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CAN FAMILY FIRMS OVERCOME BETTER AN ECONOMIC CRISIS
CARRYING OUT INNOVATIONS WITH UNIVERSITIES?

Mariano Soler-Porta¹

mariano.soler@uma.es

Beatriz Rodriguez Díaz¹

brodriguez@uma.es

Antonio Padilla Meléndez¹

apm@uma.es

¹Universidad de Málaga (Spain)

ABSTRACT

According to previous researches, the intersection between the concepts of Family Business (FB) and Innovation is not sufficiently studied and developed and new knowledge should be drawn on how the characteristics of a FB influence the possibilities and attitudes towards innovation; or if there are differences or not among them in the way of innovating.

Of all the possible variables that can influence the innovation of FBs, this study will focus on the environment in which these types of companies operate (Padilla-Meléndez et al., 2015). After a review of the literature, it can be said that a deeper analysis of this field of study, being the reasons twofold. First, in order to know if family-type businesses depend more or less on the environment than other companies (Donckels & Fröhlich, 1991). Second, to examine if the environment is a determining variable for the decisions taken by the company's executives (Dess et al., 1997)

Besides, Open Innovation is a relatively recent paradigm for innovation management (Chesbrough, 2006; Gassmann, 2006). And more specifically, universities and research institutions have been widely studied in the literature from several different aspects (Agrawal, 2001; Geiger, 2005; Hall, 2004; McMillan & Hamilton, 2003; Poyago-Theotoky et al., 2002), and it can be concluded that cooperation with these institutions, such as universities, is more beneficial than cooperation with other companies (Arvanitis & Bolli, 2011; Ayari, 2010; Belderbos et al., 2004; Bercovitz & Feldman, 2007; Blanco Hernández, 2014; Fabrizio, 2009; Fitjar & Rodríguez-Pose, 2016)

A search for specific literature that analyses how Open Innovation in Family Businesses develops with cooperation with universities yielded only one result (from the Web of Science database with more than 2,000 referenced articles on open innovation). This implies that this research is of utmost relevance to cover an undeveloped research area. There are also no papers on the impact of Open Innovation in FB in relation to overcoming an Economic Crisis; and more specifically, if one wants to understand what is the result of collaboration in overcoming the crisis if the innovation is carried out in cooperation with Higher Education Institutions.

In sum, this study is necessary to understand, in the face of the economic crisis caused by COVID-19, how FBs can overcome this crisis with better guarantees in relation to their specific aspects.

INTRODUCTION

Innovation has always been a relevant topic in management (Davidsson, 2016; Lumpkin & Dess, 1996; Schumpeter, 1982); and more specifically one of the fundamental keys to explain the survival of companies.

Innovations can be the development of new activities, products, technologies and forms of production or in the search for new markets to expand their activities (Schumpeter, 1982). Likewise, the adaptation of a product, activity or form of production to new contexts different from those originally considered is also seen as an innovation (Koellinger, 2008).

Open innovation is used by many companies to be able to access any type of innovation, carrying it out through external sources (Laursen & Salter, 2006). In this sense, the company must seek, in many cases, abroad, in order to integrate external knowledge and thus create value (Ploeg, 2011).

Open Innovation can be defined as the acquisition of knowledge from abroad to carry out or expand the internal innovation of the company (Chesbrough & Crowther, 2006) or the transfer of ideas and technology between the company and the environment that surrounds it (Lichtenthaler, 2008).

Among the benefits of Open Innovation, through cooperation with external agents, the projection and knowledge acquired over time are expanded (Dewar & Dutton, 1986; Fichman & Kemerer, 1997) and experience has shown that it is the main way for innovating based on new products (Rindfleisch & Moorman, 2001; Sivadas & Dwyer, 2000)

In addition, cooperation with stable partners, with long-term relationships, leads to the generation of more innovations (Gulati, 1995); because innovation has an unwritten component, knowledge beyond what cannot be described that is formed through shared and unwritten mental schemes and the assimilation of more complex knowledge, leading to the creation of a collaboration more fruitful (Hansen, 1999; Iansiti & West, 1997; Madhavan & Grover, 1998; Polanyi, 2009; Uzzi, 2018; Zucker et al., 2002).

The literature also indicates that the results of innovation will largely depend on the characteristics of the companies and the type of cooperation and partner with which the cooperation is carried out (Jaklič et al., 2014). In this sense, it is suggested that SMEs are more likely to monetize their internal knowledge and initiate an exchange of ideas and knowledge with their environment than other types of companies (van de Vrande et al., 2009).

However, there exists a gap in the literature regarding how FBs make management decisions and this needs to be addressed; this paucity also includes the decision to carry out innovation strategies (Ghoshal, 2017; Hambrick, 1994; Rynes et al., 2001; Sharma, 2010; F. Vermeulen, 2007);. That is why this research will be carried out on FB, since the data indicates that these exceed 80% of the companies in most of the countries and account for approximately 50% of the employment generated in the economies, which means that understanding their behaviour and results in the face of innovation will imply understanding a high proportion of innovation in the markets.

In this paper it will be presented the the path to finalize this work in progress. First, the framework of the FB and Open Innovation will be defined; the second the intersection between both fields will be characterised. Finally, the hypothesis and research proposal, as well as the variables that are expected to be used, will be presented.

FAMILY FIRMS

According to the Family Business Institute of Spain (2015), FBs represent 17 million companies in Europe, with a job creation of 100 million people. And outside the European region, in the United States, the first world economy, FBs are 80% of the businesses and generate 50% of employment in that country, according to this study. In Latin America, 85% of the businesses are FBs and they employ 30% of the population (Ernst & Young, 2016).

In Spain, in accordance with one pilot study on FBs of the Statistic National Institute, conducted in 2015, FBs companies accounted for 82.8% of all companies in Spain, occupying 49.9% of the working population and 38.0% of turnover.

In view of the economic importance of the FBs, in Spain and worldwide level, their characteristics and composition should be studied, as knowing them in an exhaustive way would mean knowing a good part of the market and predicting more adequately their behaviour. However, there is no unanimity in the literature on the features that will make up the boundaries of what is meant by FBs (Chua et al., 2012). There is a tendency to minimize the heterogeneity of definitions of the FBs (Nordqvist et al., 2014), creating a basic framework to establish some basic difference between the FBs and non FBs (Chrisman et al., 2012), opening a field to investigate and compare the behaviour and results of both types of business (Astrachan et al., 2002; De Massis et al., 2014; Dyer, W, 2006; Hernández-Linares et al., 2017; Shanker & Astrachan, 1996; Westhead & Howorth, 2007).

The European Community Union have also focused on achieving a homogeneous and consensus definition of what a FB should be considered. In a Report approved on September 8, 2015 (European Parliament, 2015), it is indicated that “a common European definition of ‘family business’ is necessary not only to improve the quality of statistical data collection on the sector’s performance, but also as a means for policy-makers to better address the needs of family businesses and society”.

It is clear that, in order to carry out an investigation on a specific subject, in this case, a review of the literature on FBs, it is essential to limit the boundaries of what exactly the companies under study will be, as indicated in this document, the European Parliament. In this sense, the European Family Businesses, European federation of national associations, established in 1997, defines the FB with the following characteristics:

- The majority of decision-making rights are in the possession of the natural person(s) who established the firm, or in the possession of the natural person(s) who has/have acquired the share capital of the firm, or in the possession of their spouses, parents, child or children's direct heirs.
- The majority of decision-making rights are indirect or direct.
- At least one representative of the family or kin is formally involved in the governance of the firm.
- Listed companies meet the definition of family enterprise if the person who established or acquired the firm (share capital) or their families or descendants possess 25% of the decision-making rights mandated by their share capital.

Despite this heterogeneity in the definitions that try to limit the perimeter of what is considered a FB, there is a list of factors that can be used to define what a FB is, especially related to the degree of control of the activity and participation in the owned by these companies (Choi et al., 2015; Rojo Ramírez et al., 2011).

On the one hand, FBs can be defined as those companies whose decisions are influenced by a family (Astrachan & Shanker, 2003; Litz, 1995; Smith et al., 1991), with ownership or administration compose by family members, varying degrees of family involvement and the potential for generational transfer. Although FBs vary in the nature

and extent of family participation, there is a general agreement that they have a structural difference with non FBs due to the vision of family members participating in the organization and control (Chrisman et al., 2005; Habbershon et al., 2003; Niehm et al., 2010).

On the basis of these two variables, numerous theories that define the FBs are developed, based on two types of data. On the one hand, the quantitative data related to participation percentages, number of positions and executives within the company that belong to the same family, etc. On the other hand, qualitative data, which is more difficult to detect, such as the real influence on business decisions of family nuclei, without necessarily being part of their executive bodies (Astrachan & Shanker, 2003; Chrisman et al., 2005).

For the development of this work, FB will be defined as the companies that belong to or are managed by groups of people related by blood, marriage, or adoption (Hollander & Elman, 1988; Winter et al., 1998).

INNOVATION AND ITS DELIMITATION

An important stream of research on innovation can be found in the literature, from the point of view of the benefits it entails for the operation of small and medium enterprises (Rosenbusch et al., 2011).

There is a general agreement that innovation is a fundamental element of entrepreneurship (Davidsson, 2016; Lumpkin & Dess, 1996; Schumpeter, 1982). This is even more true for SMEs, which can benefit from adapting to their environment better than large ones, with much faster decision making (Nooteboom, 1994; Vossen, 1998). Therefore, it is clear that the innovation factor is essential to understand the survival of companies, especially small and medium enterprises, which is justified, in part, by the need to adapt to the changing environments in which they operate.

Even in the simplest form of innovation, which can be an investment in technology, it is generally assumed that it will result in productivity and efficiency gains for most companies (Gordon, 2000; Jorgenson & Stiroh, 2017; Niehm et al., 2010; Oliner & Sichel, 2000).

However, it should not be forgotten that not all literature is in a clear position to praise the advantages of innovation. It is found that, to develop a change in business structures, resources are needed, and small businesses do not always have this resources; and, in addition, in case of having such resources, innovation may pose a greater risk for small and medium enterprises, since they have fewer resources to support a failure (Acs & Audretsch, 1987; Eisenhardt & Martin, 2000; Nooteboom, 1994; Van De Ven, 1986; Vossen, 1998). In addition, abundant literature has been found that indicates that innovation does not always improve the performance of organizations (Birley & Westhead, 1990; Heunks, 1998) or even that they perceive negative influences on them (McGee et al., 1995; P. A. M. Vermeulen et al., 2005).

At the end of the review of all these advantages and disadvantages of innovation, it is found that, even considering the existence of disadvantages, there is a general consensus of the benefits and the need for innovation to, at least, maintain income, benefits and market relevance for companies.

Once the importance of innovation is highlighted, it is also necessary to define what can be considered an innovation, in order to establish the framework of the research.

Starting from a general definition, according to Schumpeter (1982), innovation is considered when the company introduces a new good, which the public does not know; when a new form of production is carried out in the industrial sector in which the company has its market; when the expansion to a new country is achieved by opening

new markets; when new resources are acquired for the manufacture or production of the company; or when changes are made in the market structure.

In addition to the literature that is dedicated to making a delimitation on what is considered an innovation, there are also extensions on the types of innovation, such as that an innovation can be considered radical, when there is a substantial change in technology or over a new technology and also provides a significant improvement for the client over the above (Chandy & Tellis, 1998; Dewar & Dutton, 1986); or according to these same authors, an incremental innovation, when only one of the above conditions occurs.

Similarly, it is also interesting to look at the literature on innovation that treats, in a differentiated way, the innovation in services versus that of products. In this case, innovation in a service is defined when there is a change in some or some characteristics of the service or in the number of operations carried out in the service (Gallouj & Savona, 2010; Gallouj & Weinstein, 1997).

Another parameter of which studies have been found in the literature, regarding innovation, is speed. From an economic point of view, the speed of innovation refers to how long it takes to feel, in different organizations, sectors or countries, the patterns of that innovation, its effects, etc. (J. B. Barney et al., 1987; Dosi et al., 1988; Linton, 1998).

From a managerial point of view, this speed refers to how long it takes to obtain benefits from the investment of innovation, whether due to changes in the organizational structure, processes or competition (Eisenhardt & Martin, 2000; Kessler & Chakrabarti, 1996; Lawless & Anderson, 1996; Stalk & Hout, 1990).

According to the literature review, there is still a long way to go to complete the gap between management research and the practical reality of FBs (Ghoshal, 2017; Hambrick, 1994; Rynes et al., 2001; Sharma, 2010; F. Vermeulen, 2007), what supposes an opportunity of investigation in many fields of the management in the familiar companies.

Holt, Pearson, Payne & Sharma (2018) pointed, after a literature review that there are many opportunities to research the FBs but changing broader mindsets from dealing with niche management issues to study. They consider that management theory is incomplete if it has not been tested in FBs.

In the case of FBs, Decker & Günther (2017) state in their research that there is no clear evidence that FBs are more or less innovative than other companies, indicating that a key factor, to make a model on innovation in FBs, should be to consider the integration of family members in the management of the company, as a way of knowing differentiating character with respect to non FBs.

In addition, they suggest that the number of family generations of the company or how professionalized the decision making process is, should be taken into account in that model.

Moreover, when innovation in these types of companies has been studied, these have mostly been young companies focused on scientific innovations (Miller et al., 2010, 2011), leaving out of the focus of research other types of companies with which to make the comparison.

INNOVATION AND FAMILY FIRMS

Following the characteristics of the FBs that would make innovation in this type of company different from the rest, it is highlighted in the literature that the conjunction between family systems, businesses and other non-family members participating in it, makes them a genuine system and different from the rest (Chua et al., 1999; Donckels

& Fröhlich, 1991; Dunn, 1996; Hayward, 1992; Olson et al., 2003; Salvato et al., 2020; Stoy Hayward, 1989; Welsch, 1991).

In addition, the literature has highlighted that in the FBs special characteristics are given that filter from the family philosophy itself (Dyer, W, 2006; Fukuyama, 1995; Tagiuri & Davis, 1992), such as the interest in caring for the members of the family unit, seeking their development or serving as an affective, as opposed to non FBs, which focus more on obtaining benefits, efficiency and other economic objectives.

This fact makes, according to part of the literature, that the FBs start with a competitive advantage in terms of the resources and behaviour of the organization, both at the individual and organizational level, which must be taken into account when studying the management of this type of companies (Firm Resources and Sustained Competitive Advantage, 2015; Dyer, 2003; Habbershon et al., 2003; Habbershon & Williams, 1999; Prahalad & Hamel, 2009; Sirmon & Hitt, 2003).

Of all the possible variables that can influence the innovation of FBs, the study will focus on the environment in which these types of companies move (Padilla-Meléndez et al., 2015). In a first review of the literature, it is needed deepen this field of study has been detected for two reasons. First, in order to know if family-type businesses depend more or less on the environment than other companies (Donckels & Fröhlich, 1991). Second, to know if the environment is a determining variable for the decisions taken by the company's executives (Dess et al., 1997).

According to this research, the intersection between the concepts of FB and Innovation is not sufficiently studied and developed and new knowledge can be drawn on how the characteristics of a FB influence the possibilities and attitudes towards innovation; or if there are differences or not in the way of innovating.

Among the literature found in this regard, we find that it is suggested that FBs are less innovative, prone to creativity and change than non FBs (de Massis et al., 2013).

Specifically, among the variables that influence innovation the following ones can be identified: concentration and density of the same type of companies in geographic area (Hausman, 2005); technological opportunities (Cruz & Nordqvist, 2012; Weismeier-Sammer, 2011); competition pressure (Battisti & Iona, 2009; Craig & Moores, 2006; Czarnitzki & Kraft, 2004); and existence of cooperation with environmental agents, such as customers, suppliers, competitors or universities (Ankrah & AL-Tabbaa, 2015; Bruneel et al., 2010; Cruz & Nordqvist, 2012; George et al., 2002; Markman et al., 2005; Pittino & Visintin, 2009; Teece et al., 2009; Verma et al., 2012; Westhead, 1997; Wuyts et al., 2004).

THE ENVIRONMENTAL VARIABLES THAT INFLUENCE INNOVATION

It is described in the literature the benefits that it entails, for any type of innovation, that there is an input of knowledge from outside the company and associations with other external agents are encouraged, since these broaden the perspectives and knowledge of the company own organization (Cohen & Levinthal, 1990; Dewar & Dutton, 1986; Fichman & Kemerer, 1997). In addition, the cooperation between companies and the exchange of knowledge for the creation of new products has become an important source of innovation (Rindfleisch & Moorman, 2001; Sivadas & Dwyer, 2000).

It has been suggested that frequent collaboration with the same partner can lead to unique positions being generated in terms of new opportunities, which can result in innovation opportunities being identified (Gulati, 1995). This is largely due to the fact that innovations and discoveries have an unwritten component, knowledge beyond what can be described (Iansiti & West, 1997; Zucker et al., 2002) and when collaboration with the same partner, this type of knowledge begins to emerge and be shared and

unwritten mental schemes are shared and the assimilation of more complex knowledge, which ultimately makes the collaboration more fruitful (Hansen, 1999; Madhavan & Grover, 1998; Polanyi, 2009; Uzzi, 2018).

Following this line, in the literature there is a description of how to take advantage of cooperation to reduce or take advantage of the strength of competition, through cooperation with the company's own competitors, through game theory (Brandenburger & Nalebuff, 1996). It would be about, through cooperation, managing to eliminate the risks of mutual destruction and change the rules of the game, associated, above all, with the risk of competition.

With this strategy, it is possible to find new opportunities for both competitors, implement innovations with less risk of destruction by the competition, among others. Consequently, it has been shown that cooperation with the competition has a positive impact on innovation capacity, positioning this strategy as appropriate. (Benavides-Velasco & Quintana-García, 2004).

With all the above, it is proposed, as the objective of this work, to point out the variables of the environment, in which FB move, which are decisive for them to carry out innovation projects; and also how these innovations or their absence have influenced their results.

This review aims to collect the cooperation variables that have different influence on the FBs, due to the differential characteristics with the non FBs, which affect innovation.

The result of the research would help diagnose favourable and unfavourable environment variables and, consequently, there will be a tool to moderate, in part, the uncertainty that an innovation process implies for this type of companies, mainly in SMEs.

The scientific contribution intends to lay the foundations, through an exhaustive review of the literature, of possible future research, which has been pointed out, and that represent an opportunity for research, through qualitative and quantitative studies in knowing the influence of cooperation with the environment in the innovation of the FBs.

To explain the innovation with cooperation, the literature has focused on why organizations choose to carry out an innovation with internal R&D activities or look for these resources outside, often opposing the alternatives between “Making an innovation” or “Buying an innovation” (d’Aspremont et al., 1988; Petit & Sanna-Randaccio, 2000; Veugelers, 1997; Veugelers & Cassiman, 1999). However, the complementary and more frequent alternative is to combine the internal capabilities of the organization, with the use of external research and development resources. (Chesbrough, 2006; Cohen & Levinthal, 1990; Floud et al., 1991; Kamien & Zang, 2000; Radnor, 1991; Veugelers & Cassiman, 1999).

From the economic-financial perspective of the company, the influence of its environment is very relevant for decision-making, starting with its stakeholders, having pointed out the need to incorporate their perspective when studying the business management of the FBs (Manzaneque et al., 2018). This paper indicates the need to continue investigating these influences to know the relevance of these external agents in the different types of companies and in the contexts that can be established.

Although R&D continue to be carried out, mostly within the companies themselves (MacGregor, 2006; Narula, 2003), looking at market data, cooperation innovation has stood out as one of the fastest growing companies and has multiplied in the last half century (Hagedoorn, 2002). There are varied forms of cooperation that have been

found, from agreements to enter the capital of companies to simpler agreements that are limited to individual transactions (Narula, 2003).

At European level, according to the Community Innovation Survey 2016 (Eurostat, 2016), 32.5% of the companies surveyed made an innovation in a process or product through cooperation with a partner, which shows the importance of studying this type of innovations.

One of the advantages described in the innovation by cooperation is the possibility that incorporates to innovate in this way of sharing the necessary investments to carry them out, allowing lower costs of the R&D activities for each cooperation and, in addition, expand the capacities of the organization itself (Feranita et al., 2017; Hagedoorn, 2002; Narula, 2003; Veugelers, 1997).

Focusing the review on cooperation and how it influences the results of innovation, the literature describes that these results will depend on the characteristics of the companies and the type of cooperation and partner with which the cooperation has been carried out (Jaklič et al., 2014). Although there is no specific study on this subject, the literature suggests some clues to explain how it works.

It can be concluded, that cooperation with suppliers and customers is more beneficial than cooperation with competitors (Arranz & Fdez. de Arroyabe, 2008; Fitjar & Rodríguez-Pose, 2016; Janz et al., 2004; Miotti & Sachwald, 2003); or that cooperation with research institutions, such as universities, may be more beneficial than cooperation with other companies (Arvanitis & Bolli, 2011; Ayari, 2010; Belderbos et al., 2004; Bercovitz & Feldman, 2007; Blanco Hernández, 2014; Fabrizio, 2009; Fitjar & Rodríguez-Pose, 2016); or that cooperation is more effective when the geographical distance between the two is smaller, although at this point there is no clear position of the literature, contrary opinions have been described (Arvanitis & Bolli, 2011; Fitjar & Rodríguez-Pose, 2016; Löff, 2009; MacGregor, 2006; Miotti & Sachwald, 2003).

COOPERATION, INNOVATION AND FAMILY BUSINESS

For the aim of this research, it is interesting the intersection between the most common characteristics described in the literature on FBs and how those characteristics will influence companies to be more prone to innovation in collaboration with the environment. For this, it is interesting the description made by Cassia, De Massis & Pizzurno (2012), when they describe the framework of more frequent characteristics found in the literature on FBs. In this section, the links between these characteristics and innovation in cooperation with the environment, are analysed.

FBs possess some distinct characteristics that can help them achieve better results in innovation through cooperation with the agents that surround them [for details, refer to the definition proposed by Cassia, De Massis, & Pizzurno (2012)].

FBs have a longer-term vision compared to other businesses; therefore, achieving short-term results is less important (Dunn, 1996; Hayward, 1992, 1993; Stein, 1988, 1989). They will be more patient with returns on investment with a positive impact on cooperation since the consideration of the results requires a long-term vision (Soler-Porta et al., 2019).

On the other hand, FBs are less risk-prone (Donckels & Fröhlich, 1991). This could imply that they are less prone to innovation; however, innovation with cooperation, with the hand of an external agent, could help them find ways to dispel doubts and dampen the sense of risk.

Finally, in general, FB workers are usually less professional and exhibit clear risks of inefficiency in the tasks assigned; however, at the same time, they are usually more satisfied and better paid and coordinate their objectives with those of the company

(Donckels & Fröhlich, 1991; Dunn, 1996; Fukuyama, 1995; Lyman, 1991; Stoy Hayward, 1989). The cooperation to conduct innovation processes would be an appropriate way to develop innovations to replace the lack of professionalism from the outside.

A search for specific literature that studies how open innovation in family businesses develops with cooperation with universities yielded only one result from the Web of Science database with more than 2,000 referenced articles on open innovation; this implies that our research is of utmost relevance to cover an undeveloped research area. According to the literature, the FBs have a longer-term vision than the rest, with a hope of less immediate results than the rest. (Dunn, 1996; Hayward, 1992, 1993; Stein, 1988, 1989). In terms of innovation, this may mean that FBs may be more patient when it comes to visualizing a return on the necessary investment in innovation and, therefore, not fearing innovation when its benefits will be obtained in the medium-long term. Regarding the impact on cooperation, this also represents a positive influence characteristic for innovation, since the visualization of the results of a cooperation can take some time to obtain and without a long-term vision, as in this case, they can assume a failure for cooperation that need maturation and adaptation time.

Another characteristic described on FBs is risk aversion, being described as the main distinguishing characteristic with the rest of companies by Donckels & Frolich (1991) and being one of the most prominent in literature (Dunn, 1996; Hayward, 1993). This could mean that it would affect the innovative attitude of these companies, making them less prone to innovation. However, it could be a greater advantage in innovation with cooperation for the FBs, since carrying out the innovation at the hands of an external agent could dispel doubts and dampen the sense of risk compared to doing so independently. Therefore, this characteristic can have a positive influence on innovation with cooperation compared to other companies.

In relation to FB workers, it is found that, in general, they may be less professionalized and with clear risks of inefficiency in the tasks entrusted (Donckels & Fröhlich, 1991; Dunn, 1996). In contrast, FBs workers tend to be more satisfied and better paid, in addition to aligning their objectives with those of the company itself (Donckels & Fröhlich, 1991; Dunn, 1996; Fukuyama, 1995; Lyman, 1991; Stoy Hayward, 1989). This can influence innovation in a contrasting way, since a little professionalization of workers can make it unfeasible to start an innovation due to the lack of intellectual resources. However, the lack of professionalization itself makes change and innovation more necessary, for example, in the company's internal processes. As for cooperation, it would be an appropriate way to carry out the innovations, to replace the lack of professionalization from the outside.

PLANNED RESEARCH AND HYPOTHESIS

In the actual context of Economic Crisis due to COVID-19 and the recent starting of a war in Ukraine, it is important to understand the way companies come overcome an economic crisis making some adjustment in their process, products or services and applying an innovation to their companies.

In our case, after review that there is a gap in the research of Open innovation with universities in FB, will focus our project in this specific way to innovate in this kind of companies.

For this, we will conduct a statistical research based on a Survey composed of firms with 10 or more employees within the manufacturing industry in Spanish and is conducted yearly in the same companies, being the companies selected to keep representativeness the population of reference. The survey asks about the decisions

firms take regarding their competition variables. We will extract details for a longitudinal investigation from 2006 to 2010 about the innovation or no of the companies; if it is the case, the type of innovation; if it is an OI, with whom, the result in growth per year, and finally the difference between FBs and non-FBs.

We have selected the years 2006 to 2010 due to, in the last economic crisis, year 2006 is with a high economic growth and the lower unemployment rate in Spain; year 2009 is a lower economic growth and the higher unemployment rate and then, year 2010 is the starting of overcoming the economic crisis. It will permit us to infer the results to this current crisis with a one that have happen in recent years.

Our hypothesis are:

H1: Innovation helps companies perform better after an economic crisis

H2: Open innovation helps to have better returns than other types of innovation after an economic crisis

H3: Open innovation with universities helps to have better performance than other types of open innovation

H4.1: Family businesses outperform non-family businesses by applying innovation after an economic crisis

H4.2: Family firms perform better than non-family firms applying open innovation after an economic crisis*

H4.3: Family businesses have better performance than non-family businesses applying open innovation with universities after an economic crisis*

* Better performance is measured by the change in % income (Baù et al., 2018)

CONCLUSIONS

After reviewing the literature, firstly, a definition of FB was proposed. Although there is no consensus on what the exact definition of a FB should be, it can be establish, at least, a relationship between ownership, management and the real decision-making, which falls mostly on a group of people among whom there is a family relationship.

In terms of innovation, the review has highlighted the importance of focusing on this concept as a column for the survival of companies in competitive environments.

In addition, it has been found evidence that innovation through collaboration has a special impact on how companies can carry out their innovation processes and how these relationships with the environment can be a determining factor in the success of business innovations.

Given all of the above, there is an opportunity to continue researching and developing further into this area, since, although there are already publications that have tried to explain the differentiating characteristics of the process between some companies and others, there is still a long way to go to know it in depth.

In addition, a new and unexplored research opportunity opens up in the incidence of cooperation in the innovation of FBs, because although innovation is described generically in FBs, it has not yet been investigated in other aspects of innovation that they could be even more differentiated according to the type of companies, such as those already mentioned for cooperation with customers, suppliers, competitors or institutions.

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