

Innovations in family firms: a study of owner-managers' knowledge development

Innovations in
family firms

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Abstract

Purpose – The purpose of this paper is to identify the relationship between family firms' innovation output and the continuous knowledge development of owner-managers. Moreover, the study aims to investigate the effect of the level of owner-managers' educational background on family firms' innovation.

Design/methodology/approach – The data originate from a primary research conducted in Poland. A log-linear analysis was used to verify the hypotheses.

Findings – The findings demonstrate that the positive relationship between the higher levels of education of owner-managers and the innovation output of family firms does not exist. However, the innovativeness of family firms is determined by the continuous development of owner-managers' knowledge. Family firms whose owner-managers continuously expand their knowledge introduce significantly more product and marketing innovations. This relationship appears independent of firm's size, type of business activity and owner-managers' educational level.

Practical implications – Understanding how the continuous development of owner-managers' knowledge influence the firm's innovation output is potentially valuable for managers of family firms. The findings offer also practical suggestions for policymakers on how to support structures that aim to enhance innovation in family enterprises.

Originality/value – This study contributes to the family business literature by presenting quantitative findings describing links between family firms' innovation outputs and continuous knowledge development of owner-managers. Thus, the study broadens knowledge on factors determining innovation of family firms and influencing family business heterogeneity.

Keywords Education, Family business, Knowledge, Innovation

Paper type Research paper

1. Introduction

Family firms operate in various sectors of the economy, markets of various sizes, and have different organizational and legal forms (De Massis *et al.*, 2015a; Miller *et al.*, 2017). Despite the considerable heterogeneity, they share a number of features that differentiate them from non-family firms (Astrachan, 2010). Their uniqueness stems from family ownership, governance and management (Beck *et al.*, 2009). An important feature of family firms is the family's social and emotional involvement in running the business (Cleary *et al.*, 2019; Sharama and Sharama, 2011). Both business and family are tied (Seaman *et al.*, 2017) through strong formal and informal interrelationships. In family firms, family life usually revolves around running the firm (Hasenzagl *et al.*, 2017), the income it generates and its reputation. The family shapes the organizational culture of the business, sets non-economic and economic goals and defines the ways to achieve them simultaneously (Martin and Gomez-Mejia, 2016; Sharama and Sharama, 2011). A unique feature of family firms is inter-generational succession (Beck *et al.*, 2009), which is why family firms usually focus on long-term sustainability rather than short-term profit (Mandl, 2008).



The continuity and longevity of modern family businesses depend largely on their ability to generate and implement innovation (Erdogan *et al.*, 2019). This is because innovations in the contemporary world determine the competitive advantage of companies (Hauck and Prügl, 2015; Kammerlander *et al.*, 2015) and they affect positively the performance and growth of family firms (Kellermanns *et al.*, 2008). However, owners of family firms usually attempt to avoid risky ventures (Hiebl, 2012; Serrano-Bedia *et al.*, 2016) and are on average more risk averse than non-family firms (Hiebl, 2014). As such, when assessing the risks involved in their future projects, they consider both financial risk and non-financial factors (Classen *et al.*, 2014). They are concerned not only with possible financial loss, but also with the reputation and social status of the present and future generations. Thus, both economic and non-economic objectives influence family firm strategic behaviors (Chrisman *et al.*, 2012; Madison *et al.*, 2015). Therefore, out of concern for the generations to come, owners of family firms often invest their profits and patiently wait for a return on the invested capital (Mandl, 2008). Consequently, many family firms develop conservative innovation strategies (Classen *et al.*, 2014). Yet, some family firms are very innovative and aggressive (Kellermanns *et al.*, 2012). Such innovative, pro-active and ready-to-risk entrepreneurial behaviors of family firms contribute significantly to worldwide economic growth and development (Kellermanns *et al.*, 2008).

The research on innovation in family firms conducted so far offers no conclusive findings on whether, the fact a company is a family business or not, has a positive or negative effect on its innovativeness (Kraus *et al.*, 2012; Rondi *et al.*, 2017). Several studies show that family business is more innovative than non-family ones, while others suggest the opposite (De Massis *et al.*, 2015a; Duran *et al.*, 2016; Kammerlander *et al.*, 2015; Li and Daspit, 2016). Nonetheless, some authors claim that family firms invest less in research and development (R&D) than non-family firms (De Massis *et al.*, 2015a).

Presently, innovation in family firms is the object of a growing number of research projects and studies. However, our knowledge in this field remains incomplete and inconsistent (Hauck and Prügl, 2015). The factors that affect innovation in family businesses are an important research problem. Prior works show particular interest in the endogenous variables specific to this group of entities such as family management (Manzaneque *et al.*, 2017), intra-family leadership succession (Hauck and Prügl, 2015), family values or the fact that a business is deeply rooted in the past (Kammerlander *et al.*, 2015). Interestingly, despite the pivotal role of the owners of family firms in the innovation process, previous studies occasionally investigate the characteristics of owner-managers as a determinant of innovation in family businesses. Until now the evidence is lacking of how differences in the knowledge development of owner-managers influence the innovativeness of family firms. This study aims to address this gap by identifying linkage between the innovation activities of family firms and the continuous knowledge development of owner-managers. Moreover, the study aims to investigate the effect of the level of owner-managers' educational background on family firms innovation. Based on the evidence presented in the literature (OECD, 2005), the study considers four types of innovation associated with products, processes, marketing and organizational innovation.

The present research provides two main contributions to the family firm literature. First, to the best of our knowledge, this is the first empirical study that explores links between the innovation types introduced in family firms and the continuous knowledge development of owner-managers. Consequently, the survey findings broaden the knowledge about the factors that determine the innovativeness of family firms.

Second, our study demonstrates the influence of the development of owner-managers knowledge on the innovativeness of family firms. Thus, this study supports the upper echelons theory which states that strategic choices in organizations, such as the implementation of innovation, are partially predicted by managerial background characteristics (Hambrick and Mason, 1984).

2. Theoretical background

2.1 *The level of formal education of manager-owners vs family firms' innovation*

Innovation is a complex phenomenon that is important to all organizations (Dias *et al.*, 2014). It is the essence of a firms' long-term success (Kammerlander *et al.*, 2015) and a key factor in firms' competitiveness (Krašnicka *et al.*, 2018; Li and Daspit, 2016). Many authors state that innovation does not have to relate to completely new solutions. From this perspective, innovation is an idea, practice or object that an individual or other unit of adoption perceive as new. Thus, innovation refers to making changes, large and small, radical and incremental, to products, processes and services that result in the introduction of something new for the organization that adds value to customers and contributes to the organization knowledge store (O'Sullivan and Dooley, 2009). On the other hand, innovation "is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)" (OECD/Eurostat, 2018).

Implementing innovation is particularly important for family firms because it increases the probability that they will last through subsequent generations (Jaskiewicz *et al.*, 2015). Therefore, many family firms introduce innovations. Yet their strategies in this respect vary considerably and belong to four major categories: defenders, prospectors, analyzers and reactors. Defenders focus on innovation in processes in order to strengthen their position in the firm's business sector. Prospectors are product innovation-oriented and explore new areas in business. Analyzers introduce both product and process innovations, and their innovation strategies are not homogeneous. Finally, reactors have no clear innovation strategy and they have a rather low level of innovativeness (Lorenzo and Núñez-Cacho, 2013).

Whether a family business is innovative or not depends on a number of factors exclusive to this group of entities, including unique types of motivation, family's engagement in running the business, family value standards (De Massis *et al.*, 2015a; Kammerlander *et al.*, 2015), family involvement in governance (Li and Daspit, 2016), the generation to which the owners managing the business belong (Beck *et al.*, 2011), the number of generations involved in top management team (Arzubiaga *et al.*, 2019), and paths of organizational interdependencies, particularly those set by the company's founder (Kammerlander *et al.*, 2015). Furthermore, an important factor affecting innovation in family firms is multi-generation succession (Hatak and Roessl, 2015) and inter-generational dispersion of ownership (Kellermanns *et al.*, 2012). Even the owner's preoccupation with the past can have an impact on family firm's innovativeness (Kammerlander *et al.*, 2015). Nevertheless, the family firms' inclination to implement innovations is also driven by numerous external and internal factors that affect not only the innovation of family businesses, but of all companies. Within these external factors, the environment is extremely important for the implementation of innovations in both family and non-family businesses (Pichlak, 2015). The internal factors include the firm's size (Audretsch and Aldridge, 2008; Plehn-Dujowich, 2013), internationalization (Siedschlag and Zhang, 2015) and the firm's strategic features such as being a member of a group or orientation toward foreign markets (Das *et al.*, 2018). Even the type of business activity plays a role in the company's innovation due to the firms use of different practices to innovate successfully within a specific sector (Laforet, 2013). Moreover, human resources (Madrid-Guijarro *et al.*, 2009) and leadership (Escrig *et al.*, 2016) have a significant impact on the firm innovation. Leaders may encourage creativity and promote the overall capacity for change in the enterprise (Jiang and Chen, 2016). Likewise, depending on their approach, leaders can stimulate knowledge sharing and collaboration (Cunningham *et al.*, 2017). Thus, they can inspire people and design an organizational environment that enables employees to be innovative. Although the leadership is not restricted to those at the very top of the organizational pyramid, the role of top managers in the firms' innovativeness is pivotal.

This is because they usually set the company's direction and develop the vision of the firm (Prasad and Junni, 2017). However, they may also be a potent force against innovation.

In the case of family businesses, the position of top manager is often performed by a family member, the owner-manager. Thus the owner-managers' role in the innovation process is fundamental. As the central premise of upper echelons theory states the owner-manager choices regarding innovations belong to these strategic decisions that are greatly influenced by their interpretations of the situations they face. Moreover, they are affected by owner-manager experiences, values, personalities and even their demographic characteristics. These characteristics include the owner-manager's age, gender or education (Hambrick, 2007; Hambrick and Mason, 1984). As such, according to the upper echelons theory, to understand the innovativeness of family firms the exploration of owner-manager's characteristics is needed.

The upper echelons theory reveals, that among the owner-managers features that influence the choices regarding the implementation of innovations by family firms, the education of owner-managers may play a substantial role. The educational backgrounds of managers as a factor predicting a firms' innovation have been explored in macro-organizational research for many years (Hambrick and Mason, 1984). The findings of these studies are consistent. They reveal that the level of top managers' education is positively related to receptivity to innovation. Ayyagari *et al.* (2011) demonstrate that companies with better educated managers have greater growth and innovation dynamics. Other studies show the positive relationship between managers' education and their firms investments, profits and sales revenues. Companies managed by better educated managers invest more often, and generate higher profits and sales revenues than companies managed by worse-educated managers. They are also more likely to survive in the market (Fairle and Robb, 2004).

Although previous studies confirmed the positive link between the top managers' education and a firms' openness for innovation, they generally were not focused on family businesses. In family firms such research was conducted only occasionally. One of such studies with regard to family businesses was carried out by Laforet (2013). Although, in this study the issue of owner's education was not examined in detail, it's findings show that the formal education of the owner does not affect innovations in family businesses.

Family businesses differ from the rest of the companies (Li and Daspit, 2016). In family businesses, contrary to non-family firms, knowledge is passed down from generation to generation (Boyd *et al.*, 2015). This knowledge and expertise received by the next generation, makes it possible for the successors to run the company seamlessly. Therefore, in case of family firms the educational backgrounds of owner-managers may play a secondary role. Thus, although, the role of learning in the innovation processes is fundamental (Shapiro *et al.*, 2007), in family firms the relationship between owner's education and firm innovation may not exist. Considering this, it is proposed that:

- H1.* The owner-managers' level of formal education does not influence the introduction of product, process, organizational and marketing innovations in family firms. This is independent of a firm's size, market range and type of business activity.

2.2 The owner-managers' professional knowledge development vs family firms' innovation
Knowledge is an important factor affecting the company's innovative capacity (Kaya and Patton, 2011) because innovations arise from knowledge-based activities. These activities involve practical application of existing or newly developed information and knowledge (OECD, 2018, p. 46). In family firms the knowledge about the business is transferred from a predecessor to a successor (Boyd *et al.*, 2015). Thus the owner-managers gain comprehensive specialist knowledge in a specific business field. However currently,

when trends in the environment come and go rapidly, it may be not enough to run the business successfully through the generations. If owner-managers of family firms want their firms to keep up with changing customer needs and to match a customer's requirements, they must be able to implement innovations to the firm due to their positive impact on the competitive advantage of the companies (Hauck and Prügl, 2015; Kammerlander *et al.*, 2015). To offer new perspectives to the firm the owner-managers should know the changes that take place both in the industry and in the management. Hence, they ought to constantly extend their knowledge about it. Knowledge about the industry can be obtained through systematic observation of the market. This can be achieved by analyzing market reviews and participating in industry conferences. Likewise, management knowledge can be developed during conferences. This type of knowledge can also be gained by studying management literature and participation in specialized trainings.

The development of professional knowledge can help owner-managers to set strategic goals. It can also lead them to implement innovations in the company. Therefore, among the owner-managers features that may impact the innovativeness of family firms, the owner-managers' ongoing knowledge development may play a substantial role. The basis for such an assumption is provided by the research of Felin and Hesterly (2007). The results of which reveal the link between innovation and the knowledge and actions of the individuals managing this knowledge. Along the same lines, Palacios *et al.* (2009) indicate that knowledge assets have a positive impact on the firm innovative performance. Similarly, Olander *et al.* (2016) point out that knowledge assets are preconditions of a firm's future innovativeness.

Considering that knowledge flow plays an important role in the process of innovation (Roig-Tierno *et al.*, 2018), a positive relationship between the continuous development of the owner-managers' professional knowledge and the innovation activities of family firms can be assumed. Accordingly, these managers who constantly develop their professional knowledge through their participation in courses/training improving their professional knowledge; their participation in scientific conferences; and reading of up-to date professional literature/magazines, are expected to introduce more innovation to their family businesses. Thus, the following hypotheses have been formulated:

- H2.* Continuous professional knowledge development of owner-managers has a positive impact on the introduction of product, process, organizational and marketing innovations in family firms. This relationship exists independent of a firm's size, market range and type of business activity.

3. Research methodology

This study analyzes data gathered through primary research conducted in Poland on a sample of 353 family firms. The ownership and management criteria were used to identify family firms. Consequently, family firms were defined as firms "in which a family controls the majority of the ordinary voting shares and the family is represented in the firms' management" (Serrano-Bedia *et al.*, 2016, p. 498).

This study examines the impact of both the level of owner-managers' educational background and the continuous professional knowledge development of owner-managers, on the implementation of product, process, organizational and marketing innovations in family businesses. Considering the levels of education which exist in Poland four levels of owner-managers' educational background were distinguished. These include two basic levels of educational background (vocational and medium level background), higher level of educational background (college/university degree) and other, further stage of educational background (scientific degrees). The owner-managers' educational background was measured by constructing a dummy variable equal to one if owner-manager has a certain

degree and zero otherwise. The similar ways of measuring the owner's level of education has been already used in the previous research (Coleman *et al.*, 2013).

The second investigated variable was the continuous knowledge development of owner-managers. The identification of owner-managers who constantly develop their professional knowledge was based on their own indications of their participation in courses/trainings to improve their professional knowledge, their participation in scientific conferences and their reading of up-to date professional literature/magazines. Owner-managers who engaged in at least one of these activities per year for three consecutive years were classified as owner-managers who constantly grow their professional knowledge.

For the purpose of this study a broad definition of innovation was used. It refers to making changes (large and small, radical and incremental) to the products, processes and services that result in the introduction of something new for the organization that adds value to customers and contributes to the organization's knowledge store (O'Sullivan and Dooley, 2009). Following the OECD (2005) classification four types of innovation were identified: product, process, marketing and organizational innovations. Product innovations were treated as a new product or product improvements. Process innovation applied to the implementation of a new or significantly improved production or delivery method, including significant changes in techniques, equipment and/or software (European Commission, 2006). Marketing innovations include the implementation of a new marketing method involving significant changes in the product design or packaging, product placement, product promotion or pricing (OECD, 2005). Organizational innovation included the implementation of a new organizational method in the business practices, workplace organization or external relations. These innovations did not include: changes in business practices, workplace organization or external relations based on existing organizational methods, or changes in management strategy, mergers and acquisitions, ceasing to use a process, simple capital replacement or extension, changes resulting purely from changes in factor prices, customization, regular seasonal and other cyclical changes and trading new or significantly improved products as innovations (European Commission, 2006).

The study used an e-mail questionnaire. A number of factors explain this way of collecting data. First, respondents could complete the questionnaire at a convenient time, which is extremely useful considering the busy life and work commitments of the target group. Moreover, respondents could take as much time as they needed to fully understand and complete the survey, which helped to improve the quality of the gathered data. Furthermore, an e-mail survey often stimulates higher response levels than ordinary "snail mail" surveys (Saunders *et al.*, 2009).

In order to address research aims, a structured questionnaire was developed. It consisted of dichotomous (0/1) and fixed-alternative questions, which ensured consistency and reliability in the research method (Saunders *et al.*, 2009). The questions identified business practices related to the functioning of family firms.

The questionnaire was addressed to owner-managers of family firms. The main survey was preceded by a pilot survey of a sample of fifteen family firms. Then, based on their feedback, the original questionnaire was modified. It was supplemented with validating questions. The final version of the questionnaire was sent by mail to all owner-managers of family firms who were members of the Polish Family Firm Initiative (*Inicjatywa Firm Rodzinnych IFR*). This yielded 353 fully completed questionnaires for the analysis. Such sample size corresponded to our preliminary estimations that included the number of family businesses in Poland and the confidence level for the study at 95%; fraction set to 0.5, and with a maximum error set to 5 percent.

The surveyed group included micro, small and medium family enterprises from all Polish provinces, including legal persons, entities without legal personality and natural persons conducting business activities (self-employed). The respondents represented all major

sectors, including commerce, services, manufacturing and construction. Table I summarizes the data in detail.

The specified variables were analyzed using the χ^2 test, in which a p -value below 0.05 was treated as statistically significant. Identified variables were included in a model constructed for further log-linear analysis. This type of statistical analysis enabled to construct a model using any number of variables and any set of interactions. Moreover, it was important that the data in the contingency table were distributed with no discrepancy between the dependent and independent variables (Brzezińska, 2013).

Conducting a test of all k -factor interactions simultaneous showed an improvement in fit when including different interactions in the model. Then, using tests of marginal and partial association, significant interactions were identified and included in the log-linear analysis.

4. Research results

At the first step of the analysis the descriptive statistics and the χ^2 test were performed (Table I). The results of it show that the owner-managers' educational level does not influence the innovativeness of family firms. Moreover, it was found out that owner-managers' knowledge development influences two types of innovations: product ($p = 0.01$) and marketing ($p < 0.01$) innovations. However, owner-managers' knowledge development does not affect the introduction of process and organizational innovations.

The results of the analysis also reveal that there appear statistical differences in terms of the type of business activity and firms market range. The type of business activity significantly affects process innovations ($p < 0.01$). Furthermore, the family firms' market range impact both product ($p < 0.05$) and marketing innovations ($p < 0.01$).

Based on the descriptive statistics and the χ^2 test results, a model for further log-linear analysis was constructed. In this model only the variables with at least two statistical differences related to innovation introduction were included. Thus, the model contained the following variables: knowledge development, market range, product innovations and marketing innovations. Table II presents the specification of analyzed model.

Then, to build the best model, a simultaneous tests of all k -factor interactions were conducted (Table III). The results of it show that the improvement in fit when including all two-way interactions in the model (k -factor = 2) is highly significant (i.e. the model provides a very poor fit). Meanwhile, adding all 3-way interactions to the model (k -factor = 3) is not significant.

As the final step of our analysis, the results of the marginal and partial association tests were reviewed to identify the two-way associations for the following log-linear analysis. In Table IV, an asterisk was used to indicate the four significant interactions with asterisk (12; 13; 23; 34). All of these were included in the log-linear analysis.

Table V and Figure 1 present the results of log-linear analysis. The model indicates four important effects, which are the dependence between:

- (1) knowledge development and product innovations;
- (2) knowledge development and marketing innovations;
- (3) market range and marketing innovations; and
- (4) product innovations and marketing innovations.

The above findings of the statistical analysis led to the positive verification of $H1$ stating that the owner-managers' level of formal education does not influence the introduction of innovations in family businesses; and this is independent of a firm's size, market range and type of business activity. The results of the present research indicate that no relationship between the owner-managers' level of formal education and the family firm's innovation activities exists.

Table I.
Descriptive statistics
for the specified
variables and χ^2 test

Variable	Product innovations			Organizational innovations			Marketing innovations			Process innovations					
	n	%	χ^2 level p	n	%	χ^2 level p	n	%	χ^2 level p	n	%	χ^2 level p			
<i>Firms size</i>															
Microfirms	103	56.28	2.466	91	49.73	2.235	0.5251	59	32.96	6.461	0.0912	78	43.09	4.905	0.1789
Small firms	57	57.00		56	56.00			32	32.00			41	41.00		
Medium firms	24	60.00		24	60.00			16	40.00			11	27.50		
Large firms	22	70.97		18	58.06			17	54.84			9	29.03		
<i>Industry</i>															
Construction	9	47.37	4.603	9	47.37	2.154	0.7074	8	42.11	5.104	0.2768	6	31.58	14.182	0.0067
Trade	41	63.08		30	46.15			16	25.40			26	40.00		
Mixed	64	63.37		56	55.45			41	41.41			54	53.47		
Production	17	62.96		15	55.56			8	29.63			6	22.22		
Services	75	52.82		79	55.63			51	35.92			47	33.57		
<i>Market range</i>															
Local	99	54.67	6.089	89	49.17	2.746	0.2533	51	28.65	10.024	0.0067	77	42.78	1.782	0.4103
Domestic	49	54.44		51	56.67			33	36.67			31	34.83		
International	58	69.89		49	59.04			40	48.78			31	37.35		
<i>Owner- managers that develop their knowledge</i>	173	62.01	5.924	152	54.48	0.171	0.6788	110	39.86	8.543	0.0035	114	41.16	1.233	0.2867
<i>Level of owner- managers education</i>															
Vocational	17	62.96	1.014	14	51.85	0.685	0.8768	7	26.92	5.407	0.1443	11	40.74	5.097	0.1648
Medium	56	55.45		51	50.50			27	27.55			48	48.00		
Higher	127	59.35		118	55.14			85	39.72			77	36.15		
Another	6	50.00		6	50			7	26.92			3	25.00		

Source: Own elaboration

Moreover, the analysis partially confirms the *H2* according to which knowledge development of owner-managers has a positive impact on the introduction of innovations in family firms. It also assumed that this relationship exists independent of a firm's size, market range and type of business activity. Our results show that owner-managers'

Variable code:	(1)	(2)	(3)	(4)
Variable name:	Knowledge development	Product innovations	Marketing innovations	Market range
Level of coding variable	2	x 2	x 2	x 3

Source: Own elaboration

Table II.
Specification of analyzed model

<i>k</i> -factor	df	Max. likelihood χ^2	Probability <i>P</i>	Pearson χ^2	Probability <i>P</i>
1	5	202.3047	0.000000	205.6040	0.000000
2	9	45.8900	0.000001	53.3326	0.000000
3	7	5.8169	0.561284	5.3725	0.614606
4	2	1.5207	0.467498	1.4036	0.495691

Source: Own elaboration

Table III.
The simultaneous test of all *k*-factor interactions of the model

Effect	df	Partial association χ^2	Partial association <i>P</i>	Marginal association χ^2	Marginal association <i>P</i>
1	1	119.4480	0.000000		
2	1	9.3330	0.002251		
3	1	29.1332	0.000000		
4	2	44.3905	0.000000		
12*	1	4.0064	0.000000	7.05937	0.007885
13*	1	6.5255	0.010634	10.20514	0.001400
14	2	0.9800	0.612620	2.37602	0.304827
23*	1	12.9033	0.000328	17.47917	0.000029
24	2	3.0378	0.218950	5.32999	0.069600
34*	2	6.9200	0.031429	9.83904	0.007303
123	1	2.1559	0.142021	1.46240	0.226548
124	2	0.3201	0.852098	0.46319	0.793268
134	2	2.1111	0.347993	1.98882	0.369943
234	2	1.7779	0.411080	1.64879	0.438501

Note: *Significant interactions

Source: Own elaboration

Table IV.
Tests of marginal and partial association for the specified variables

Tested model: 12,31,32,34	df	<i>p</i>
χ^2 the highest faith: 11.527	13	0.56678
χ^2 Pearson: 10.561	13	0.64750

Notes: Delta: 0.5000; Max. Iterations: 50; Crit. convergence: 0.0100; Convergence at 5 iterations was achieved
Source: Own elaboration

Table V.
The results of log-linear analysis

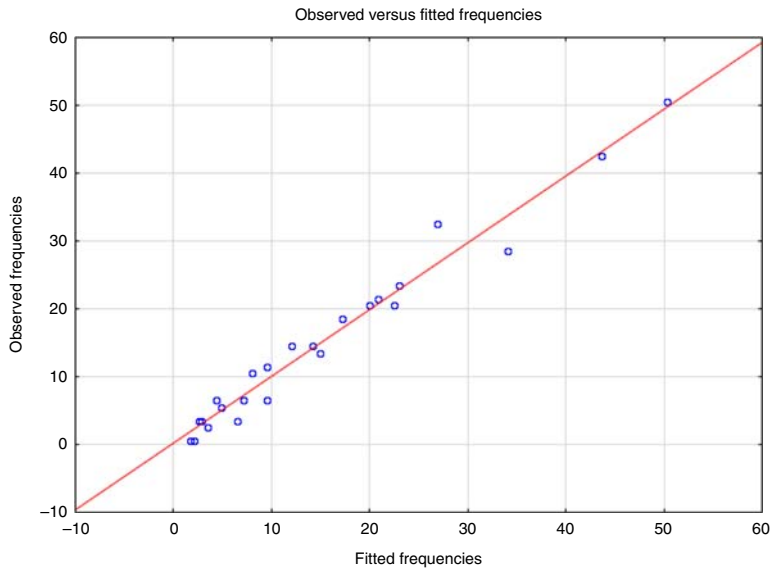


Figure 1.
Observed vs fitted
frequencies of the
analyzed model

Source: Own elaboration

knowledge development does not affect two types innovations: process and organizational innovations. However, owner-managers' knowledge development foster the implementation of product and marketing innovations in family businesses. The statistical analysis demonstrates that this relationship exists independent of a firms size, type of business activity and owner-managers' educational level. Nevertheless, this relationship appears to depend on the firm's market range.

In addition, the statistical analysis demonstrates that family firms' market range influences marketing innovations. Finally, the data analysis reveals a relationship between product innovations and marketing innovations.

5. Discussion

This study aimed at exploring the relationship between the innovation activities of family firms and two factors: the continuous professional knowledge development of owner-managers; and the level of owner-managers' educational background. Of the selected determinants, only ongoing professional knowledge development of owner-managers turned out to be an important driving force for family firms' innovation. To be precise, the results of this study show that family firms whose owner-managers regularly participate in professional courses/trainings, thematic conferences, or read up-to date professional literature, introduce significantly more product and marketing innovations than the family businesses whose owner-managers are not engaged in these activities on an ongoing basis. Importantly, this finding applies to firms of any size, type of business activities and the owner-managers' educational level.

Our findings demonstrate that the positive relationship between the higher levels of education of owner-managers' and the innovation capacity of family firms does not exist. Accordingly, although some prior research has suggested that the level of top managers' education is positively related to a firms' openness to innovation (Ayyagari *et al.*, 2011), the present study does not confirm that such relationship occur in family businesses with

regard to owner-managers. The similar findings, also in relation to family businesses, have been already received by Laforet (2013) whose study focused on three factors determining innovation: the type of organization, age and size. Although examined only marginally, Laforet's study found that owner's formal education has no impact on innovation in family firms. Our survey provides further and more detailed evidence for it.

As mentioned before, our findings indicate, owner-managers are more likely to introduce product and marketing innovations if they constantly develop their professional knowledge. However, no similar linkages were found regarding process and organizational innovations. Despite it, our study well supports the findings from earlier research showing that knowledge flow plays an important role in the process of innovation (Kaya and Patton, 2011; Palacios *et al.*, 2009; Roig-Tierno *et al.*, 2018). It also confirms prior studies demonstrating that there is the link between innovation and the knowledge and actions of the individuals managing this knowledge (Felin and Hesterly, 2007). Likewise, it is in line with the Price *et al.*'s (2013) work that reveals the relationship between knowledge and innovation in family firms.

Indeed, as these two types of innovation are closely related, the continuous knowledge development of owner-managers affects both the product and marketing innovation activities of family firms. Marketing innovations may enhance the positive impact of product innovations on the company's performance. Thanks to marketing activities, the company may communicate with its customers and promote an innovative product by offering customers new added value (Biégas and Steiner Neto, 2015). Hence, through continuously developing knowledge, owner-managers seem to be aware of the importance of marketing innovations when introducing new products.

When analyzing the impact of owner-managers' knowledge development on product innovations, one should note that product innovation, particularly very radical ones, is associated with high risks (Davicik and Sharma, 2017; De Massis *et al.*, 2015b). Innovation is always a "risky venture due to the uncertainties inherent both the innovations themselves and their commercialization" (Coras, 2014, p. 120). Accordingly, it often fails to bring enough high profits compared to the costs that are associated with it. Therefore, many owner-managers of family firms do not want to engage in innovation fearing that they can destroy the heritage of generations. Thus, they are reluctant to introduce changes (Kellermanns *et al.*, 2012) and try to maintain both traditional products and their own ways of doing things (De Massis *et al.*, 2016; Duh, 2014). However, as our results reveal, regardless of firms' size, type of business activity, and the owner-managers' educational level, owner-managers are more likely to introduce product innovations if they constantly develop their professional knowledge. Considering that successful innovation requires a deep understanding of the risks and benefits of the process (Pantano, 2016) such findings may suggest that continuous professional knowledge expansion makes owner-managers more willing to take the risk. Hence, it seems that the regular and ongoing development of knowledge makes them more aware that, although tradition is important for family firms, to survive for the next generations, they must renew through innovation. The owner-managers who continuously expand their knowledge may also better understand than other owner-managers that innovation can be used as a tool to protect or strengthen their firms' tradition (Erdogan *et al.*, 2019).

In the light of the survey results, the continuous development of knowledge by owner-managers who manage family firms does not determine organizational innovations. Considering that finding, it needs to be highlighted that the introduction of organizational innovation is always challenging. Only 30 percent of the organizational changes that firms initiate are successful (Burnes and By, 2012) because this type of innovation causes greater uncertainty amongst employees than do product, process and marketing innovations. The later results from factors such as human conservatism and adherence to the cultural, social,

political or other institutional determinants. Furthermore, social problems or conflicts more strongly and directly affect organizational innovations (Hámori and Szabó, 2013; Kraus *et al.*, 2012). Accordingly, in case of organizational innovation, it is not only a matter of owner-managers' professional knowledge, or his perception of risk. It is also about the employees' acceptance of risk. Thus, although the knowledge continuous development of owner-managers seems to reduce their low risk-taking propensity, which is one of the main impediments to organizational innovation (Hámori and Szabó, 2013), it may be not sufficient to overcome other obstacles occurring in the environment.

According to our results the continuous development of owner-managers' knowledge is also not a factor that determines process innovation. In that case two different factors may play a role. First of all, it is the willingness of families to continue their own, traditional ways of doing things. For many families it is crucial to maintain a special technology or commercial know-how that distinguishes them from their competitors (Duh, 2014). Second, process innovations require considerable capital expenditure and R&D investments (PwC, 2016). This factor seems to be of particular importance since, as other studies show, a firm's involvement in R&D and commercialization of market-leading products is limited due to insufficient funds (Covin *et al.*, 2016).

Some studies have already explored the importance of owner-managers' knowledge development in family firms. However, previous research has generally investigated that issue from a different perspective mainly addressing the development of next-generation family members in context of successful succession (Duh, 2014). There were also surveys concerning the trainings of next-generation family members after they have joined the management team (Mazzola *et al.*, 2008). They highlighted that the next generation may benefit by relevant training experiences. Our research does not contradict the results of these studies. Instead, it develops and adds to existing findings showing that the continuous development of knowledge is crucial for successors at every stage of their career.

Our survey findings broaden the knowledge about the factors that determine innovation of family firms. They add another factor – owner-managers' continuous knowledge development – to the catalogue of previously established factors. Thus, this study supports the upper echelons perspective theory. It states that strategic choices, such like innovation strategies, can be predicted by managerial (either of the CEO or other central actors) background characteristics (Hambrick and Mason, 1984).

6. Conclusions

Many internal factors determine the innovation of family firms. However, our study shows that a profound impact on the implementation of innovations in family businesses has the continuous expansion of professional knowledge by owner-managers. Namely, family firms whose owner-managers constantly develop their professional knowledge by the participation in courses/trainings improving their professional knowledge; the participation in thematic conferences; the reading of up-to date professional literature/magazines, introduce significantly more product and marketing innovations than the other family businesses. In other words, higher education alone is not sufficient in boosting innovation; instead; ongoing skill-enhancement through continues knowledge expansions helps to increase the innovativeness of family firms. Our findings suggest that motivation, ability to act and managerial skills are not the only features that characterize innovative owner-managers of family firms. Their continuous knowledge development is also important.

By identifying linkage between the innovation activities of family firms and the continuous knowledge development of owner-managers our study provides an empirical support for the upper echelons theory. It shows that innovations of companies, that represent one type of organization's behavior, depend on the "dispositions of their most powerful actors – their top executives" (Hambrick, 2007, p. 334). As such, this study shows

that to understand the innovation of family firms the exploration of owner-manager's characteristics is needed.

Our findings extend current understanding of an important, understudied topic relating to family business. This study broadens the current knowledge on the determinants of innovation in family firms. To the best of our knowledge no detailed studies on innovations in family firms and owner-managers' continuous expansion of knowledge exists so far. Therefore, this study discusses new issues that require further investigation in the context of the knowledge-based economy.

In addition, our study contributes to the ongoing debate on the explanation of the differences among family firms (Cirillo *et al.*, 2017). By showing that the development of owner-managers' knowledge influences the family firm's innovation, our study reveals that the development of owner-managers' knowledge is a factor that differentiates the strategies of family firms.

Knowledge on the effect of owner-managers' continuous professional development on the innovation of family firms is valuable for both policymakers and family firm entrepreneurs. Information about the association between family firm innovation and the owner-managers' ongoing knowledge development can influence future policies and the support structures that aim to enhance innovation in family enterprises. Based on our research results, local organizations such as universities, foundations and institutions that support both entrepreneurship and family businesses should begin to organize regular, free of charge, educational training for owner-managers and actively encourage their participation. Moreover, this study can help family firm owner-managers to determine whether to increase their knowledge and qualifications. Our findings show that owner-managers of family businesses striving for innovation in the company should still develop themselves regardless of educational background and the practical experience gained from the previous generations.

Our study raises interesting research questions for further exploration. Future studies should focus on the types of manager-owners' knowledge development and their impact on innovation within family firms. It would be interesting to ascertain whether the relationships found in our study also exist in non-family companies run by the owner. Finally, an important direction for future studies concerns the reasons of the lack of links between the innovation of family firms and the level of owner-managers' educational background. It is possible that an explanation of this can be provided by resource-based view (RBV) theory – a framework that has been used for many years to explain sources of advantage for family-controlled corporations (Habbershon and Williams, 1999). The RBV approach highlights the impact of idiosyncratic resources that are complex, intangible and dynamic within a particular business unit for the company's behavior. In the light of the RBV theory, “the entrepreneur's task is to develop, acquire and assemble these resources in such a way as to create a firm's competitive advantage” (Coleman *et al.*, 2013, p. 2). In family businesses these resources, including the management practices, know-how, business experience and values are accumulated by predecessors and passed on to next generation. Accordingly, family members from the early years generate firm-specific tacit knowledge (Yeniaras *et al.*, 2017). That knowledge resources, and not formal education, may therefore be of the key importance in the decisions of manager-owners concerning the innovation strategies of their companies. Thus, future research exploring that issue may provide more detailed information about the fundamental role of generational transfer of tacit knowledge in family firms.

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Further reading

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