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Collaborative innovation in the family SME: conceptualization, goals, and success factors

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Abstract In a constantly changing environment, collaborative innovation enables the knowledge creation and new product designs, the improved efficiency of the production process, and the reduction of time-to-market. However, the achievement of such results in the family SME depends mainly on the unique characteristics of this type of organization, which in turn, represent the most widespread kind of business worldwide. Therefore, the objective of this article is to analyze how the composition of the management team, the factors related to the capabilities –cognitive factors, absorptive capacity, and innovative trajectory- and the attitudes –preservation of SEW and intra-organizational behavior- of the decision makers, mainly influenced by the family, affect when designing and implementing collaborative innovation processes in a successful way.

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PALABRAS CLAVE
Innovación colaborativa; PYME familiar; capacidades innovadoras; actitudes innovadoras; equipo directivo

La innovación colaborativa en la pyme familiar: conceptualización, objetivos y factores de éxito

Resumen En un entorno en constante cambio, la innovación colaborativa permite la creación de conocimiento y de nuevos diseños, la mejora de la eficiencia del proceso de producción y la reducción de tiempo para la comercialización de los nuevos productos. Sin embargo, la consecución de tales resultados en las pymes familiares depende en buena medida de las características propias de este tipo de organizaciones, que a su vez representan el tipo de empresa más extendida a nivel mundial. Por lo tanto, el objetivo de este artículo es analizar como la composición del equipo directivo, los factores relacionados con la capacidad –factores cognitivos, capacidad absorptiva y trayectoria innovadora- y las actitudes –preservación del legado socio-emocional y comportamiento intra-organizacional- de los decisores, en buena medida influenciados por la familia, afectan al momento de diseñar e implementar los procesos de innovación colaborativa de manera exitosa.

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Introduction

In today´s dynamic and global environment, in which the demands of the different agents that intervene in the market change at a dizzying speed and the development of new technologies is continuous, companies are forced to adapt to new scenarios to offer innovative answers (Paunov, 2012). It is in this context that one can easily understand the reason why studies on innovation processes have boomed in recent years (Holt and Daspit, 2016; Kraiczy, Hack, and Kellermans, 2014). Far from being conceived as a linear, delimited and automatic process, innovation is considered as a changing process, with no apparent limits and, above all, dynamic (Chang, Hughes, and Hotho, 2011). This process allows the experience and knowledge of different people and organizations to interact, that is to say, that the know-how flows between the various agents, favoring its feedback (Jensen, Johnson, Lorenz, and Lundvall, 2007). Thus, the mechanisms that allow interaction within the organizations themselves (collaboration between different units, or the participation of the company's personnel in the innovation processes) and the networks with which the company relates to its environment (other companies, universities, research, and technology centers) are gaining increasing prominence (Öberg, 2016). In this context, De Massis, Frattini, and Lichtenthaler (2012) argued that given the interaction between agents has a significant impact on the future of innovation, and collaborative innovation will have a very prominent role soon, both internally (intra-organizational collaboration) and externally (inter-organizational collaboration).

Collaborative innovation is defined as voluntary agreements among independent firms, who exchange and share capital, information, knowledge, and technology to achieve a common innovation goal (Feranita, Kotlar, and De Massis, 2017; Un, Cuervo-Cazurra, and Asakawa, 2010). It is a particularly interesting strategic option for small and medium-sized enterprises (SMEs) since it enables the development of new resources and capabilities to maintain and improve their competitiveness in the market (Muñoz-Bullón, Sanchez-Bueno, and De Massis, 2019). Besides, it allows to have resources that could not be obtained otherwise, or that would imply an excessive cost, and all this without having to give up the desire to be creative and innovative (Miles, Miles, and Snow, 2005). However, this activity is not without risks, given the complexity of the process and the numerous agents and factors that intervene. This complexity is accentuated by the nature of family-owned SMEs, which represent between 80-90% of commercial companies and are responsible for 70% of the employment generated in the private sector (Instituto de Empresa Familiar de España, 2016). In this regard, the lack of studies on collaborative innovation in the field of family businesses is particularly striking (Casprini et al., 2017; De Massis, Frattini, and Lichtenthaler, 2012; Feranita et al. 2017). Thus, the research carried out on the collaborative innovation process has focused mainly on the study of large companies (Spithoven, Vanhaverbeke, and Roijakkers, 2013), leaving the smaller ones relegated to a second stage, even though these smaller companies, as previously stated, represent the critical element of economic and social development.

For all the above reasons, this article focuses on the collaborative innovation processes in the family SME. For this purpose, a conceptualization of this phenomenon is presented by analyzing the factors that affect the success of the family SME when dealing with collaborative innovation processes, as well as the perceived benefits. In this way, this article makes at least two theoretical contributions. Firstly, a contribution to the innovation literature is formed by carrying out a conceptualization of the collaborative innovation process, aiming to deepen in its solid foundation to delve into and inspire a more rigorous approach. Secondly, a comprehensive approach of collaborative innovation processes in the context of the family business is offered, by identifying their distinctive characteristics and how such can influence this type of strategy.

From a practical point of view, this study also contributes to those responsible for designing and executing public policies in the field of innovation. It is expected for public institutions to act as facilitators of business innovation processes (Kontinen and Ojala, 2011), with the difficult task of distributing the limited public resources among companies that want to pursue innovative activities (Zúñiga-Vicente, Alonso-Borrego, Forcadell, and Galán, 2014). In this regard, two of the main distinctive features of family businesses are their long-term orientation and their close ties with the communities where they are based (Lumpkin, Brigham, and Moss, 2010), the fact of highlighting the benefits that family SMEs attain from innovation processes enables public institutions to assess the effect of the invested public resources more precisely.The remainder of this article is structured as follows. Next section describes a conceptualization of collaborative innovation, highlighting which are the objectives sought through the implementation of this type of processes. Subsequently, the main distinctive characteristics of family SMEs are briefly discussed. Afterward, the different elements that make up the theoretical model of collaborative innovation processes in family SMEs are thoroughly explained, focusing on the composition of the management team as well as on the differential factors related to capacity and attitude of family SMEs. In the last section, the contributions of this study are summarized, and a series of relevant aspects are outlined for future studies.

Collaborative Innovation

Conceptualization

Collaborative innovation is defined as the creation of innovations beyond the limits of the company, and even the industry or sector, through the exchange of ideas, knowledge, experiences, and opportunities (Ketchen, Ireland, and Snow, 2007). It refers to a process of creation and development that involves multiple actors, from outside and from within organizations, working together in order to generate ideas, concepts or solutions in the form of product, process or service (Skippari, Laukkanen, and Salo, 2017) for business or for their own use (Haefliger, 2012). During its development and regularly, the collaborating agents reveal the results of their individual and collective efforts with the agreed partners (Baldwin and von Hippel, 2011).

Social capital is defined by Bourdieu (1986: 248) as "the sum of real or potential resources linked to the possession of a lasting network of relations of knowledge and mutual recognition." It is considered a key element for strategic collaborations, increasing the probability of successful collaborations due to the trust and willingness to share resources among the partners (Hitt, Ireland, Camp, and Sexton, 2001; Nahapiet and Ghoshal, 1998; Siebert, Kraimer, and Liden, 2001). In this sense, Galán and Castro (2004: 108) pointed out that "confidence can lead to joint efforts and, for this reason, it is considered as an antecedent and an extraordinary lubricant of collaboration." Also, they added that "when two units begin to trust one another the willingness to share resources increases without worrying about the advantages that the other party will incur."

In this way, the existence of inter-organizational trust implies excellent coordination of tasks among the companies that sustain relationships or transactions, providing relevant knowledge about their norms, routines, and procedures (Gulati, Nohria, and Zaheer, 2000). In this regard, Davis and Eisenhardt (2011) emphasized the significant interactions among the several members of the supply chain, which is one of the main productive ecosystems where collaborative innovation occurs, through the search for complementary partners with the resources needed (Venkatesh and Yadav, 2011).

Objectives of collaborative innovation

Companies committed to collaborative innovation pursue several specific goals that can be grouped in three major groups: enabling knowledge creation and new product designs, improved efficiency of the production processes, ad reduction of time-to-market (Skippari et al., 2017).

Enabling knowledge creation and new product designs

Collaboration among different organizations or agents in the innovation chain, from the idea generation to its conversion into a product or service, stimulates the cross-fertilization of shared knowledge and experiences (Swink, 2006), which leads to a higher number of initiatives on new products or services (Faems, van Looy, and Debackere, 2005). These benefits can be especially valuable in the case of technological innovations by facilitating staff involved in R&D activities with greater access to information and experiences (Roy and Sivakumar, 2010). For example, the collaboration between different organizations increases the quality of product design solutions, thus increasing their attractiveness to customers (Skippari et al., 2017).

Collaborative innovation can also be exciting when companies interact with either potential or current customers (Haefliger, 2012). On this regard, one of the most novel phenomenon developed in recent years is the co-design of products, which is the result of the collaborative work between companies and consumers (Fuchs and Schreier, 2011). This collaboration allows consumers to benefit from improvements in the products they usually consume, ensuring that these products will have better acceptance in the market, thus reducing the likelihood of rejection by better understanding what customers value (Tsai, 2009). In this search and identification of new markets, it is also worth noting that customized products and services tailored to niche audiences, which are willing to pay more if they can design the product themselves (Franke, Schreier, and Kaiser, 2010).

Improved efficiency of the production process

Collaborative innovation can also be beneficial concerning efficiency and cost reduction in the development and production stages (Min et al., 2005). Thus, the collaboration between different companies allows managing learning and knowledge of the product creation processes (Öberg, 2016). A partnership facilitates cost reduction and enables the maximization and shared use of product platforms, global product

designs, and generations of such products, among others (Swink, 2006).
A clear example of this practice is that carried out by the Spanish family supermarket chain Mercadona with its suppliers (Negocios en Navarra, 2016). Thus, Mercadona establishes collaborative ties with its inter-suppliers both in processes (reducing electricity and water consumption, minimizing waste, and optimizing logistics) and products. Mercadona, aware of its customers' needs and tastes, transfers them to its suppliers specialized in manufacturing, with whom it maintains stable and long-term commercial relationships. Thus, this joint consideration provides richer insights on network innovation output, producing in 2015 alone more than 100 new process improvements and at the same time, establishing solid foundations to collaborate in product and process development shortly.

Reduction of time-to-market

Collaborative innovation can also result in a reduction in the time needed to commercialize a new product, a factor that allows companies to extend their market participation (Davis and Eisenhardt, 2011). Multi-organizational innovation teams tend to find solutions more quickly since they have a full range of knowledge sources (Ganesan et al., 2009), which allows faster and more numerous iterations of designs (Holmen, Aune, and Pedersen, 2013). On the other hand, collaboration encourages the reuse and better use of previous design and development work (Street and Cameron, 2007). Besides, the partnership allows the development process to begin without the need to fully complete the last phase design since the most relevant information is accessible to those responsible for making decisions during the product development phase (Swink, 2006).
Finally, although collaborative innovation, in general, leads to the development of new products and services (Rumball, 2007), how the process is developed and even the results acquired vary depending on the type of company that carries it out (Filip, Hansen, and Frölunde, 2016). SMEs have fewer resources than necessary to carry out basic research (Roxas, Piroli, and Sorrentino, 2011). Thus, collaborative innovation processes of SMEs often include as collaborating agents to universities, vocational training institutes and communities, groups and business clusters arising around some of the aspects to be developed as well as to different companies involved in the innovation process (Von Hippel and Von Krogh, 2003).

The Family SME and its unique characteristics

A family business is identified as such by the participation of the family in the company. The family influence is determined regarding ownership, management, and government (Steiger, Duller, and Hiebl, 2015; Mazzi, 2011). In addition to family involvement, the behavior and desire to be a family business is undoubtedly another distinguishing feature of this type of organization (Dawson and Mussolino, 2014; Chrisman, Chua, and Sharma, 2005). In this sense, one of the most recognized definitions of family business is the one proposed by Chua, Chrisman, and Sharma (1999), as that entity where the government and management falls on a dominant coalition controlled by members of the same family or a small number of families, whose desire is the sustainable maintenance of the business for future family generations.
The actions of family businesses are based on the dynamic interaction between family and business subsystems with a transgenerational expectation; that is, a desire to keep the company under the family control throughout different generations (Anderson and Reeb, 2003; Habbershon, Nordqvist, and Zellweger, 2010), differentiating from nonfamily counterparts (Zellweger, Eddleston, and Kellermanns, 2010). Thus, family businesses tend to exhibit a clear long-term orientation in their strategic decisions (Le Breton-Miller and Miller, 2006). In this sense, Goel and Jones (2016) pointed out that the need to balance and align the interests of the family and the company means that family businesses have resources and unique governance that directly affects their strategic decision-making. The desire to maintain control of the company in the long-term can translate into a more conservative behavior to avoid risk exposure (Gómez-Mejía, Haynes, Núñez-Nickel, Jacobson, and Moyano-Fuentes, 2007). This fact is known in the literature as the desire to maintain the socio-emotional wealth (SEW), which is one of the priority objectives of family businesses. SEW refers to a set of intangible elements such as the feeling of belonging, the perpetuation of family values, the preservation of the family dynasty, or family altruism, among others (Gómez-Mejía et al., 2007).
The distinctive cultural elements of the family business, long-term orientation, and risk aversion as a result of their desire to preserve the socio-emotional wealth have a positive effect on strategic decision-making, and therefore, on the adoption of innovation strategies (Arzubiaga, 2019). These strategies are driven by the management team, who are usually influenced by the opinion of the family, given that family members are usually included in the top management team or the board of directors (Minichilli, Corbetta, and MacMillan, 2010). The

fact that the management team is composed of family and non-family members of different generations and that there might be managers who are also owners means that both businessand family objectives have to be considered simultaneously (Kraiczy et al., 2014; Zellweger, 2007).

Determining factors in collaborative innovation in the Family SME

The collaborative innovation process has a series of unique characteristics when it takes shape in the family SME. In line with the above, the factors related to the capabilities and attitude of these companies affect their collaborative innovation processes. Likewise, these factors are also influenced by the characteristics of the management teams, in which the familial element can have a significant influence (Rondi, De Massis, and Kotlar, in press), farther in the case of SMEs given the limited number of personnel in the top management (Figure 1).

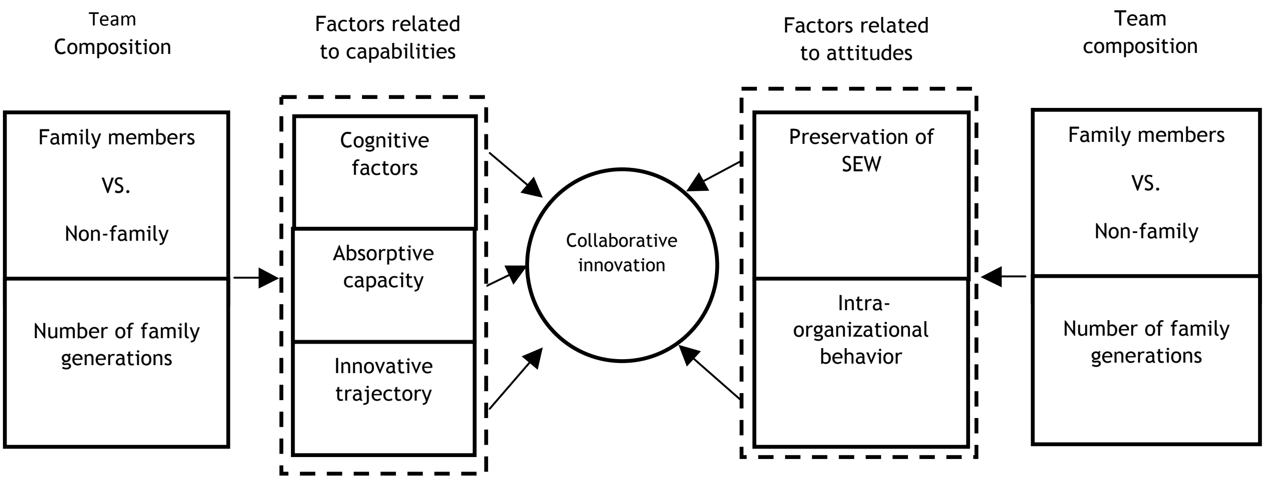

Figure 1 Factors related to the success of collaborative innovation in the family SME.

Based on the scheme presented in Figure 1, the following sections elucidate on each of the elements that contribute to and affect the collaborative innovation process of the family SME.

The management team composition

The top management team composition and its diversity are aspects with a strong influence on the behavior and decision-making of the organization (Ling and Kellermanns, 2010). In addition to the diverse elements common to any company, family SMEs have two diversity factors, which are considered unique and differentiated (Kraiczy et al., 2014): the ratio of family members in the management team and the number of generations involved in the management team (Arzubiaga, Maseda, and Iturralde, 2017).

Concerning the presence of family members in top management, their influence as a group stems from an educational base and common organizational culture, sharing experience, and knowledge acquired over time (Lozano-Posso and Urbano, 2017; Minichilli et al., 2010). Besides, they have unique values such as commitment, long-term orientation, and customer service, which gives them a more robust organizational culture and values (Chrisman, Chua, Pearson, and Barnett, 2012). However, a high percentage of family members in the management team can also minimize the broad-mindedness and knowledge of other organizations (Kraiczy et al., 2014), a pivotal point to achieve high efficiency in innovation processes. In this sense, the presence of non-family managers usually provides more diverse external knowledge and perspectives (Talke, Salomo, and Rost, 2010), due to their different managerial skills acquired outside the family business (Veider and Matzler, 2015) and better network contacts with external advisors. These advisors can provide experiences and technical knowledge in various areas (Classen, Van Gils, Bammens, and Carree, 2012), which can be vital to establishing relationships with third parties to design and implement collaborative innovation projects.

The number of family members can also affect the attitude of managers when making decisions about innovation in general (Minichilli et al., 2010), and collaborative innovation in particular (Magistretti, Dell'Era, De Massis, and Frattini, 2019). Thus, non-family managers may need to demonstrate that their employment is justified (Hiebl, 2015), so they will seek to increase their managerial impact and leave their professional imprint through the design and implementation of more risky projects (Casillas, Moreno, and Barbero, 2011). Also, this fact accentuates the difference in family members concerning the attitude toward risk, minimizing the risk of investment in innovation, with the ultimate goal of preserving the socioemotional wealth of the family in the organization (Gómez-Mejía et al., 2010).

Regarding the number of family generations involved in the top management team, such inter-generational presence is considered a vital diversity factor when making decisions about the innovation processes (Kellermanns and Eddleston, 2006). Thus, the involvement of different generations in the management team allows to diversify the knowledge as a result of the various educational backgrounds, experiences (Talke et al., 2010), different perspectives, and even, different network contacts (Chirico, Sirmon, Sciascia, and Mazzola, 2011). In this way, it is easier to identify the needs of new clients and markets, and the innovation processes can be more efficient by combining the new knowledge provided by the new generations with the tacit knowledge contributed by previous generations (Litz and Kleysen, 2001). However, knowledge combinations across different generations also require a flexible attitude that allows integrating this knowledge (De Clercq and Belausteguigoitia, 2015), shelving inter-generational tensions as to how to address the innovation in collaboration with third parties.

In short, the two primary sources of diversity in the management team composition play a prominent role in the factors related to the capabilities and attitudes of family SMEs when designing and implementing collaborative innovation processes.

Factors related to capabilities

The competence of the decision-making bodies in the strategic area is also of particular importance when launching innovation projects (Talke et al., 2010). Thus, in the field of collaborative innovation, cognitive factors stand out (Skippari et al., 2017), the absorption capacity (Filip et al., 2016) and the innovative trajectory (Hibbert and Huxham, 2010) as critical factors to success in collaborative innovation processes.

Cognitive factors

The cognitive factors of the agents involved in collaborative innovation processes play a crucial role in the design and development of innovations (Corsaro, Cantú, and Tunisini, 2012) and depend, to a large extent, on the knowledge acquired, the experiences lived and the unique social interactions experienced by individuals or teams (Marcel, Barr, and Duhaime, 2010).

As noted above, in family SMEs, most of the times, family members are responsible for leading and making decisions about aspects related to innovation (Sciascia, Mazzola, and Chirico, 2013). Usually, those family members share similar elements such as academic background, business know-how, and business culture acquired over the years (Lozano-Posso and Urbano, 2017; Minichilli et al., 2010). Such excessive homogeneity of cognitive factors, derived from a high proportion of family members in positions of responsibility for innovation processes, can result in a lack of knowledge diversity and diverse perspectives (Chrisman, Fang, Kotlar, and De Massis, 2015). Thus, generating a mental rigidity in the cognitive maps of these decision-makers (König, Kammerlander, and Enders, 2013). It is generally acknowledged that non-family members are the ones contributing more knowledge and new perspectives (Arzubiaga, Iturralde, Maseda, and Kotlar, 2018; Talke et al., 2010), different management capabilities, and better access to external network contacts (Veider and Matzler, 2015). This knowledge diversity and skills promotes the use of external information, thus reinforcing the absorption capacity of the company (Classen et al., 2012).

Nonetheless, the concurrence of new family generations in the decision areas can help alleviate the excessive mental rigidity in the cognitive maps of the management teams with a large proportion of family members of the same generation (Cruz and Nordqvist, 2012). Younger generations will contribute new ideas and network contacts to successfully design collaborative innovation projects (Litz and Kleysen, 2001). For example, the implementation of new technologies and tools (Fang, Kotlar, Memili, Chrisman, and De Massis, 2018), which represents essential knowledge to meet the challenges of a dynamic market (Sciascia et al., 2013). In this sense, family SMEs with high heterogeneous teams into innovation will have a greater tendency towards collaborative innovation and a higher probability of success.

Absorptive capacity

The absorption capacity refers to the ability of the organization to assess, assimilate, and apply new knowledge from collaborators (Cohen and Levinthal, 1990). It is based on a series of routines and organizational processes through which companies acquire, assimilate, transform, and exploit new knowledge (Zahra and George, 2002). Therefore, absorption capacity plays a vital role when collaborating with different agents in collaborative innovation processes (Reagans, Zuckerman, and McEvily, 2004).

In the family SME, the absorption capacity varies according to the capabilities of the people who lead the innovation processes (Kotlar, De Massis, Frattini, and Kammerlander, 2019; Kraiczy et al., 2014). Thus, SMEs with a more significant proportion of non-family members in the company, represents a diversity factor regarding knowledge, skills, and expertise (Veider and Matzler, 2015), with a higher probability of success in collaborative innovation processes. In this sense, mixed teams have a higher potential absorption capacity that allows them to be more receptive to the acquisition of external knowledge and more effective when assimilating that know-how (Alexiev, Jansen, Van den Bosch, and Volberda, 2010). In the same way, a more significant proportion of non-family members also increases the real absorption capacity of family SMEs, that is, to transform and recombine the information and knowledge acquired from different sources for later exploitation (Rodan and Galunic, 2004).

Given that family SMEs are reluctant to incorporate managers from outside the family, the absorption capacity can be driven by the inclusion of new generations in the decision-making processes on innovation projects and collaborative innovation (Kellermanns, Eddleston, Barnett, and Pearson, 2008). Thus, the teams responsible for designing and implementing collaborative innovation projects that enjoy a higher absorption capacity will be more effective as they have a higher ability to exploit the rents resultant from this collaboration.

Innovative trajectory: depth and breadth

The know-how and expertise accumulated during the organizational life cycle are also influential factors when it comes to success in collaborative innovation processes (Filip et al., 2016). Thus, a long history of innovation leads to a wide range of recombinations of knowledge and experience, which will be of greater importance to the extent that the innovative trajectory has been more profound, in terms of accumulation of knowledge in a specific area, and more broadly, in terms of knowledge diversity in several areas (Davis and Eisenhardt, 2011).

Family SMEs with a more substantial proportion of family members tends to have deeper innovative trajectories, acquiring tacit knowledge about a specific area over the years in the company. This gives them an advantage of knowing how to discriminate, within this scope, which collaborative innovation projects will be more likely to succeed, and identify from the first moment those that should be abandoned (Katila and Ahuja, 2002). However, the lack of knowledge diversity, expertise, and network contacts of those teams composed mostly by family members lessen the innovation trajectory (Arzubiaga, Kotlar, De Massis, Maseda, and Iturralde, 2018), which results in less knowledge and experience about the recombinations of novel elements (Ahuja and Katila, 2004) and translates into less effective collaborative innovation processes.

Consequently, balanced teams concerning family and non-family members, in principle, seem to be in a more advantageous situation to address diverse collaborative innovation projects. Relatedly, the presence of new generations in those bodies responsible for collaborative innovation projects can help to alleviate, in a certain way, the limited breadth of ideas and knowledge that senior management teams of family firms usually portray (Sciascia et al., 2013).

Factors related to attitudes

The second axis on which the collaborative innovation processes of family SMEs pivot deals with the attitudes of the teams responsible for designing and implementing those processes, as shown in Figure 1. In this regard, two different characteristics can be distinguished that affect the collaborative innovation processes, such as the preservation of socio-emotional wealth (SEW) and risk aversion (Gómez-Mejía et al., 2007), as well as intra-organizational behavior (Nordqvist, Sharma, and Chirico, 2014).

Preservation of SEW

The influence of the familial factor on family businesses has been related both to economic results, including competitive advantage and wealth creation, and to results unrelated to the financial scope, including the preservation of tradition, the strengthening of family ties, and the value creation across generations (Pearson, Carr, and Shaw, 2008). Consequently, decision-making also has this twofold facet, pursuing economic objectives, as well as those objectives closely linked to the family (Mahto et al., 2010; Souder, Zaheer, Sapienza, and Ranucci, 2016), such as the preservation of the socio-emotional wealth (Gomez-Mejía et al., 2007).

In this sense, family businesses tend to estimate at all times how different strategic decisions can affect the business family (Chua, Chrisman, and De Massis, 2015; Vieira, 2014), prioritizing those processes and initiatives that avoid, as far as possible, the assumption of risks for the future of the business family (Gomez-Mejía, Makri, and Kintana, 2010; Kotlar, De Massis, Wright, and Frattini, 2018). Given that collaborative innovation brings uncertainties typical of this type of operations, family SMEs may not be willing to assume certain risks. On the one hand, innovation processes are inherent to chance, since they do not offer certainty of the results (Veider and Matzler, 2015). This uncertainty about the investment recovery, both in financial terms and intangible resources, can jeopardize innovation initiatives in general (Brinkerink and Bammens, 2018; Naldi, Nordqvist, Sjöberg, and Wiklund, 2007). On the other hand, family SMEs are often very reluctant to share knowledge with other collaborators outside the organization (Ireland and Webb, 2007). These companies, many of them located in the industrial sector, have developed for years know-how based on learning-by-doing (Chirico, 2008), resulting in tacit knowledge about a series of specialized products (Duran, Kammerlander, Van Essen, and Zellweger, 2016).

In general, SMEs usually have limited access to resources and lack of specific knowledge and technical expertise within a particular area (George, 2005), leading to difficulties when entering collaborative innovation due to their reluctance to lose experience and not seize knowledge opportunities from the collaborators. Thus, faced with the challenge of disclosing their know-how in addition to not being able to take advantage of what has been contributed by the other participants in the innovation processes, the participation of family SMEs in collaborative innovation with third parties is constrained (Debicki, Kellermanns, Chrisman, Pearson, and Spencer, 2016). Putting at risk the competitive advantage that implies having the differential know-how, in exchange for not obtaining clear benefits.

Given that these issues may affect the future viability of the organization, family SMEs will be conservative when taking part in collaborative innovation processes (De Massis, Chirico, Kotlar, and Naldi, 2013). This conservative attitude will be more accentuated in the case of family SMEs with a large proportion of family members amongst those who make strategic decisions (Kraiczy et al., 2014). This conservative attitude of family members can be weakened with more diversified management teams (Zahra, 2005). Thus, the heterogeneity due to the inclusion of non-family members and the concurrence of different family generations will help to create a prone attitude towards collaboration with third parties in innovation projects.

Intra-organizational behavior

Innovation is fundamentally a collaborative effort between people who share ideas, perspectives, and values (Adler and Kwon, 2002). That is why social capital, understood as the set of values, norms, and attitudes that foster collaborative dynamics is a resource that favors the exchange of knowledge and information (Nahapiet and Ghoshal, 1998), as well as innovation processes (Sánchez-Famoso, Iturralde, and Maseda, 2015). The family business, given its peculiar characteristics linked to the family with solid business values and strong social ties (Hall, Melin, and Nordqvist, 2001), are companies with essential reserves of social capital in which inter- and intra-organizational relations have a strong influence on their behavior and dynamics (Sánchez-Famoso, Maseda, and Iturralde, 2017).

In family SMEs, family members in charge of innovation decision-making tend to consider internal ideas and perspectives of higher value than those coming from outside the organization (Menon and Pffefer, 2003). Even though, there may be certain misgivings by family members to the recognition of the ideas and advice of the non-family group inside the organization since it can be understood as a transfer of power to those non-family members (Alexiev et al., 2010). Therefore, the internal social capital that the company possesses or the network of external relations acquired (external social capital), can determine to a large extent the predisposition towards collaborative innovation. Hence, family SMEs in which the inclination for external knowledge prevails will encourage collaborative inter-organizational innovation, while those that value internal cooperative dynamics more will opt for intra-organizational innovation. In this sense, greater participation of new generations in the decision-making process of collaborative innovation can play a unifying role between family groups and those of non-family members of the company (Casillas, Moreno, and Barbero, 2010).

Conclusions and future lines of research

In this article, a deepening in the conceptualization of collaborative innovation strategy has been made as an increasingly common and widespread phenomenon, outlining the three main objectives pursued by this strategy: the knowledge creation and new product designs, the improved efficiency of the production process and the reduction of time-to-market. However, the achievement of collaborative innovation in the family SMEs depends mostly on the unique characteristics of this type of organization. Thus, factors such as the management team composition -the proportion of family members or the number of generations involved in management- factors related to capabilities -the cognitive factors, the absorption capacity, and the innovative trajectory in terms of depth and breadth, as well as those factors referred to preferences -conservation of the SEW and inter-organizational behavior- primarily mediated by the influence of the family in all cases, play a crucial role in the successful design and implementation of collaborative innovation.

The main contributions of this work refer to deepen in the solid foundations that allow in the future to delve into the academic study of collaborative innovation and the identification of differentiating characteristics of family SMEs that affect this process, which give rise to future lines of research in this field. On the one hand, a significant advance in this matter would require an empirical study of the model presented in this article, to assess the theoretical development presented here. In this sense, it would be of particular interest to consider the possible moderating effects of the size of the company and sector variables, which would allow refining the impact of the variables of this model. On the other hand, the empirical testing of the model using longitudinal data would shed light on critical decision-making whether or not to be involved in the collaborative innovation process, e.g., the time required for collaborative innovation to bring about benefits for the company.

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