Transgenerational innovation capability in family firms

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Abstract

Purpose - Based on the Theory of Dynamic Capabilities, this manuscript aims to analyze how the generational level influence the innovation capacity on family businesses performance. To achieving this goal, the study tests a moderation model that uses the generational model as the determinant of the groups considered.

Design/methodology/approach – This study used a sample of 106 family businesses CEOs who were surveyed by mail using the Limesurvey 2.5 platform. The results obtained were analyzed using the second generation Partial Least Squares (PLS) structural equation model. The MICOM (Measurement Invariance of Composite Models) approach was used to analyze the moderating effect.

Findings – This research sheds lights on the innovation capacity to influence the family businesses performance, and on the generational level moderating this effect. As a result, the influence of the innovation capacity in second generation family businesses performance is higher than in the first generation.

Research limitations/implications – This study reveals the influence that the generational level has on the effect of innovation capacity on the family business performance. A greater dispersion of ownership, more participatory decision-making, and greater CEOs commitment to leadership in second- and later-generation family businesses, are the main key drivers of this result.

Originality/value – In comparison to previous studies, this research provides insights into the moderating effect of the generational level on the influence of innovation

capacity on the family businesses performance through the MICOM approach (Measurement Invariance of Composite Models).

Keywords: innovation capability, family firms, generational stage, moderating effect, PLS-SEM, MICOM

1. Introduction

Growing turbulence and constant environmental change prevent companies from holding on to competitive advantages with only the support of static resources and capabilities. A firm's competitiveness depends on renewing and adapting resources and capabilities to an environment that is subject to massive changes and a high degree of uncertainty. In response to this situation, a novel approach defined dynamic capabilities, has emerged. Some authors (Díaz et al., 2006; García-Valderrama et al., 2009; Hernández-Perlines et al., 2019; Monteiro et al., 2019) propose to use the Theory of Dynamic Capacities to analyze the innovation capability. This use is justified because the company must be able to create and/or reconfigure its resources and capabilities to maintain its competitive advantage (Damanpour and Wischnevsky, 2006) in the long run. Along the same lines, Teece et al. (1997), Bounfour et al. (2019), Camisón-Haba et al. (2019) state that innovation capability influences the company's performance. Finally, the company's response to environmental changes depends on its ability to develop new products and/or processes (Caseiro and Coelho, 2019; Helfalt et al., 2007; Teece et al., 1997).

This study explores whether the influence of innovation capacity on family firms differs significantly depending on the generation of the family that runs the firm (generational stage). The analysis of innovation capacity is justified because authors such as Acur et al. (2012) Hughes and Morgan (2007), and Szutowski, et al. (2019) state that innovation capacity positively influences business growth. In this research, innovation capacity is defined as the result of the continuous development of innovations derived from the creation, transformation and application of knowledge (Joshi et al., 2015). It is a dynamic approach that is related to the appearance of new

products and/or processes (Lumpkin and Dess, 1996) and to the development and introduction of innovations (Nakata et al., 2011).

Why the analysis of the innovation capability of family firms deserves special attention? Family firms were chosen for two reasons. First, family businesses are the main economic force in many countries (Gedajlovic et al., 2012; Gómez-Mejía et al., 2007; Mallon et al., 2018; Masulis et al., 2011; Poza and Dauguerty, 2013). Franco and Prata (2019) recognize that the growth and well-being of many economies are due to family businesses. In addition, this growth is due to the fact that family businesses are capable of generating stable jobs (Fan et al., 2011; Hernández-Perlines, 2018; Matthews et al., 2012;). Spain is no exception. Family businesses represent 89% of total businesses, 57% of GDP and 67% of employment in the private sector according to Corona and Del Sol (2016).

This study analyzes the role of the generational level. The interest in including the generational level is due to two reasons: a) the generational level is present in many definitions of family business (Cruz and Nordqvist, 2012; Eijdenberg et al., 2019), b) the transfer of the business to future generations is one of the key objectives of the family business (Huston, 2004). Recent years have witnessed a spike in the number of studies of family firms (Sharma et al., 2012), with innovation standing out as a particularly attractive topic (e.g., Nieto et al., 2015; Padilla-Meléndez et al., 2014). Although innovation has been studied in the family firm context, the study of innovation capability is in its nascent stages. The value of this research lies on the examination of the effect of innovation capability on performance depending on generational stage. This study thereby addresses the following research question: Does generational stage moderate the effect of innovation capability on firm performance?

To empirically test our research hypotheses, a model was developed using the Partial Least Square Structural Equations (PLS-SEM) approach. SmartPLS 3.2.8 was used to perform the analysis (Ringl et al., 2015). This type of model is of particular interest because of its flexibility in relation to the data required and capability of handling complexity and relationships among variables. PLS-SEM is becoming an increasingly common methodology on family firms studies (Sarstedt et al., 2014).

The data were gathered between April and June 2017 using a questionnaire sent by email to CEOs of family firms registered with the Spanish Family Firm Institute. The data collection process yielded valid data on 106 family firms.

The manuscript is organized into five main sections. Section 1 provides an introduction and justification of the topic for the study. Section 2 presents a review of the salient literature on innovation capability and the role of generational stage. Here, our research hypotheses are also formally stated. Section 3 describes the target population of the study, the measurement of the variables, and the data analysis method. Section 4 presents and analyzes the results of the hypothesis testing. We end the manuscript by providing the key conclusions of the study, highlighting the study's limitations, and offering ideas for future research.

2. Theory and hypotheses

Innovation has been deeply empirically studied in business management research. It is therefore possible to analyze both the antecedents to innovation and the effects of innovation on firm performance.

This study focuses on the latter of these two approaches. For authors such as Schumpeter (1934) innovation is identified with the development of new products and services, new production methods and new forms of organization. In addition,

innovation also include the identification of new markets and the discovery of new sources of supply. For Orlay (1993), innovation allows the satisfaction of customer needs from new or improved products and processes.

There has been no consensus on the dimensions that should be considered in innovation. Thus, Miller and Friesen (1983) considered four different dimensions: 1) innovation of new products or services, 2) methods of production or provision of services, 3) risk taking by key executives, and 4) search for unusual or novel solutions. For their part, Capon et al. (1992) analyzed innovation from three different dimensions: 1) market innovation capacity, 2) tendency to be a strategic pioneer and 3) technological sophistication. Finally, for Prajogo and Sohal (2006) innovation can be both product (generation of ideas or the creation of something totally new) and process (changes in the way products or services are obtained).

This study opted for the two-dimensional conceptualization of innovation, which represents a broader and newer vision than the traditional one based on Research and Development (R&D). This concept of innovation has been chosen because it has been widely used in literature (Camisón and Villar-López, 2010; Prajogo and Sohal, 2006). Innovation therefore allows companies to access new markets (Wang and Ahmed, 2004) as long as it is done regularly and continuously (Hjalager, 2010).

Innovation capability can be defined as the ability and willingness of the organization to introduce new processes, products, or ideas (Damanpour, 1991; Hult et al., 2004). Spriggs, Yu et al. (2013, p. 33) defined innovation capability as the "behaviors, routines, and capabilities used by the firm to identify opportunities, openly share information, promote discussion, and implement new ideas that enable the creation of new products, processes, and organizational forms". For McGrath (2001) innovation capability is related to the routines and processes of the firm that give rise to

new products and processes. According to Wang and Ahmed (2007), innovation capability refers to the capacity of a firm to develop new products and/or markets by aligning an innovative strategic orientation with innovative behaviors and processes. The definition of innovation capability adopted in this study covers the development of new products as well as new methods of production (Prajogo and Sohal, 2006).

A firm's ability to develop and exploit innovations has been shown to be crucial for sustained competitive advantage (Hussain, et al., 2019; Ribau et al., 2019). Family firms are no different, and the ability to innovate also allows them to develop and maintain a competitive advantage.

There is contradictory evidence on the role of innovation in family businesses. For Cabrera-Suárez et al. (2001), family firms tend to be reluctant to invest in new firms. For Carney (2005), they do not usually invest in the development of new products. Finally, for Morck and Yeung (2004) innovation is usually scarce in family businesses. However, Eddleston et al. (2008) and Gudmundson et al. (2003) argue that family firms that innovate are more competitive.

Abundant literature provides evidence of the influence of organizational characteristics on innovation capability (e.g., Damanpour, 1991; Deshpandé et al., 1993; Hurley amd Hult, 1998; Siguaw et al., 2006). Analysis of the literature reveals two streams of research on innovation (Prajogo and Ahmed, 2006). The first stream consists of studies of the technological elements of innovation (e.g., LeBlanc et al., 1997). The second consists of studies that examine innovation from a human perspective (e.g., Cooper and Kleinschmidt, 1995; Zien and Buckler, 1997).

The influence of innovation capability on firm performance largely depends on human capital (Leiponen, 2005) and social practices (Nordstrom and Steier, 2015; Prajogo & Ahmed, 2006). For example, Romijn and Albaladejo (2002) affirm that the

influence of innovation capability on firm performance is directly related to the knowledge of the firm's employees. Birdthistle and Fleming (2007) report that the firm's ability to detect the evolution of the environment positively influences the way in which innovation results in better performance. Furthermore, firms that lack such competencies tend to struggle to compete based on the innovations they develop (Mohnen and Röller, 2005). Innovation capability explains the links between a firm's resources and capabilities and the market (Wang and Ahmed, 2007).

The relationship between innovation and performance has been examined in the literature (Mani and Lakhal, 2015). In general, high levels of innovation have been shown to be associated with high levels of performance. For example, Guan et al. (2006) report that innovation capability influences firm performance. Sher and Yang (2005) affirm that innovation capability is one of the most important variables in explaining firm performance. According to Yam et al. (2011), innovation capability enables firms to increase sales. Calantone et al. (2002) report that innovation capability positively affects a firm's financial performance. Cefis and Marsili (2006) found that innovation capability strongly influences a firm's performance, growth, and survival. Finally, scholars such as Lau et al. (2010), Sok and O'Cass (2011), Tseng et al. (2012), and Xie et al. (2013) analyzed innovation capability from the perspective of technology, finding that it has a positive impact on innovation performance, which in turn is an antecedent to firm performance (Atalay et al. , 2013; Chong et al., 2011; Lee, et al., 2011).

Innovation in family firms is an important and promising research area because there is good theoretical reason to believe that the antecedents and effects of innovation differ from family to non-family firms (Villalonga and Amit, 2009). This study responds to the increasing scholarly attention paid to analyzing innovation in family

firms (Block, 2012; Hoy and Sharma, 2010) and responds to calls made by authors such as Sharma et al. (2012) to continue investigating innovation in family firms.

The relationship between innovation capacity and the performance of family businesses has also been studied. Lichtenthaler and Muethel (2012) highlight that innovation capacity translates into improved performance. Based on the above, the following hypotheses are proposed in this research:

H_1: Innovation capability positively influences family firm performance.

Family businesses are a heterogeneous group in terms of behavior and performance due to the effect of variables such as age, size, the generation of the family that owns and runs the business (i.e., the generational stage), the gender of the founder, whether the CEO is a member of the family or not, the dispersion of ownership and the intention of the family during succession (Chua et al., 2012).

This heterogeneity of family businesses has led to the appearance of numerous studies analyzing their differentiating characteristics. In this sense, we find studies in the literature that focus on how some of the characteristics of family businesses affect innovation. For example, Hoskisson et al. (2002) state that innovation is affected by the ownership structure of the family business. Gómez-Mejía et al. (2007) prove that family businesses that tend to protect their socioemotional wealth have a lower capacity for innovation. Craig et al. (2014) argue that proactive family businesses have better levels of innovation. Finally, Broekaert et al. (2016) argue that innovation outcomes depend on the relationship between ownership type and organizational system.

Of the different characteristics of family businesses, this study focuses on the generational stage. The generational level has been analyzed in numerous studies (Chrisman et al., 2003), specially taking into account the influence it has on the

management of family businesses (Bammens et al., 2008; Duller et al., 2011; Lussier and Sonfield, 2010).

In this sense, the generational stage affects different aspects of the family business, such as:

1) the degree of formalization and planning of the family business (Miller, 1983),

2) the degree of centralization of decisions (Carney, 2005; Kelly et al., 2000),

3) the formation of successive generations (Chirico et al., 2011),

4) corporate governance (Bammens et al., 2010; Voordeckers et al., 2007),

5) the management and structure of family businesses (Lansberg, 1999),

6) the culture of innovation (Wang et al., 2019),

7) the innovation capability (Hauck and Prügl, 2015).

At this point, the authors propose the following question: how does the generational stage affect innovation capacity? Some studies analyze innovation in family businesses according to the generational level, proving that it is usually lower in first-generation businesses than in second and later generation businesses. According to Damanpour (1991) this result is due to the fact that in first-generation family enterprises the ownership structure is more concentrated, while in second- and later-generation family enterprises the ownership structure is more dispersed (Prajogo and Ahmed, 2006). Chin, et al. (2009) corroborated that first-generation family enterprises are not encouraged to innovate because of the strict control that characterizes the ownership structure in this type of enterprise. In second- and next-generation family-owned enterprises, the distribution of capital tends to be wider. In this sense, this greater participation of the family tends to positively affect innovation capacity (Cassia et al., 2012; Czarnitzki and

Kraft, 2009; Gudmundson et al., 2003; Hsu and Chang, 2011;). Based on these theoretical arguments, the following hypothesis is proposed:

H_2: The generational state moderates the influence of innovation capability on family firm performance.

The research model that reflects these hypotheses appears in Figure 1.

Insert Figure 1 here.

3. Method

3.1. Sample

The data for this study were gathered from a questionnaire emailed via Limesurvey v. 2.5 to the CEOs of firms in a sample drawn from the Spanish Family Firm Institute. To ensure that the innovation across firms was as similar as possible, the authors have followed the recommendations of Classen et al. (2012) and sampled firms from the agri-food sector. To make the questionnaire-based data collection process as rigorous as possible, the authors have followed the recommendations of Hsu and Chang (2011) and Lichtenthaler and Muethel (2012). The sample comprised 1,045 family firms registered within the Spanish Family Firm Institute. The data collection process, which took place between April and June 2017, yielded 106 complete questionnaires, providing a response rate of 10.14%.

Insert Table 1 here.

In relation to the data, it was first verified whether the size of the data set was sufficient to perform the analysis. The minimum number required to reach acceptable

levels of statistical power, taking into account the quality of the measurement model, is 100 (Reinartz et al., 2009). Second, the statistical power of the sample was calculated. The retrospective test proposed by Cohen (1992), calculated in the software G*Power 3.1.9.2 (Faul et al., 2009), was used for this purpose. For the sample used in this study (106 cases) the statistical power was 0.93, which exceeded the minimum value recommended by Cohen (1992) of 0.80. Considering the above, the minimum sample size is 77 cases, for a statistical power of 0.80, an effect size of 0.15 and a significance level of 0.05 (Nitzl, 2016). In our study, the previous minimums are surpassed by having information from 106 family businesses.

3.2. Measurement of variables

Following Henseler, Hubona, and Ray's (2016) recommendations, we measured the variables in this study using previously validated scales.

3.2.1. Innovation capability

To measure innovation capability, the scale proposed by Prajogo and Sohal (2006) has been used. This second-order composite applies to two types of innovation: product innovation (measured using five items) and process innovation (measured using four items or indicators). The items of these two variables were measured on a 5-point Likert scale that ranged from 1 (strongly disagree) to 5 (strongly agree).

3.2.2. Performance

In this research a general measure of the company's performance has been used based on the perceived competitive performance (Olson et al., 2005). More specifically, firm performance has been measured as a combination of the scales proposed by Chirico et al. (2011), Kellermanns et al. (2012), Kraus et al. (2012), and Wiklund and

Sheperd (2003). Our scale comprised four items. It represents a first-order factor. The authors have used a Likert scale of 5 points ranging from 1 (strongly disagree) to 5 (strongly agree).

3.2.3. Generational stage

In this research the generational stage was measured by a direct question about whether the person running the family business was the founder or some descendant of the founder. This variable has been used by authors such as Casillas and Moreno (2010), Cruz and Nordqvist (2010), and Sciascia et al. (2012). It has been considered as a binary variable to which the guidelines proposed by Shuberth et al. (2018) have been applied. The authors coded this binary variable as 1 for the first generation and 2 for the second and beyond generation.

3.2.4. Control variables

In this research the size of the company (number of employees) and age (number of years since its foundation) were used as control variables. These control variables have been used extensively in family firm studies (Chrisman et al., 2005). The selection of these control variables enabled us to analyze the common variance among predictors and avoid the overestimation of parameters. However, a comparison of the results of three separate statistical analyses—considering all control variables, only control variables that were significantly related to the dependent variable, and no control variables—showed that the parameters were almost identical and that there were no changes in the levels of significance or confidence intervals. Therefore, following Berneth and Aguinis's (2016) recommendations, no control variable was included in this work.

3.3. Data analysis

To analyze the data, the multivariate quantitative technique of partial least squares structural equation (PLS-SEM) modeling has been used in this study. The authors have chosen this method for several reasons. First, this method enabled the study of our research questions because of its predictive nature (Hair et al., 2017; Sarstedt et al., 2014). Second, this method enabled the identification of different causal relationships (Astrachan et al., 2014). Third, no highly demanding assumptions about the distribution of the variables were necessary (Henseler et al., 2009). Fourth, this method was less demanding in terms of sample size (Henseler et al., 2015). Fifth, this is an explicative investigation (Henseler, 2018). Finally, as mentioned earlier, family firm studies based on PLS-SEM are increasingly common (Sarstedt et al., 2014). The PLS-SEM SmartPLS software v.3.2.8 has been used in this work for the analysis (Ringle et al., 2015).

3.4. Measurement model

In this paper, the reliability and the convergent and discriminant validity of the variables are first analyzed. As Table 2 shows, values for the Cronbach's alpha coefficient and composite reliability exceeded the threshold of 0.80 established by Henseler et al. (2009). The authors also performed a reliability test for composites using Dijkstra and Henseler's (2015) consistent reliability coefficient ρA. The data in Table 2 show that the values exceeded the recommended threshold of 0.7 (Dijkstra & Henseler, 2015). Finally, convergent validity also held because the values of the average variance extracted (AVE) for each composite exceeded the threshold of 0.50 established by Henseler et al. (2009).

Insert Table 2 here.

Fornell and Larcker's (1981) criterion confirmed the conceptual nature of the composites under study because the square root of the AVE for each composite was greater than the variance that each composite shared with other composites (Table 3).

Insert Table 3 here.

The authors calculated the heterotrait-monotrait ratio (HTMT) to check the validity of the discriminant. As the data in Table 4 show, the discriminant validity held because the value of the HTMT was below the most conservative limit of 0.85 (Henseler et al., 2015), thereby confirming discriminant validity for each pair of composites (Table 4).

Insert Table 4 here.

Discriminant validity was also tested using the HTMT inference criterion because the values of the HTMT were significantly different from 1. As the data in Table 5 show, the confidence intervals did not include the value 1 (Henseler et al., 2016).

Insert Table 5 here.

Therefore, the composites used in this study (innovation capability and family firm performance) had suitable values for reliability and convergent and discriminant

validity. Therefore, in the study it is possible to proceed with the analysis of the structural model.

4. Results

4.1. Analysis of the structural model

4.1.1. Direct model

As Table 6 and Figure 2 show, innovation capability exerted a significant positive effect on family firm performance. The path coefficient was 0.358, exceeding the minimum threshold of 0.2 proposed by Chin (2010). The influence of innovation capability on firm performance was significant, given its t value of 4.467, which was obtained following a process of bootstrapping based on a one-tailed t(4,999) test. Therefore, innovation capability was able to explain 40.6% of the variation in family firm performance.

Insert Table 6 here.

Insert Figure 2 here.

4.1.2. Moderation model

The aim of this study was to analyze how generational stage moderates the effect of innovation capability on family firm performance. To this end, in this study we divide the sample into two groups. The first consisted of first-generation family firms, and the second consisted of second-and-beyond-generation family firms. The first group comprised 59 firms, whereas the second comprised 47.

Before testing for the moderating effect of generational stage, the authors evaluate the invariance of the measure. Measurement invariance can prove a major

problem in multigroup analyses. To evaluate the measurement invariance, the authors use the measurement invariance of composite models (MICOM) procedure. Henseler et al. (2016) list three steps to assess measurement invariance. The first step consisted of analyzing configural invariance to check that the parameters and the estimation method for the composites were the same for all groups. To analyze configural invariance, the measurement model, research model, and estimation algorithm of the model must be the same for all groups. In this study, the questionnaire, proposed research model, and estimation algorithm for the model were the same for both groups. Configural invariance was thereby confirmed.

The second step consisted of analyzing the compositional invariance. The compositional invariance means that the weights of the indicators should be identical. To test for compositional invariance, the authors used the MICOM procedure in SmartPLS 3.2.8 (Ringle et al., 2015) with 5,000 permutations. All c values were close to 1 (Table 7).

Insert Table 7 here.

The permutation test also confirmed that no c value was significantly different from 1 (Table 8). Therefore, compositional invariance was confirmed for our model.

Insert Table 8 here.

The third step consisted of verifying the equality of mean values and variances. As the data in Table 9 show, the mean values and variances were equal.

Insert Table 9 here.

These three steps support the existence of measurement invariance. This invariance was full because all three criteria were met. Therefore, multigroup analysis is possible in this study (Henseler et al., 2016). In this research, the trajectory coefficients for each group were estimated and significant differences verified (Table 10).

Insert Table 10 here.

As the data in Table 10 show, there were significant differences between the path coefficients. Therefore, generational stage moderated the influence of innovation capability on family firm performance.

The data in Table 11 indicate that generational level moderated the influence of innovation capability on family firm performance. Innovation capability explained 47.5% of the variation in the performance of second-and-beyond-generation family firms and 33.6% of the variation in the performance of first-generation family firms.

Insert Table 11 here.

Insert Figure 3 here.

After verifying that generational stage moderated the effect of innovation capability on family firm performance, the authors estimated the intensity of this effect using the f2 statistic (Henseler et al., 2012). In this case, the value of f^2 was 0.24,

indicating a moderate impact based on Henseler et al.'s (2012) classification of moderation intensity.

Finally, this study also calculated the goodness-of-fit of the proposed model using the standardized residual quadratic mean (SRMR). The proposed model had a good fit, with an SRMR value of 0.068 (Henseler et al., 2014). A research model can be considered to have a good fit when the SRMR value is less than 0.08.

5. Discussion

This study analyzes the reliability and validity of composite materials in the measurement model (i.e., innovation capability and family firm performance). The model had acceptable reliability and convergent and discriminant validity values, as all the indicators considered in this study confirmed (Dijkstra and Henseler, 2015; Fornell & Larcker, 1981; Henseler et al., 2009, 2015, 2016).

In this research we apply the PLS method, which is commonly applicable on family businesses studies. Therefore, this study is promoted by its use as a method of data analysis and hypothesis testing (Sarstedt et al., 2014).

The MICOM approach allowed us to analyze the three forms of measurement invariance: configuration invariance, composition invariance, and equality of compound mean values and variances. This study confirms the three types of measurement invariance (i.e., the invariance was complete), which enabled us to perform the multigroup analysis.

The proposed model is adequate because it has a good fit with the empirical data obtained (Henseler et al., 2014).

The work proves that the capacity for innovation influences the performance of family businesses, as previous studies have shown (Calantone et al., 2002; Lichtenthaler

and Muethel, 2012; Sher and Yang, 2005). Innovation capability can explain 40.6% of the variation in the performance of family firms. This paper therefore recommends that family businesses wishing to improve their performance focus on innovative capacity, both in terms of products and processes.

This study tests that the effect of innovation capacity on the performance of family businesses differs depending on the generation of the family that runs the business. The results suggest that this effect is greater in second-and-beyond-generation family firms than it is in first-generation family firms. In second-and-beyond-generation family firms, innovation capability explains 47.5% of the variation in performance, versus 33.6% in first-generation family firms. This difference may be a consequence of the greater ownership dispersion and more participative decision making in second-and-beyond-generation family firms (Damanpour, 1991; Prajogo and Ahmel, 2006). Furthermore, innovation capability is greater when managers are involved in the leadership of the firm (Ayup-Gonzalez et al., 2019; Holtgrave et al., 2019).

6. Conclusions

This article tests empirically that the capacity for innovation positively influences the family businesses performance. This study also contributes to the literature by testing that this influence varies according to the generational level it is considered. Therefore, this research confirms that innovation capacity has a greater influence on the performance of second-generation family firms than on first-generation firms. Several potential lines of research may be highlighted. First, the authors focus on the possibility of using qualitative analysis methods (De Massis et al., 2013) such as case studies or qualitative comparative analysis of diffuse sets (fsQCA). This manuscript encourages academics to divide innovation capacity into product innovation

capacity and process innovation capacity to empirically test any difference in the effect on the family business performance. It would also be of interest to analyze the moderating effect considering other firm characteristics such as management professionalization, issues linked to corporate governance, and socioemotional wealth. The authors advocate the study of the effect of the capacity for innovation according to the sector of the family business, the characteristics of business environment or the degree of internationalization of the company. Finally, the authors propose an analysis of the effect of innovation capacity on the innovative performance of family businesses.

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Table 1:

Sample details

Property of the sample	Details
Target population (universe)	1,045 Spanish family firms
Analysis unit (sampling unit)	The company
Sample size/response rate	106 valid surveys/10.14% response rate
Confidence level	95%; $z = 1.96$; $p = q = 0.50$; $\alpha = 0.05$
Sampling error	9.03%
Key informant	CEO
Date of data collection	April to June 2017

Table 2:

Reliability and convergent and discriminant validity

	AVE	Cronbach's alpha	Composite reliability	Rho
Innovation capability	0.893	0.881	0.944	0.852
Product innovation capability	0.721	0.846	0.891	0.847
Process innovation capability	0.753	0.823	0.884	0.865
Family Firm Performance	0.717	0.867	0.910	0.874

Table 3:

Discriminant validity of the innovative capacity items

	Product innovation capability	Process innovation capability
Product innovation capability	0.850*	
Process innovation capability	0.793	0.867*

Note: * entries on the diagonal show the square root of the AVE.

Table 4:

Correlation matrix and HTMT ratio

Composite/indicators	Innovation capability	Firm performance
Innovation capability	0.628	
Family Firm performance	0.543	0.561

Table 5:

HTMT$_{inference}$

	Original sample (O)	Sample mean (M)	5.0%	95.0%	Sample mean (M)	Bias	5.0%	95.0%
Family firm performance > innovation capability	0.272	0.282	0.082	0.497	0.272	0.010	0.076	0.481

Table 6:

Direct structural model

	R^2	Path coefficient (β)	t value (bootstrap)	95% confidence intervals		Supported?
				Inferior	Superior	
H_1 = CINNOV → FIRMPERF	0.406	0.358***	4.467	0.248	0.685	Yes

Note: *** $p < 0.001$, based on t(4,999) one-tailed test; CINNOV – innovation capability; FIRMPERF – family firm performance.

Table 7:

Composite invariance

Composite	c-value (= 1)	95% confidence interval	Compositional invariance?
CINNOV	0.997	[0.994; 1.000]	Yes
FIRMPERF	0.994	[0.991; 1.000]	Yes

Note: For the MICOM procedure, SmartPLS 3.2.7 for 5,000 permutations was used;

CINNOV – innovation capability; FIRMPERF – family firm performance.

Table 8:

Metric invariance assessment [a]

LV	Product innovation capability					Process innovation capability				Firm performance			
MV	CId1	CId2	CId3	CId4	CId5	CIs1	CIs2	CIs3	CIs4	FP 1	FP 2	FP 3	FP 4
Differences	0.11	0.01	- 0.12	- 0.20	0.09	- 0.17	0.06	- 0.03	- 0.30	- 0.15	- 0.11	- 0.09	- 0.06
P	0.07	0.32	0.25	0.38	0.09	0.28	0.14	0.09	0.11	0.08	0.31	0.47	0.28
Significant	No	No	No	No	No	No	No	No	No	No	No	No	No

Note: [a] Permutation-based procedure for multigroup analysis: Analysis of significant differences in loadings between groups.

Table 9:

MICOM: Equal variance and equal means

Composite	Difference in composite variance ratio (= 0)	95% confidence interval	Equal variance?
CINNOV	-0.002	[-0.270; 0.279]	Yes
FIRMPERF	-0.005	[0.337; 0.322]	Yes
Composite	Difference in composite's mean ratio (=0)	95% confidence interval	Equal means?
CINNOV	-0.003	[-0.228; 0.218]	Yes
FIRMPERF	-0.004	[-0.213; 0.225]	Yes

Note: For the MICOM procedure, SmartPLS 3.2.7 for 5,000 permutations was used;

CINNOV – innovation capability; FIRMPERF – family firm performance.

Table 10:

Test for the multigroup analysis

	First generation	Second-and-beyond generation	Difference between first and second-and-beyond generation	$t_{Parametric\ (EV)}$	$t_{Parametric\ (NEV)}$	$P_{Permutation}$	$P_{Henseler}$
CINNOV → FIRMPERF	0.264	0.387	-0.123	3.646[a]	3.518[a]	0.057[b]	0.048[c]

Note: [a] Significant (one-tailed t distribution, one-sided test), [b] significant at 0.10, [c] significant (one-sided test); CINNOV – innovation capability; FIRMPERF – family firm performance.

Table 11:

Results for the multigroup model

	β	t-value	R^2
Complete model	0.358	4.467***	0.406
First generation	0.243	3.628***	0.336
Second-and-beyond generation	0.427	5.525***	0.475

Notes: *** $p < 0.001$, based on t (4999), one-tailed test.

Figure 1:

Research model

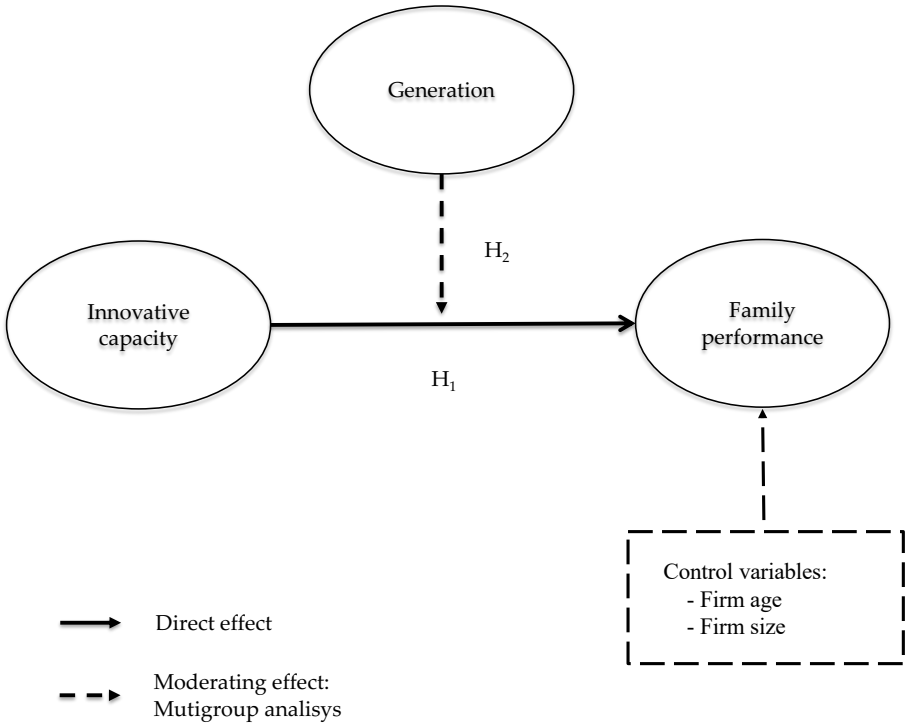
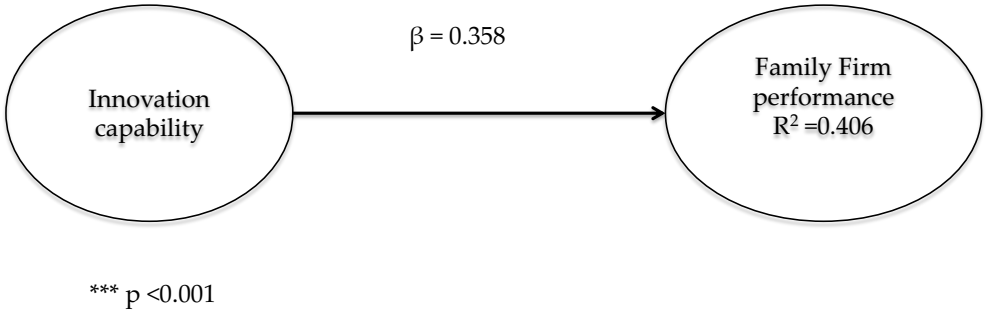


Figure 2:

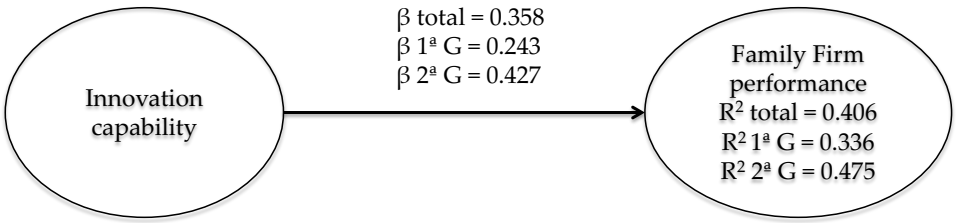
Direct structural model



*** p <0.001

Figure 3:

Results for the multigroup model



*** p <0.001