digitalization. We show that even though family SMEs have some characteristics that hamper their innovation progress associated with lower innovation inputs (Sciascia *et al*., 2015), and thus lower levels of innovation outputs (De Massis *et al*., 2013, Calabrò *et al*., 2018), they may make use of their conventional craftsmanship knowledge and experience gained over generations and combine it with new innovative technologies to outperform non-family enterprises and gain an edge in this ever-changing environment.

This promising intersection between digitalization and family SMEs contributes not only to the family business literature and theory, but the implications are also manifold for practitioners, especially for decision makers in family firms. In particular, in the current turmoil among business leaders and senior executives over this digital phenomenon (McKinsey, 2016; PwC, 2017), practitioners can draw important conclusions from this study. First, craft family SMEs can gain insights on the importance of digital technologies and their sensitization to Craft 4.0. Second, for managers, this study highlights the impact of family involvement on digitalization in the firm. Finally, this study also advocates the need for craftsmanship associations to offer appropriate services with regard to the digitalization topic.

6. Conclusion, limitations, and future research

Digitalization is a widely discussed and relevant topic, especially in relation to craftsmanship and SMEs. Although digitalization research has developed over the years, remaining unclear from a management perspective, especially in the context of family business, are the factors that might influence the adoption of digitalization and the challenges as well as advantages for firms. This study attempts to contribute to the literature by enhancing knowledge of the current and expected digitalization level of craft family SMEs in South Tyrol, and how small, financially weak family SMEs lacking skills can successfully overcome the challenges of digitalization. A relevant research question for future studies concerns the dynamics that characterize family firms and how they embrace digitalization. The current research does not explore family firm heterogeneity in terms of family involvement and influence on the digitalization process, limiting the possibility to search for significant differences and similarities in the innovation dynamics across the family SMEs in our sample, and thus unable to provide an evidence-based response to this question. However, we believe that this could be a great opportunity for future studies. In addition, a larger sample, including a more detailed categorization of family firms in terms of their characteristics could provide more representative results. Against this background, the present research can be considered explorative, showing the main emerging relationships between digitalization in craft family SMEs and acknowledging the complexity of studying innovation dynamics in this field for future impactful research. Finally, focusing only on one industry further limits the study, and thus extending the scope to more industries would be desirable. Nonetheless, with this study we hope to inspire future scholars to examine this promising intersection more in depth, as we have only started to scratch the surface of the fascinating digitalization topic.

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INNOVATION PERFORMANCE AND TECHNOLOGICAL COLLABORATION WITH BUSINESS PARTNERS IN FAMILY FIRMS

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Abstract

This research examines how the family firm status of the business and the level/degree of family management moderate the relationship between business partner collaboration and technological innovation performance. We provide empirical evidence by using a panel data of around 12,000 observations on Spanish manufacturing firms via regression analysis. Results show that the family firm status moderates the relationship between technological collaboration with business partners and innovation in a way that reduces the likelihood of achieving higher innovation performance. Furthermore, within the group of family firms, the interaction between the level/degree of family involvement in the management and the business partners' technological collaboration has a negative and significant impact on the innovation performance.

1. Introduction

Firms increasingly establish technological collaborations with external partners to improve their innovation performance (Chesbrough, 2003). However, the adoption of an open behavior in innovation processes is still controversial in family firms. On one hand, some studies provide evidence that these firms are more open compared to other forms of organizations as they may rely on a higher number of external partners thanks to their human, social and marketing capital (Llach and Nordqvist, 2010). On the other hand, papers based on the socio-emotional wealth (SEW) approach suggest that family firms are less open compared to the non-family ones (Classen et al., 2012, Kotlar et al., 2013; Lazzarotti et al., 2017) as non-economic goals characterizing the SEW approach (e.g. the desire to maintain the control of the firm) restrain the attitude towards collaboration in innovation activities.

Moreover, De Massis et al. (2015) show that some partners (the "business" partners such as suppliers, customers and competitors) are considered more critical than others (the "scientific" partners such as universities), since the latter contrast the pursuing of non-economic goals more and thus they may cause high loss of SEW in terms of firm control, sense of identity, family emotions and bonds. Recent studies (Brinkerink et al., 2017; Feranita et al., 2017) claim that, even when family firms decide to collaborate with this type of business partners, the relationship with them remains complicated since the family nature of the firm's governance and management obviously continues to exert an influence. As a consequence of the difficult working relationship, the resulting innovation performance may be negatively affected, with undesirable effects on the family firm's performance in general.

Given the relevance of a good technological collaboration, it is thus crucial to shed light on the family factors that may affect it. Considering that in this regard the extant studies are still anecdotal (Brinkerink et al., 2017; Perri and Peruffo, 2017), we aim to further investigate the topic. In particular we focus on collaborations that family firms activate with business partners in order to pursue technological innovation. In such a setting, the goal of the paper is twofold: first, it examines how the family nature of the firm's ownership (i.e. family status) affects the technological innovation performance obtainable from collaborations with business partners and, second, it investigates the influence on these results exerted by an increasing level of family member involvement in firm management.

The hypotheses are tested on a sample of around 1,200 Spanish manufacturing firms, observed over the period 2008-2014. To pursue the first goal, we consider the entire sample, composed of family and non-family firms, while for the second goal the analysis is focused only on the group of

family firms. Results show that both the family nature of the business (i.e. family status) and family involvement in management (i.e. level of family member involvement in the firm management) weaken the impact of business partners' collaboration on innovation performance by reducing the marginal benefits of acquiring external knowledge through technological collaboration.

The paper contributes to enhancing the understanding of the difference between family and non-family firms regarding the benefit in terms of technological innovation deriving from collaborations with business partners. In addition, it allows us to analyze more in depth what happens within the family firms themselves, by enriching the empirical quantitative evidence about the family factors that explain why family firms are heterogeneous subjects.

The paper is structured as follow. First, we provide a review of the literature on the above-mentioned topics and we develop the hypotheses; then we describe the methodology; lastly, we discuss the results, conclude and outline the main limitations of the study.

2. Literature review and hypotheses

2.1. Technological collaboration with external partners and innovation

Technological collaboration with external partners is a form of strategic alliance where firms can enter voluntarily into a relationship with one another in order to sustain rapid technological change and, more specifically, new product development (Deeds and Rothaermel, 2003). Since the seminal work of Chesbrough (2003), the amount of literature regarding the benefits deriving from technological collaboration with external partners has increased dramatically (Baum et al., 2000; Deeds and Hill, 1996; Rogers, 2004; Shan et al., 1994; Stuart, 2000). Indeed, extant research has shown that these forms of partnerships offer an easier access to complementary assets, useful for commercializing firms' new products (Hagedoorn, 1993; Teece, 1986). They imply the access to resources and skills that reside outside the firm (Camisón and Forés, 2010); they encourage the transfer of tacit knowledge (Ahuja, 2000; Doz and Hamel, 1997; Eisenhardt and Schoonhoven, 1996; Lambe and Spekman, 1997); they reduce R&D costs (Hagedoorn, 2002); they generate higher revenues (Faems et al., 2005) and so on. In short, it seems that these forms of open innovation strategies greatly improve and sustain innovation performance, that in turn leads firms to achieve a competitive advantage over their competitors.

In this regard, prior studies have emphasized the importance of collaborations with different types of partners as they provide diverse sources

of knowledge with different possible benefits on innovation results. For example, Nieto and Santamaria (2007) investigate both the type of partner selected (e.g. suppliers, customers, competitors, etc.) and the diversity of the network (e.g. firms that collaborate with more than one type of partner). Their results show that in general technological collaboration with external partners has a positive impact on innovation performance and that the effect is even stronger when the network diversity is greater, since a higher richness of knowledge contribution may be achieved.

Although the partner-type diversity is recognized as a crucial factor in enhancing innovation performance, the need to study the contributions provided by specific types of partners still remains a relevant focus for scholars' attention. For instance, Du et al. (2014) distinguish between business (e.g. customers and suppliers) and scientific partners (e.g. universities and research centers) in the strong belief that their peculiarities also require different approaches to managing the collaboration in order to achieve satisfactory innovation results. Scientific partners are in general considered more problematic than business partners for the successful working of the collaboration because of cultural issues and distance from business logic (Pertuzè et al., 2010; Lazzarotti et al., 2016). However, where family firms are involved, the greater "closeness" with the business partners may become critical. Indeed, some authors (Brinkerink et al., 2017; Feranita et al., 2017) suggest that a collaborative relationship with them generates a great concern since they may cause fear of SEW loss. At the same time, it is however undeniable that business partners may play a significant role in enhancing innovation performance in family firms as they may complement the lack of internal family resources, (Bayona-Sáez et al., 2002).

Thus, as business partners seem to be both critical for the collaboration management and crucial for innovation performance, in the following we focus our attention on them. First, we analyze the main contributions regarding technological collaboration with business partners and its effect on innovation performance, to move them to ground this form of partnership in the peculiar setting of the family firms.

2.2. Technological collaboration with business partners and innovation

Technological collaboration with business partners entails the involvement in the innovation process of customers, suppliers, external consultants and also competitors. This set of players is defined as business partners because their close link to the market is crucial for the firms' innovation performance (Du et al., 2014). For example, collaboration with customers is aimed at searching for new ideas as they provide firms with valuable information on market needs (von Hippel, 1988). In contrast, collaboration with suppliers helps the firm in identifying technical problems

in the innovation process in order to improve the quality of the product (Hagedoorn, 1993). In addition, competitors may be selected as partners in a technological collaboration because of synergy effects (Das and Teng, 2000) and sharing of R&D costs.

To sum up, these collaborations enrich the firm with a pool of new and external knowledge that may improve innovation and at the same time increasing its performance as well. However, there are also some disadvantages to be considered. Although the business partners are similar to the focal firm as they belong to the same competitive context and they have the same business culture (Lazzarotti et al., 2016), the risks of asymmetric information and consequent potential opportunistic behavior remain (Jensen and Meckling, 1976). As a result, transaction costs (Williamson, 1998; Chen and Yuan, 2007) may increase and with them also the need to coordinate, to manage and to monitor the behavior of the different actors involved in the technological collaboration.

Prior research has empirically studied the relationship between technological collaboration with business partners and innovation performance for manufacturing firms in general (Faems et al., 2005; Lasagni, 2012; Bianchi et al., 2016), revealing in most cases a positive relationship (Lettl et al., 2006; Song and Di Benedetto, 2008). On the other hand, when the focal firms involved in such collaborations are family-type, the evidence is still scarce. The urgent call to enrich this line of research (e.g. Feranita et al., 2017) encourages us to study more in detail the peculiar setting that involves family firms.

2.3. Family firms, technological collaboration with business partners and innovation

Scholars recognize the fact that family firms represent a peculiar organizational setting where preferences, values and goals differ from those of non-family firms as well as from other family firms, leading them to be highly heterogeneous (Chua et al., 2012; Chrisman et al., 2013). It is thus expected that this set of preferences, values and goals in family firms, compared to non-family ones, affect strategic decision-making as well as their decision to enter into a collaboration or to involve a particular type of partner for fostering innovation. For example, Gomez-Mejia et al. (2007) show that family businesses hesitate to join a cooperative since it threatens and/or it restrains the family control over their own business although this choice might lead to lower financial performance. In a similar way, Cassia et al. (2012) suggest that family firms are more "inward-looking" than non-family firms, thus involving business partners at a lower extent when the discretion and the know-how/secrets of the family are at risk.

Previous research also provides the opposite evidence by showing a more open attitude of family firms to collaborate with respect to non-fa-

mily firms (Llach and Nordqvist, 2010; Pittino et al., 2013). It emerges that family firms consider factors such as trust and the existence of long-term relations with the possible partners to be of crucial relevance in setting-up a partnership. Indeed, family firms, unlike non-family ones, may decide to involve those customers and/or suppliers with whom they share similar goals and values and whose relationship is nurtured across generations (Roessl, 2005; Arregle et al., 2007; Pittino et al., 2013). Therefore, family firms' ability to develop external social capital (Sirmon and Hitt, 2003) is determinant for encouraging alliances and partnerships (Llach and Nordqvist, 2010; Lazzarotti and Pellegrini, 2015).

However, this does not mean that once the family firms have entered into a collaboration with a business partner the relationship is free from drawbacks. There is also a dark side. Business partners, who share similar economic goals and values with the family firms, may entail a great risk of spillovers. In addition, they may threaten the family firm's desire to exert control over the innovation projects. Furthermore, transaction costs may increase because of the control mechanisms necessarily adopted for avoiding opportunistic behaviors. In other words, although factors such as a long-term trusting relationship and sharing of values and goals may favor the collaboration set-up, the managing of the collaboration itself remains complicated (De Massis et al, 2015). Shedding light on the family factors that influence the working of the collaboration is the scope of this paper, thus hypotheses are coherently developed.

2.4. Hypotheses development

To investigate the relationship between technological collaboration and innovation performance, by considering the family factors that may affect it, we develop two hypotheses. The first concerns a comparison between family and non-family firms in order to test whether the relationship between technological collaboration with business partners and innovation performance is influenced by the fact that the focal firm is family-type. This is defined as family firm "status". The second is grounded in the group of family-firms only, in order to test whether a specific family factor, i.e. the level/degree of family involvement in the management, plays a further role in shaping the relationship mentioned above.

2.4.1 The family firm status

An important characteristic differentiating family from non-family firms is the presence of family members in the ownership. Indeed, this feature provides an interaction between two systems, the family and the business, that leads to the creation of peculiar characteristics in family firms in

turn affecting firms' performance. With regard to innovation behavior, an extant strand of the literature has already investigated whether the family nature of the ownership impacts on the innovation input (Block et al., 2012; Kotlar et al., 2013) or on innovation output/performance in general, with positive and negative evidence (Rod, 2016).

When, instead, the innovation performance specifically derives from technological collaboration with business partners, studies on the impact of family-type ownership are still very scant. What we may suppose by relying on previous works (e.g. Niemela, 2004; Kotlar et al., 2013; De Massis et al., 2015) is only that the critical nature of SEW preservation, determined by a family-type ownership, continues to exert its influence in a collaboration setting. Indeed, partners of a technological collaboration gain and lose power through continuous processes of bargaining, negotiation and compromise (Niemela, 2004), which in turn leads to restriction of the family firms' control over the product innovation project thus generating fear of SEW loss also in the management phase of collaboration. As a consequence, the context in which the collaboration is carried out is likely to become very challenging, complex and potentially conflictual; thus, a negative impact on the result of the collaboration itself, i.e. the innovation performance, can be expectable too.

Based on these arguments we posit that:

H1: The family firm status moderates the relationship between technological collaboration with business partners and innovation performance, in such a way that this relationship is weakened.

2.4.2 Level of family involvement in the management

Despite the fact that studies on family involvement in the management (hereinafter: family management) are quite common, results on whether and how family management affects innovation performance are still controversial (Matzler et al., 2015). To explain the relationship between family management and innovation performance, scholars basically rely on two important theories, i.e. agency theory and behavioral theory. Agency theory (Jensen and Meckling, 1976), which identifies the asymmetric information between owners and managers as the cause of agency costs and of potential opportunistic behaviors, suggests that the level of family involvement in the management decreases the agency costs, having in turn a positive impact on firm's innovation performance (Matzler et al., 2015). Indeed, family members who own the family business and at the same time also occupy managerial positions facilitate the alignment of goals between managers and owners, by improving communication and decision-making speed through close family bonds (Gersick, 1977).

However, agency theory ignores a relevant part of the complexity of family firms' dynamics. To compensate this lack, some scholars (e.g. Schulze et al., 2001, 2003) have contributed to the development of the behavioral theory that complements the agency perspective by also emphasizing some negative aspects of the family involvement. For example, a higher level of family involvement in the management, measured for instance through the number of family members participating in the firm's boards, may reflect a higher goal-diversity among family members that in turn may make the decision-making process more complex, also regarding innovation choices (Kotlar and De Massis, 2013). Furthermore, arguments related to non-economic goals of family members, such as fear of SEW loss, e.g. control preservation, identity, perpetuation of family dynasty through future generations, may lead family firms to be more prone to appoint family members to strategic and managerial roles, instead of selecting external managers. This may likely in turn reduce the expertise and the competencies necessary to achieve technological innovation (Classen et al., 2012; Lazzarotti and Pellegrini, 2015; Filser et al., 2018).

To sum up, high levels of family management can be carriers of a negative impact on innovation performance and it is reasonable to suppose that this also occurs in a collaboration context. While on one hand technological collaboration with business partners may compensate the lack of resources in family firms and is beneficial for innovation performance, on the other, a higher involvement of family members in the management may be detrimental. Indeed, it may increase the potential goal-diversity and thus the complexity of the collaboration management and/or the lack of competencies required.

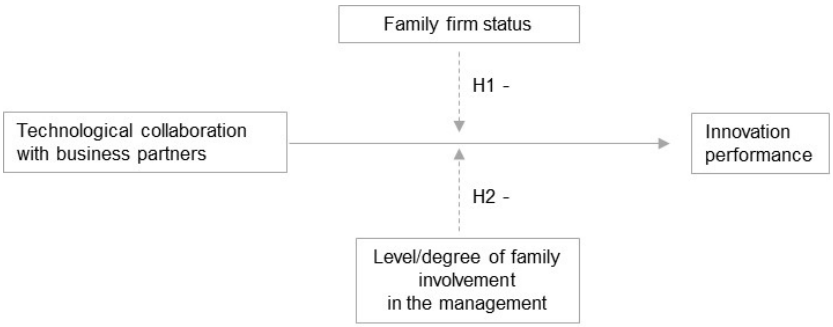
Based on these arguments, it is possible to suppose that higher levels of family management reduce the effect of business partners' technological collaboration on innovation performance.

We thus suppose that:

H2: The level of family management moderates the relationship between technological collaboration with business-partners and innovation performance, in such a way that this relationship is weakened.

Figure 1 summarizes the above-mentioned arguments: technological collaboration with business partners acts as a driver of innovation performance while the family firm status and the level of family management act as negative moderators in the relationship between collaboration and innovation performance. In the following sections, we describe data and methodology applied to test the hypothesized relationships.

Fig. 1: Research framework



3. Data and methodology

3.1 Sample and data

We tested our hypothesis by using data from the annual Spanish Business Strategies Survey (SBSS), i.e. a longitudinal database of Spanish manufacturing firms that contains data from 1990 up to 2016. The survey is carried out yearly by SEPI, Foundation, which is financed by the Spanish Ministry of Industry. It is designed to gather data from a representative sample, by industry and by size, on different topics such as internationalization, innovation, market, performance, technological collaborations and so on. Moreover, this database also distinguishes family firms from non-family ones and it has been used by a wide number of scholars for academic research in the field of innovation and family business (Fernandez and Nieto, 2005; Kotlar et al., 2013; Nieto et al., 2015; Bianchi et al., 2016; Dieguez-Soto et al., 2016). Indeed, in line with previous studies, the main reasons that suggest the use of this database are: i) the database is public and thus easily accessible by many scholars; ii) it provides a large sample of firms with a wide set of data on different family-business features; iii) the longitudinal nature of this database allows the collection of the same type of information over many years.

All these features ensure the reliability and the replicability of the study. Furthermore, as the survey is designed to gather data from manufacturing firms, it represents an appropriate setting for studying technological collaboration with business partners in which product innovation typically includes elements developed by other players (Almirall and Casadesus-Masanell, 2010; Kotlar et al., 2013).

The data for this study were collected in February 2018 and they cover the period from 2008 to 2014. Throughout these seven years of observations firms may enter and exit the survey, thus the nature of our panel data

is quite unbalanced and also characterised by missing values. Our initial sample includes on average 1,750 Spanish private firms and around 12,000 observations from 2008 to 2014, while the subsample of family firms includes on average 752 firms and around 3,500 observations over the period 2008-2014. Table 1 presents industry and some sample descriptive statistics both for the full sample and for the subsample of the family firms.

4. Dependent variable

The dependent variable is related to the innovation output, namely innovation performance, of the firm *i* in a specific period *t*. Scholars have used different measures of innovation performance such as the number of patents or the percentage of sales derived by new products. In this paper we measure the innovation performance by the number of new innovative products developed and commercialized by the firm *i* at time *t* (Bianchi et al., 2016). Indeed, the number of new and innovative products developed by the firm represents the ability to introduce new products on the market (radical innovation) and also to improve the existing products (incremental innovation) and as such is an important indicator of innovation performance (Schoonhoven et al., 1990). The nature of this variable is that of "count data" with a minimum value of 0 and the maximum value of 299 product innovations over the period 2008 to 2014.

Tab. 1: Sample descriptive analysis

Industry	Percentage of firms	Avg. employees	Avg. number of product innovation	Percentage of firms	Avg. employees	Avg. number of product innovation
	Full sample (1,750 average n. of firms from 2008-2014)			Family-managed firms (752 average n. of firms from 2008-2014)		
1. Meat products	3.83%	302	0.88	4.44%	338	1.35
2. Food and tobacco	12.11%	158	0.63	14.36%	131	0.40
3. Beverage	2.33%	126	0.61	3.25%	107	0.84
4. Textiles and clothing	6.62%	81	0.52	7.69%	96	0.82
5. Leather, fur and footwear	2.86%	43	0.66	2.74%	40	0.81
6. Timber	3.16%	40	0.07	2.56%	33	0.07
7. Paper	4.36%	138	1.27	4.27%	83	1.56
8. Printing	3.68%	65	0,12	2.91%	27	0.06
9. Chemicals and pharmaceuticals	7.29%	236	1.44	5.81%	203	0.94
10.Plastic and rubber products	5.26%	236	0.69	5.47%	56	0.56
11. Nonmetal mineral products	6.84%	133	0.59	8.03%	132	0.98
12. Basic metal products	3.38%	437	0.23	2.22%	295	-
13. Fabricated metal products	12.56%	94	0.11	13.68%	78	0.16
14. Machinery and equipment	5.86%	148	1.13	5.64%	128	0.94
15. Computer products, electronics etc.	1.58%	751	1.52	0.68%	185	-
16. Electric materials and accessories	3.83%	267	3.12	2.91%	114	0.50
17.Vehicles and accessories	5.26%	750	0.24	4.10%	514	0.08
18. Other transport equipment	2.18%	709	0.29	1.37%	196	0.75
19. Furniture	4.14%	72	0.42	4.27%	109	0.40
20. Other manufacturing	2.86%	52	0.97	3.59%	39	0.43

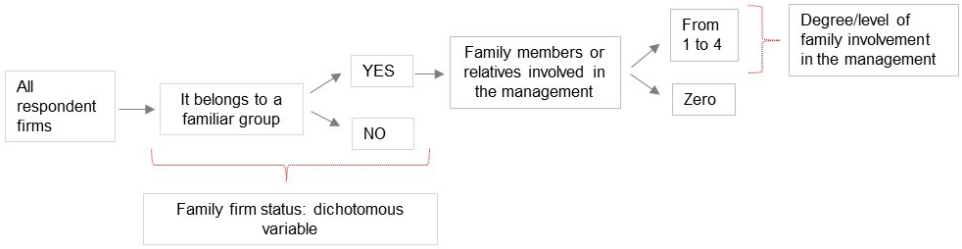
5. Independent variables

Regarding the family nature of the business we identified two independent variables, the first refers to the family firm status (Classen et al., 2012; Brinkerink, 2018; Brinkerink and Bammens, 2018) as it investigates differences between family and non-family firms; the second refers to the level of family management in order to explore differences within the group of family firms. Starting from the first independent variable, that is the family firm status, the SBSS survey adopts a dichotomous variable to distinguish between family and non-family firms. In this regard, respondents have to indicate if the firm "belongs to a family group" (i.e. yes if it belongs to a family group, and no if it does not belong to a family group) without specifying the percentage of the family ownership. Despite this limitation of the data, it can be inferred that the term "belongs to" entails possession and respondents who indicate they belong to a family group perceive themselves as a family firm. Hence, in order to define the family firm status, in this study we adopt a less stringent definition of family firm by including only the perception criteria and neglecting a precise ownership-percentage criterion (Brinkerink, 2018). This dichotomous variable takes value equal to 1 if a family group is actively involved in the control or management of the firm and 0 otherwise.

Referring to the family management variable, the existing literature suggests that it reflects family goals, values and vision that influence strategic decision-making (Chua et al., 1999), such as innovation. However, the SBSS survey does not include a direct measure that represents the family firm goals, vision and values. It reports only the number of owner and owners' relatives who hold a managerial position. Therefore, according to

previous studies and taking into account that family involvement in the firm is highly related to the family goals, vision and values (Chrisman et al., 2013) our measure of family management follows that of Kotlar et al. (2013). Thus, we measure the level/degree of family involvement in the management by considering the number of owner and owner's relatives who occupy managerial positions within the family firm (Kotlar et al., 2013). Figure 2 describes the identification process of the two independent variables, representative of the family firms' factors.

Fig. 2: Identification process of independent variables regarding family firms



An additional independent variable is the technological collaboration with business partners. Indeed, firms that aim to be successful over time in such competitive and dynamic markets have to rely on a more open approach, such as collaboration with business partners, in order to foster innovation and thus to gain competitive advantage. Hence, we construct a dichotomous variable that measures the heterogeneous nature of the collaborative network (Nieto and Santamaria, 2007). It takes value of 1 if the firm has worked with at least one partner out of customers, suppliers, competitors and/or external advisors; otherwise it takes value 0.

6. Control variables

In addition to the key variables for testing our hypotheses, we employ a variety of control variables that may influence the innovation performance of the firm. We control for size measured by the number of employees' logarithm (*Size*). Indeed, larger firms are more likely to innovate for two reasons: first, because this process is considered a natural step to growth and, second because larger firms usually accumulate more resources compared to smaller firms and in turn are more able to innovate. Thus, size is one of the most important control variables for the firm technological innovation behavior (Becheikh et al., 2006). We also introduce the variable R&D intensity, measured as the total expenditure on R&D to total sales (*R&D intensity*). Scholars also suggest that firms engaged in export activities have a higher probability to innovate. Thus, we include a variable that

captures firms' *export intensity*, defined as the percentage of exports out of total sales. Moreover, we include an additional variable that is, *market dynamism* to control for specific environmental determinants of the studied market, i.e. the Spanish market. This variable is an aggregate index that indicates the dynamism of all markets covered by the firm *i* in the year *j*. Lastly, scholars suggest that the ownership structure may also represent an important variable that affects innovation performance. Empirical studies also highlighted the relevance of the impact of foreign ownership on innovation. The latter may increase managerial capabilities of the firm and thus play a role in innovation behavior.

To control for this effect the percentage of direct or indirect participation of foreign capital in the social capital of the company was also included (*Foreign ownership*). Years and industry dummy variables were also included.

7. Interaction effect

The contribution of this study is to explore the moderation effect of family firm status and the level of family management on the relationship between technological collaboration with business partners and innovation performance. To assess the moderation effect of family firm status and the level of family management we follow the methodology suggested by Dawson (2014), that is a two-way moderation effect. In other words, we test firstly the main effects of technological collaboration with business partners and the family firm variables, independently, on innovation performance, and then we observe if there exists a moderation effect of the family firm status and the level of family management on the relationship between business partners' technological collaboration and innovation. In order to test moderation two additional variables, i.e. the interaction term, have been calculated as the product of the originating variables that is: 1) *family firm status x business partners' technological collaboration; 2) level of family management x business partners' technological collaboration.* Table 2 presents a summarized description of all variables illustrated above.

8. Data Analysis

A negative binomial estimation model (Greene, 1999) is used. This is suitable given the count data nature of the dependent variable, predicting innovation performance. The average number of product innovations implemented by the firms in our sample equals 1.16. Table 3 presents descriptive statistics and table 4 reports correlations of the variables.

The variance inflation factor was calculated to check for multicollinearity.

According to Neter et al. (1989), individual VIF values greater than ten and average VIF values greater than six reflect multicollinearity problems. In our study values are within these limits so multicollinearity is not an issue.

Tab. 2: Description of variables

Variables	***SBSS* Items**	**Variable definition**	**Type of the variable and/or calculation**	**Abbreviation**
Dependent variable: Innovation performance	NIP	Number of product innovations which the company achieved in the financial year.	Count data response format: units	NIP
Independent variable:	Business partner collaborations	Technological collaborations with customers and/or suppliers and/or competitors and/or external consultants	Dichotomous variable that takes value 1 when the firm declares it collaborates at least with one of these partners; 0 otherwise	B-partners
Moderating variable	PAFDG	Number of owners and relatives who hold managing positions in year 20XX	Count data response format: units	Family member involved in the management
	FAMILI	Categorical variable that indicates whether a familiar group is actively involved in the control or management of the firm	Dichotomous variables that take value 1 when the firm declares it is a family firm otherwise 0	Family firm status
Control variable	PERTOT	Number of total employees	ln (employees)	Firm size
	GTID	Total expenses in R&D activities	R&D expenditures/total sales	R&D intensity
	IDMERPN	Aggregate index of dynamism of all the markets covered by the company during the year. The index is obtained adding the products of the variables: Market Weighting and Situation of Dynamism of the Market	Percentage	Mkt dynamism
	PX	State whether the company, either directly or through other companies belonging to the same group, exported goods in 20XX (even to the European Union), and their value.	Exports/total sales	Export intensity
	PCAEXT	Direct or indirect participation of foreign capital in the share capital of the company	Calculated as the percentage of direct or indirect participation of foreign capital in the firm's capital	Foreign ownership

Tab. 3: Means, Standard deviation, Min and Max values of the selected variables

Variables	Mean	Standard Deviation			Min	Max
		Overall	Between	Within		
Number of product innovations	1.1645	8.1727	6.7038	5.3029	0	299
Business-partner collaboration	0.3036	0.4598	0.3956	0.2384	0	1
Family firm status	0.3363	0.4725	0.4401	0.1845	0	1
Level of family management	0.8508	1.0165	0.8997	0.4857	0	4
R&D intensity	0.0055	0.0187	0.0176	0.0095	0	0.58
Market dynamism	33.4528	31.798	23.9187	22.5759	0	100
Export intensity	22.8175	29.1571	27.3507	8.8649	0	100
Foreign ownership	14.2218	34.1712	32.3722	9.9845	0	100
Firm size	201.1701	687.961	645.1547	72.5693	1	13.091

Tab. 4: Correlations

Variables	1	2	3	4	5	6	7	8	9
Number of product innovations	1								
Business-partner collaboration	0.1072	1							
Family firm status	-0.0184	-0.0036	1						
Level of family management	-0.0146	-0.1427	0.2897	1					
R&D intensity	0.0519	0.3115	0.0053	-0.0420	1				
Market dynamism	-0.0010	0.1059	0.0197	0.0069	0.0577	1			
Export intensity	0.0544	0.3095	-0.0558	-0.1575	0.1688	0.1683	1		
Firm size	0.0934	0.4598	-0.1014	-0.2697	0.1561	0.1451	0.4146	1	
Foreign ownership	0.0768	0.2108	-0.2375	-0.3025	0.0286	0.0437	0.3084	0.4362	1
VIF (mean VIF: 1.27)		1.39	1.13	1.20	1.12	1.04	1.29	1.63	1.37

9. Empirical results

Table 5 presents the results of the random effects of the negative binomial regressions testing our H1. Model 1 presents the results of the control variables. Model two adds independent variables. Model 3 includes the interaction term between family management and business partner collaboration. Hypothesis 1 predicts that family firms moderate the relationship between technological collaboration with business partners and innovation in such a way that the relationship will weaken. Starting from the main effect, both independent variables, business partners' technological collaboration and the family firm status show a positive and significant impact on innovation performance, in line with some previous literature in the topic (Lasagni et al. 2012; Diuegez-Soto et al., 2016). The moderation effect, on the other hand, tested by including in the regression model the interaction term between the family firm status and business partners' technological collaboration shows a significant value equal to $p<0.1$. As

hypothesized the sign of the coefficient of the interaction term is negative, suggesting that family firm status weakens the relationship between business partners' collaboration and innovation performance confirming H1.

Table 6 presents the results of analysis conducted within the group of family firms and tests our H2. Also, in this analysis Model 1, Model 2 and Model 3 introduce respectively control variables, adding the independent variables and finally the moderation effect calculated through the interaction term. Models 4 and 5 introduce our estimations testing for robustness. That is, in these models we introduce another variable that accounts for all family members working in the family business, for example while a family firm may have only one family member on the management, it may also have other two members working in the family business without managerial roles.

Tab. 5: Estimating number of product innovations (negative binomial regression) – family firm status

		Model 1		**Model 2**		**Model 3**	
Variables	B-partners			1.27232	***	1.37626	***
	Std. error			*0.06626*		*0.08369*	
	Family firm status			0.21884	***	0.36598	***
	Std. error			*0.06427*		*0.09584*	
Interaction terms	Family firm status*B-partners					-0.23658	**
	Std. error					*0.11450*	
Control variables	N. of employees	0.42127	***	0.28979	***	0.28991	***
	Std. error	*0.02913*		*0.02936*		*0.02943*	
	R&D intensity	9.84619	***	6.47625	***	6.50412	***
	Std. error	*1.11525*		*1.03267*		*1.02985*	
	Exp intensity	0.00358	***	0.00306	**	0.00305	**
	Std. error	*0.00120*		*0.00119*		*0.00119*	
	Foreign ownership	-0.00388	***	-0.00204	**	-0.00203	**
	Std. error	*0.00093*		*0.00095*		*0.00095*	
	Mkt dynamism	0.00067		-0.00001		0.00005	
	Std. error	*0.00079*		*0.00078*		*0.00078*	
	Constant	-2.854248	***	-2.85171	***	-2.91148	***
	Std. error	*0,22792*		*0.22678*		*0.22958*	
	Year dummy	YES		YES		YES	
	Industry dummy	YES		YES		YES	
	N. of observations	12,105		12,105		12,105	
	N. of firms	2,420		2,420		2,420	
	Log likelihood	-8804.308		-8597.1224		-8594.990	
	*** p<0.01, ** p<0.05, * p<0.1						

The independent variables referring to the business partners' technological collaboration and to the level of family management show that the direct effect is positive and significant implying that innovation outcome will benefit from a business partner's technological collaboration and will benefit also from a higher number of family members involved in the management.

Focusing in detail on the moderation effect of the level of family management, H2 predicts that a higher level/degree of family involvement in the management negatively moderates the relationship between technological collaboration with business partners and innovation performance. As the number of family members involved in the management increases, its interaction with business partners' collaboration decreases the likelihood of having a greater number of innovative products.

Hence H2 is confirmed. In terms of control variables in both Table 5 and Table 6 results show a positive and significant coefficient, except for the variable market dynamism.

Furthermore, for a better explanation of the moderating effect of family management, in Figure 3 we represent graphically the marginal effect of business partners' technological collaboration on innovation performance depending on the level/degree of family management. Figure 3 shows that innovation output/performance benefits more from technological collaboration with business partners rather than no collaborations at all.

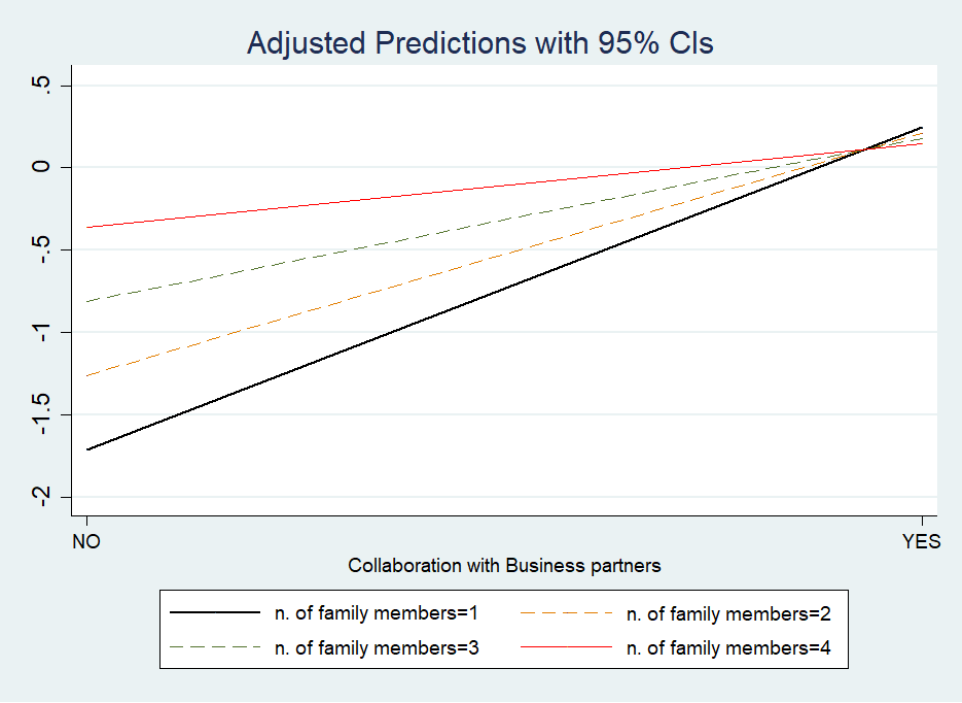
However, the slope of the red line, representing the cases of 4 family members actively involved in the management when collaboration with business partners is in place, is shallower than that of the black line, representing the case where only 1 family member is involved in the management. This evidence supports our H2 since it shows that the higher family involvement is, the lower is the likelihood of achieving new innovative products through collaborations with business partners.

Tab. 6: Estimating number of product innovations (negative binomial regression) – level of family management

		Number of family owners and relatives holding managing positions as moderator						Robustness check: Number of all family members and relatives working in the family business			
		Model 1		Model 2		Model 3		Model 4		Model 5	
Variables	B-partners			1.10808	***	1.89548	***	1.15664	***	1.31261	***
	Std. error			*0.13338*		*0.26654*		*0.10239*		*0.14000*	
	Level of family management			0.12386	*	0.36409	***	0.20464	***	0.09375	***
	Std. error			*0.06790*		*0.09568*		*0.05979*		*0.05253*	
Interaction terms	Level of family manag. *B-partners					-0.39963	***			-1.10089	*
	Std. error					*0,11545*				*0,06062*	
Control variables	Firm size	0.50063	***	0.35857	***	0.35082	***	0.33600	***	0.33724	***
	Std. error	*0.05083*		*0.07674*		*0.07640*		*0.05049*		*0,05063*	
	R&D intensity	5.97503	***	2.83850	*	2.83818	*	4.24727	***	4.33771	***
	Std. error	*1.46917*		*1.45968*		*1.47852*		*1.38269*		*1.39003*	
	Export intensity	0.00532	**	0.00553	**	0.00504	*	0.00425	**	0.00429	**
	Std. error	*0.00192*		*0.00266*		*0.00267*		*0.00186*		*0.00186*	
	Foreign ownership	-0.00486	**	-0.01214	*	-0.01121	*	-0.00426	**	-0.00442	**
	Std. error	*0.00218*		*0.00645*		*0.00646*		*0.00213*		*0.00213*	
	Market dynamism	-0.00053		-0.00128		-0.00133		-0.00138		-0.00140	
	Std. error	*0.00119*		*0.00159*		*0.00157*		*0.00118*		*0.00118*	
	Constant	-2.59482	***	-2.43997	***	-2.83305	***	-2.47336	***	-2.59733	***
	Std. error	*0.37026*		*0.41940*		*0.43667*		*0.35589*		*0.36493*	
	Year dummy	YES		YES		YES		YES		YES	
	Industry dummy	YES		YES		YES		YES		YES	
	N. of observations	3,515		3,515		3,515		3,515		3,515	
	N. of firms	934		934		934		934		934	
	Log likelihood	-3783.151		-2285.234		-2279.276		-3717.505		-3716.120	

*** p<0.01, ** p<0.05, * p<0.1

Fig. 3: Effects of level of family management on the business partners collaboration-IP relationship



10. Discussion

Our results provide two types of evidence: the first regards the moderating effect of the family firm status on the relationship between technological collaboration with business partners and innovation performance; the second, examines whether the number of family members involved in the management moderates the relationship. In doing so, the study first compares family and non-family firms and then, by focusing on the group of family firms, explores their heterogeneity deriving from the number of family members involved in the management.

Similar to some previous works, our findings confirm the positive main direct effect of the independent variables (i.e. technological collaboration with business partners, family firm status and the level/degree of family management) on innovation (Nieto and Santamaria, 2007; Lasagni, 2012; Du et al., 2014; Maztler et al., 2015; Dieguez-Soto et al., 2016). Focusing instead on the family firm status and on the level of family management as moderator variables, results show a negative effect exerted on the link between technological collaboration with business partners and innovation

performance (H1 and H2, confirmed). These findings lead to some interesting suggestions. Referring to the first hypothesis, it seems that the likelihood of achieving new product innovation increases by depending on the main effect of the business partners collaboration and the family firm status independently. In particular, family firms seem to show a better innovation performance in comparison to non-family firms as the main effect of the family firm status on the dependent variable is positive. However, the interplay between collaboration and family status is negative: the family firm status weakens the effect of business partners' technological collaboration on innovation performance. In other words, it seems that family firms benefit less from technological collaborations with respect to non-family firms. It is likely that the family status exacerbates the criticality of SEW preservation in the collaboration context, in which by definition family firms lose full control over the product innovation project and technology trajectory (Kotlar et al., 2013). As a final consequence, a negative impact on the result of the collaboration itself (i.e. the innovation performance) occurs.

Concerning the second hypothesis, our evidence suggests a negative moderating role exerted by the level of family management. In other words, while technological collaboration with business partners seems to be beneficial for innovation performance in family firms, a higher involvement of family members in the management emerges as detrimental. A possible explanation resides in the higher complexity of the relationship caused by the goal-diversity which increases when the number of family members involved in the management grows (Kotlar and De Massis, 2013). This can easily occur in situations where family branches increase (Miller and Le Breton-Miller 2011; Le Breton-Miller and Miller 2013; Sciascia et al. 2014) and their involvement in the firms reflects individual goals and resources, which may also affect innovation choices and outcomes. A second possible explanation is related to the expertise and competencies required to satisfactorily pursue technological innovation. Indeed, a higher level of family members' involvement may impoverish the knowledge wealth of the family firm, if they are not selected on competence-based criteria, with negative consequences also in terms of innovation performance deriving from collaboration (Classen et al., 2012; Lazzarotti and Pellegrini, 2015; Filser et al., 2018).

11. Theoretical and managerial implications

Our findings have theoretical and practical implications. From a theoretical point of view our study contributes to the ongoing discussion about the possible influence of family factors on innovation performance. In particular, we enrich the current literature by investigating the inter-

play between technological collaboration with business partners and two specific aspects of family firms (i.e. the family firm status and the level of family management) and we provide evidence on whether the interaction between these predictors affects innovation performance. To the best of our knowledge, this is the first research that analyzes such a moderating role. Indeed, despite the fact that previous literature recognizes the strategic importance for family firms of collaborating with external partners (Classen et al., 2012), the study of the results obtainable from collaborations due to specific family factors has been overlooked.

More in general, our findings can be positioned with respect to other studies (e.g. Serrano-Bedia et al., 2016), which already analyzed the moderating effect of family factors on the relation between external sources of knowledge and innovation performance. In particular, while Serrano-Bedia et al. (2016) studied the moderating effect of family factors only in contractual collaborations, our work enriches this stream of research by exploring data concerning also informal relationships with business partners, considered more complex by many scholars (Du et al., 2014; De Massis et al., 2015; Serrano-Bedia et al., 2016).

From a managerial point of view, practitioners should encourage family firms' CEOs (Chief Executive Officers) to better understand the goals, both economic and non-economic ones, and the attitudes of each family member involved in the management to avoid conflicting situations, which makes the management of collaborative innovation projects complex, with negative consequences in terms of innovation results. This need is even more important for the oldest family businesses, characterized by many family branches involved both in the ownership and in the management of the firm. Family owners and family members who manage the firm should be increasingly aware of those family factors, such as values, goals and long-term trusting relationships with a diverse set of players, which are crucial to foster innovation, thus in turn sustaining the firm's competitive advantage. At the same time, this awareness should encourage family members to avoid those behaviors that are too conflicting and to promote an alignment of their goals so as to benefit from collaboration with business partners, as this may lead to higher innovation performance.

Finally, policy makers and industrial associations should stimulate family firms to set up technological collaboration with business partners and more in general with other types of external partners, by means, for instance, of dissemination conferences, which emphasize the relevance of collaboration to enhance innovation, and/or contractual frameworks and tax incentives which facilitate the creation of a collaborative context.

12. Limitations, conclusion and agenda for further research

Our work suffers from several limitations.

First, the sample relies only on Spanish manufacturing firms. Taking a cross-country perspective, further insights may emerge.

Second, the study relies on secondary data sources and thus it may be affected by data-availability constraints. Hence it has not been possible to employ a precise measure of the family firms status in order to include both ownership and perception criteria as in previous studies (Classen et al., 2012; Brinkerink, 2018; Brinkerink and Bammens, 2018) as well as a more precise measure of the level of family management (e.g. the percentage of family members in the top management team with respect to the total number of managers), which could allow us to grasp the studied moderating role more in detail. Lastly, as explained in the result section, the unbalanced nature of our sample and the missing values evidenced by the survey have prevented the significance of further analysis splitting the business partners construct in single partner-type (e.g. technological collaboration only with customers, only with suppliers and so on) collaboration. Thus, it has not been possible to investigate more thoroughly the effect of the family factors on the relationship between specific collaboration-types and innovation performance.

Furthermore, it would also be interesting to learn more about the moderating effects of other family firm variables, such as the family education level or family members' tenure within the family business, on the relationship between technological collaboration with business partners and innovation performance.

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LE DETERMINANTI DELL'ECOINNOVAZIONE NELLE PMI INNOVATIVE: PROSPETTIVE TEORICHE ED EVIDENZE EMPIRICHE

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Abstract

The exponential growth of the sensitivity of the community towards environmental issues and the awareness of environmental risks has led companies to coherently adapt to environmentally sustainable development their productive processes and products. In order to accelerate these processes, a flourishing international research stream that investigates the determinants that underlie the adoption of eco-innovations among firms has emerged.

In light of the above objective, this paper aims to identify the level of dissemination of eco-innovations and the determinants that support their adoption within a specific population of Italian SMEs, the innovative SMEs introduced by law 33/2015. The results obtained show that a large part of the companies investigated show a high sensitivity towards eco-innovation issues; in particular, under the pressure of customers and final consumers.

The choice to follow the principles of eco-compatibility, however, turns out to be dictated above all by factors of an individual nature, whereas, in the absence of an exhaustive public intervention, firms are still unable to perceive the economic advantages connected with the adoption of eco-innovations; from the image improvement, to the profitability increase.

1. Introduzione

Da almeno un quindicennio sussiste una notevole attenzione sul tema delle *ecoinnovazioni*. L'Unione Europea (UE), ad esempio, prevede diversi programmi di finanziamento delle ecoinnovazioni. Al riguardo basta ricordare che, dal 2013, l'*Environmental Technologies Action Plan* ha investito oltre 12 miliardi di € per progetti di ecoinnovazione rientranti nel 6° e 7° Programma Quadro ed altri programmi di finanziamento comunitari. Più recentemente l'UE ha finanziato *Horizon 2020*, che prevede uno stanziamento di 27 mld € ed il *COSME* (P*rogramme for the competitiveness of enterprises and small and medium-sized enterprises* 2014-2020) per 2,3 mld €.

In funzione dei risvolti economici, finanziari e competitivi connessi all'implementazione delle ecoinnovazioni, che afferiscono sia le condizioni di operatività, sia le scelte strategiche dell'azienda, il tema ha attratto l'interesse di numerosi studiosi di discipline economiche e manageriali.

Tale interesse si è tradotto, in parte, nell'individuazione degli elementi che sollecitano ad investire in ecoinnovazioni, ovvero le *determinanti* (Triguero et al., 2013; Cai e Zhou, 2014). Finora, l'attenzione degli studiosi si è rivolta prevalentemente sulle grandi aziende, per via del loro rilevante impatto ambientale. Scarsi e frammentati sono i contributi dedicati alle PMI (Schiederig *et al.*, 2012; Klewitz *et al.*, 2013; de Jesus Pacheco *et al.*, 2017); sebbene rappresentino il 99% della popolazione delle aziende e 67% dell'occupazione a livello europeo.

Atteso che i processi decisionali e le condizioni di competitività tra grandi e piccole aziende non necessariamente coincidono, l'esigenza conoscitiva di indagare sulle determinanti è maggiormente avvertita in paesi come l'Italia, dove il ruolo delle PMI nel sistema economico è particolarmente significativo. Ad oggi, tuttavia, ancora non esistono specifici modelli interpretativi, o indagini empiriche che analizzano specificamente le determinanti delle PMI nazionali (Mazzanti e Zoboli, 2009; Cainelli e Mazzanti, 2013; Marin *et al.*, 2015). Un *gap* conoscitivo che rischia di ostacolare tanto la diffusione delle ecoinnovazioni di per sé, quanto della sensibilità ambientale nel sistema delle aziende (Guoyou *et al.*, 2013; Triguero *et al.*, 2013; Xavier *et al.*, 2017).

Al fine di contribuire a ridurre questa zona d'ombra, la domanda di ricerca del presente lavoro è indentificare in che modo le PMI italiane percepiscono le principali determinanti dell'ecoinnovazione così come individuate dalla letteratura scientifica. In particolare, si intende valutare come le PMI interpretano i fattori ritenuti maggiormente influenti sulle scelte di investimento in ecoinnovazione; nonché il peso ad essi attribuito.

In funzione di quanto sopra si è indagato un campione rappresentativo di aziende estratto da una specifica popolazione, le *PMI innovative* iscrit-

te nell'apposito registro del Ministero dello Sviluppo Economico e delle CCIAA, che per sua natura dovrebbe esibire un'elevata propensione verso l'adozione di innovazioni. A tali PMI è stato somministrato un questionario indirizzato ad individuare la percezione delle richiamate determinanti.

Poiché nessuna indagine di tal tipo è stata finora condotta in Italia con specifico riferimento alle PMI, i riscontri ottenuti hanno una forte valenza per rispondere sia al bisogno informativo dei *policy maker* di definire un piano di azione verso la sostenibilità ambientale, sia a quello degli imprenditori/manager di impegnarsi in tal direzione.

Il contributo è organizzato come segue. Dopo la presente introduzione, la sezione 2 specifica il concetto di ecoinnovazione, la 3 riporta il quadro teorico e la 4 la metodologia. La sezione 5 evidenzia i risultati dell'indagine empirica, mentre la sezione 6 le conclusioni, i limiti e le implicazioni di policy.

2. Sostenibilità aziendale ed ecoinnovazioni

Negli anni '90 ci si domandava se l'adeguarsi ai crismi dello *sviluppo sostenibile*, ovvero riuscire a soddisfare i bisogni delle generazioni presenti senza compromettere l'analoga capacità delle future generazioni (UNEP, 2011), fosse compatibile con il perseguimento delle tradizionali condizioni di economicità aziendali. Oggigiorno, in coerenza con i consolidati dettami della scuola aziendalista italiana (Coronella *et al.*, 2016; Venturelli et al., 2017), si ritiene che ciò non solo sia possibile, ma indispensabile per le stesse esigenze di sopravvivenza e sviluppo delle imprese (EEA, 2014; Ronchi *et al.*, 2014), allorché la loro competitività e lo stato di salute delle comunità che le circondano sono interrelate (Porter e Kramer, 2006; Corazza *et al.*, 2017; Porter e Kramer, 2019).

D'altra parte, negli ultimi 3-4 decenni è aumentata in modo esponenziale la sensibilità dei cittadini verso le *environmental issue* e la consapevolezza dei rischi ambientali. Circostanza che ha indotto i *policy maker* di molti paesi ad avallare azioni alquanto pervasive di contrasto al degrado territoriale ispirate ai basilari dettami della cosiddetta *green economy*; vale a dire alla capacità di generare un benessere di migliore qualità e più equamente esteso, tutelando il capitale naturale attraverso un modello di sviluppo basato sulla riduzione delle risorse consumate, l'uso di fonti rinnovabili, il riciclo dei rifiuti e la minimizzazione delle emissioni (Pearce *et al.*, 1989). In conformità ai dettami della *Corporate Social Responsability*, di recente è stato anche introdotto l'obbligo della rendicontazione non finanziaria per le grandi aziende (direttiva 2014/95/UE) relativo, tra l'altro, all'utilizzo di risorse rinnovabili, all'emissione di inquinanti, all'impatto della loro attività su salute e sicurezza.

Tali sollecitazioni hanno avviato un'inarrestabile diffuso processo di miglioramento delle condizioni di impiego delle risorse ambientali ed umane, queste ultime al contempo anche clienti delle aziende. Ne discendono immediati risvolti sul governo dell'azienda, allorché le unità organizzative debbono rideterminare buona parte delle modalità gestionali ed organizzative con l'adozione di tecniche, tecnologie e processi produttivi ecosostenibili. Una dinamica foriera di percorsi virtuosi di salvaguardia ambientale (*go-green*) ma anche di opportunità economiche; con una pluralità di benefici potenziali che spaziano dal rafforzamento dell'immagine verso i clienti all'ottenimento di incentivi pubblici. In parallelo sorgono nuovi mercati per aziende che si dedicano precipuamente alla produzione di beni e servizi ambientali (*core-green*) destinati ad altre imprese.

Non sorprende, pertanto, quantomeno per le aziende che aspirino ad essere leader del mercato, *first mover* o a posizionarsi nella fascia alta di mercato, che le esigenze della sostenibilità siano attualmente considerate anzitutto un investimento di medio-lungo termine, piuttosto che un mero costo. Come per tutti gli investimenti finalizzati ad accrescere la futura competitività, il motore di questi cambiamenti risiede nella costante implementazione di innovazioni (Ahmed e Shepherd, 2010; Corbetta e Morosetti, 2018). Nello specifico si fa riferimento ad innovazioni che la letteratura ha finora definite in varie guise quali *green* o *ambientali* o *sostenibili* (Guoyou *et al.*, 2013; He *et al.*, 2018). Tali innovazioni sono più genericamente inquadrate come *ecoinnovazioni* e sono qui intese come "the introduction of any new or significantly improved product (good or service), process, organizational change or marketing solution that reduces the use of natural resources and decreases the release of harmful substances across the whole life-cycle" (EIO, 2012: 8).

3. Le determinanti dell'ecoinnovazione

Quanto finora detto lascia agevolmente intuire come, dal punto di vista aziendale, sussistono molteplici stimoli verso l'adozione delle ecoinnovazioni che si legano ad una pluralità di elementi; sia di tipo positivo (differenziarsi dai concorrenti, aumentare la soddisfazione dei clienti, beneficiare di un incentivo…), sia di tipo negativo (dover rispettare una norma, evitare delle penalità, adeguarsi alla concorrenza…). Alla stregua di ogni investimento, le ecoinnovazioni impattano sulle configurazioni dei costi e sui ricavi, effettivi ed attesi, con conseguenze sulle dinamiche economiche e finanziarie immediate; così come quelle competitive di medio-lungo termine. Inoltre, in non pochi casi, è richiesta la disponibilità di adeguate risorse tangibili ed intangibili e si presuppongono cambiamenti nei consolidati processi produttivi.

Tutti aspetti che introducono elementi di incertezza nel governo dell'azienda, accrescono la complessità e complicano il processo decisionale.

Appaiono palesi, pertanto, le ragioni che sollecitano la comprensione dell'impatto esercitato delle varie *determinanti* sulle scelte di implementazione e diffusione delle ecoinnovazioni in ambito aziendale, come il relativo peso che di volta in volta possono esercitare (Carrillo-Hermosilla et al., 2010; Schiederig *et al*., 2012; del Rio et al., 2017). D'altronde, essendo molteplici con tendenza a sovrapporsi o ad influenzarsi reciprocamente, anche in direzioni opposte in termini di stimoli o barriere, tali determinanti non sono agevoli da identificare; conferendo, così, caratteristiche di maggiore specificità alle scelte aziendali rispetto ad analoghe sollecitazioni (Horbach, 2008; Mazzanti e Zoboli 2009; Marin *et al*., 2015). Inoltre, spesso, più determinanti sono considerate in modo aggregato o, viceversa, una stessa determinante disaggregata. Per quanto riguarda segnatamente le PMI, ad esempio, la letteratura ha finora identificato ventitré determinanti (de Jesus Pacheco *et al*., 2017); parte delle quali riportate nella Tabella 1. Si tratta di un numero elevato che ne impedisce una contemporanea ponderazione, così come l'analisi delle reciproche interazioni.

Tab. 1: Le principali determinanti dell'ecoinnovazione nelle PMI

Determinante	Contributi
Competenze e *knowledge*	Kesidou e Demirel, 2012; Triguero et al, 2016; de Jesus Pacheco et al., 2018;
Risorse finanziarie	Zhu et al., 2011; Jové-Llopis e Segarra-Blasco, 2018
Performance ambientali (minore inquinamento o consumo di risorse)	Kesidou e Demirel, 2012; Marin et al., 2015: Rio et al., 2017
Performance economiche (riduzione di costi, vantaggi competitivi…)	Bos-Brouwers, 2010; Pereira e Vence, 2012; Woo et al., 2014
Incentivi e sussidi	Zhu et al., 2011; Hoogendoorn et al., 2015; Triguero et al, 2016
Normative	Hojnik e Ruzzier, 2016; de Jesus Pacheco et al., 2017; He *et al*., 2018
Presenza di università, centri di ricerca... (*technological pull*)	Zhu et al., 2011; Triguero et al, 2013; de Jesus Pacheco et al., 2017
R&D interna (*technological push*)	Yalabik e Fairchild, 2011; De Marchi, 2012; Kiefer et al., 2017;
Cultura ambientale aziendale	Kiefer et al., 2017; de Jesus Pacheco et al., 2018
Caratteristiche aziendali (ampiezza, settore, spesa in R&D…)	Triguero et al, 2013; Woo et al., 2014; Hoogendoorn et al., 2015

Internazionalizzazione (*export*)	Martìn-Tapia et al., 2008; He et al., 2018; Hojnik et al., 2018
Attrazione di investitori	Halila e Rundquist, 2011; Zhu et al., 2011; Jové-Llopis e Segarra-Blasco, 2018;
Attese dei clienti	Horbach et al., 2012; Hojnik e Ruzzier, 2016; Kiefer et al., 2017
Pressioni dei fornitori	Bos-Brouwers, 2010; Yalabik e Fairchild, 2011; Guoyou et al., 2013
Livello di concorrenza	Zhu et al., 2011; del Rio et al., 2016; de Jesus Pacheco et al., 2017

Di solito, infatti, ogni contributo si limita ad analizzare l'effetto di un numero contenuto di determinanti, generalmente interpretate o classificate secondo angolazioni differenti. Le più note riguardano i *technology-push* o *marked-pull factors* (Horbach, 2008; De Marchi, 2012; Triguero *et al*., 2013) oppure i driver *interni* legati a pregressi fattori e caratteristiche aziendali od *esterni*, connessi alle sollecitazioni degli attori esogeni (Horback *et al*., 2012; Cai e Zhou 2014; Del Rio *et al*., 2017). Un'altra chiave di lettura suggerisce che le risposte delle aziende alle sollecitazioni esterne dipendono, secondo l'interpretazione della *Resource based view*, fondamentalmente dalle risorse e competenze endogene, oppure, secondo la *Institutional theory,* dalle aspettative del contesto socio-ambientale (Demirel e Kesidou, 2012; Zhu *et al*., 2011; Cai e Li, 2014).[1]

Considerando anche che il tema di ricerca è relativamente nuovo, pertanto, non può sorprendere se gran parte delle indagini finora condotte presentano limiti conoscitivi connessi, ad es., alla disponibilità di dati, al tipo e numero di variabili considerate e persino allo stesso concetto di ecoinnovazione adottato. Raramente, ad esempio, si distingue tra ecoinnovazioni incrementali o radicali, tra quelle di processo, prodotto o organizzative, o relative a tipologie diverse di clienti (B2B, B2C…); pur sapendo che queste differenze possono esercitare una distinta influenza (Klewitz e Hansen, 2013; del Rio *et al*., 2016; García-Granero *et al*., 2018).

Alla luce di quanto sopra, in coerenza con la scelta di utilizzare un questionario d'indagine derivato da quello realizzato da Cai e Li (2018), si classificano le determinanti in stimoli provenienti dagli attori istituzionali e quelli connessi alle capacità e risorse endogene. Nello specifico, nel primo ambito si è considerata l'influenza degli *stakeholder* e, più nello specifico, delle *pubbliche amministrazioni*; nel secondo ambito quello di *competenze* e di *performance ambientali ed economiche* attese.

[1] Un altro approccio, tuttavia, preferisce ricondurre le determinanti in tre livelli: *macro*, *meso* o *micro* (Diaz-Garcia *et al*., 2015).

3.1 Gli stakeholder

La prima categoria include i gruppi di pressione legati al posizionamento competitivo dell'azienda. Dal lato della domanda (*market-pull factor*), forti sollecitazioni provengono sia da aziende clienti (B2B), sia dai consumatori finali (B2C) (Horbach *et al.*, 2012; Hojnik e Ruzzier, 2016), laddove i secondi sono ritenuti il soggetto più attento alle esigenze della *green economy* (Doran e Ryan, 2011; Yalabik e Fairchild, 2011). Pertanto, il disattendere le aspettative dei consumatori alimenta un elevato rischio di *exit* dal portafoglio clienti. Nei paesi a basso reddito pro capite questa spinta è più debole poiché la coscienza ambientale dei consumatori è mitigata dalla minore possibilità di pagare prezzi più elevati per prodotti e servizi ecocompatibili (del Rio *et al.*, 2016).

Parimenti, i fornitori possono esercitare una pressione sulle aziende loro clienti affinché si adeguino a delle ecoinnovazioni coerenti con quelle da loro già adottate o per implementare delle loro creazioni (*technology-push factor*) (Yalabik e Fairchild, 2011; Guoyou *et al.*, 2013). In generale, al crescere del grado di integrazione e cooperazione con altre imprese, aumenta la probabilità di adottare ecoinnovazioni (Triguero *et al.*, 2013; de Jesus Pacheco et al., 2018; Tumelero *et al.*, 2019); come mostra l'esperienza delle *supply chain* (Wu, 2013). Anche l'apertura internazionale risulta significativamente e positivamente associata all'ecoinnovazione (Martín-Tapia et al., 2008; Hojnik *et al.*, 2018); così come la presenza di un'alta intensità competitiva (del Rio *et al.*, 2016).

Onde crearsi un'immagine di istituzione verde, etica in senso lato, gli intermediari finanziari e gli investitori mostrano una crescente propensione nel finanziare investimenti ecocompatibili (Halila e Rundquist, 2011;Jové-Llopis, Segarra-Blasco, 2018). Similmente, è possibile che il personale interno dell'azienda stimoli l'adozione di ecoinnovazioni, perché incentivato dall'azienda stessa, in qualità di cliente/consumatore o di beneficiario dei cambiamenti introdotti; ad es. con metodologie lavorative più gradevoli (Pereira e Vence, 2012; Woo *et al.*, 2014). In generale, l'intero *ambiente culturale* esogeno può esercitare un'influenza positiva sull'adozione di ecoinnovazioni (de Jesus Pacheco *et al.*, 2017).

3.2 Pubbliche Amministrazioni

Ogni innovazione apporta esternalità positive a livello territoriale grazie alla fertilizzazione ed all'effetto imitativo. Nel caso delle ecoinnovazioni si riducono anche le diseconomie ambientali che, tuttavia, solitamente non sono valorizzate dal mercato (ad es. inquinamento da emissioni) (Rennings, 2000). A fronte di ciò, gli enti pubblici ai vari livelli locali, naziona-

li o internazionali, hanno molteplici strumenti per sollecitare l'azione di ecoinnovazioni (*policy-driven ecoinnovation*) per favorire la riduzione delle esternalità ambientali negative connesse all'operatività aziendale. A partire dalla mera *moral suasion*, essi possono introdurre penalizzazioni e premialità, o imporre norme vincolanti. In generale, le politiche di *demand-pull* hanno un impatto maggiore sull'ecoinnovazione rispetto agli strumenti di *supply-push*; vale a dire che le politiche di regolamentazione pubblica sono più efficaci delle sovvenzioni (Mazzanti e Zoboli, 2009; Hojnik e Ruzzier, 2016; He *et al.*, 2018). Essendo spesso rivolte anche ai cittadini, tali norme non di rado inaugurano nuovi mercati o rafforzano quelli esistenti (ad es. l'obbligo della raccolta differenziata o gli incentivi alla rottamazione di vecchie auto). Poiché anche gli enti di diffusione delle conoscenze, come le università ed i laboratori di ricerca, sono sempre più rivolti a studiare ed approfondire i temi della sostenibilità, ne consegue che nel loro abituale relazionarsi con le aziende essi tenderanno a proporre ecoinnovazioni (Cainelli *et al.*, 2012; Triguero *et al.*, 2013). Non sorprende, dunque, se le fonti esterne di conoscenza – come la vicinanza regionale alle università e centri di ricerca – siano, per le ecoinnovazioni, più rilevanti che per altri tipi di innovazioni (Horbach, 2014; Tumelero *et al.*, 2019).

3.3 Le competenze

Le pressioni esogene all'azienda, ad ogni modo, devono confrontarsi con quelle che sono le sue endogene capacità tecnologiche, organizzative e gestionali di implementare ecoinnovazioni (*internal driver*) (Mazzanti e Zoboli, 2009; Kesidou e Demirel, 2012; de Jesus Pacheco et al., 2018). Le ecoinnovazioni, difatti, sono molto eterogenee e possono spaziare dalla mera sostituzione di un vecchio macchinario con uno nuovo meno inquinante, fino al richiedere cambiamenti significativi nei processi produttivi.

Per le PMI, la disponibilità delle suddette competenze, così come di adeguate risorse finanziarie, è meno scontata che per le grandi imprese (Horbach, 2008; Pereira e Vence, 2012); con ciò rallentandosi i percorsi di adozione delle ecoinnovazioni. La difficoltà di valutare la presenza di tali risorse tangibili e intangibili tende a sottovalutarne il peso nelle indagini sull'ecoinnovazione; sebbene in taluni casi possano rivelarsi, come detto, particolarmente rilevanti, se non decisive (del Rio *et al.*, 2016).

3.4 Performance economiche ed ambientali

A livello prettamente *cost-based* è presumibile che l'adozione di ecoinnovazioni possa comportare degli elevati sacrifici di ricchezza non compensati da analoghi immediati benefici. Ad es., investimenti in innovazioni che riducano le emissioni o accrescano la sicurezza sul lavoro determinano

degli oneri supplementari, sia di investimento sia di gestione corrente che, riverberandosi sul costo di produzione, penalizzano le aziende adottanti rispetto alle equivalenti non adottanti; almeno inizialmente.

È, quindi, possibile che l'esito socialmente auspicabile di un minore inquinamento connesso all'operatività aziendale si riveli incompatibile con l'obiettivo della massimizzazione del profitto (Horbach, 2008). Tuttavia, come ricordato da Porter e van der Linde (1995), migliori prestazioni ambientali e strategie di ecoinnovazione possono essere una fonte di vantaggio competitivo, traducendosi in benefici economici indiretti di futura valorizzazione che afferiscono alle altre dimensioni dello sviluppo aziendale (quella sociale, ambientale e competitiva). Tra essi il miglioramento dell'immagine, la legittimazione da parte degli *stakeholders*, quote di mercato più ampie pur con superiori prezzi di vendita del prodotto/servizio.

In sintesi, la risultante economica delle ecoinnovazioni è alquanto incerta, in quanto dipendente da reazioni imprevedibili dei diversi attori industriali. Una maggiore spinta verso l'ecoinnovazione è plausibile quando le imprese sono soggette a rigide norme di politica ambientale e forti incentivazioni (Bos-Brouwers, 2010; Pereira e Vence, 2012; He *et al.*, 2018), o quando, aspirando ad essere leader di un segmento di mercato, devono proporsi come *first mover* nell'adozione di innovazioni (Ahmed e Sheperd, 2010).

L'effetto delle ecoinnovazioni sulle performance ambientali, invece, traducendosi in una riduzione del consumo di risorse, delle emissioni e dell'inquinamento, solitamente è ritenuto riverberarsi positivamente sulla dinamica dei costi (Horbach, 2008; Horbach *et al.*, 2012; Demirel e Kesidou, 2011). Potrebbero, altresì, manifestarsi i citati benefici indiretti (Marin *et al.*, 2015); più difficili da far risaltare nelle PMI in mancanza di una *voluntary disclosure.*

In generale, quindi, non c'è un *trade-off* tra il perseguimento di uno sviluppo sostenibile e la redditività (Doran e Ryan, 2011; del Rio *et al.*, 2017); sebbene, in coerenza con l'affermazione testé ricordata (sezione 2), l'adozione di ecoinnovazioni è considerata un investimento più che un costo.

4. Metodologia d'indagine

La tipicità degli obiettivi che si intende perseguire con la presente ricerca esplorativa necessita di una metodologia di indagine che superi la natura olistica tipica delle indagini qualitative e permetta di ottenere indicazioni sull'interpretazione del problema che siano funzionali anzitutto alle esigenze dei *policy maker* interessati a promuovere una più diffusa adozione delle ecoinnovazioni nei contesti di riferimento. In tale ottica si è fatto ricorso ad una indagine di tipo quantitativo. Nello specifico sono state inda-

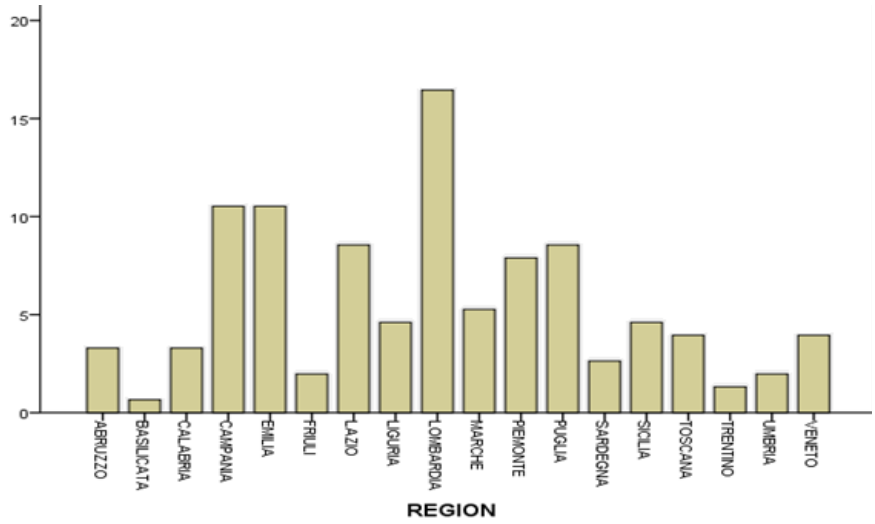
gate le determinanti dell'ecoinnovazione nelle 1.035 *PMI innovative* iscritte al 1 aprile 2019 in un apposito registro del Ministero dello Sviluppo Economico e delle CCIAA. Si tratta di una tipologia di impresa introdotta dalla Legge 33/2015 per favorire la crescita sostenibile, lo sviluppo tecnologico e l'occupazione, nonché contribuire alla creazione di un ecosistema dell'innovazione, con la promozione dei processi di trasferimento tecnologico, la valorizzazione della ricerca e l'attrazione di talenti e capitali dall'estero.

Le PMI innovative beneficiano di una serie di agevolazioni che spaziano da regole flessibili per la gestione societaria, alla possibilità di raccogliere capitale tramite *equity crowdfounding*, nonché dalle facilitazioni per l'accesso al credito bancario agli incentivi fiscali per gli investimenti. Possono iscriversi all'apposito registro le società dell'UE, purché con una sede produttiva o filiale in Italia, non quotate, che rientrino nella definizione di PMI e soddisfino definiti parametri riguardanti l'innovazione tecnologica (incidenza delle spese in R&S ed innovazione, livello di istruzione ed esperienza professionale dei fondatori, proprietà di brevetti). Considerare la suddetta popolazione consente di indagare le imprese che dovrebbero costituire una parte consistente del tessuto industriale nazionale più orientato all'innovazione e con le maggiori potenzialità di rapida espansione, sì da essere equiparate alle *gazzelle* o *high-growth firm* (Acs *et al.*, 2008) di cui il Paese appare particolarmente bisognoso. Inoltre, in virtù dell'omogenea giovane età, esse dovrebbero esibire una mentalità più aperta e sensibile verso il tema della sostenibilità ambientale; mentre le eterogeneità dimensionali, operative e settoriali le rendono alquanto rappresentative degli orientamenti dell'imprenditorialità domestica verso i settori a prevedibile sviluppo futuro.

Al riguardo va specificato che le determinanti differiscono tra settori (Horbah, 2008; Cainelli e Mazzanti, 2013; Triguero *et al.*, 2013), mentre età e dimensione esercitano un'influenza positiva (De Marchi, 2012; Woo et al., 2014; Hoogendoorn et al., 2015). Ne consegue che molte tra le aziende più giovani e piccole potrebbero non essere ancora adeguatamente strutturate per approcciarsi in modo sistematico (ad es. adottando un *environmental management system*) verso le esigenze di sostenibilità ambientale (Cai e Zhou, 2014; Hojnik e Ruzzier 2016; Cai e Li, 2018).

Per evitare i tipici limiti (Zhang, 2012; Wallgren e Wallgren, 2014) relativi alla qualità dei dati provenienti da archivi amministrativi (ad es. il mancato o ritardato aggiornamento) che possono introdurre effetti distorsivi causati da errata selezione (e conseguentemente errori di copertura) si sono inizialmente contattate tutte le 1.035 aziende incluse nel registro, depurando la lista dalle aziende prive di un sito web, una e-mail o un recapito telefonico (51 in totale). In ragione della eterogeneità spaziale della distribuzione delle aziende, si è fatto ricorso ad un campionamento stratificato[2], usando la regione come variabile di stratificazione (Figura 1).

Fig. 1: Distribuzione delle imprese incluse nel campione nelle regioni italiane



La numerosità campionaria è stata determinata considerando la variabilità di alcune caratteristiche strutturali, quali le classi di addetti, di capitale e di produzione indicate nel registro delle PMI innovative alla data del 1 aprile 2019. Essa è stata fissata in 155 unità, che rappresentano oltre il 15% della popolazione totale. Tutte le aziende estratte dal registro con campionamento casuale semplice sono state invitate a partecipare alla rilevazione tramite la compilazione di un questionario on line articolato in domande chiuse con scala *Likert* a 5 modalità (Allegato 1), onde indagare la percezione delle determinanti; ovvero il grado di rilevanza attribuito da un intervistato un elemento per le sue scelte in tema di investimenti in ecoinnovazioni (Marin et al., 2015).

In coerenza col *framework* teorico nonché con altri questionari utilizzati per indagini analoghe (e.g. Cai e Li, 2018), le domande investono 4 aree: *stakeholders*, ruolo delle pubbliche amministrazioni, competenze endogene, performance economiche ed ambientali. Tre aziende non hanno fornito un *feedback* e nonostante i tentativi di recupero delle unità non rispondenti, esse hanno limitato la numerosità finale del campione a 152.

La Tabella 2 riporta le variabili strutturali di impresa (classi di addetti, di produzione, di capitale e settore di attività) per macro ripartizione nazionale; così come riportate nel registro. Si osserva che ci si riferisce fondamentalmente a microimprese debolmente capitalizzate (in particolare al Sud), attive di gran lunga nel settore dei servizi. L'essere PMI ad alto valore

[2] Come noto, si tratta di una procedura probabilistica che prevede la suddivisione della popolazione di riferimento in sottopopolazioni omogenee rispetto ad una o più variabili di classificazione, consentendo di ridurre la *selection bias* e di avere un campione che rifletta precisamente la popolazione di riferimento.

aggiunto, tuttavia, tende a far risaltare dei livelli di fatturato proporzionalmente più elevati.

Tab. 2: Distribuzione percentuale ed assoluta (in parentesi) delle unità campionarie

	Nord	Centro	Sud	
Classe di addetti				Totale
0-4	25,4 (18)	25,7 (9)	47,8 (22)	32,2 (49)
5-9	18,3 (13)	20,0 (7)	26,1 (12)	21,0 (32)
10-19	26,8 (19)	34,3 (12)	13,0 (6)	23,3 (37)
20-49	18,3 (13)	11,4 (4)	10,9 (5)	14,5 (22)
50-249	9,9 (7)	5,7 (2)	2,2 (1)	6,6 (10)
>250	1,4 (1)	2,9 (1)	0,0 (0)	1,3 (2)
Totale	*100* (71)	*100* (35)	*100* (46)	(*152*)
Classe di fatturato (€ *1.000)				
0-100	8,5 (6)	11,4 (4)	15,2 (7)	11,2 (17)
101-500	26,8 (19)	34,3 (12)	34,8 (16)	30,9 (47)
501-1.000	16,9 (12)	17,1 (6)	17,4 (8)	17,1 (26)
1.001-2.000	12,7 (9)	17,1 (6)	19,6 (9)	15,8 (24)
2.000-5.000	16,9 (12)	8,6 (3)	10,9 (5)	13,2 (20)
5.0001-10.000	9,9 (7)	0,0 (0)	2,2 (1)	5,3 (8)
10.001-50.000	8,5 (6)	11,4 (4)	0,0 (0)	16,6 (10)
Totale	*100* (71)	*100* (35)	*100* (46)	*(152)*
Classe di capitale (€)				
0-5.000	2,8 (2)	0,0 (0)	0,0 (0)	1,3 (2)
5.000-10.000	12,7 (9)	8,6 (3)	21,7 (10)	14,5 (22)
10.000-50.000	33,8 (24)	40,0 (14)	39,1 (18)	36,8 (56)
50.000-100.000	11,3 (8)	20,0 (7)	8,7 (4)	12,5 (19)
100.000-250.000	12,7 (9)	5,7 (2)	13,0 (6)	11,2 (17)
250.000-500.000	4,2 (3)	5,7 (2)	6,5 (3)	5,3 (8)
500.000-1.000.000	4,2 (3)	5,7 (2)	8,7 (4)	5,9 (9)
1.000.000-2.500.000	9,9 (7)	2,9 (1)	2,2 (1)	5,9 (9)
2.500.000-5.000.00	1,4 (1)	5,7 (2)	0,0 (0)	2,0 (3)
>5.000.000	7,0 (5)	5,7 (2)	0,0 (0)	4,6 (7)
Totale	*100* (71)	*100* (35)	*100* (46)	*(152)*
Settore				
Commercio	4,2 (3)	5,7 (2)	8,7 (4)	5,9 (9)
Manifatturiero	19,7 (14)	22,9 (8)	28,3 (13)	23,0 (35)
Servizi	76,1 (54)	71,4 (25)	63,0 (29)	71,1 (108)
Totale	*100* (71)	*100* (35)	*100* (46)	*(152)*

Per verificare l'esistenza di una relazione di dipendenza tra le caratteristiche aziendali descritte e la ripartizione territoriale si è condotta un test basato sulla statistica χ^2 (Tabella 3). L'analisi dei valori della statistica –test ottenuti permette di osservare che le caratteristiche delle imprese incluse nel registro delle PMI innovative sono indipendenti dalla ripartizione territoriale. Si tratta di una considerazione rilevante alla luce dei riscontri empirici che vogliono solitamente le aziende settentrionali più proattive di quelle meridionali anche dal versante della propensione innovativa (OBI, 2019).

Tab. 3: Valori del test χ^2 per caratteristiche delle aziende

Caratteristiche	χ^2	**p-value**
Classe di addetti	14,963	0,133
Classe di produzione	14,469	0,272
Classe di capitale	20,092	0,328
Settore	2,497	0,645

5. L'analisi delle determinanti

Prima di analizzare le determinanti indagate, sono opportune alcune considerazioni riguardanti l'approccio che, in generale, i rispondenti mostrano verso l'ecoinnovazione. Solo il 10% dichiara di avere un piano documentato o delle regole per la gestione ecologica, rispetto al 32% che ammette di non possederne affatto. Eppure un terzo delle aziende riconosce che tanto il proprio output quanto i processi produttivi debbono soddisfare precisi requisiti di ecocompatibilità. I riscontri sono leggermente migliori per quanto concerne il ritenere l'*audit ambientale* una norma di gestione, mentre è forte la sollecitazione verso i dipendenti affinché si adoperino per il risparmio energetico e la riduzione delle emissioni. Questi ultimi, ad ogni modo, sembrano recepire solo parzialmente gli inviti aziendali nel proporre azioni di sostenibilità.

Tale quadro, tra l'altro, va collegato al mancato obbligo, per le PMI, di rendicontare agli *stakeholders* il proprio impegno verso l'ecosostenibilità. La maggioranza delle imprese conferma di non preoccuparsi di tale necessità.

I suddetti riscontri, ad ogni modo, non riflettono l'elevata sensibilità ambientale che emerge nel complesso quale riflesso dell'importanza riconosciuta alla sostenibilità ambientale. Nelle regioni meridionali, in particolare, più della metà delle PMI esprime attenzione verso le ecoinnovazioni (χ^2 significativo al 10%). Si potrebbe addirittura ipotizzare che le aziende meridionali pensino all'ecoinnovazione come ad un modo per poter ridurre gli svantaggi comparati con le equivalenti di altre aree; ma anche ad una

reazione alle note criticità ambientali che caratterizzano molte aree locali.

Un'altra ragione del *gap* tra sensibilità ed azioni concrete dei rispondenti si lega al fatto che le unità economiche, in quanto prevalentemente aziende piccole e poco strutturate, potrebbero non avere adeguate risorse economiche da investire allo scopo. Si spiegano in tal modo i richiamati stimoli verso i propri dipendenti mentre, nei fatti, è presente solo nel 10% dei casi una figura professionale *ad hoc*, come l'*energy manager*; sebbene il 15% dei rispondenti ne preveda l'assunzione. Quest'ultima esigenza, è particolarmente avvertita nel manifatturiero, dove il 26% delle aziende ne prevede l'assunzione rispetto all'8% dei servizi (χ^2 significativo al 5%).

A fronte di questo *landscape*, in linea con le determinanti della ecoinnovazione specificate nella sezione 3, emerge anzitutto una sostanziale equivalenza territoriale nel considerare di impatto mediamente alto l'influenza esercitata dalle aspettative dei clienti; di gran lunga superiori a quelle degli altri *stakeholder* (Tabella 4).

Tab. 4: Distribuzione delle unità in base alla percezione del contributo degli stakeholder (%)

	Nord	Centro	Sud
Le richieste dei clienti stimolano a perseguire ecoinnovazioni			
Per nulla d'accordo	18,3	28,6	13,0
…	29,6	14,3	26,1
…	18,3	17,1	21,7
…	14,1	22,9	17,4
Pienamente d'accordo	19,7	17,1	21,7
Le proposte dei fornitori stimolano a perseguire ecoinnovazioni			
Per nulla d'accordo	25,4	20,0	15,2
…	26,8	20,0	30,4
…	29,6	31,4	32,6
…	12,7	20,0	15,2
Pienamente d'accordo	5,6	8,6	6,5
Gli intermediari finanziari sono più predisposti a finanziare investimenti ecocompatibili			
Per nulla d'accordo	29,6	25,7	26,1
…	28,2	42,9	30,4
…	29,6	17,1	23,9
…	9,9	8,6	19,6
Pienamente d'accordo	2,8	5,7	0,0
I venture capitalist sono più predisposti a finanziare aziende ecocompatibili			
Per nulla d'accordo	21,1	17,1	13,0
…	31,0	28,6	30,4
…	22,5	20,0	30,4
…	21,1	31,4	19,6
Pienamente d'accordo	4,2	2,9	6,5

Gli altri attori del contesto economico locale inducono ad adottare ecoinnovazioni			
Per nulla d'accordo	15,5	11,4	6,5
…	21,1	37,1	50,0
…	42,3	40,0	28,3
…	14,1	8,6	15,2
Pienamente d'accordo	7,0	2,9	0,0

L'influenza dei fornitori si rivela assai contenuta, maggiore solo a quella dei *venture capitalist*, ma inferiore sia agli intermediari finanziari ordinari sia agli altri attori del sistema economico. A ben vedere il risultato è in linea con l'elevato peso che le PMI assegnano alle capacità interne (v. infra) che supportano la funzione di R&S per l'accesso alle innovazioni in generale, anche rispetto al ruolo svolto dai centri di ricerca (reputati utile o molto utile dal 66,5%), dalle partnership (61,9%) o dalle consulenze specializzate (53,9%).

Con riferimento alla seconda categoria di determinanti esterne, gli impulsi connessi al ruolo delle pubbliche amministrazioni (PA), la maggioranza dei rispondenti non ritiene sussistano adeguati benefici fiscali e monetari per stimolare l'adozione di ecoinnovazioni, mentre considera l'iter burocratico per riceverli particolarmente complesso. Le PMI, inoltre, giudicano inadeguata la cornice normativa di riferimento (Tabella 5). Pur globalmente deboli, tali riscontri appaiono del tutto coerenti con la bassissima percentuale (14%) di aziende che ha richiesto gli incentivi previsti dalle normative a favore della ecoinnovazione (solo l'8% li ha ricevuti), mentre oltre il 51% non ha ritenuto di poterli richiedere ed il 34% dichiara di non esserne a conoscenza.

Tab. 5: Percezione della efficacia delle azioni a sostegno delle aziende da parte della PA per settore

A Vostro avviso, la PA offre…	Settore (%)		
	Commercio	Industria / Artigianato	Servizi
adeguati benefici fiscali per le ecoinnovazioni di vostro interesse			
Per nulla d'accordo	33,3	22,9	28,7
…	33,3	42,9	38,9
…	11,1	22,9	25,0
…	22,2	8,6	5,6
Pienamente d'accordo	0,0	2,9	1,9
adeguati incentivi monetari per le ecoinnovazioni di vostro interesse			
Per nulla d'accordo	44,4	28,6	32,4
…	44,4	40,0	38,0
…	11,1	22,9	21,3

…	0,0	5,7	6,5
Pienamente d'accordo	0,0	2,9	1,9
un iter burocratico sufficientemente snello			
Per nulla d'accordo	33,3	34,3	49,1
…	66,7	45,7	28,7
…	0,0	11,4	17,6
…	0,0	2,9	4,6
Pienamente d'accordo	0,0	5,7	0,0
un quadro normativo che supporta l'adozione di ecoinnovazioni			
Per nulla d'accordo	44,4	20,0	35,2
…	44,4	40,0	35,2
…	11,1	31,4	23,1
…	0,0	2,9	6,5
Pienamente d'accordo	0,0	5,7	0,0

Per quanto riguarda le determinanti interne, il primo aspetto indagato riguarda la disponibilità di competenze tecnologiche, organizzative, manageriali e di risorse tangibili necessarie ad adottare ecoinnovazioni di interesse. Mentre le tre tipologie di competenze sono ritenute abbastanza o del tutto adeguate alle esigenze, risultano, invece, fortemente deficitarie le dotazioni di risorse materiali e finanziarie (Tabella 6). Una constatazione che amplifica, nella percezione delle aziende, la debole offerta di incentivi di natura pubblica, con conseguente effetto di disincentivazione.

Tab. 6: Percezione delle competenze possedute dalle aziende (%)

Quanto ritenete siano adeguate alle ecoinnovazioni che intendete adottare le attuali…			
competenze tecnologiche		competenze manageriali	
Del tutto inadeguate	12,5	Del tutto inadeguate	7,9
…	17,8	…	19,1
….	28,3	….	27,6
…	23,7	…	30,3
Più che adeguate	17,8	Più che adeguate	15,1
competenze organizzative		risorse materiali e finanziarie	
Del tutto inadeguate	11,8	Del tutto inadeguate	14,6
…	15,8	…	27,8
….	29,6	….	32,5
…	27,6	…	18,5
Più che adeguate	15,1	Più che adeguate	6,6

Circa gli stimoli legati alla possibilità che dalle ecoinnovazioni discendano migliori performance ambientali ed economiche, i riscontri appaiono alquanto differenziati. Dal versante ambientale, oltre il 42% delle aziende riconosce che l'adozione delle ecoinnovazioni ha effettivamente comportato una chiara riduzione nel consumo delle materie prime, nelle emissioni (47%) e nei costi per l'energia ed altre materie (Tabella 7).

Tab 7: Performance economico-ambientali

Gli investimenti in ecoinnovazione hanno consentito di:			
ridurre il consumo di energia/ materie prime		ridurre il costo di energia/materie prime	
Per nulla d'accordo	25.7	Per nulla d'accordo	27,0
…	17,8	…	21,1
…	14,5	…	17,1
…	29,6	…	24,3
Pienamente d'accordo	12,5	Pienamente d'accordo	10,5
ridurre l'inquinamento connesso all'attività aziendale]		*accrescere il numero di occupati]*	
Per nulla d'accordo	22,4	Per nulla d'accordo	44,1
…	19,7	…	19,7
…	20,4	…	19,7
…	23,7	…	11,2
Pienamente d'accordo	13,9	Pienamente d'accordo	5,3
incrementare le vendite		*aumentare l'utilizzo capacità produttiva*	
Per nulla d'accordo	40,8	Per nulla d'accordo	42,8
…	16,4	…	17,8
…	23,7	…	19,7
…	9,9	…	13,8
Pienamente d'accordo	9,2	Pienamente d'accordo	5,9
migliorare i risultati economici		fidelizzare i clienti	
Per nulla d'accordo	38,8	Per nulla d'accordo	37,5
…	21,1	…	15,8
…	20,4	…	21,1
…	14,5	…	15,1
Pienamente d'accordo	7,2	Pienamente d'accordo	10,5

Dal versante delle performance economiche, invece, circa il 60% delle aziende non ha registrato un beneficio in termini di incrementi delle vendite o della capacità produttiva degli impianti. Né, si è registrato un impatto

positivo sulla redditività, un miglioramento della posizione competitiva o una maggiore fidelizzazione dei clienti. Ancora, per oltre l'60% dei rispondenti, l'impatto delle ecoinnovazioni sulla creazione di occupazione è trascurabile.

5.1 Una proposta di raggruppamento

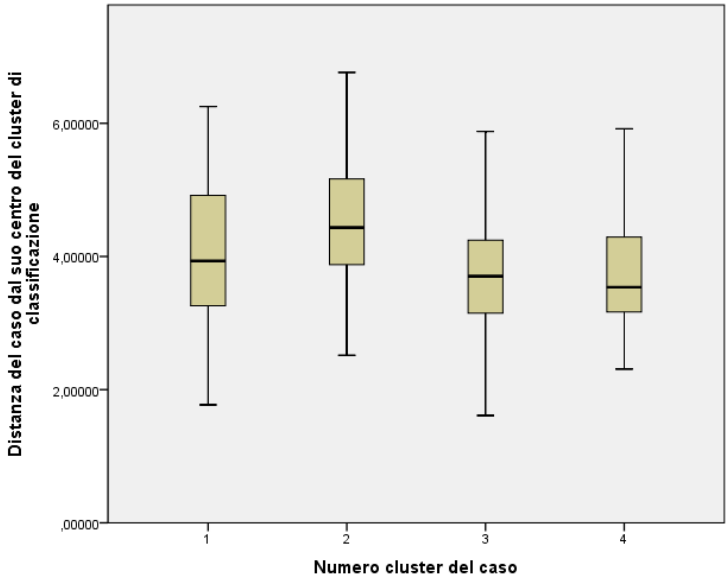
Per evidenziare eventuali analogie tra le PMI in relazione alle determinanti dell'ecoinnovazione si è utilizzata la metodologia statistica della *cluster analysis.* Nella procedura di analisi sono stati inclusi tutti gli item analizzati precedentemente.

Poiché il considerevole numero di aziende rende di difficile interpretazione l'analisi gerarchica, si è utilizzata una procedura a due *step* (Hair at al., 2009). Nel primo, si è sviluppato un algoritmo gerarchico[1], che mira a costruire una gerarchia tra i gruppi, fornendo indicazioni sul numero dei cluster. Questa indicazione è utile per imporre il numero dei gruppi in cui le aziende dovranno essere suddivise nel passaggio successivo, basato sull'algoritmo di raggruppamento non gerarchico delle k-medie[2].

L'assegnazione delle aziende ai singoli cluster ottenuti dalla procedura delle k-medie permette di identificarne i profili in base alla loro propensione verso le ecoinnovazioni. La procedura non gerarchica, infatti, assegna a ciascun item un punteggio per ogni gruppo individuato. Ciascun gruppo è, così, descritto da una serie di *item* inclusi nell'analisi che consente di descriverne le caratteristiche; di conseguenza gli aspetti ai quali ciascun di essi è più sensibile e che connotano le aziende incluse in quel particolare gruppo.

Dall'analisi condotta è emersa la presenza di quattro raggruppamenti omogenei di imprese. Per sintetizzare le misure caratteristiche della distribuzione delle aziende all'interno dei gruppi si riporta nella Figura 2 il *box-plot*. Esso riassume le caratteristiche della distribuzione delle aziende incluse nei *cluster.* Osservando il *box-plot* emerge che la variabilità interclasse non è eccessiva. Non sono presenti, inoltre, valori anomali, o *outlier,* nei gruppi identificati.

Fig. 2: Box-plot sulla distanza delle aziende dal centroide del gruppo di assegnazione



Le aziende sono state tutte incluse nei cluster, seppur distribuite in maniera alquanto eterogenea (Tabella 8).

Tab. 8: Distribuzione delle PMI nei cluster

Cluster	n	%
1	49	32,2
2	37	24,3
3	40	26,3
4	26	17,1
Totale	152	100,0

L'analisi degli item consente di profilare due gruppi di aziende maggiormente sensibili all'adozione delle ecoinnovazioni. Il primo, definibile delle aziende *scettiche*, si connota per un legame marcato verso gli stimoli indotti dalla pubblica amministrazione verso le ecoinnovazioni. Tale rapporto, tuttavia, non è percepito come costruttivo. Le aziende lamentano l'insuffi-

[1] Per il primo *step* è stato utilizzato un algoritmo agglomerativo del centroide che ricalcola ad ogni passo la matrice delle distanze partendo non dalle distanze precedenti ma dai baricentri di ciascun cluster, riducendo, in tal modo, l'incidenza di eventuali valori anomali.
[2] Il clustering non gerachico, o partizionale, si basa su una funzione che permette di definire l'appartenenza ad un gruppo sulla base della distanza tra l'unità ed un punto rappresentativo del cluster (centroide, medioide etc). In questo caso, il numero dei gruppi da formare è prefissato.

cienza dei fondi previsti oltre a difficoltà burocratiche che ne scoraggiano la richiesta. Pur conoscendone la disponibilità, queste aziende sono accomunate dal fatto di non averne richiesto l'accesso.

Il secondo cluster individuato raggruppa le PMI *attive*; quelle che conoscono i riferimenti normativi ed hanno le competenze necessarie per adottare innovazioni indipendentemente dai supporti esogeni. Pur non avvertendo particolarmente il bisogno di adottare ecoinnovazioni per la loro attività operativa, esse sono particolarmente attente alle problematiche ambientali, al risparmio energetico ed all'efficienza. È frequente, nel loro organigramma, ritrovare precipuamente la figura dell'*energy manager* mirante a migliorare l'efficienza energetica e ridurre l'impronta ambientale dell'azienda. La sensibilità di tali aziende si riscontra anche con riferimento al grado di attenzione rivolto alle sollecitazioni provenienti dagli *stakeholder*. Gli altri due gruppi di aziende, invece, appaiono meno attente alle sostenibilità ambientale e all'efficienza energetica. Sono pertanto aziende che in vari casi non hanno avallato specifici investimenti in ecoinnovazioni. Le aziende del terzo gruppo, in particolare, pur cominciando ad evidenziare una certa sensibilità verso le problematiche ambientali, al momento non sono stimolate a sostenere investimenti di sorta in ragione dell'assenza di adeguate richieste da parte deli *stakeholder*. Per tali ragioni esse sono definibili come aziende *apatiche*. Le PMI del quarto *cluster*, numericamente il meno numeroso, sono quelle che si rivelano più disattente agli aspetti ambientali ed all'ecoinnovazione. Si tratta di un debole interesse che cela una vera e propria problematica gestionale ed organizzativa. Esse, difatti, spesso sono consce di doversi adeguare alle richieste e sollecitazioni provenienti dall'esterno, che riescono a discernere, ma non hanno sufficienti competenze, risorse tangibili interne, o propensione manageriale per farvi fronte. In conseguenza sono state etichettabili come *passive*.

Per meglio profilare le caratteristiche delle aziende all'interno dei cluster di appartenenza si riporta la loro distribuzione percentuale distinta per settore di attività (Tabella 9).[3] La statistica – test di indipendenza χ^2 evidenzia la presenza di un legame tra l'appartenenza ad un *cluster* ed il settore di attività (χ^2 significativo al 10%). Si può così affermare che il settore è una discriminante per l'appartenenza ai gruppi identificati. Si evidenzia, altresì, che le aziende del Commercio sono quelle che maggiormente lamentano le lentezze burocratiche e la limitatezza delle risorse messe a disposizione dalla PA per le ecoinnovazioni (cluster 1). Questo riscontro può ascriversi al fatto che tale tipologia di aziende è spesso esclusa dalle normative di incoraggiamento all'adozione di ecoinnovazione; che tendono a privilegiare il comparto manifatturiero (Cainelli e Mazzanti, 2013). A loro volta, le PMI manifatturiere sono le più sensibili ed aperte alle ecoinnovazioni; influenzate dai *feedback* e stimoli della PA, attente agli aspetti normativi ed alla dotazione di competenze. Esse sono anche le aziende più consapevoli del

loro impatto ambientale e della conseguente influenza delle ecoinnovazioni sulle dinamiche reddituali ed economiche; per tali ragioni anche le più propense ad investire in ecoinnovazioni (cluster 2).

Tab. 9: Distribuzione delle PMI nei cluster in base al settore (%)

Cluster	Settore		
	Commercio	Manifatturiero	Servizi
1	55,6	34,3	29,6
2	11,1	37,1	21,3
3	11,1	25,7	27,8
4	22,2	2,9	21,3
	100,0	100,0	100,0

6. Conclusioni

Comprendere le determinanti che supportano i processi di ecoinnovazione nelle aziende è importante per accelerarne le dinamiche di adeguamento alle esigenze della *green economy*. È altrettanto significativo che l'attenzione degli studiosi si rivolga tanto alle grandi quanto alle piccole e medie imprese; data l'elevata incidenza di queste ultime in taluni contesti territoriali. Le indagini sui processi di ecoinnovazione nelle PMI, tuttavia, sono poche, frammentate e raramente si riferiscono allo specifico contesto italiano.

In funzione di quanto sopra, partendo dai riscontri della letteratura scientifica internazionale sulle determinanti che influenzano le scelte di ecoinnovazione delle PMI, il presente contributo ha indagato come alcune delle determinanti che sono ritenute maggiormente influenti sono percepite dalle *PMI innovative* italiane iscritte nell'apposito Registro istituito da MISE e CCIAA. Pur nei limiti di un'indagine a valenza esplorativa, emergono dei riscontri interessanti e meritevoli di futuri approfondimenti.

In generale, si rileva che il problema dell'ecosostenibilità è sufficientemente avvertito da tali PMI, soprattutto grazie alle sollecitazioni provenienti dagli stakeholder; in particolare dai fornitori (Bos-Brouwers, 2010; Yalabik e Fairchild, 2011) e *venture capitalist* (Halila e Rundquist, 2011; Zhu et al., 2011). Invece i clienti (Horbach et al., 2012; Hojnik e Ruzzier, 2016) non appaiono esercitare una grande spinta in tale direzione. Per quanto concerne il ruolo della pubblica amministrazione, le imprese sono alquanto critiche tanto verso i benefici fiscali offerti, quanto e specialmente con

[3] Sono state considerate anche le distribuzioni in base a ripartizione geografica, regione, classe di addetti, classe di capitale e classe di produzione. I risultati, tuttavia, non evidenziano relazioni di dipendenza statisticamente significative. Tali tabelle sono disponibili su richiesta.

riguardo agli incentivi monetari (Hoogendoorn et al., 2015; Triguero et al, 2016). Sono, inoltre, considerate come barriere ad ecoinnovare le complessità burocratiche da perseguire ed il quadro normativo di riferimento (Hojnik e Ruzzier, 2016; He *et al*., 2018).

Di contro, gli intervistati ritengono complessivamente adeguate le soggettive dotazioni di competenze di tipo tecnologico, manageriale, organizzativo e finanziario disponibili in azienda; che pure sono considerate svolgere una chiara influenza sulla propensione ad ecoinnovare (Kesidou e Demirel, 2012; Triguero et al, 2016). Le PMI sottolineano i benefici ambientali connessi alle ecoinnovazioni in termini di riduzione del consumo di risorse ed inquinamento; mentre sono più scettiche sulla capacità di accrescere l'occupazione, incrementare il fatturato, migliorare l'utilizzo della capacità produttiva, fidelizzare i clienti o migliorare la redditività. Dunque, mentre le performance ambientali si rivelano una determinante di rilievo (Marin et al., 2015: del Rio et al., 2017), quelle economiche non appaiono tali; in opposizione a quanto affermato nella maggioranza degli altri studi empirici (Pereira e Vence, 2012; Woo et al., 2014).

In sintesi, emerge un quadro in chiaroscuro, non del tutto rassicurante per il prossimo futuro allorché alcune delle determinanti che in altri contesti svolgono un ruolo fondamentale nelle scelte di investimento, quali la pubblica amministrazione, in ambito domestico sembrano invece rallentare l'adozione delle ecoinnovazioni.

Tale percezione presumibilmente si riconduce al quadro normativo nazionale ancora incompleto, scarsamente conosciuto e complesso da perseguire; anche per quanto riguarda l'offerta di stimoli ed incentivi all'ecoinnovazione. Un'esigenza particolarmente avvertita, infatti, concerne la limitatezza delle risorse tangibili; piuttosto che quella di competenze endogene. È coerente con quanto affermato il ritenere maginale il ruolo propulsivo di università e centri di ricerca; mentre all'estero tendono ad avere un elevato peso specifico (Horbach, 2014; Tumelero *et al*., 2019).

Forse si lega a tale ruolo marginale la debole percezione dei potenziali benefici economici connessi all'adozione delle ecoinnovazioni; così come il loro conseguente riverbero sulle dinamiche competitive aziendali. Nello specifico, seguendo un pensiero consolidato (Porter e Kramer, 2006; Porter e van der Linde, 1995), le ecoinnovazioni sono ritenute impattare fondamentalmente sul consumo di risorse tangibili o energetiche. Viceversa è reputato limitato l'effetto sulla dinamica economica, sulla concorrenza in termini di differenziazione del prodotto/servizio offerto e sulla legittimazione. Non sorprende, pertanto, se l'adozione di ecoinnovazioni sia fondamentalmente *necessity-pull*, più che una scelta consapevole maturata autonomamente in previsione di benefici che si manifesteranno a valere nel tempo (*opportunity-push*) (Berrone *et al*., 2013).

Gli imprenditori, ad ogni modo, mostrano di avere le idee chiare sulle linee che dovrebbero seguire delle *policy* proattive per incoraggiare l'adozione di ecoinnovazioni. Tra esse, l'introduzione di incentivazioni automatiche, come il credito d'imposta, un maggiore attivismo degli enti di finanziamento, il supporto alla creazione di partenariati e collaborazioni con aziende più grandi, l'offerta di risorse organizzative e manageriali tramite formazione ex-ante ed assistenza in itinere per le ecoinnovazioni più complesse da implementare, la disponibilità di incentivi ad hoc rivolti anche ad impianti ex novo, oltre che per la riconversione di quelli esistenti.

Ragionando nei termini dei quattro *cluster* individuati, l'obiettivo delle *policy* non può che essere il supportare la transizione dalle aziende meno sensibili (*passive* ed *apatiche*) verso i due gruppi di aziende più sensibili, ma anche di quelle che risultano sensibili fondamentalmente perché costrette da ragioni contestuali (*scettiche*), verso il gruppo delle ecoinnovative per intrinseca convinzione. Allo scopo, le aziende *passive* avrebbero prioritariamente bisogno di supporto nella dotazione di risorse e competenze, mentre le *apatiche* potrebbero beneficiare di rapporti più aperti e frequenti con altri interlocutori economici, affinché comprendano l'importanza delle ecoinnovazioni ancor prima di dover inseguire un'eventuale necessità di adeguamento. Per le aziende *scettiche*, invece, uno stimolo a trasformare la loro sensibilità in azione sembra legarsi anzitutto all'ottenimento di certezze normative; ovvero dal poter minimizzare i *compliance cost* connessi alle decisioni di investimento.

Ovviamente il quadro così definito non è generalizzabile *tout court*. Anzitutto, in linea con tutte le precedenti indagini, il presente lavoro considera solo una parte delle variabili trattate in letteratura. Alle difficoltà di ordine pratico nel contemplare contemporaneamente tutte le determinanti delle ecoinnovazioni nelle PMI finora censite (de Jesus Pacheco *et al*., 2017), si aggiunge la mancata precisa distinzione tra *driver* e barriere, che possono essere spesso interpretate l'uno come l'opposto dell'altra (Marin *et al*., 2015), nonché l'elevata possibilità che si manifestino influenza reciproche tra le variabili (Pereira e Vence, 2012; Xavier et al., 2017).

In seconda battuta, i riscontri di cui sopra risentono dell'elevata incidenza, nella popolazione considerata, di aziende di servizi (ad es. nel comparto delle ICT). Queste ultime hanno maggior difficoltà a migliorare la propria impronta ecologica già di per sé contenuta. Non a caso emerge che le imprese più attente alla sostenibilità ambientale sono le manifatturiere, forse proprio perché più consapevoli del proprio impatto, ma anche maggiormente destinatarie di normative od incentivazioni *ad hoc*; come di controlli.

In terzo luogo va considerato che le PMI indagate presentano delle specificità non comuni nella maggioranza delle altre PMI nazionali, rappresentandone la parte presumibilmente più aperta al cambiamento. Questa

caratteristica è coerente con la distinta percezione del problema della sostenibilità ambientale; seppure non con quello dei benefici complessivamente sottesi all'adozione delle ecoinnovazioni. È, dunque, probabile, che il quadro delineato sia migliore di quello ottenibile da altre tipologie di PMI; eventualità quest'ultima che non potrebbe che destare una certa preoccupazione nei *policy maker*.

È, pertanto, auspicabile tanto la replica di tale indagine per altre popolazioni di aziende, diverse per settore, dimensione e localizzazione geografica, quanto la proposizione di investigazioni condotte con metodi differenti per valutare eventuali differenze e similitudini nei risultati. In aggiunta, la focalizzazione su un numero più contenuto di variabili o determinanti potrebbe consentire di meglio delineare il peso che ciascuna di essa detiene nella specifica realtà indagata. L'obiettivo è sempre il riuscire a proporre un quadro quanto più efficace dell'eterogeneo panorama di elementi che afferiscono la scelta di ecoinnovare, a sostegno della transizione dell'intero sistema economico verso un modello di sviluppo sostenibile.

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Il questionario

1. Quanto conta per l'accesso alle innovazioni da parte della Vostra azienda:
   - ○ l'attività di R&S interna
   - ○ il rapporto con università/centri di ricerca
   - ○ la partnership con altre aziende
   - ○ il ricorso a consulenze specializzate
   - ○ l'acquisto di brevetti
   - ○ la partecipazione a fiere/convegni

2. La Vostra azienda:
   - ○ ha un piano documentato o delle regole per l'ecoinnovazione e la gestione ecologica
   - ○ considera l'audit ambientale come una norma di gestione.
   - ○ stimola il personale ad adoperarsi per il risparmio energetico e la riduzione delle emissioni
   - ○ pubblicizza presso gli stakeholders il suo impegno verso l'ecosostenibilità

3. Vostri prodotti/servizi devono soddisfare i requisiti delle normative ambientali nazionali ed internazionali:

4. I Vostri processi di produzione devono soddisfare i requisiti delle normative ambientali nazionali ed internazionali

5. A Vostro avviso la Pubblica Amministrazione offre:
   - ○ adeguati benefici fiscali per le ecoinnovazioni di vostro interesse
   - ○ adeguati incentivi monetari per le ecoinnovazioni di vostro interesse
   - ○ un iter burocratico più snello per l'accesso ai vantaggi previsti
   - ○ un quadro normativo che supporta l'adozione di ecoinnovazioni

6. I Vostri clienti sono attenti alle problematiche ambientali e di sostenibilità

7. Le richieste dei clienti Vi stimolano a perseguire ecoinnovazioni

8. I Vostri fornitori sono attenti alle problematiche ambientali e di sostenibilità

9. Le proposte dei fornitori Vi stimolano a perseguire ecoinnovazioni

10. Banche ed intermediari finanziari sono più predisposti a finanziare investimenti ecocompatibili

11. Business angel e serial investor sono più predisposti a finanziare aziende che perseguono l'ecocompatibilità

12. Gli altri attori del contesto economico locale sollecitano l'adozione di ecoinnovazioni

13. La presenza di centri di ricerca ed università favorisce l'adozione di ecoinnovazioni?

14. Nella Vostra azienda
   - ○ la sostenibilità ambientale è un problema molto avvertito
   - ○ i Vs. dipendenti propongono azioni di sostenibilità ambientale
   - ○ ci sono figure professionali (ad es. energy manager) che si dedicano alle questioni di sostenibilità ambientale
   - ○ prevedete di assumere figure professionali che si dedichino alle questioni di sostenibilità ambientale

15. Gli investimenti in ecoinnovazione hanno consentito di:
    - ○ ridurre il consumo di energia e di materie prime
    - ○ ridurre il costo dell'energia e di altre materie prime
    - ○ ridurre l'inquinamento connesso all'attività aziendale
    - ○ accrescere il numero di occupati
    - ○ incrementare le vendite
    - ○ aumentare l'utilizzo della capacità produttiva
    - ○ migliorare i risultati economici e reddituali
    - ○ ottenere un vantaggio competitivo rispetto ai concorrenti
    - ○ fidelizzare i clienti
    - ○ migliorare le condizioni di lavoro dei dipendenti

16. Quanto ritenete siano adeguate alle ecoinnovazioni che intendete adottare le attuali
    - ○ competenze tecnologiche dell'azienda
    - ○ competenze organizzative dell'azienda
    - ○ competenze manageriali dell'azienda
    - ○ risorse materiali e finanziarie dell'azienda

17. Nell'immediato futuro prevedete di investire in ecoinnovazioni allo scopo di:
    - ○ ridurre il costo dell'energia e di altre materie prime
    - ○ accrescere le performance economiche e finanziarie
    - ○ migliorare l'immagine sul mercato e differenziarvi dai concorrenti
    - ○ ridurre l'impatto ambientale della Vs azienda
    - ○ contribuire a rispettare i target europei
    - ○ ricevere i contributi previsti

18. La Vostra azienda ha richiesto i benefici previsti per gli investimenti in ecoinnovazione?
    - ○ Ha richiesto e ricevuto
    - ○ Ha richiesto ma non ricevuto
    - ○ Non ha richiesto
    - ○ Non ne sono a conoscenza

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HOW TO INVEST IN R&D DURING DOWNTURNS? EXPLORING THE DIFFERENCES BETWEEN FAST-GROWING AND SLOW-GROWING HIGH-TECHNOLOGY SMES

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Abstract

This paper examines the relationship between R&D investments, innovation and growth in high-technology SMEs during a period of economic downturn. We conduct a quantile regression analysis of longitudinal data collected on a panel of 460 high-technology SMEs over a 6 years period, to test the impact of different activities characterising firms' innovation strategies (internal R&D investments, external knowledge sourcing through collaborative R&D and the introduction of new products to the market) over the distribution of firms' growth. We show that the impact of R&D investments is considerably different over the distribution of growth for firms in the sample during a period of economic downturn. More specifically, two distinct profiles emerge. Younger, smaller and innovating companies still experience fast growth rates as a result of the introduction of new products to the market. Conversely, negative returns on R&D investments characterise slow-growing high-technology SMEs. In such cases, a balanced approach between internal R&D investments and collaborative R&D activities positively contributes to growth.

1. Introduction

Fast-growing Small and Medium-sized Enterprises (SMEs), especially those from the high-technology sectors, figure high on the European innovation policy initiatives as global drivers of technological innovation (European Commission, 2019a), given their relevant contribution to job creation, productivity and growth across countries (Muller *et al*., 2017; OECD, 2019). In the last decades, a large body of literature has been investigating the positive relationship between R&D investments, innovation activities and growth at the firm level, both in terms of profit and employment (see, among others, Cefis and Ciccarelli, 2005 and Lööf and Heshmati, 2006; 2008). However, and despite SMEs represent the largest share of economic activities in most European economies (OECD, 2019), most empirical studies addressing this relation have been conducted on 'top R&D investors', typically large and very large companies (European Commission, 2019b). Furthermore, only a few studies have investigated if business R&D investments and innovation activities still represent a source of growth during periods of economic downturns. Given these knowledge gaps in the existing literature, this paper provides evidence of the relationship between R&D investments, innovation activities and growth in high-technology SMEs during a period of time characterized by a very severe financial crisis (started in late 2008) and a global economic downturn in the following years (2009-2013)[1]. This study has two objectives. First, it aims to empirically verify if the observed positive relationship between R&D investments, innovation activities and growth in high technology sectors – which has been assessed in periods of economic development (Coad and Rao, 2006) – still holds during a period of economic downturn. In fact, during such periods, firms may be induced to reduce their investments in R&D to survive the crises (Cincera et al., 2010), rather than increasing investments in R&D to adapt to the changed competitive environment and transform an existing threat into a potential market opportunity (Vossen, 1998). Second, it aims to investigate if the pursuit of different types of R&D efforts (internal R&D vs. external knowledge acquisition through collaborative R&D) and innovative activities influences such a relationship. To meet these purposes, we exploited a unique dataset combining firm-level information

[1] To the purpose of this study we take into consideration the entire time period between 2009 and 2013. Following the global financial crisis started in late 2008, Italy experienced a dramatic fall in external demand and, consequently, a huge decrease in the levels of industrial production and firms' investments in the following years. Notwithstanding the partial recovery of the international markets in 2012 and 2013, industrial production and firms' investments remained well below their pre-crisis levels. Furthermore, from 2012 onwards, the emergence of liquidity constraints in the financial market and conditions of very weak internal demand determined a new worsening of the general economic conditions.

gathered from different sources[2] on a panel of 460 high-technology SMEs over a 6 years period, therefore allowing for the use of longitudinal estimation methods. Albeit the assessment of the relationship between R&D investments, innovative activity and growth may be problematic for SMEs in general (as the latter show a lower attitude towards formalized R&D processes with respect to their larger counterparts – e.g., Vossen, 1998), our focus on high-technology SMEs should prevent such a problem. In fact, high-technology SMEs are usually focused on the development of one or a few leading-edge technologies as their main asset (Oakey, 2013) and, more in general, are used to complement in-house technical skills with external knowledge throughout the innovation chain (Rothwell and Dodgson, 1991). In turn, following prior studies that have adopted a similar approach (Ahn et al., 2015), this focus on high-technology innovating SMEs may lead to a clearer evidence of the linkage between R&D investments and growth during a period of economic downturn. To evaluate the R&D-growth paths of high-technology SMEs we adopted an empirical strategy based on quantile pooled regression. Such an approach differs from OLS regression as it provides multiple estimates of the relationship at different points of the growth distribution (e.g. for "slow-growing" vs. "fast-growing" firms), rather than a single point average estimate. This methodological choice allowed us to estimate the relationship between R&D investments, innovation activities and growth for different profiles of high-technology SMEs and to shed light on existing differences while, at the same time, accounting for firms' unobserved heterogeneity.

Our results confirm the relevance of R&D and innovation activities for growth also during periods of economic downturn. In particular, R&D effectiveness of high-technology SMEs is linked to their capability to adapt to turbulent market conditions by reconfiguring their innovation processes towards the exploitation of internal R&D and the introduction of innovative products and services to the market. However, more novel and interesting are our findings concerning high-technology SMEs with R&D investments and slow or negative growth. In fact, only firms which have been able to complement internal R&D investments with external (collaborative) R&D activities experience a positive return on their R&D investments during periods of economic downturn. Evidence emerging from our study adds to extant literature by shedding light on the considerable heterogeneity observed in the relation between R&D investments and growth during periods of economic downturn. Moreover, it offers potential useful information for the design of evidence-based policies.

[2] As better detailed in the methodological section, the dataset combines survey-based data on SMEs R&D investments and innovation activities with economic and financial data gathered from Bureau van Dijk Amadeus Database.

2. Background and hypotheses

The effect of R&D investments and innovation activities on firms' growth is a well-discussed topic in the field of economics of innovation. However, the theoretical debate about this issue gained new impetus after the global downturn started with the financial crisis in late 2008[3].

A vast and longstanding literature has shown that R&D investments are linked to growth as a result of their positive effects on productivity, technological competitiveness and new knowledge creation at the macro level (Dasgupta, 1986; Griliches, 1990; Crépon *et al*., 1998). The current empirical discussion on the nexus between R&D investments and growth at the firm level is still controversial. While evidence of a positive linear relation has been found at the country-level, considerable heterogeneity is observed across industries and firms (Malerba *et al*., 1997; Cefis and Orsenigo 2001). Notably, firm-specific patterns characterise the relationship between R&D and profitability (Cefis and Ciccarelli, 2005), R&D and survival (Lefebvre *et al*., 1998), as well as between R&D and growth (Del Monte and Papagni, 2003).

Furthermore, the impact of economic downturns on R&D investments is a matter of controversy in the current literature.

Divergent results in empirical findings are attributed to a substantial lack of official data and to some significant knowledge gaps in SMEs' R&D and innovation management literature concerning firms' behaviour in reaction to economic downturns.

On the one hand, a vast literature has elicited the contention that firms do not treat R&D activities differently from other investment activities, therefore supporting the hypothesis of pro-cyclical behaviour (i.e. firms cut R&D investments to reduce costs to survive the crisis). To this point, Cincera *et a*l. (2010) find a negative impact of R&D intensity on the expected R&D investments during economic crises for both large and small companies. Also, from a financial perspective, R&D investments are significantly pro-cyclical in firms facing tighter constraints on capital supply; in fact, due to the prevalent cash-flow nature of their R&D budgets, SMEs seem to show high sensitivity to the economic cycle (Voigt and Moncada Paternò Castello, 2009).

On the other hand, according to the Shumpeterian view of 'creative destruction' (1947), a period of economic downturn may represent a source of an *opportunity* for those firms able to re-organize their R&D and inno-

[3] Time series analyses report the biggest fluctuations of R&D financed by the business sector during the period 2009-2013. R&D investments from the business sector experienced a sharp drop in 2009 and a partial recovery in 2010-2011, with caution about the worsening of the general economic context in 2012, due to liquidity constraints on the financial market. (EU Commission, 2012a; 2012b).

vation processes, since the impact of recessions forces firms to focus on the most promising segments of their value chains. From this perspective, while larger firms tend to preserve their R&D investments while spreading the risk among projects in a medium- and long-term planning horizon, smaller firms formally engaged in R&D activities rather tend to delay R&D investments while turning from R&D-based innovation towards business innovation (i.e. the introduction of new products and services to the market) (Leadbeater and Meadway, 2008; Ortega Argiles *et al.*, 2009; Voigt and Moncada Paternò Castello, 2009; Archibugi *et al.*, 2013). Large evidence seems therefore to confirm the relevance of SMEs behavioural advantages in terms of adaptability and attitude to risk taking (Acs and Audretsch, 1987; Vossen, 1998) also during periods of economic downturn.

As a matter of fact, high-technology firms with short-term R&D budgets and operating in highly competitive markets should be better able to adjust their R&D strategies to turbulent (i.e. rapidly changing) environmental circumstances, to avoid falling behind competitors. To preserve their competitive advantage, such companies should be therefore more inclined to adopt a countercyclical behaviour than large companies during a period of recession. In fact, a positive relationship between R&D investments and growth has been observed over time only in small sub-populations of SMEs with persistent innovation activities (Cefis and Ciccarelli, 2005). Such firms have been identified as New Technology-Based Firms (NTBFs), Fast-Growing Firms (FGFs), Young Innovative Companies (YICs). They differ from Basic SMEs, which do not conduct repetitive innovation processes and undertake little or no internal R&D, or from Adapting SMEs, defined as incremental innovators with no significant in-house R&D (Veugelers, 2008; Shneider and Veugelers, 2010). Summing up, large empirical evidence supports the hypothesis that, during a period of economic downturn, high-technology SMEs are capable to find effective ways to reconfigure their ongoing R&D activities towards the development of new products and services and their introduction to the market (Leadbeater and Meadway, 2008; Voigt and Moncada-Paternò-Castello, 2009).

Consistently, we expect that high-technology SMEs investing in R&D and in innovation will have a significant advantage in terms of growth during an economic downturn.

(H1) During a period of economic downturn, the impact of R&D investments on growth will be positive and significant for high-technology and innovating SMEs.

When examining the relationship between R&D investments, innovation activities and growth in high-technology SMEs, it is also important to evaluate the effects that different types of firm-specific innovation activities exert on the performance outcomes during economic downturns. To

this point, earlier works on small business economics and entrepreneurship has widely illustrated the peculiar characteristics of SMEs' innovation processes (Acs and Audretsch, 1987; Vossen, 1988; Freel, 2000), emphasising SMEs' inherited organizational weakness, more commonly addressed as "liabilities of smallness". Due to limited R&D funding, small innovation portfolios, shortness of ability in R&D planning and management and limited market influence, SMEs often lack crucial resources and capabilities needed to transform inventions into new products, and the complementary assets to commercialize their innovations (i.e. manufacturing, distribution, marketing assets).

To this point, more recent literature on alliances and networks (Baum, Calabrese, and Silverman 2000; Lee *et al*. 2010) and on open innovation in SMEs (Brunswicker and van de Vrande, 2014) has widely demonstrated that innovation in SMEs almost always has an interorganizational and boundary-spanning component. In fact, collaborative R&D activities within firms' (open) innovation processes (Chesbrough, 2003), help SMEs to access critical resources and complementary assets and to extend the range of internal technological competencies, driving innovation performance (Brunswicker and Vanhaverbeke, 2015).

Building on prior literature, it is therefore reasonable to expect that combinations of internal and external innovative activities (i.e. internal R&D activities and external technology acquisition through collaborative R&D) will influence high-technology SMEs' growth paths during downturns. In fact, as a large scientific evidence suggests, firms' growth should be regarded as a multidimensional construct, since it is contingent on different combinations of innovation inputs (Yasuda, 2005; Chen *et al*., 2011; Catozzella and Vivarelli, 2014), on complementarities between internal and external innovative activities (Cassiman and Veugelers, 2006), and on the possible interactions between firms' innovation strategies and other complementary growth strategies (Lefebvre *et al*., 1998; Golovko and Valentini, 2011). From such a perspective, the link between R&D, innovative activities and growth in high-technology SMEs may therefore be affected by the interplay between internal R&D activities – aimed at increasing the internal knowledge base of firms – and collaborative R&D activities – aimed at sourcing relevant external knowledge and technologies.

Accordingly, we hypothesize that:

(H2) During a period of economic downturn, R&D investments will have a positive impact on growth for firms able to balance internal R&D investments and external technology acquisition through collaborative R&D activities.

3. Data and methods

3.1 Sample characteristics and data collection

This study is based on longitudinal data gathered from different sources. Firstly, cross-sectional year-wise survey data were collected during the 2008-2015 time period on a population of 1,600 high-technology firms with R&D laboratories localised in Italy[4]. In each survey wave, firms' owners and managers were interviewed through Computer Assisted Telephonic Interviews (CATI)[5]. The questionnaire included specific questions related to the companies' R&D and innovation processes: amount of R&D investments, number of employees working in R&D departments, types of R&D activities (explorative vs exploitative; internal vs collaborative), number of products and services new to the market introduced as a result of prior R&D activities (i.e. technological innovations, OECD 2005). Secondly, we matched cross-sectional year-wise data from 493 companies with available information over the 2009-2014 period with economic and financial data collected from their profit and loss accounts (Source: Bureau Van Dijk). By combining different data sources, we managed to rule out the risk of common method biases, that may have led to erroneous conclusions about the relationship between the independent variables and the dependent one (growth).

Our final dataset consists of a panel of 460 high-technology SMEs with available data for 6 years (Table 1).

[4] In this context, high-technology SMEs have been identified following two criteria: 1) share of R&D expenditure over sales larger than 50% in year; and/or, 2) share of R&D employees over total employees larger than 20% in year. Similar criteria have been adopted by the Italian Ministry of Economic Development for the identification of Innovative Startups within the Italian Startup Act (www.mise.gov.it).

[5] CATI is a procedure which is frequently used to optimize the number of interviews according to the sample strata (in this case industry and location), and therefore to guarantee the generalizability of the results from the interviewed sample to the entire population.

Tab. 1: Sample characteristics

Industry	**Number of firms** *(n)*	**Number of employees** *(mean)*	**Age** *(mean)*	**Average R&D intensity*** *(%)*
Life Sciences	49	26	13	37.9
Chemical	31	31	13	20.8
Energy / Environment	30	15	13	32.2
Electronics / Optics	49	20	12	30.5
Industrial automation	110	24	13	31.3
ICT	164	14	12	39.3
Knowledge-intensive services	27	11	9	36.1
Total	460	20	12	32.6

**R&D expenditures over sales*

Table 2 reports the R&D-growth profiles of high-technology SMEs in the sample. The strength of the relationship between R&D investments rates and growth rates is measured by the Pearson correlation coefficients, controlled by year, for different types of firms in the sample (i.e. firms at different quantiles of the growth distribution).

Tab. 2: R&D-Growth profiles of high-technology SMEs in the sample.
Pearson correlation coefficients between R&D investments rates and sales growth rates for SMEs at different quantiles of the growth distribution*

Growth (quantiles)	Correlation coefficients (r) between R&D Investments$_{(t-1)}$ and Growth $_{(t)}$
q10	-0.330**
q25	-0.078†
q50	-0.001
q75	0.137**
q90	0.333***

*Sig. (two tailed): †= p≤0.1; *≤p<0.05; **p ≤0.01; ***p≤0.001*
**R&D investments lagged by one year*

The statistics showed in Table 2 allow to compare two categories of high-technology SMEs in the sample: 1) firms with a positive return on R&D investments during downturn and 2) firms which a negative return on R&D investments during downturn. For the first category, including firms in the 90th quantile of the growth distribution (i.e. those who "tried and succeeded"), a positive and significant relationship between R&D investments and growth is observed (r=0.333, p=0.012); conversely, for firms in the 10th quantile (i.e. those who "tried and failed") a negative and signifi-

cant relationship between R&D investments and growth is observed in the period (r=0.333, p=0.000). Notably, firms in the 75th quantile and in the 25th quantile of the growth distribution follow the same patterns.

3.2 Empirical strategy

In line with prior empirical studies evaluating the impact of R&D and innovation over an observed distribution of firms' growth (Coad and Rao, 2006), we used a pooled quantile regression model to obtain a complete view of the R&D-growth paths of different companies in the sample. The advantage of using quantile regression models is that such an approach provides multiple estimates of the impact of independent variables on the outcome variable at different points of the conditional distribution (99 quantiles), rather than estimating the average relationship (OLS single-point estimates for the "average firm").

More in detail, the choice of this empirical strategy was motivated by three reasons:

1) The sampled firms experienced very little growth over the entire period. As Figure 1 shows, both the mean and the median values of the of the GROWTH distribution were near to zero, with high dispersion; these features are typically recurrent in SMEs during periods of economic downturn.

2) The quantile plot (Figure 2) confirmed that GROWTH varied at different points of the distribution: while a first fraction of firms in the distribution experienced negative growth over the period of downturn, the last fraction of firms experienced positive and high growth. A single OLS estimation of GROWTH for the "average firm" would be therefore of little interest. Rather, quantile estimations would have allowed us to evaluate the differences in the relationship between the independent variables and the outcome variable at different points of the distribution (i.e. to calculate coefficients estimates at different quantiles) and to provide a richer characterisation of the R&D-growth profiles of different types of firms at different points of the GROWTH distribution.

3) Quantile regression is more robust than OLS regression to non-normal errors and outliers. Relaxing the assumption that error terms are identically distributed at all points of the GROWTH distribution, allowed us to account for inter-firm heterogeneity. Finally, through quantile regression, we would be able to obtain robust slope coefficient estimations which are not influenced by outliers in the dependent variable.

Fig. 1: Distribution of GROWTH for firms in the sample

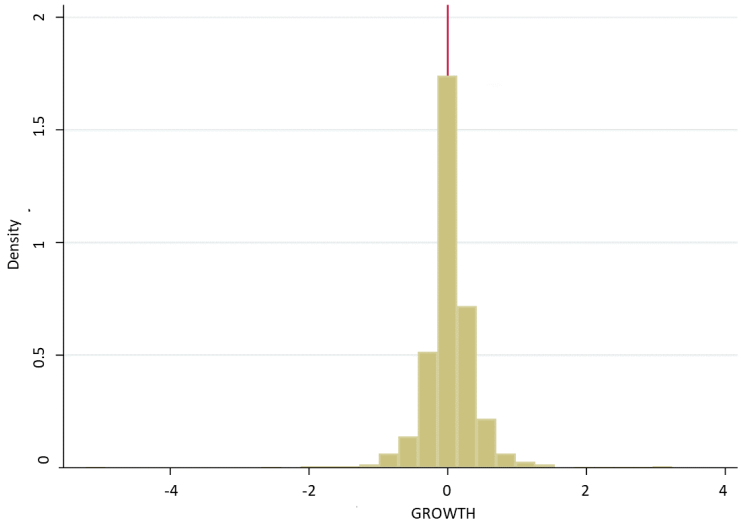
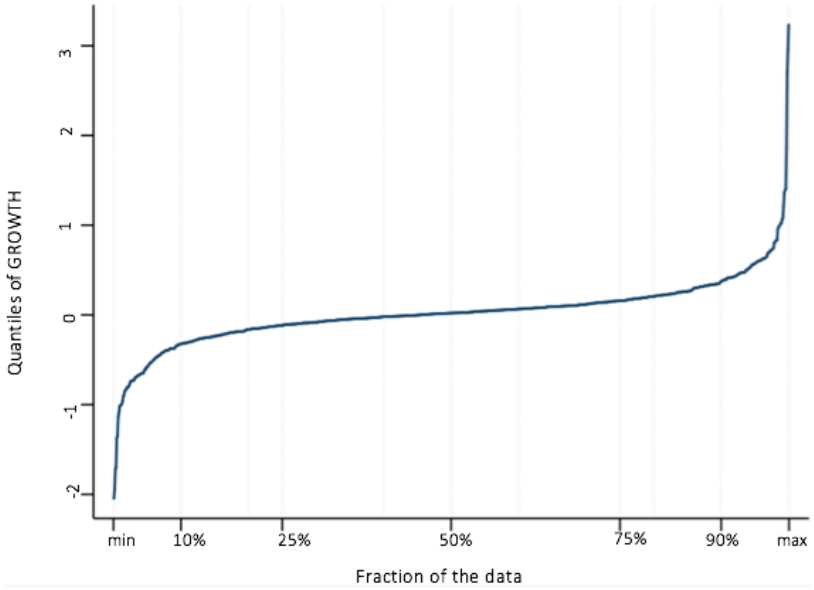


Fig. 2: Quantile plot of GROWTH



3.3 Variables definition and operationalization

3.3.1 Dependent variable

Firms' sales and employment are among the most used measures of organisational growth (Delmar *et al.*, 2003). In the context of this study, we considered net sales growth as a meaningful indicator of firm's post-innovation performance (Del Monte and Papagni, 2003; Coad and Rao, 2006). The main reason underlying this choice is that other performance indicators (like firms' market share, innovation income or financial performance) might present drawbacks that limit their applicability in a context of economic downturn, since they are industry-specific and very sensitive to changes over time (Delmar *et al.*, 2003). In light of these considerations, GROWTH was measured by a continuous variable, operationalised as the difference in the natural logarithm of net sales for the firm *i* between year *t* and year *t-1*.

3.3.2 Independent variables

The first independent variable, RD, is a continuous variable operationalized as the growth rate of R&D expenditures for the firm *i* between year *t* and year *t-1*. To rule out the risk of endogeneity, the variable was lagged by one year.

To test H1, we operationalized Innovation (INN) as a binary variable. For each firm-year observation, INN indicates whether a firm introduced one or more products/services new to the market (1) or not (0) as a result of prior R&D investments.

To test H2, we calculated three dummy variables characterising non-exclusive combinations of internal and external innovation activities undertaken by the firm *i* in each time period.

More in detail:

- INT_only is a binary variable indicating whether firm *i* invested in internal R&D (1) or not (0) in year *t*;
- EXT_only is a binary variable indicating whether firm *i* engaged in collaborative R&D activities aimed at external technology acquisition (1) or not (0) in year *t*;
- INT_EXT is a binary variable indicating whether firm *i* pursued both internal and collaborative R&D activities (1) or not (0) in year *t*.

3.3.3 Control variables

Firms' export intensity (EXT) was introduced to control for the influence of sales on the international markets on growth during the period (Golovko and Valentini, 2011). EXT was operationalized as a continuous

variable through the share of sales on international markets over total sales for firm *i* in year *t*.

Firms' SIZE and AGE were operationalized as the number of employees of firm *i* in year *t* and the number of years since its foundation in year *t*, respectively.

Finally, we introduced 7 industry dummy variables and 5 year dummy variables to control for both industry and time effects.

3.4 Test of hypotheses

To test our research hypotheses, we estimated two distinct models, using the STATA 13 software package. To test H1 (Model 1), we ran a quantile regression of GROWTH over RD and INN (Model 1), including controls. To test H2 (Model 2), we further introduced the three binary variables characterising different R&D activities as combinations of internal and collaborative activities (INT_only, EXT_only, INT_EXT).

4. Results and discussion

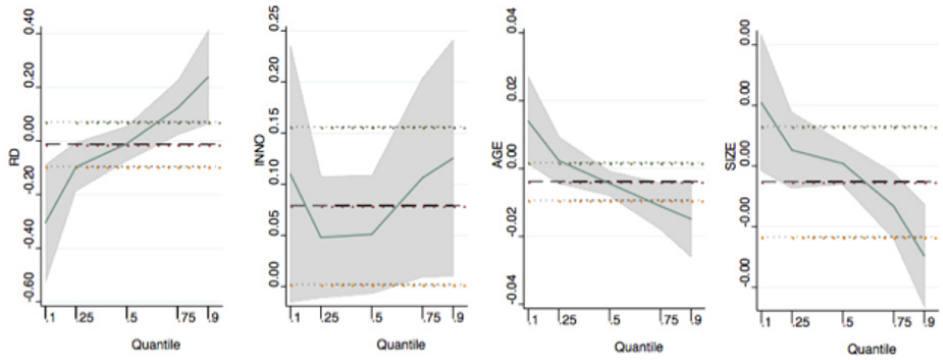
Table 3 reports the quantile regression estimates[6] at 10th, 25th, 50th, 75th and 90th percentiles of SMEs' growth distribution for both Model 1 and Model 2. A first important result is related to the significant differences observed in the coefficients of RD, INN, AGE and SIZE over the conditional distribution of GROWTH (Model 1 and Figure 2). Two R&D-growth paths emerge, which are associated to two different profiles of high-technology SMEs in the sample.More specifically, we observed that the marginal effect of an increase of RD on GROWTH is negative and significant for firms at the lower quantiles of the distribution (q10 and q25), and positive and significant at the upper quantiles (q75 and q90). That is, the marginal effect of an increase in RD is positive and strong for fast-growing firms (at q75, the coefficient is 12 times larger than the median; at q90, it is 24 times larger than the median), and it is negative for poorly performing firms (i.e. firms that are experiencing steady or negative GROWTH). The coefficients of INN are positive and significant at both the highest and the lowest quantiles of the growth distribution (p75, p90, p10). On the one side, this result indicates that sub-populations of small, young and innovative firms experience faster growth rates as a result of R&D investments and innovation activities during economic downturns; on the other side, this result reveals that firms able to adjust their ongoing R&D activities towards innovation activities benefit from a positive effect on growth during periods of economic downturn. This evidence strongly supports H1.

*Tab. 3: Quantile regression estimates**

	Model 1					Model 2				
	q10	q25	q50	q75	q90	q10	q25	q50	**q75**	**q90**
RD	-0.280**	-0.098*	-0.007	0.111*	0.220**	-0.308**	-0.121**	-0.025	0.111*	0.226*
INN	0.125*	0.05†	0.043	0.114**	0.154**	0.059	0.03	0.042	0.110*	0.139*
INT_only						0.086	0.068*	0.006	0.007	-0.005
EXT_only						0.097	0.087*	0.063*	0.031	0.068
INT_EXT						0.177*	0.096**	0.042*	0.006	0.006
EXP	-0.108	0.029	0.029	0.059a	0.094	-0.216	-0.004	0.012	0.068	0.061
AGE	0.014*	0.002	-0.004*	-0.011***	-0.016**	0.019**	0.002	-0.003*	-0.011***	-0.016**
SIZE	0.001**	0.000	0.000	-0.001**	-0.001**	0.001	0.000	0.000	-0.007**	-0.013**
Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
cons	-0.994**	-0.977**	-0.314	-0.137	-0.190	-0.983**	-0.970**	-0.352	-0.129	-0.197
Pseudo R^2	0.068	0.035	0.0223	0.053	0.100	0.079	0.040	0.027	0.054	0.102
N	932	932	932	932	932	932	932	932	932	932

**Robust SE (1000 bootstrap replications)* *†= p≤0.1; *≤p<0.05; **p ≤0.01; ***p≤0.001*

Fig. 2: Variation of the coefficients of RD, INNO, AGE and SIZE over the conditional quantile distribution of GROWTH.



In Model 2 we observed an increase in the quality of fit of our estimates in q10 and in q90, indicating that the full model explains an additional amount of variance between fast-growing and slow-growing high-technology SMEs.

[6] Robust standard errors were obtained using 1000 bootstrap replications.

First of all, the coefficients of INT_EXT (the dummy variable indicating firms undertaking both internal R&D activities and collaborative R&D activities for external technology acquisition) is positive and significant in the first two quantiles of the growth distribution (i.e. for slow-growing firms). This result clearly suggests a positive effect generated by the combination of internal and collaborative R&D activities on GROWTH for firms which experience negative returns on their internal R&D investments during downturns. Interestingly, for these firms, a balanced combination of internal R&D and external technology acquisition has a higher impact on growth with respect to single approaches (OnlyINT; OnlyEXT).

This evidence confirms H2 only for "slow growing firms".

Overall, in line with prior empirical research on high-technology SMEs in Europe (see, e.g. Coad and Rao, 2006 and Hölzl, 2009), two distinct R&D-growth profiles emerge from this study. First, a small sub-population of young, small and innovative high-technology SMEs experienced positive returns on R&D investments during the period of downturn as a result of persistent innovation activities (i.e. the introduction of new products and services to the market). Fast growing SMEs are therefore those which were able, during the period of economic downturn, to reconfigure their R&D processes towards product innovation.

A second profile includes high-technology SMEs with higher average age and size, which experienced a negative or slow growth over the recession. Notably, the negative relationship between R&D efforts and growth in this second category of firms may be the result of higher resource constraints and limited internal competencies for the successful exploitation of the results of R&D. The positive effect of balancing internal R&D with collaborative R&D aimed at external technology acquisition (i.e. to engage in open innovation approach) on growth, for this category of firms, strongly supports this argument.

As also noted by the literature on open innovation during downturns (see, e.g. Di Minin *et al.*, 2010), an increased degree of "openness" through collaborative R&D can be an effective approach to adapt firms' innovative activities to a turbulent environment. Our results therefore confirm that, during recessions, high-technology SMEs with low or negative returns on internal R&D benefit from external knowledge/technology sourcing to complement their internal capabilities and improve performance. More specifically, a balanced approach between different types of R&D activities within firms' innovation strategies, rather than single activities in isolation, will exert a positive impact on growth.

5. Conclusions, limitations and future research opportunities

The aim of this study was to provide evidence about the relationship between R&D and growth in high-technology SMEs during a period of economic downturn. As fast-growing and R&D-investing SMEs have been recognized as engines of growth in developed economies -being inclined to introduce radical innovations, develop new leading-edge technologies to introduce to the market and generate high-skilled workforce-, we conducted an in-depth analysis of the main elements characterizing different patterns of growth during a period of economic downturn. By means of a quantile regression we analysed the impact of R&D efforts over the conditional distribution of growth during a period of economic downturn. This approach allowed us to identify two different firms' profiles: fast growing and slow growing high-technology SMEs. For each profile, different characteristics of R&D investments and innovation activities appear to matter for growth. We show that fast growth in high-technology SMEs is not simply the direct result of R&D efforts: rather, sub-populations of such SMEs with different profiles in terms of R&D-growth paths exist (Freel, 2000). As already observed for EU high-technology firms (Coad and Rao, 2006) and innovative SMEs (Hölzl, 2009), we conclude that the distribution of "returns on R&D" is considerably different across firms.

Our findings about high-technology SMEs in Italy are largely in line with the empirical literature on R&D and innovation in European SMEs. In fact, we observed different SMEs profiles according to firms' size, age and innovativeness and these results are consistent with those of Tether and Massini (1998) and Mason *et al.* (2009) on high-technology SMEs in UK and with those of Delmar *et al.* (2003) in Sweden. Our study contributes to such a literature by showing how, additionally to other factors, also the type of R&D investments promoted by high-technology SMEs affects their growth paths in periods of economic downturn. In fact, for "R&D investing and fast-growing" SMEs – which are characterized by a smaller size, a younger age, and a higher ability to introduce technological innovations into the market with respect to their counterparts – investing in R&D plays a role on growth, irrespective of the type of R&D investment done. Conversely, the profile of "R&D investing and slow-growing" firms shows that growth in small high-technology SMEs is not simply the result of internal R&D efforts: companies with unfocused R&D activities may indeed grow less or experience a negative return on R&D. Therefore, firms experiencing slow growth during periods of economic downturn should complement their internal R&D investments with external technology acquisition in order to improve R&D effectiveness. In these cases, a balance between internal and collaborative R&D activities has a positive impact on growth. This last result represents the main contribution that this study offers and has rel-

evant policy implications. Innovation policies targeting high-growth entrepreneurship (such as YICs, gazelles and high-tech startups) and typically supporting new product development and commercialization may indeed exert only a limited impact.

Similar to many other studies, the design of the current work is subject to limitations.

First, we intentionally focused our analysis on high-technology SMEs, to get a clear evidence of the linkage between R&D investments and firm performance during periods of economic downturns. Although we recognize that different degrees of R&D formalization exist across industries (Pavitt, 1974), our results might be affected by negligible errors as the sample selection was focused on the identification of high-technology firms pursuing continuous and formalized R&D activities. In light of this limitation, our results are not generalizable to the overall population of SMEs.

Second, to the purpose of this study we considered the entire time period 2009-2013 period as a phase of economic downturn, although different types of crises (financial crisis, economic crisis, liquidity constraints in the credit market) with different intensities occurred. Our choice was motivated by two reasons. First, from a methodological perspective, our model did not intend to estimate pre- and post-crisis effects. Second, and regardless of the nature of the recession, a period of downturn represents a good research setting to evaluate the effects of exogenous shocks on the relation between SMEs' R&D investments and performance and to compare it with prior evidences in different years.

Third, the type of data and the methodology used did not allow to explore and evaluate firms' strategic intentions nor organizational choices during a period of economic downturn. Also, the nature of variables used did not allow to provide empirical evidence of important theoretical concepts, like firms' absorptive capacity (Cohen and Levinthal, 1989) to evaluate the effects of learning on innovation. Qualitative analyses may be needed to address these aspects. We believe that all these limitations represent, at the same time, opportunities for future research.

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I MERCATI EMERGENTI E LA DISTANZA CULTURALE: UNA RIVISITAZIONE DEI DRIVER DEL PROCESSO D'INTERNAZIONALIZZAZIONE DELLE PMI

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Abstract

The theme of the internationalisation process of small and medium-sized enterprises (SMEs) has always aroused the interest of scholars and academics for its peculiarities. Often, some difficulties were encountered for SMEs in initiating internationalisation processes, especially if the target markets are characterised by a certain degree of liability of foreignness, which makes their approach more difficult, but at the same time can represent an important opportunity for the future development of the business. This work aims to place itself within this line of studies to try to offer an original theoretical starting point and contribute to the debate on the internationalisation strategy, highlighting the drivers that can influence the variety of the strategy of SMEs in emerging markets, according to their different stock of resources and the networking capabilities of the decision-makers.

The implications that lie ahead are twofold. In the first place, we want to bring to the attention of the specialised operators some strategies that can be followed and better matched to the current phase of globalisation, to penetrate those emerging markets characterised by intercultural distance. Secondly, the proposed conceptual framework aims to help analysts and researchers to better interpret the process of internationalisation of SMEs in empirical analyses.

1. Introduzione: perché una rivisitazione del framework teorico?

Le barriere spaziali e temporali sono cadute grazie ai progressi nell'automazione, nell'ICT e più in generale della *knowledge economy*. Luoghi una volta all'apparenza distanti non lo sono più grazie anche alla velocità con cui oggi viaggiano le informazioni.

L'ingresso nell'era della quarta rivoluzione industriale e le trasformazioni connesse alla tecnologia digitale (Leamer e Storper, 2001; Levy e Murnane, 2004) hanno poi consentito risparmi enormi di risorse e reso più agevole la produzione, allora, frammentata e delocalizzata su scala globale (Feenstra, 1998; Grossman e Rossi-Hansberg, 2008; Los *et al.*, 2015).

Questa viene organizzata in siti capaci di sincronizzarsi, in cui la coordinazione e l'interconnessione tra le diverse unità produttive sono molto elevate, tale per cui, sempre più spesso compiti e mansioni sono svolti ad un livello internazionale (Krugman, 1998; Porter, 2003).

Dunque, le imprese che sanno riorganizzare i loro processi produttivi possono riuscire ad integrarsi nelle reti globali del valore e trarre così dei benefici dai differenziali di costo dei fattori produttivi o dalla ricerca di competenze migliori. Allora, un elemento discriminante che emerge dall'attuale fase della globalizzazione è proprio il know-how detenuto dalle imprese.

Il tema dell'internazionalizzazione che è stato più volte richiamato in letteratura (Buckley e Casson, 1976; Dunning, 1988; Lall, 2002; Gereffi *et al.*, 2005; Johanson e Vahlne, 2009), invero, appare più problematico da inquadrare in riferimento alle piccole e medie imprese (De Chiara e Minguzzi, 2002; Caroli e Lipparini, 2002; Ruzzier *et al.*, 2006; Lu e Beamish, 2006; Jansson e Sandberg, 2008; Crick, 2009; Kuivalainen *et al.*, 2012; Zucchella e Servais, 2012), in cui, i processi decisionali individuali dell'imprenditore assumono configurazioni che difficilmente possono trovare collocazione nei framework teorici elaborati dall'ortodossia economica per le imprese sono di grandi dimensioni. La modalità di ingresso nei mercati esteri che rimane ancora un ambito da esplorare maggiormente (Laufs e Schwens, 2014).

Infatti, le PMI hanno la tendenza a mostrare una certa specificità nel loro processo di internazionalizzazione rispetto a quello delle grandi imprese (Bonaccorsi, 1992; Pitoni, 2013; Musso, 2013) che, pertanto, rende necessaria un'analisi più rispondente per la comprensione delle loro determinati. Il livello d'internazionalizzazione delle PMI soprattutto se a conduzione familiare sarebbe gravato da una maggiore incertezza rispetto alle non familiari (Zahra, 2003).

In questo discussant paper si cercherà di colmare questo gap proponendo – per mezzo di una revisione della letteratura – una tassonomia che rivisita il framework delle strategie di internazionalizzazione con riferimento alle PMI cercando di analizzarle da un punto di vista alternativo re-

stando dal lato dell'offerta. Nel trattare le analisi sul processo d'internazionalizzazione delle PMI non si può, allora, non considerare la centralità che assume il ruolo dell'imprenditore, il quale, ha solitamente una tendenza a valorizzare solo alcune delle sue specifiche capacità (Guercini, 2005; Ferrero *et al.*, 2012; Francioni, 2016), o più in generale, non può non considerarsi il ruolo rivestito da uno sviluppo adeguato del capitale umano detenuto dall'impresa (Preti *et al.*, 2005; Pedrini e Dal Bianco, 2007; Bortoluzzi e Balboni, 2011; Vignola e Marchi, 2012).

Il punto di vista alternativo che si vuole adottare permette di guardare ai percorsi d'internazionalizzazione delle PMI andando oltre le tradizionali rappresentazioni che ci forniscono i consueti driver per l'internazionalizzazione e aprire, dunque, ad un framework maggiormente incentrato sulla conoscenza (Lamb *et al.*, 2011) necessaria per intraprendere questo tipo di percorso di crescita per vie esterne.

In altri termini, esistono delle diversità nelle *internationalisation practices*, tali per cui, il processo d'internazionalizzazione evolve per salti incrementali, dunque, che lo rendono discontinuo ma che, comunque, dipendono pur sempre dall'esperienza accumulata dall'impresa sui mercati, anche in riferimento alla differente dotazione e natura in cui si articola la conoscenza (Paoli, 2009).

Questo per l'impresa comporta, allora, essere capace di detenere una certa abilità nell'accumulare conoscenza ed il sapersi adattare a contesti spesso culturalmente tra i più distanti.

Da tempo la letteratura riconosce che le imprese non sono isolate ma connesse per mezzo del *networ*king relazionale intrattenute con gli altri attori di mercato, attraverso le quali acquisisce e implementa *know-how* e conoscenza. Le relazioni dalle imprese, sovente, si caratterizzano per la frequenza con cui si ripetono le interazioni, le interdipendenze o i processi di continuo adattamento. L'impresa e le controparti scambiano in modo ricorsivo risorse, stringono alleanze, condividono i fini, innovano e apprendono, in ultimo, divengono sempre più interconnesse (Ford *et al.*, 2003; Hakansson *et al.*, 2009; Tunisini e Bocconcelli, 2013).

In questo lavoro l'approccio teorico *network instated* all'*internationalization business* (Johanson e Mattson, 1988; Coviello e Munro, 1995) va a combinarsi in maniera sinergica con quello *resource-based*, che individua nella capacità delle imprese di dotarsi di risorse e competenze la fonte primaria della loro condotta strategica della capacità di sviluppo sui mercati internazionali al fine di acquisire delle competenze distintive di base, in grado di generare e sostenere un vantaggio competitivo rispetto ai concorrenti, che sia il più a lungo durevole e difendibile (Hamel e Prahalad, 1990; Barney, 1991; Teece *et al.*, 1997; Lipparini, 2002). Per cui, è pur vero che nel cercare di interpretare il processo d'internazionalizzazione delle imprese possono essere adottate diverse prospettive di analisi, ma potrebbe essere

utile il considerare tutti questi punti di vista come tra di loro complementari piuttosto che alternativi (Bell *et al.*, 2003).

Al fine di rendere sistematico e analitico il discussant paper di seguito presentato, lo studio vuole fornire, in prima battuta, *(i)* un quadro teorico per mezzo di una revisione della letteratura che meglio possa prestarsi ad una lettura in chiave dinamica della strategia d'internazionalizzazione delle PMI, per poi, *(ii)* proporre una rivisitazione del framework teorico dei driver, infine, *(iii)* tracciare le considerazioni conclusive e le implicazioni.

2. Il processo d'internazionalizzazione delle imprese e la varietà della prospettiva di analisi

Le opportunità di business che si schiudono dai contesti globali impongono oggi alle imprese di ripensare all'ortodossia dei modelli d'internazionalizzazione tradizionali (Buckley e Casson, 1976; Dunning, 1988; Gereffi *et al.*, 2005; Lall, 2002; Johanson e Vahlne, 2009). Da tempo, le PMI – e non solo – stanno rivedendo le loro strategie internazionali per consolidare la presenza nei mercati esteri e per far leva sulle nuove fonti del vantaggio competitivo (Masurel, 2001).

Dunque, è in questo senso che si avverte il bisogno a ripensare al processo d'internazionalizzazione per far sì che le PMI possano penetrare i mercati emergenti (Ferrucci *et al.*, 2018) come, ad esempio, quelli del continente africano dalle interessanti prospettive di crescita, ma che si caratterizzano pure per la presenza di ostacoli di ordine tecnico quali, la necessità di dotarsi di adeguate risorse e informazioni attendibili, difficoltà nello stringere accordi, alleanze e partnership, la mancanza di personale qualificato (Ferrucci e Paciullo, 2015).

Interessante è stato lo studio di Andersen *et al.* (1997) che individua quattro possibili percorsi all'internazionalizzazione delle PMI: *(i)* guidata da un cliente nazionale, *(ii)* attraverso l'integrazione nella *supply chain* di una grande impresa, *(iii)* per mezzo di accordi di collaborazione con altre PMI sia nazionali che internazionali, *(iv)* in maniera autonoma.

In altre parole, ripensando l'innesto nelle *global value chain* delle PMI, questo può avvenire lungo tre direttrici: *(i) delocalizzazione della rete di PMI subfornitrici*, in cui sono coinvolte le attività a più alto contenuto di lavoro e che si collocano negli stadi iniziali della filiera produttiva, *(ii) scomposizione e delocalizzazione della filiera produttiva*, le attività collocate a monte della filiera vengono delocalizzate presso le fonti della materia prima, quelle intermedie e più critiche rimangono nell'impresa, mentre, l'assemblaggio tende ad essere decentrato nei mercati geografici di destinazione, *(iii) l'internazionalizzazione dell'intera rete di PMI subfornitrici*, si tratta di agganciare le PMI ad una catena globale del valore mantenendo, allo stesso tempo,

relazioni di networking locale lungo tutta la filiera produttiva.

Dunque, se da un lato il *network* delle relazioni si è indebolito a causa della delocalizzazione delle PMI subfornitrici, che hanno contribuito a generare una nuova domanda di beni intermedi nelle aree di destinazione del decentramento, dall'altro, è proprio grazie alla stessa che le PMI possono intraprendere uno slancio internazionale per generare, a loro volta, una nuova domanda di beni intermedi a seguito della ri-specializzazione produttiva. È proprio a fronte di un ri-posizionamento lungo le catene globali del valore che l'attività delle PMI subfornitrici che fabbricano prodotti di alta qualità in serie corta – in piccoli lotti ed in tempi estremamente ristretti – non ha subito un ridimensionamento, contrariamente a quanto accade alle imprese le cui produzioni si collocanoin una fascia qualitativa mediobassa che sono state direttamente colpite dalle strategie di delocalizzazione dei produttori finali.

In definitiva, oggi alle PMI è richiesta una maggiore capacità di crescita dimensionale, soprattutto in termini qualitativi, ovvero, nella conoscenza e nella gestione – che è sempre più complessa – dei processi situati lungo la catena del valore a monte – come l'innovazione – e a valle – quali il marketing e la distribuzione. Mentre, alle imprese leader sono oggi richieste capacità e competenze per guidare il processo d'internazionalizzazione lungo quello che è stato definito come il "quarto capitalismo industriale" (Mariotti e Mutinelli, 2009; Varaldo *et al.*, 2009; Ferrucci e Guercini 2013).

2.1 Una breve revisione della letteratura

Gli studi a matrice economica (Buckley e Casson, 1976; Dunning, 1988; Lall, 2002; Gereffi *et al.*, 2005) contribuiscono a spiegare le decisioni localizzative all'estero sopratutto delle grandi imprese attraverso dei propri insediamenti di tipo greenfield o brownfield quali alternative all'*export-oriented*. Ma l'internazionalizzazione è un processo più complesso, in cui interagiscono dimensioni diverse, legate alla specificità di certe caratteristiche delle PMI (Bonaccorsi, 1992; Zahra, 2003; Pitoni, 2013; Musso, 2013), come quelle personali e professionali dell'imprenditore (Guercini, 2005; Ferrero *et al.*, 2012; Francioni, 2016), o più in generale, del capitale umano e dei processi di apprendimento esperienziale (Preti *et al.*, 2005; Pedrini e Dal Bianco, 2007; Bortoluzzi e Balboni, 2011; Vignola e Marchi, 2012) in grado, dunque, di supplire anche alle inefficienze organizzative ed alle difficoltà finanziarie di cui spesso le PMI possono soffrire (Manolova *et al.*, 2002).

Vernon (1966) sulla scia di Hymer (1960) analizzando il ciclo di vita del prodotto/settore mostra come l'impresa riesca ad ottenere dalle proprie produzioni dei differenziali di guadagno accedendo ai mercati esteri prima di decidere la dismissione o il rilancio di alcuni prodotti. Tale decisone dipende proprio dello stato di avanzamento tecnologico del prodotto ri-

spetto al paradigma tecno-economico dominate nel paese/mercato servito (Perez, 1983). Per cui, se c'è rispondenza adattiva tra la maturità tecnologica di un certo prodotto ed il mercato che viene servito, l'impresa avrà una convenienza economica a penetrare tale mercato ed estendere il proprio business oltre i confini nazionali (Vernon, 1983). Ma in questo approccio teorico, seppur contraddistinto da originalità – in cui entra in gioco la variabile tecnologica – appare ancora forte la deriva strutturalista e la contesa dell'aspetto dimensionale, per cui, mal si adatta a descrivere la condotta strategica e organizzativa delle PMI che, invece, non possono beneficiare dei vantaggi derivanti dalla scala dimensionale.

Il passo successivo è rappresentato dalla teoria degli stadi della scuola di Uppsala (Johanson e Wiedersheim-Paul, 1975; Johanson e Vahlne, 1977) e dalla *learning by doing theory* da cui attinge (Lindblom, 1959). L'internazionalizzazione diviene un processo di accumulazione di conoscenza e di apprendimento relativo ai mercati esteri, alle modalità di entrata e alle attività di marketing, che progressivamente riducono la percezione della distanza culturale, dunque, del rischio percepito della *liability of foreignness* nell'operare nei mercati esteri e connessa proprio alle differenze di tipo economico, culturale, politico-sociale esistenti tra i differenti paesi (Zaheer, 1995). Nei diversi stadi, l'impresa tende ad adattarsi sempre meglio al contesto in cui decide di operare. In ognuno dei quattro stadi sequenziali: *(i)* nessuna attività internazionale, *(ii)* internazionalizzazione commerciale, *(iii)* creazione di una rete di vendita propria, *(iv)* internazionalizzazione produttiva; l'impresa ha accesso ad un insieme sempre maggiore di informazioni e solo il raggiungimento di una certa massa critica nell'apprendimento negli stadi inferiori consente all'impresa di passare agli stadi successi. Studi più recenti hanno mostrato che le imprese non hanno la tendenza a seguire un modello per fasi sequenziali (Bonaccorsi, 1992; Benito e Grispud, 1992) o che addirittura nascono già globali (Gabrielsson e Manek Kirpalani, 2004). Queste imprese, infatti, sono in genere start-up dell'high-tech che praticano l'esportazione dei loro prodotti in regime di *capital-saving resource* come attività primaria e che, per l'appunto, nascono con lo scopo di servire i mercati di nicchia globali e che sono in grado di raggiungere fornitori e clienti in tutto il mondo sin dalla nascita.

Dunque, quello che fa la differenza è la distanza "psichica" (Vahlne e Nordstrom, 1992) percepita rispetto al mercato domestico che definisce il progressivo espandersi all'estero dell'impresa da mercati considerati come vicini a quelli più lontani.

Questa può essere definita come l'insieme di quei fattori di disturbo che perturbano le imprese che vogliano perseguire una strategia di penetrazione in un mercato straniero, oppure, come un insieme di *hidden cost* o di costi di transazione in cui incorre l'impresa lungo il suo processo d'internazionalizzazione. In altri termini, secondo la *stage theory* è l'esperienza

accumulata dall'operare nei mercati esteri ad essere il fattore chiave che influenza tempo e modalità di penetrazione nel contesto internazionale. In tal senso, l'internazionalizzazione è concepita come processo incrementale basato su di un apprendimento anch'esso crescente.

Gli studi successivi sulla creazione di *international business network* e sulle *born-global firm* hanno poi esteso questo approccio e hanno reso evidenti, rispetto al modello in origine teorizzato, che le traiettorie di crescita delle imprese sono maggiormente variegabili e differenziabili (Johanson e Mattson, 1988; Forsgren e Johanson, 1992; Rennie, 1993; McDougall *et al.*, 1994; Gabrielsson e Manek Kirpalani, 2004; Coviello, 2006; Zucchella e Scabini, 2007; Elango e Pattnaik, 2007; Presutti *et al.*, 2008; Johanson e Vahlne, 2009; Parker *et al.*, 2010).

In particolar modo, le imprese più piccole possono contare su di una relazionalità diffusa, più o meno intensa, con intermediari, clienti e fornitori esteri, nonché con partner e attori istituzionali dei paesi stranieri (Gilmore *et al.*, 2006; Evers e Knight, 2008). Una intensa ed efficace attività di *networking*, dunque, consente a queste imprese di superare i limiti derivanti dalle loro ridotte dimensioni o da una loro minore esperienza. Così riescono a cogliere le opportunità per lo sviluppo internazionale del loro business. Le reti in questione, possono assumere natura verticale o orizzontale (Ghauri *et al.*, 2003) ed incentivare la "coopetition", ossia una condotta strategica basata tanto sulla compresenza di cooperazione e concorrenza (Niccolini, 2008; Dagnino e Rocco, 2009).

Un'impresa che opera da diverso tempo sui mercati internazionali e che sa come relazionarsi con differenti attori economici ed istituzionali, sviluppa una naturale tendenza ad accrescere le capacità di affrontare e gestire gli eventi e le situazioni impreviste rispetto ad altre imprese, ma ha anche l'opportunità di cogliere nuovi spazi di business (Barkema e Vermeulen, 1998; Eriksson *et al.*, 2000; Eriksson e Chetty, 2003), ad esempio, maturando nuove esperienze che contribuiscono, in ultimo, ad accrescere e migliorare lo stock di conoscenza e la capacità di assorbimento (Cohen e Levinthal, 1990).

In ultimo, nell'analisi sui *driver* del processo d'internazionalizzazione delle imprese, non può non essere considerata la prospettiva degli studi che attingono alla *resource-based view* (Hamel e Prahalad, 1990; Barney, 1991; Teece *et al.*, 1997; Bloodgood *et al.*, 1996; Lipparini, 2002; Dhanaraj e Beamish, 2003). In quest'ottica, le conoscenze e le risorse detenute dall'impresa sono di tipo *firm-specific* (Wernerfelt, 1984) e sono alla base della condotta strategica e dello sviluppo del business.

La scelta d'internazionalizzazione, dunque, diviene una particolare modalità d'impiego e di valorizzazione della conoscenza e delle risorse detenute che vengono reinventate dall'impresa per operare in uno spazio della competizione più esteso. In tal senso, allora, assumono una rilevanza non trascurabile i processi decisionali e di selezione delle scelte adoperati dal

management e dall'imprenditore. in definiva, esperienza, abilità e competenze sono alla base della stessa sopravvivenza dell'impresa nei mercati esteri e sono conseguenza dello sviluppo internazionale del business (Westhead *et al*., 2001; Sapienza *et al*., 2006).

2.2 Una variabile determinante: un cenno alla letteratura sulla liability of foreignness

Zaheer (2002) analizzando i costi strutturali dei network relazionali ed istituzionali nei paesi ospitanti mostra come, i primi, siano associati alla collocazione assunta dell'impresa all'interno del *network* locale e ai *linkage-effect* spigionatesi con importanti attori di mercato, mentre, i costi istituzionali incidono sulla legittimità dell'impresa straniera ad operare nel mercato, nonché, sulla sua capacità di apprendimento dal contesto locale.

Sulla stessa scia anche Sethi e Judge (2009), che mostrano come la penetrazione in una ASA all'estero includa tutti i costi connessi alla *cross-cultural distance* nelle operazioni transfrontaliere che coinvolgono le sussidiarie estere e di cui, allora, la *liability of foreignness* è solo una componente (Petersen e Pedersen, 2002; Eden e Miller, 2004). Comunque, in linea generale, la letterature evidenzia che le PMI prediligono forme di presenza all'estero che sono *non equity-oriented* (Brouthers e Nakos, 2004).

Cuervo-Cazurra *et al.* (2007) mostrano come i costi per l'internazionalizzazione sono più elevati se le risorse che generano i vantaggi specifici dell'impresa non possono essere trasferiti all'estero. Ciò dipende dalle risorse specifiche già detenute dall'impresa che possono dare luogo poi a degli svantaggi nel paese ospitante, o al fatto che all'impresa mancano le risorse strategiche complementari di marketing necessarie per operare con successo nel nuovo mercato.

Elango (2009) sostiene che le imprese possono ridurre gli effetti della *liability of foreignness* attraverso un'efficace elaborazione delle informazioni acquisite sul mercato estero e quindi riusicre così ad infondere una maggiore sicurezza agli *stakeholder* locali. Dunque, la capacità di saper adeguatamente gestire questi due spetti connessi alla presenza dell'impresa sui mercati esteri aumenta, in ultimo, la sua probabilità di sopravvivenza. Lo studio di Elango (2009) mostra che operare con una gamma ampia di prodotti, ottenere visibilità, incontrare i gusti locali e stringere alleanze con imprese locali per condividere risorse e *know-how* sono le strategie più efficaci per ridurre al minimo gli effetti della distanza culturale.

Barnard (2010) ha mostrato, invece, che a volte le capacità specifiche dell'impresa possono non essere appropriate o non abbastanza sviluppate per superare la distanza culturale di un dato mercato ostico prevedendo, allora, un necessario ricorso alla forza lavoro ed ai fornitori locali per garantire le competenze mancanti.

Yildiz e Fey (2012) riferendosi alle economie in transizione caratterizzate da un ambiente istituzionale volatile, incerto e mutevole, nell'analizzare la distanza culturale, sostengono che le imprese ospiti possono adottare pratiche gestionali rivolte all'omologazione istituzionale per cercare di perseguire i propri obiettivi senza il dover necessariamente rinunciare ai loro valori di fondo. Quindi, le imprese riescono ad evitare strategie di adattamento all'ambiente locale e avere maggiore probabilità di riuscire a trovare personale con valori assimilabili a quelli detenuti a causa dello stato transitorio di queste economie. Infatti, la trasformazione istituzionale in corso porta ad un livello più elevato la differenziazione dei valori culturali tra i diversi gruppi sociali in termini di istruzione, interessi e abitudini di consumo. In definitiva, Yildiz e Fey (2012) quando descrivono queste strategie alternative fanno riferimento principalmente alla grande impresa. Ciò non toglie che anche le imprese di più piccole dimensioni non possano adottare queste strategie, ma chiaramente è più difficile o persino impossibile se queste non dispongono di adeguate risorse o non sono trainate da un'impresa più grande. C'è poi anche il dover considerare il ruolo del governo ospitante che, ad esempio, ha maggiore probabilità di offrire incentivi alle grandi imprese che possono comportare un aumento significativo dei livelli occupazionali e contribuire a risollevare il paese con investimenti rilevanti, piuttosto che alle PMI, che da sole difficilmente potranno garantire gli stessi risultati.

Moeller *et al.* (2013), poi, sono andati oltre, distinguendo tra una *material* ed un'*immaterial liability of foreignness*, tanto per fattori interni che esterni all'impresa. Mentre l'incertezza esterna può essere rimandata alle teorie istituzionali (Di Maggio e Powell, 1983; Notrh, 1990), l'approccio ai fattori interni dovrebbe essere inquadrato, invece, nella teoria della distanza culturale. Le imprese estere soffrono di un evidente gap rispetto alle locali e dovuti, in gran parte, alle differenze riscontrabili nella gestione dei dipendenti assunti localmente. I formatori aziendali, infatti, sono impegnati nel dover mediare tra la necessaria coerenza interna con le consolidate *routin* organizzative dell'impresa e la necessità di adattamento al contesto culturale locale (Bartlett e Ghoshal, 1989). Inoltre, il capitale umano potrebbe mostrare della reticenza a sottoporsi alle norme e alle pratiche aziendali, mettendo, in ultimo, in discussione la volontà decisionale del management (Kostova e Zaheer, 1999).

Anche se il concetto della distanza culturale è stato discusso a diversi livelli, gli studi non mostrano risultati unanimi ed in parte sono pure contrastanti. Dunque, non è possibile approcciare alla sottesa *liability of foreignness* con una teoria definitiva ed in grado di descrivere a pieno il fenomeno. Il mercato globale include, poi, una tale varietà contestuale, per cui, sarebbe impossibile definire il fenomeno con un unico framework senza incorrere nel rischio di perdere un livello significativo di dettagli. Gli studiosi,

quindi, si trovano di fronte a un compromesso quando devono approcciare a questo concetto.

La visione tradizionale della *liability of foreignness*, che indaga principalmente gli svantaggi che l'impresa deve affrontare rispetto ai concorrenti locali, non appare adatta a descrivere l'intera serie di costi di funzionamento in un contesto economico globalizzato. Ad esempio, Sethi e Guisinger (2002) giungono a ritenere che solo attraverso un adeguato processo di scansione, interpretazione, e analisi si possa superare la distanza culturale e che talvolta questa possa divenire persino un potenziatore del vantaggio competitivo nei confronti delle imprese locali se adeguatamente valorizzata dall'impresa estera. Le competenze di base sviluppate internamente, allora, sono si il principale *driver* a disposizione dell'impresa, ma non l'unico. Anche i partenariati, le reti, e una localizzazione per accrescere le risorse complementari di marketing sembrano necessari per meglio approcciare il contesto economico globale.

Dunque, Sethi e Judge (2009) sostengono che non devono essere presi in considerazione solo i costi del fare business all'estero, ma anche i benefici, quindi, l'impatto – positivo o negativo – diviene un effetto combinato da molteplici *driver*. Nei paesi in via di sviluppo, allora, diversi studi (Pelinescu e Rădulescu, 2009; Kinoshita, 2011; Kurihara, 2012; Sridhar *et al.*, 2016; Yaqub, 2016) riconoscono la valenza di un approccio specifico per settore di tipo *picking the winners.*

3. Una rivisitazione del framework teorico dei driver del processo di internazionalizzazione delle PMI

Stante alle considerazioni sulla letteratura di cui sopra, la strategia delle PMI finalizzata all'ingresso nei mercati emergenti – che sono poi quelli contraddistinti da una maggiore complessità e caoticità sociale, politica, istituzionale, oltre che da fattori di natura macroeconomica che contribuiscono ad accentuarne la vulnerabilità strategica – dovrebbe consentire di rendere il più agevole possibile la penetrazione in questi mercati che possono, dunque, rappresentare un'importante opportunità di sviluppo del loro business.

La consapevolezza della presenza di regioni in rapido sviluppo anche se fortemente instabili ha indotto le imprese a riconsiderare la propensione al rischio. Questa non è più solo percepita come condizione negativa, ma in tutt'altra chiave di lettura, allora, ha pure una funzione locomotrice che spinge le imprese ad intraprendere nuove opportunità d'investimento in mercati caratterizzati da elevati potenziali di crescita.

In particolare, una decisione strategica che all'apparenza può sembrare controcorrente come, ad esempio, quella di investire in un contesto socio-

economico ad elevato rischio ed in un momento in cui gli altri competitor sembrano optare per il ritiro, potrebbe invero, rivelarsi molto vantaggiosa sia in termini di profittabilità attesa che di definizione del proprio business.

Quando le PMI si trovano a dover approcciare a questi mercati, spesso per ragioni strutturali e organizzative, possono mancare di risorse finanziarie, di competenze e capacità gestionali o di marketing, di esperienza sui mercati esteri, di padronanza della lingua straniera, di esperienza culturale, di informazioni sul mercato estero ed avere paura di tutti i rischi connessi.

In altre parole, queste imprese possono percepire una certa distanza psichica, in virtù delle loro qualità distintive che sono differenti rispetto a quelle della grande impresa, non solo da un da un punto di vista organizzativo ma anche decisionale, per cui, anche il loro approccio ai mercati internazionali risulterà divergente.

L'internazionalizzazione appare, dunque, una conseguenza di tutta una serie di decisioni incrementali di tipo *path-history dependency* e di attività di *networking*, che spesso si originano proprio da investimenti che denotano un certo grado di innovazione comportamentale del management o dell'imprenditore (Cedrola e Battaglia, 2011; Bortoluzzi e Balboni, 2011; Vignola e Marchi, 2012; Francioni *et al.*, 2015).

In questa parte del lavoro, tenendo conto della prospettiva teorica multiforme e della liability of foreignness, si proverà a riformulare il quadro dei principali driver che spingono le PMI ad interfacciarsi in maniera difforme nei mercati caratterizzati da forte criticità e con qualche esempio tratto dalla letteratura sui mercati emergenti dell'Africa (Ferrucci e Paciullo, 2015).

In Ferrucci et al. (2018) la definizione di networking acquisisce una configurazione nuova per esprimere le relazioni innescabili dall'impresa con i clienti, i fornitori e le istituzioni, in funzione di tre tipi di rete attivabili: (i) confined local network, in cui le conoscenze di mercato acquisite dall'impresa attraverso una rete locale sono market-specific, per cui non possono essere replicate e hanno valenza solo in un dato mercato, (ii) network with bridging, in cui l'impresa sfrutta le relazioni che già detiene per ottenere l'accesso ai mercati target, (iii) clone network, quando l'impresa riesce a replicare con successo la rete di relazioni che supporta le operazioni di business pure in altri mercati. Le alternative di networking proposte in Ferrucci et al. (2018), in ultimo, appaiono rilevanti per il proseguo di questo studio.

3.1 La market followership network strategy

Questa condotta si verifica quando le imprese fornitrici di dimensioni ridotte che gravitano attorno ad un'impresa leader più grande, per un effetto *pull* – o di *bandwagon* – assecondano il suo processo d'internazionalizzazione ed ingresso nelle *global value chain* attraverso investimenti in autonomia o facendo rete.

Le imprese leader di un distretto potrebbero decidere di effettuare un investimento in un mercato ostico percepito come sufficientemente sicuro e stabilirvi una propria base operativa, per poi implementare una strategia d'internazionalizzazione verso realtà limitrofe e tessere network con clienti e fornitori del luogo.

Secondo Draper e Scholvin (2012) questo produrrebbe un effetto domino a beneficio della rete di fornitori, la quale sarà indotta ad approfittare del gateway offerto dal'impresa leader per travalicare i confini nazionali e proiettarsi anch'essa nei mercati esteri contenendo efficacemente i *sunk cost* e restando *lean and flat*. Ad esempio, Altman *et al.* (2005) forniscono delle prove empiriche al riguardo circa il settore creditizio, delle telecomunicazioni e della grande distribuzione in molte delle economie dell'Africa sub-sahariana.

In questo caso, la modalità di governance delle catene globali del valore (Kaplinsky e Morris, 2001; Humphrey e Schmitz, 2002; Gereffi *et al.*, 2011) possono sia agevolare che ostacolare il potenziamento internazionale delle imprese fornitrici.

Luiz e Stephan (2012) mostrano come le imprese di telecomunicazioni sudafricane sono riuscite ad espandersi in Africa sub-sahariana proprio grazie all'esperienza acquisita *on-filed* attraverso quelle di dimensione maggiore, che hanno rappresentato, prima, una piattaforma con cui comprendere l'ambiente competitivo africano e poi un volano all'internazionalizzazione. Inizialmente queste imprese si sono espanse nei mercati a loro più familiari come quelli confinanti e di lingua inglese, poi, acquisita una certa dimestichezza ed esperienza circa il modo di conduzione del business, si sono spostate verso quei mercati meno conosciuti come quelli di lingua francese.

Altre evidenze empire in questa direzione possono venire da Owhoso *et al.* (2002), che indagano la penetrazione nei mercati dell'Africa sub-sahariana delle grandi imprese americane, mostrano come queste possono ottenere un vantaggio strategico nell'essere *first-mover* nel penetrare questi mercati attraverso un investimento "a testa di ponte" posto in Sud Africa, dal quale poi poter dare vita a delle future penetrazioni verso i mercati limitrofi.

Dunque, è attraverso l'apprendimento organizzativo che le imprese riescono a conoscere i gusti, le preferenze e le abitudini dei loro potenziali consumatori. Tuttavia, le imprese che si sono aperte al mercato sudafricano hanno dovuto affrontare un ambiente competitivo caratterizzato da forte concorrenzialità e non proprio privo di incertezza politica e rischi per la sicurezza. L'analisi di Owhoso *et al.* (2002) suggerisce che solo le imprese più grandi e diversificate hanno la disponibilità dei mezzi finanziari e delle risorse manageriali per entrare nel mercato africano attraverso investimenti idiosincratici in capitale fisso.

Tra l'altro, dal punto di vista organizzativo le imprese che si stabiliscono in questi mercati gravati da forte instabilità, mostrano la tendenza ad

adottare come struttura organizzativa quella adhocratica, che permette di gestire molteplici linee di produzione, che favorisce il coordinamento tra i livelli gerarchici e che meglio si adatta ai cambiamenti improvvisi. Tale maggiore coordinamento consente, infatti, all'impresa leader di riuscire *(i)* a gestire le fasi più importanti del processo produttivo dei suoi subfornitori e al contempo, *(ii)* di semplificare l'organizzazione del network, mentre, alle imprese subfornitrici potrebbe consentire di *(i)* estendere più agevolmente la gamma dei prodotti e servizi offerti, (ii) accrescere il vantaggio competitivo derivante dalla loro flessibilità organizzativa.

3.2 La market relations network strategy

Questa ulteriore condotta si origina quando l'impresa riesce ad instaurare accordi formali e informali, partnership strategiche o di *co-marketing* facendo rete con gli interlocutori economici locali quali, clienti, fornitori e pure competitor.

L'analisi della letteratura suggeriscecome le PMI possono fare affidamento sui network relazionali per superare i loro svantaggi dimensionali quando cercano una crescita per vie esterne e riuscire a superare così il loro eventuale isolamento.

La prospettiva della rete sostiene che l'internazionalizzazione avviene attraverso il *networking* (Johanson e Mattson, 1988) e che le imprese sono in grado di acquisire dal mercato globale conoscenza, risorse finanziarie, di marketing e manageriali. In altre parole, attraverso la collaborazione con partner nazionali ed esteri riescono ad attenere dei vantaggi competitivi.

Una delle modalità più apprezzate sono le partnership attraverso joint venture, che dipendono fortemente dai livelli di fiducia tra i partner. Presentano dei vantaggi sia in termini di apprendimento organizzativo, di condivisione e di contenimento dei costi di transazione, sia, più in generale, dei rischi, permettendo, in ultimo, degli interscambi fondati su di un vantaggio da *cooperation*.

Parte della letteratura ha contribuito a ridurre il pessimismo sul potenziale di crescita delle PMI nei mercati emergenti in Africa (Pedersen *et al.*, 1994; McCommick, 1996; Rutashobya e Jaensson, 2004; Mtigwe, 2005).

Ad esempio, nella maggior parte dei paesi africani, la trasparenza nell'informativa contabile e nel bilancio delle imprese è molto scarsa, per cui, dati i ridotti presupposti di affidabilità informativa, nel penetrare questi mercati vi sarà anche il dover considerare un rischio variabile connesso ad una possibile incoerenza tra gli effettivi valori di mercato delle imprese ed i dati contabili dichiarati, oltre che, per questo motivo, essere gravati da uno scarso sviluppo del settore creditizio e finanziario a supporto delle operazioni di mercato (Owhoso *et al.*, 2002). Questi fattori, insieme all'incertezza circa il quadro politico e istituzionale dei paesi, contribuiscono a creare un'asimme-

tria informativa elevata tra i partner. Per evitare questi disordini è possibile ricorrere ad accordi informali e non (Rutashobya e Jaensson, 2004; Mtigwe, 2005). Allora, instaurare rapporti cooperativi attraverso joint venture nei mercati emergenti può essere preferibile rispetto ad operazioni di M&A in quanto possono ricevere anche egli incentivati dagli attori istituzionali.

Dunque, le partnership, la creazione di reti e cluster sono una modalità alternativa per molte PMI magari scarsamente dotate di risorse per far crescere il loro business oltre i confini nazionali ed affrontare così la sfida imposta dalla globalizzazione. Questo dipenderà molto dalle capacità di manager ed imprenditori di saper tessere delle adeguate reti relazionali riducendo, allora, al minimo i costi della *liability of foreignness*. Grazie all'apprendimento e all'esperienza acquisita dall'operare nei mercati esteri, l'impresa aumenterà lo stock di know-how detenuto che può essere utilizzato per l'internazionalizzazione, oppure, da poter valorizzare nel mercato domestico.

In generale, se l'esperienza sui mercati esteri è stata positiva e con buoni risultati potrà indurre un effetto benefico a livello di cultura d'impresa che poi inciderà sull'orientamento strategico di fondo, allora, con una propensione maggioredell'impresa all'internazionalizzazione.

3.3 L'institutional and government network strategy

Quest'altra condotta strategica attiene ad una possibilità di internazionalizzazione delle imprese attraverso l'instaurazione di network al fine di promuovere eventi, come la partecipazione a manifestazioni fieristiche e consorzi, soprattutto, attraverso il ricorso a canali attivati, eventualmente da attori istituzionali per mezzo di accordi bilaterali, imprese e istituzioni locali allo scopo di rendere più agevole l'ingresso nei mercati esteri.

Diversi sono gli autori che hanno analizzato le interazioni ricorrenti tra attori istituzionali e tessuto imprenditoriale, circa il ruolo rivestito dalle politiche attive per l'internazionalizzazione dei territori e il modo in cui poi queste vengono formulate e attuate dai policy maker (Paoli, 1999; Bellini, 2000; Vaccà e Varaldo, 2000; Kohli, 2004).

Ad esempio, già Noble (1998) sosteneva l'importanza della creazione di consorzi allo scopo di promuovere l'internazionalizzazione, la ricerca e lo sviluppo, oltre che, per facilitare la creazione di imprese conferendo, allora, all'attore pubblico un ruolo di primo piano nella predisposizione delle policy del tipo *picking the winner*. Le imprese che volessero affacciarsi con propri investimenti sul mercato internazionale, non solo dovrebbero allinearsi al vantaggio comparato del paese, in modo tale che i costi dei fattori produttivi siano i più bassi possibili, ma dovrebbero anche poter sostenere i costi di transazione e quelli connessi alla *liability of foreignness* tra i più bassi possibili, dunque, proprio per mezzo dell'azione mediatrice e di buon coordinamento messa in campo, ad esempio, dagli attori istituzionali.

Tra gli altri attori istituzionali che possono avviare accordi, alleanze, partnership strategiche e avere un ruolo attivo di promozione e sviluppo sul piano internazionale ci sono poi le varie associazioni di categoria (Chetty e Blackenburg-Holm, 2000; Bertoli e Bertuzzi, 2002; Depperu et al., 2009), come quelle degli imprenditori che attraverso i consorzi incoraggiano le imprese alla partecipazione e all'organizzazione di eventi fieristici, alla creazione di centri di ricerca e formazione professionale, alla promozione di poli sinergici per lo sviluppo o di reti di imprese, oltre che, essere di aiuto all'identificazione di quei settori e mercati in cui sia conveniente per le imprese internazionalizzarsi (Francioni *et al.*, 2012).

Dunque, istituzioni dotate di una buona visione strategica possono essere fondamentali per promuovere nel lungo periodo l'innesto delle imprese lungo i sistemi di divisione internazionale del lavoro (Doner e Schneider, 2000) e per la formazione di eventuali cluster distrettuali territorialmente radicati, in cui poter accresce il know-how detenuto (Krugman, 1998; Porter, 2003; Zeng, 2015).

Le associazioni di imprese possono, ad esempio, progettare e monitorare programmi di formazione dei lavoratori e identificare quali competenze mancano alla forza lavoro per lo sviluppo delle forme di produzione distrettuali (Perez-Aleman, 2000; Guercini e Woodside, 2012).

I mercati emergenti in cui le istituzioni stanno assumendo un ruolo attivo nella definizione delle politiche industriali attraverso un policy-mix di iniziative con gli imprenditori possono risultare, allora, più attraenti alle imprese che decidono di approcciare i mercati internazionali (Cammett, 2007).

Dunque, adeguate policy poste in essere da istituzioni strategicamente lungimiranti sono tanto più necessarie nell'era del quarto capitalismo imprenditoriale, in quanto la costante ricerca dell'innovazione e dell'internazionalizzazione per il miglioramento della produttività sembrano alla base dell'odierna competitività della media impresa industriale (Castellani e Zanfei, 2007; Kafouros *et al.*, 2008; Prashantham, 2008; O'Cass e Weerawardeba, 2009; Cerrato e Depperu, 2010; Kylaheiko *et al.*, 2011).

3.4 La core-competence and capability investment strategy

Quest'ultima modalità attiene all'investimento in formazione e all'apprendimento di *skill* specifiche poi detenute da manager o particolari personalità dotate di una sensibilità *captive* che vanno a collocarsi nei mercati fungendo, allora, da riduttori dell'incertezza percepita.

In altre parole, la strategia d'internazionalizzazione delle PMI è fortemente influenzata dalle caratteristiche personali e dagli atteggiamenti assunti dagli imprenditori, che stanno alla base di processi decisionali innovativi (Preti *et al.*, 2005; Guercini, 2005; Pedrini e Dal Bianco, 2007; Bortoluzzi e Balboni, 2011; Ferrero *et al.*, 2012; Vignola e Marchi, 2012; Francioni, 2016).

La capacità degli imprenditori di intraprendere comportamenti innovativi dipende non solo dall'ambiente competitivo, ma anche dalle caratteristiche e dai tratti della loro personalità costruita nel tempo attraverso la formazione, oltre che dall'estroversione, dall'apertura a nuove esperienze, dal rispetto delle diversità culturali e delle tradizioni (Frimousse *et al.*, 2012; Omri e Becuwe, 2014). L'imprenditore dovrebbe possedere un insolito mix di competenze e capacità personali, come intraprendenza e autostima, oltre ad una certa dose di aggressività, tanto da giustificare l'internazionalizzazione più come un appagamento personale (Prefontaine e Bourgault, 2002) o un momento di apprendimento e di fronteggiamento del rischio (Pedrini e Dal Bianco, 2007; Bortoluzzi e Balboni, 2011; Vignola e Marchi, 2012), piuttosto che essere dettata da logiche di profitto.

I processi decisionali nelle PMI sono in gran parte informali e altamente personalizzati, pertanto, l'imprenditore farà molto affidamento sulla sua capacità di supervisione effettuerà numerosi viaggi nei mercati esteri attivando forme originarie di apprendimento dal mercato (Sadler-Smith *et al.*, 2001).

D'altro canto, paradossalmente, le imprese dei mercati emergenti possono trasformare lo svantaggio derivante dall'operare in contesti caratterizzati da ambienti istituzionali deboli in un vantaggio competitivo quando queste investono in altri mercati aventi caratterizzazioni simili ed in cui le condizioni per una buona governance sono altrettanto ostiche (Cuervo-Cazurra e Genc, 2010; Luiz e Stephan, 2012). Allora, la formazione di elevate professionalità nei mercati sviluppati, poi detenute da individui di nazionalità estera, possono giocare un ruolo molto importante per lo sviluppo dei loro paesi. Potendo godere questi di una posizione particolarmente favorevole, possono fungere da *link*, ad esempio, nella stipula di accordi commerciali o nell'intrapresa di investimenti diretti per la costituzione di start-up o di fondi d'investimento, come lo sono stati i professionisti cinesi e indiani trapiantati nella Silicon Valley (Saxenian, 2006).

In riferimento ai mercati emergenti delle'Africa, in maniera simile, sembra ragionevole ritenere che studenti africani formatesi nei paesi sviluppati possano fungere da risorsa preziosa in un'ottica di marketing territoriale ed essere, allora, degli *hub* che facilitano l'instaurazione di relazioni reciproche tra imprese e attori istituzionali (Mtigwe, 2005).

Ad esempio, il mantenere ed il valorizzare a questo modo nel continente africano il capitale umano dotato di un'alta formazione e dall'elevato profilo professionale potrebbe contribuire notevolmente a ridurre il problema della fuga dei cervelli, che invece l'Africa nel suo complesso sta da tempo affrontando (Mpinganjira, 2011).

Un altro esempio del loro impiego può essere quello di fungere da riduttori dell'incertezza percepita dalle PMI che vogliono internazionalizzarsi e che sono, allora, alla ricerca di professionalità specifiche con cui

intrattenere rapporti di collaborazione. Le imprese italiane in Algeria, ad esempio, sono consapevoli che un'adeguata formazione dei manager locali permetterà loro di superare le barriere culturali e di predisporre un ambiente di lavoro privo di equivoci. Mostrando rispetto delle diversità, possono riuscire ad instaurare dei buoni rapporti commerciali. La cultura algerina che è di derivazione islamica, sembra caratterizzarsi per un basso grado di orientamento dei lavoratori alla performance e da un basso grado di assertività delle prestazioni, per cui, vi sono una serie di forti implicazioni per i manager italiani, che devono, allora, ricercare il massimo del coinvolgimento possibile dai dirigenti locali al fine di superare queste avversità contestuali (Calza *et al.*, 2010).

In definitiva, questa strategia mira a conseguire una migliore *customer satisfaction* dei bisogni e comprensione del mercato target (Cavusgil e Godiwalla, 1982; Knight, 2000; Valdani e Bertoli, 2006; Bertoli, 2010).

4. Conclusioni e implicazioni

4.1 Considerazioni conclusive

I cambiamenti nell'economia mondiale, in particolare, a seguito: (i) *de*l crescente potere delle multinazionali, (ii) del*l'es*pansione del commercio estero e (iii) de*lla d*ivisione su scala internazionale del lavoro lungo le global v*alue chain, hanno* concorso, in definitiva, allo sviluppo di un complesso e interconnesso sistema socio-economico. Questo fa sì che, oggi, la globalizzazione vada considerata almeno lungo tre direttrici: economica, culturale e politica (Abecrombie *et al.*, 2000).

La principale caratteristica dell'attuale fase, allora, è la molteplicità di collegamenti e interconnessioni innescate dai paesi, ma più in generale dal tessuto imprenditoriale che opera nel sistema socio-economico mondiale che, paradossalmente, ha la tendenza a concentrare le produzioni sempre di più in *cluster* globalmente localizzabili (Krugman, 1998; Porter, 2003).

Dunque, "globalizzazione" e "localizzazione" sono due fenomeni complementari dalla comune matrice. Nel senso che ogni economia nazionale è parte integrante di un sistema economico e sociale che è maggiore della somma delle parti che lo compongono e che si regge su di una moltitudine di interconnessioni tra paesi (Dunning *et al.*, 2007).

Le imprese che riescono a beneficiare della localizzazione in particolari regioni o cluster, possono intrattenere importanti collegamenti con i loro fornitori e clienti, condividere informazioni, sprigionare esternalità positive o collaborare con centri di ricerca locali (Castellani *et al.*, 2013). Questi luoghi possono divenire degli *hub* globali di addensamento ed apprendimento della conoscenza (Markusen, 1996) o rappresentare dei particolari

learning markets scientifico-tecnologici o di marketing (Ferrucci, 2000).

L'accesso a tali regioni o cluster consente alle imprese che vi accendono di accrescere lo stock delle competenze distintive (Hamel e Prahalad, 1990) e di valorizzare al massimo le risorse specifiche di cui sono dotate, come avviene nelle SEZ o nelle città globali.

Le *Special Economic Zone* (SEZ) sono, allora, delle aree definite geograficamente, gestite ed amministrate come entità socio-economiche a se stanti allo scopo di promuovere gli investimenti esteri ed accrescere i livelli di occupazione nel settore manifatturiero (Zeng, 2015). In altri termini, promuovono il posizionamento del sistema industriale dei paesi lungo le *global value chain* e accrescono la sua attrattività e competitività nel mercato internazionale. Le imprese che vi si collocano all'interno possono beneficiare di un ambiente *duty-free* in cui è agevolato il *know-how* ed il *technology transfer*. Le città globali, invece, rappresentano un'opportunità per ridurre la *liability of foreigness* e limitare sia la complessità sia l'incertezza percepita nelle operazioni con l'estero, inoltre, hanno il vantaggio di offrire connettività internazionale alle imprese (Goerzen *et al.*, 2014; Santangelo, 2018). Le città globali offrono dei vantaggi da localizzazione ed attraggono investimenti di tipo *market-seeking*. Quelle di dimensioni maggiori poi attraggono pure più talenti e menti creative (Florida, 2005). Pur tuttavia, le città possono anche presentare problemi di eccessiva agglomerazione spaziale e in generale di congestione, che ne aumentano i costi di transazione e ne peggiorano la qualità della vita.

Dunque, l'accelerazione impressa negli ultimi trent'anni alla globalizzazione sta trasformando la conformazione socio-economica delle principali economie sviluppate ed emergenti, che ormai si apprestano, allora, ad entrare in una nuova fase della mondializzazione, i cui risvolti sul piano politico, culturale ed economico saranno variegati (Abecrombie *et al.*, 2000) e che sembrano ormai interessere in particolare le nuove economie emergenti come lo sono quelle dell'Africa (Ferrucci e Paciullo, 2015; Tassinari *et al.*, 2018). Pur tuttavia, i mercati emergenti, sovente, incorrono in taluni riscontrabili elementi di criticità (Singh e Jun, 1999; Bende-Nabende, 2002) quali, *(i)* una marcata instabilità del quadro politico e sociale, *(ii)* un mercato del lavoro non adeguatamente regolamentato o sprovvisto completamente di norme per la tutela dei lavoratori, *(iii)* delle difficoltà nella logistica dettate

da carenze spesso di natura infrastrutturale, *(iv)* le transazioni commerciali sono rese difficoltose dalla totale assenza di codici di condotta e di *best practices* difficilmente generalizzabili.

Allora, nel mercato così globalizzato, l'internazionalizzazione attivata delle PMI necessità di un adeguato sistema di interlocutori istituzionali capaci di fungere da integratori di conoscenza, in grado di assicurare un'esaustiva ed adeguata rappresentatività diplomatica al sistema Italia, capaci di basare le proprie azioni su multilateralismo e su cooperazione, oltre che essere in grado di predisporre dei validi *captive front-desk* che siano di supporto alle imprese che si vogliono internazionalizzare.

Queste preoccupazioni, tanto che siano *soft* o *hard*, hanno come effetto quello di aumentare il rischio percepito dagli investitori, dunque, in ultimo aumentano i costi delle transazioni e della *liability of foreignness* delle operazioni di business. Infatti, potrebbe accadere che siano maggiori i costi, tanto effettivi che potenziali, rispetto ai benefici ricavati, ad esempio, dal voler solo ricercare manodopera a costi vantaggiosi nei mercati emergenti o in altri paesi dal basso reddito pro-capite. Inoltre, questi mercati emergenti sono caratterizzati anche dal sopravanzare di una nuova calasse media che potrebbe consentire alle imprese di ritrovare alcune delle condizioni di consumo che hanno permesso lo sviluppo del business nei loro mercati domestici di riferimento (Florida, 2005; Varaldo et al., 2010; Antonelli e Viganò, 2012; Guercini e Runfola, 2016).

4.2 Implicazioni

L'implicazione di questo lavoro è duplice. In primo luogo, si pone un intento di tipo pratico e di portare a conoscenza del management e degli imprenditori che vogliono affacciarsi con le loro imprese nei mercati emergenti tutta una serie di possibili condotte strategiche percorribili nell'attuale scenario globalizzato ed in funzione di alcuni fattori connessi alla distanza interculturale che marcatamente caratterizzano questi mercati. Il che può significare praticamente per manager e imprenditori il poter predisporre di una sorta di bussola per prendere decisioni con un maggiore grado di responsabilità e consapevolezza. Allora, per affrontare i costi e i rischi connessi alla *liability of foreignness*, la percezione della distanza psichica prodotta dalla non conoscenza di contesti culturali differenti, si richiede una *market-experience learning* che non sempre le imprese più piccole riescono direttamente a conseguire.

In secondo luogo, vuole essere di sostegno alla comprensione dei framework teorici con cui analisti e ricercatori possono guardare al processo d'internazionalizzazione delle PMI nei mercati emergenti e di cui possono avvalersi anche per delle successive analisi empiriche.

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REVIEW: G. CORBETTA E P. MOROSETTI, LE VIE DELLA CRESCITA. CORPORATE STRATEGY E DIVERSIFICAZIONE DEL BUSINESS, EGEA, MILANO, 2018.

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Abstract

The book analyzes the ways of growth that can be undertaken by multibusiness-type companies, highlighting the advantages and disadvantages of the multiple alternatives, the resources, and capabilities necessary to support these paths, as well as the numerous pitfalls not to be underestimated. For this reason, the volume represents a useful tool, a reference benchmark, also for micro and small business entrepreneurs interested in starting development paths, often unavoidable in the current globalized context of the digital economy, to increase the chances of long-term survival.

Uno dei tradizionali dilemmi strategici delle imprese di minore dimensione è quello di decidere se crescere la dimensione verticale ed orizzontale delle attività, ovvero non crescere, stabilizzandosi su livelli dimensionali non eccessivamente impegnativi sotto il profilo organizzativo e manageriale, oltre che finanziario. Quando le imprese optano per la crescita, si trovano di fronte a molteplici alternative, che vanno attentamente valutate e ponderate, richiedendo adeguate conoscenze competenze di tipo manageriale ed economico finanziarie. Il libro di Corbetta e Morosetti, approfondendo il tema delle decisioni di *corporate strategy* con l'intento di promuovere percorsi di crescita di successo, analizza le vie della crescita che possono essere intraprese da aziende di dimensione almeno media, di tipo multibusiness, mettendo in evidenza i vantaggi e gli svantaggi delle molteplici alternative, le risorse e le capacità necessarie a supportare tali percorsi, nonché le numerose insidie da non sottovalutare. Per questo il volume rappresenta uno strumento utile, un benchmark di riferimento, anche per imprenditori di micro e piccole imprese interessati ad avviare percorsi di sviluppo, spesso ineludibili nell'attuale contesto globalizzato dell'economia digitale, per accrescere le probabilità di sopravvivenza a lungo termine.

Nelle prime pagine del volume, dopo aver chiarito la differenza tra strategia competitiva e corporate strategy, specificando che la corporate strategy è la via attraverso la quale raggiungere e mantenere un vantaggio aziendale creando valore economico, si sottolinea come le pratiche di Corporate Social Responsibility (CSR) siano entrate a far parte a pieno titolo delle strategie corporate delle imprese multibusiness o dei gruppi d'impresa. Molteplici ricerche empiriche infatti mostrano che l'orientamento alla sostenibilità promuove la creazione di valore nel lungo termine. Tuttavia, il grado di integrazione delle attività di CSR nella strategia dipende dall'orientamento dei vertici aziendali definendo cinque stadi evolutivi della CSR: CSR informale, CSR corrente, CSR sistematica, CSR innovativa e CSR dominante.

Le decisioni di crescita riguardano tre elementi fondamentali che sono approfonditi nel volume: dove crescere, perché crescere e come crescere.

L'opportunità di trarre vantaggio dallo sfruttamento di sinergie, intese come vantaggio economico derivante dalla gestione congiunta di più business, giustifica la crescita che si realizza mediante l'investimento nei business in portafoglio e l'ingresso in nuovi business. Le sinergie sono classificabili in finanziarie ed operative: le prime afferiscono alla gestione finanziaria e a quella fiscale, mentre le seconde nascono dalle relazioni tra le attività della catena del valore dei vari business. Tali sinergie promuovono la riduzione dei costi unitari grazie allo sfruttamento di economie di scala, economie di saturazione del-

la capacità produttiva, economie di esperienza, di raggio di azione ed economie nei costi di transazione. Ovviamente, occorre prestare molta attenzione alle sinergie negative che derivano da limiti ed errori della crescita. Potrebbero manifestarsi diseconomie di scala e perdita di flessibilità, potrebbero essere compiuti errori di sovrastima delle sinergie positive, sottostima degli investimenti di adattamento, nonché insidie connesse all'integrazione verticale.

È proposto un metodo per definire il *core* business di un'impresa multibusiness, indicando due criteri da soddisfare: la generazione di sinergie operative di rilievo e la possibilità di approfittare di opportunità di crescita redditizie. L'utilità dell'individuazione del *core* business risiede nel supportare la leadership aziendale nelle scelte di allocazione delle risorse.

La crescita con approccio sinergico-organizzativo si distingue in opzioni di rinforzo operativo, espansione correlata o esplorazione correlata. È interessante notare che nel passaggio dal rinforzo operativo all'espansione correlata e poi all'esplorazione correlata, la possibilità di sfruttamento delle risorse disponibili diminuisce, mentre la necessità di sviluppare nuove risorse cresce e conseguentemente aumenta anche il livello di rischio.

La relazione tra il grado di diversificazione e la performance d'impresa è incerta. Gli studi evidenziano tre tipi di relazione. Il modello *value-enhancing* mostra una relazione positiva tra diversificazione e performance poiché produce vantaggi di mercato, economia di scala e di scopo, vantaggi a livello di mercato dei capitali e riduzione del rischio o della volatilità dei tassi di rendimento. I modelli *inverted-U* mettono in evidenza una relazione positiva contraddistinta da sinergie e vantaggi sino ad un certo livello di diversificazione, oltrepassato il quale la relazione diventa negativa; inoltre, si precisa che i vantaggi competitivi riguardano esclusivamente la diversificazione correlata. Il terzo modello detto *value-destroying* dà rilievo ad una relazione negativa tra diversificazione e performance, dovuta a costi di influenza, ad un mercato dei capitali interno inefficiente e a problemi di agenzia.

Le molteplici alternative realizzative della crescita sono illustrate dall'albero della crescita contraddistinto da sviluppo interno e sviluppo esterno. Lo sviluppo interno è favorito da innovazioni di prodotto o di processo, dall'export, dalla costituzione di filiali all'estero e da iniziative di *corporate venturing* che promuovono lo sviluppo imprenditoriale. Tra i vantaggi dello sviluppo interno, si citano l'impegno finanziario graduale, l'apprendimento strategico e organizzativo, l'allineamento culturale e la possibilità di controllare il processo; sono svantaggi invece la lentezza dell'operazione, la possibile mancanza di competenze di sviluppo, il rischio di ostacoli organizzativi interni o la mancanza di efficienza.

Lo sviluppo esterno si realizza attraverso alleanze non-equity, alleanze equity, acquisizioni e fusioni. Le alleanze si caratterizzano per la rapidità dell'operazione, l'accesso a risorse complementari ed un impegno finanziario limitato a cui fanno da contrappeso i rischi contrattuali, il limitato controllo del processo, la rigidità organizzativa e il rischio di apprendimento asimmetrico. I vantaggi relativi ad acquisizioni e fusioni sono rappresentati dai tempi rapidi, dall'esclusività del rapporto con l'impresa target, dalla possibilità di controllare il processo e dall'eliminazione di concorrenti; i principali svantaggi sono riconducibili all'importante esborso finanziario, alla possibilità di acquisire risorse non necessarie e alla difficoltà di integrazione post-acquisizione.

La rilevanza del fenomeno di M&A è indubbia mentre la relazione esistente tra tali operazioni e le performance che producono è tuttora incerta. Tuttavia, alcune evidenze empiriche sembrano essere consolidate in letteratura. Ad esempio, i tassi di successo di acquisizioni, alleanze ed operazioni di sviluppo interno sono simili; le imprese acquirenti e gli azionisti, in media, non traggono benefici economici dall'acquisizione; la performance delle operazioni di M&A ha una forte varianza. Interessante è la curva di apprendimento nelle operazioni di M&A secondo la quale la performance peggiora sino all'ottava/nona acquisizione per poi iniziare la fase di recupero.

L'importanza delle alleanze strategiche è aumentata negli anni a causa della globalizzazione, della necessità di investimenti crescenti per lo sviluppo dei prodotti e dei significativi cambiamenti tecnologici. Però il tasso di fallimento delle alleanze sembra essere molto alto, addirittura pari al 70 per cento secondo alcuni studiosi. Le ragioni dell'insuccesso di un'alleanza strategica sono numerose, e tra di esse vi è il disallineamento strategico tra i partner, l'incompletezza dell'accordo, l'asimmetria informativa, la difficoltà di integrazione culturale e la scelta errata del team che gestisce l'alleanza.

Se Friedman ritiene che il processo di globalizzazione sia concluso e contraddistinto da un appiattimento delle differenze tra i vari Paesi, molte imprese invece hanno dovuto adattare il proprio sistema di offerta alle specificità dei mercati esteri a causa di differenze culturali, amministrative, geografiche ed economiche. La selezione del mercato geografico, la modalità di entrata *equity* o *non-equity*, nonché l'entità delle attività da svolgere all'estero rendono i percorsi all'estero complessi da gestire e spesso con performance inferiori alle attese. I percorsi della crescita sono necessariamente influenzati dagli assetti proprietari e dalle scelte di corporate governance. Esiste infatti una relazione di causalità tra proprietà, governance e strategia (PGS). La proprietà e la governance, nelle loro svariate combinazioni, a seconda delle condizioni di

contesto, avrebbero un'influenza sulla strategia che, a sua volta, produrrebbe effetti sulla performance aziendale. In letteratura, il modello di grande impresa ad azionariato diffuso non è più considerato superiore agli altri modelli d'impresa. Anzi, la diffusione di start-up ad alta crescita ma con dimensione contenuta e la continuità con successo del modello d'impresa familiare sono esempi dell'esistenza di una varietà di assetti proprietari e di governance.

In tutti i modelli d'impresa, emerge il fabbisogno di leadership che nasce dalla necessità di gestire il cambiamento, ossia di rivedere periodicamente la strategia e l'organizzazione. Nelle piccole imprese la dimensione ridotta limita il fabbisogno di leadership a una o poche persone. Le ambizioni, i valori e i modelli mentali dei leader contano ed influenzano le scelte, anche strategiche. Il leader oggi non è più un eroe solitario, ma è colui che sa scegliere i propri collaboratori, creare organizzazioni sociali coese, promuovere lo sviluppo della capacità di apprendimento e favorire la diffusione di valori comuni e condivisi. La leadership negativa va evitata attraverso un adeguato sistema educativo e formativo, in quanto rappresenta sempre una minaccia.

Il volume è interessante perché è arricchito da tanti esempi e da materiale di approfondimento disponibile on line dedicato a casi aziendali. Inoltre, sottolinea sistematicamente le insidie che caratterizzano le vie della crescita e che occorre prudentemente considerare per evitare che le strategie di crescita possano distruggere valore anziché crearlo.

Per questo la lettura del libro è adatta ad imprenditori e manager, consiglieri di amministrazioni non esecutivi, consulenti direzionali e di corporate finance, analisti finanziari, studenti universitari e partecipanti ai corsi di formazione manageriale.

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