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Internationalization and innovation performance: the role of family management

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ABSTRACT

L'obiettivo del presente articolo è quello di approfondire le relazioni tra internazionalizzazione, natura familiare delle imprese e innovazione adottando la prospettiva teorica della *resource-based view* (RBV). Facendo leva sull'importanza delle risorse (materiali e immateriali) che sono peculiari per imprese familiari, l'articolo esamina come l'internazionalizzazione e il *family management*, variabili considerate sia autonomamente che congiuntamente, influenzino la *performance* innovativa. Le ipotesi sono testate attraverso una serie di analisi di regressione, applicate a un *dataset* di circa 9.000 osservazioni relative a imprese manifatturiere spagnole. In primo luogo, risultati mostrano che l'internazionalizzazione e il *family management* hanno un effetto positivo autonomo e diretto sulla *performance* innovativa. In secondo luogo, analizzando l'effetto moderatore del *family management* sulla relazione che lega internazionalizzazione e innovazione, i dati mostrano un impatto positivo che rafforza l'influenza dell'internazionalizzazione sulla *performance* innovativa. Infine, la discussione dei risultati, i limiti e alcuni *trend* per futuri sviluppi della ricerca concludono l'articolo.

The aim of this paper is to contribute to a better understanding of the relationships among internationalization, family-managed firms and innovation by adopting the theoretical perspective of the resource based-view theory (RBV). Leveraging on the relevance of the firms' set of resources and in particular on the unique bundle of resources in family firms, specifically the intangible resources, the paper examines how internationalization and family involvement in the management independently, as well as jointly, influence the innovation performance. We provide empirical evidence by using a panel data of roundly 9,000 Spanish manufacturing firms via regression analysis. Firstly, results show that both internationalization and family involvement in the management have a positive effect on innovation performance. Second, by exploring the moderation role of family management, it critically emerges as positive and significant further factor, which emphasizes the effect of internationalization on innovation. Finally, conclusion, limitations and an agenda for further research are discussed.

Keywords: internationalization, innovation performance, family management, moderation effect, quantitative analysis

1 – Introduction

Innovation and internationalization are considered crucial strategies (Coviello and Munro, 1997; Golovko and Valentini, 2011) for achieving and sustaining the business competitive advantage that in turn leads firms to be successful and to grow over time (Freeman et al., 1983; Zahra and George, 2002; Vila and Kuster, 2007). According to Barney (1991) at the core of firm's competitive advantage is the bundle of resources considered as rare, valuable and inimitable. It is noteworthy then these resources are also at the basis of the internationalization and innovation processes. Indeed, studies on innovation suggest that technological resources and capabilities for creating new products facilitate firms to overcome obstacles for expanding the business in foreign markets (Basile, 2001; Cassiman and Golvko, 2011; Cassiman and Martinez-Ros, 2007). Internationalization, on the other hand, provides firms with new technological knowledge due to the exploitation of new markets that in turn fosters innovation (Cassiman and Golvko, 2011; Pla-Barber and Alegre, 2007) and overall the firm performance (Tsao and Lien, 2013). Though, originally, innovation and internationalization have been investigated separately, recent literature shows that these two strategies, important for rejuvenating the business and for sustaining its competitive advantage, are interrelated (Filippetti et al., 2011; Kylaheiko et al., 2011; Lewandowska et al., 2016). A considerable amount of studies analyzed the innovation – internationalization link both in terms of direct relationship (i.e. innovation that affects internationalization), reverse causal relationship (i.e. internationalization that affects innovation), bidirectional (i.e. innovation that affects internationalization and vice versa) and/or the joint effect of the two for instance on firm performance. In this regard, the vast majority of the studies showed a large consensus among scholars on the positive influence between innovation and internationalization. However, when the focus is on the reverse causal relationship, literature remains still sparse and inconsistent. Indeed, several studies on the influence of internationalization on innovation found a positive, or a negative but also a not significant relation between these two variables. As a matter of fact, it is surprising that technological resources and innovation encourage firms' internationalization, while the reverse relationship cannot be always confirmed. Thus, this inconclusive evidence encourages for further investigation.

The paper aims at answering such a call, by focusing on a particular empirical setting, i.e. the family business in which the relevant research shows a growing attention to internationalization and innovation strategies (Fernandez and Nieto, 2005; Nordqvist and Llach, 2010; Calabró et al., 2013).

The underlying rationale, which motivates this great interest, relies on the fact that family firms assume a significant relevance not only because of their presence around the world (La Porta et al., 1999) but also due to their unique characteristics in terms of resources and capabilities (Chua et al., 2012; Chrisman et al., 2013), arising from the participation of family members in the firm ownership and management. Indeed, considering that a firm's bundle of resources is determinant for innovation and internationalization (e.g. Cassiman and Golvko, 2011), the uniqueness of resources and capabilities characterizing family firms makes them even more interesting to be studied. Hence, from a resource perspective, family-specific characteristics such as their peculiar intangible resources (e.g. tacit knowledge, trust, commitment associated to the family management influence on the firms' strategic decision) compared to those of non-family firms or even to those firms without an active family member involved in the management, may be determinant to address the firms' internationalization - innovation issues.

However, empirical evidence regarding the influence of family ownership and management on firms' outcomes such as internationalization and innovation is still limited (Matzler et al., 2016; De Massis et al., 2018; Fang et al., 2018) and controversial. For instance, Zahra (2003), suggests that

family ownership and management support internationalization because family members are expected to behave as stewards of firm's resources. Gomez-Mejia et al. (2010), instead, argue that the concern about socio-emotional wealth restrains family firm's willingness to expand their activity beyond home markets leading as such to lower levels of internationalization. Contradictory findings emerge also considering family firms in relation to innovation behavior. In this regard, Irina Rod (2016) provides an extensive literature review on the topic and, by disentangling innovation process in innovation input, activities and output, she identifies also a lack of empirical studies related to the impact of family-specific characteristic on innovation output, namely innovation performance.

Thus, based on these premises and grounding this study on the resource-based view theory, our goal is threefold:

Firstly, we aim to further corroborate the reverse causal relationship between internationalization and innovation by providing further empirical evidence;

Second, focusing purposely on the family involvement in the management as main factor that reflects family-specific characteristics and unique bundle of resources, we aim at investigating the direct impact of family management on innovation performance;

Third, we aim at examining to what extent being an exporter and/or a internationalized firm, jointly with the fact of being a family- managed firm, moderates the relationship between internationalization and innovation performance.

As we focus especially on this last issue, we yield a twofold contribution.

Firstly, as more relevant contribution, we provide a theoretical improvement by suggesting a combined perspective between exporters and family firms whereby the firm's resources, and specifically the relevance of family firms' unique bundle of resources, lead to a greater exploitation of the new knowledge acquired from the exposure to foreign markets that in turn improves firms' existing competencies and it favors even more innovation. Hence, stemming from the unique intangible resources of family firms the study advances our knowledge on the interaction between family-managed firms and internationalization and its effect on the innovation performance. In particular, disentangling the family effect from the pool of the exporter firms allows to show to what extent the former strengthens the internationalization - innovation positive relationship, providing a clearer and a more complete picture of the relationship between internationalization and innovation through the lens of the resources based-view theory.

Secondly, as minor contribution, we provide additional empirical evidence shedding further light on the reverse causal link between innovation and internationalization.

The hypotheses are tested on a panel dataset of roundly 9,000 of Spanish manufacturing firms where internationalization and innovation are measured respectively by export intensity (i.e. ratio of exports on total sales) and by the number of innovative products. Family management is built as binary variable considering both the family ownership and at least one family member involved in the management of the firm. Control variables suggested by previous literature, such as for instance size, are considered as well.

In the remainder the article is structured as follows: in the first part, we review the existing literature on the above-mentioned topics, and we develop the hypotheses; then we describe the methodology; we discuss the results, we underline the contribution to theory and practice and, also, we recognize the limitations of the study.

2 – Theoretical background and hypotheses

The paper focuses on a large sample of Spanish family and non-family firms and it seeks to examine the relationship between internationalization, family involvement in the firm management as well as their interaction effect on innovation performance. Mainly, two are the reasons for choosing this

set of variables: first, many studies have investigated internationalization capability as a driver of innovation (Golovko and Valentini, 2011; Filipescu et al., 2013; Ren et al., 2015), but evidence is still sparse and inconclusive. Second, proposing a resource-based view approach and specifically relying on the unique bundle of resources associated to the family involvement in the management may shed further light on the link between internationalization and innovation. Therefore, in the following section, we discuss the current debate on the relationship between internationalization and innovation and on the influence that family management can exert firstly on innovation and then in shaping the relationship between internationalization and innovation itself.

2.1– *Internationalization and innovation*

Internationalization and innovation are key strategic decisions and they are also the most important factors (Golovko and Valentini, 2011) for the business growth. Innovation, on one hand, is essential for achieving long-term benefits from successful research projects (Hambrick and Macmillan, 1985), by creating new products and/or processes that ensure as such the firm's competitive advantage. On the other hand, internationalization is important too for sustaining the company growth thanks to the entry into new markets and by allowing the commercialization of a firm's new and/or existing products. Given such a crucial role, the interest among scholars about innovation and internationalization and on their relationship is always alive. As a matter of fact, a considerable number of studies have investigated the relationship between the two concepts, by pointing out a more nuanced picture of such a link. In this regard, Table 1 summarizes the main empirical findings on the topic by highlighting the different streams of research along which the relationship between internationalization and innovation has been developed.

As a result, studies on the direct impact of innovation on internationalization (the latter considered mostly from the viewpoint of export propensity) and studies on their reverse causal link, i.e. the impact of internationalization on innovation, emerge as the most investigated. Moreover, recently scholars have dedicated great attention to the bidirectional or the reciprocal effect, i.e. innovation that fosters internationalization and vice versa, as well as the simultaneous and complementary effect between these two strategies on firm's performance and firm's growth. Table 1 also outlines a considerable consensus among scholars regarding the positive relationship between innovation and internationalization, while it provides evidence on the controversial results with respect to the reverse causal relationship (Blind and Jugmittag, 2004; Salomon and Shaver, 2005; Silva and Leitao, 2007). In this regard, numerous studies report different findings. Girma et al. (2008) and Ren et al. (2015), who examine the internationalization-innovation relation, do not find a significative link among them. Silva and Leitao (2007), instead, in a study of Portuguese industrial firms, show that firms with higher export intensity have lower propensity toward product innovativeness, thus leading to a negative relationship. In contrast, Salomon and Shaver (2005) suggest that both the export status and the export volumes allow the firm to develop more innovative products. They argue that learning from the export activity generates new knowledge, thus benefiting innovation.

Therefore, it is evident that the impact of internationalization on innovation has not been deeply addressed and that further assessment on this relationship is needed. Hence, drawing on the resource-based view theory, where the firm is considered as a bundle of tangible and intangible resources (Barney, 1991), this study aims to further corroborate the positive impact of internationalization on innovation (Hitt et al., 1997; Filipescu et al. 2013) by purposely focusing on intangible resources acquired and developed during the internationalization process.

Direction of the relationship	Authors	Sample	Sign of the relationship	Findings
Innovation ---> Internationalization	Guan & Ma (2003)	213 industrial Chinese firms	+	Innovation capability fosters export performance
	Pla-Barber & Alegre (2007)	121 science-based French firms	+	Positive relationship between innovation and export intensity
	Cassiman et al. (2010)	9,300 observations of Spanish manufacturing firms (longitudinal study from 1990 to 1998)	+	Innovation positively affects exports (the latter in terms of export status, dummy variable)
	Cassiman & Golokov (2011)	8,402 observations of Spanish manufacturing firms (longitudinal study from 1990 to 1998)	+	Positive relationship between product innovation (dummy variable) and exports (the latter in terms of export status, dummy variable)
	Braga et al. (2017)	154 family firms	+	Positive effect of innovation on internationalization in family firms
	Saridakis et al. (2019)	12,823 UK SMEs	+	Both innovation and its antecedents positively affect internationalization (the latter proxied by export propensity/status, dummy variable)
Internationalization ---> Innovation	Blind and Jugmittag (2004)	2,019 service German firms	+	Being an exporter is positively and strongly correlated with the probability of being both a product innovator and a process innovator
	Salomon & Shaver (2005)	3,060 Spanish manufacturing firms	+	Positive impact of export status and export volume (the latter proxied by total foreign sales) on innovation (the latter proxied both by number of new innovative products and number of patents)
	Girma et al. (2008)	10,361 observations for Britain and 8,364 observations for Ireland	+ (for Irish firms); no effect for British firms	Exporting status, and not export intensity, affect positively innovation for Irish firms, but not for British firms
	Salomon & Yin (2008)	1,755 technologically leading vs lagging Spanish industries spanish	+	Export status positively affect innovation (the latter proxied by the number of patents)
	Silva and Leitao (2007)	1,429 industrial Portuguese firms	-	Firms with high export intensity are less capable of innovating their product, comparing with firms with lower export intensity

	Ren et al. (2015)	176 Chinese SMEs	no significant effect (though the sign of the coefficient is negative)	No significant effect found regarding internationalization impact on innovation performance
Innovation-Internationalization reciprocal causal relationship	Monreal-Perez et al. (2012)	14,142 observations of Spanish manufacturing firms (2001-2008, longitudinal analysis)	+	Positive relationship between innovation and export activity (self-selection effect and learning by exporting effect). Export activity measured by a dummy variable that express the export propensity.
	Esteve-Perez and Rodriguez (2013)	1,016 SMEs	+	R&D activity positively affect export propensity (dummy variable) and vice e versa.
	Filipescu et al. (2013)	696 Spanish manufacturing firms (longitudinal study from 1994-2005)	+	There is a causal relationship between R&D intensity, (product and process) innovation, and exports (breadth and depth) and vice versa.
	Alarcon & Sanchez (2016)	165 agricultural firms and 783 food firms (longitudinal 2006-2011)	+	Bidirectional effect of innovation and exports (both export and innovation are dummy variables) verified only for food industry and not for agricultural ones.
Innovation-Internationalization complementarity and simultaneity effect on firm's performance/growth	Love et al. (2010)	131-709 observations	+	Innovation combined with export activity positively affect productivity; innovation itself is not sufficient to affect productivity
	Golovko & Valentini (2011)	8,802 firm-year observations of Spanish manufacturing firms (longitudinal study from 1990 to 1999)	+	Complementarity between innovation and exports in fostering firms' growth
	Boerman & Roelfsema (2016)	150 Ducth small firms	+	Internationalization is a necessary condition for innovation to increase firm performance
	Nosi et al. (2017)	169 Italian gold-fashion firms	+	Antecedents of innovation and internationalization, and their simultaneous effect positively affect firm performance

Table 1 – Summary of main articles on the innovation-internationalization relationship

The underlying rationale is that exporter firms can benefit from interactions with international markets (Garcia et al., 2012; Filipescu et al., 2013) both in terms of gaining access to new technological know-how (Salomon and Jin, 2010) and further knowledge drawn from new alliances with suppliers, universities and competitors (Santos et al., 2004). This suggests that firm's capability to export and therefore to interact with foreign partners promotes learning, by creating and developing new knowledge. In this way, firms improve their basic competencies that stimulate innovation and sustain the overall firms' competitive advantage. In sum, internationalization provides firms with the inputs and the necessary resources, crucial for innovation (Hitt et al., 1997).

Basing on these arguments, it can be expected that internationalized firms achieve higher degrees of innovativeness. Specifically, by focusing on a particular measure of the degree of internationalization that is the export intensity, we claim that the higher the level of export intensity the more innovative the firms are. Coherently with these literature suggestions, we suppose that:

H1: There is a positive and significant relationship between the levels of export intensity and innovation.

2.2 – *Family involvement in the firm management and innovation*

In order to foster innovation, the resource perspective states that internationalized firms must be able to acquire and to develop new knowledge from their foreign contacts, i.e. intangible resources, which thus improve firms' own competencies and skills. Hence, as particular emphasis is placed on the development of intangible resources for firms in general, it is interesting to investigate what happens when the studied firms are family firms, given their exacerbated uniqueness of resources and capabilities.

Indeed, several studies emphasize such a uniqueness and its potential effect on innovation and thus on the competitive advantage. For instance, according to Habbershon et al. (2003) family firms, with respect to other forms of organizations, have a unique bundle of resources and capabilities deriving from the interaction of the family and the business system. The family itself also represents a valuable source for the competitive advantage (Eddleston et al., 2008). Indeed, the involvement of family members in the management strongly influences the accumulation of intangible resources (Kellermans, 2005) and the firms' ability to innovate. In sum, family management represents the distinctive element with respect to non-family firms that promotes the creation of those peculiar intangible resources which are important for firms' strategic decision such as innovation. However, some drawbacks must also be considered. For example, family-managed firms can be more inclined to appoint family members as managers rather than qualified external managers (Le Breton-Miller et al., 2011). This kind of decision may result in firms with a poor human capital, with the consequent lacking the necessary resources for a firm's innovation ability, crucial to obtain a long-term competitive advantage (Dyer, 2006). Nonetheless, Miller and Miller (2006) suggest that family-specific characteristics, such as longevity and the long-term orientation, may encourage investments in firms' mission, as well as nurture the long-stand relationships and motivate employees in counterbalancing the possible negative effects of family management. Moreover, managers' deep knowledge about the business, their strong commitment to the firm as well as the flexibility to face uncertainty events allow family firms to easily adapt to situations when new economic scenarios are in place.

Recently, literature concerning the relationship between family-specific characteristics in terms of the unique bundle of resources associated to the family ownership and management and the innovation behavior has grown exponentially. Despite previous research is rather consistent in

supporting that family management have a negative influence on the innovation, basically in terms of innovation inputs (Block et al., 2012; Kotlar et al., 2013), mixed results emerge with respect to the innovation output (Rod, 2016) regardless of whether the focus has been more in general on R&D expenditure, product/process innovation or patents. For example, Hatak et al. (2016) propose that family firms bring fewer products innovation on markets as well as Block et al. (2013) report a negative relationship between family ownership and innovation outcomes (i.e. patent data). In contrast to these findings, Matzler et al. (2015) and Dieguez-Soto et al. (2016) suggest that family firms, and more in detail the active involvement of family members in the management, increase the level of innovative products. Further studies also highlight the positive influence of family management on firm's innovation performance (Classen et al., 2012; Anderson et al., 2012).

All in all, in the family business context, although empirical literature has advanced our knowledge toward different important topics, the influence of family management on innovation still remains an open issue. An important study of Llach and Nordqvist (2010) suggests that family firms are more innovative than non-family firms because of their human, social and marketing capital. Hence, under the resource-based view perspective and by emphasizing the fact that family firms can build their competitive advantage by leveraging on their family-specific characteristics, we claim that family management may positively influence innovation performance and, more specifically, that family involvement may lead to a higher number of innovative products. Accordingly, we posit that:

H2: Family involvement in the management has a positive influence on innovation performance, resulting in a higher number of innovative products if compared to non-family firms.

2.3 – *The moderation effect of family involvement in the management*

Focusing on the resource-based view theory, we suppose that internationalization has a positive effect on the innovation (H1) and we suppose that family management has a positive influence on innovation (H2). In particular, by taking into account the importance of resources in H1 and the relevance of the unique bundle of resources characterizing family firms in H2 we assumed in both hypotheses a positive relationship, respectively between internationalization and family involvement with innovation. In particular, in terms of intangible resources it is worth emphasizing the advantages of family involvement in management and the benefits that the firm may receive in terms of exploitation of available capabilities (Chrisman et al., 2013; Habbershon et al., 2003; Kim and Gao, 2013; Sirmon and Hitt, 2003; Zahra, 2010). Indeed, family managers provide the firm with intangible resources such as personal contacts, trust, affective commitment to the family firm (Meyer and Allen, 1991), tacit knowledge, social capital (Sirmon and Hitt, 2003; Llach and Nordqvist, 2010), as well as tangible resources such as the family wealth invested in the family business. Thus, although some scholars consider internationalization and innovation complex processes which require specific and qualified competencies that a family firm may lack, prior research has also recognized that family management may show a positive influence on both of them. For instance, Tsao and Lien (2013), drawing on the agency theory, investigate whether internationalized family firms are more or less innovative by finding a positive and significant relationship. Indeed, they argue that involving family owners in managerial roles may significantly reduce agency problems associated to internationalization, as the participation of family members in the daily operations entails lower conflicts of interest in relation to innovation activities. Additionally, Zahra (2003), by adopting a stewardship perspective, suggests that family involvement supports internationalization because family managers act as stewards of their existing resources (Arregle et al., 2012).

Given these suggestions about the positive influence of family involvement, associated to internationalization, on firm innovation performance, it is surprising that within a resource-based

perspective, scholars have neglected the interplay of such factors, and in particular the family management role in influencing the internationalization-innovation relationship. Indeed, the "familiness" concept (Cabrera-Suarez et al., 2001; Sirmon and Hitt, 2003), which results in the unique bundle of resources associated to the family involvement in the firm, strongly affects innovation. Moreover, having assumed that also internationalized firms may be more innovative because of their bundle of developed resources, generated thanks to foreign contacts, it can be supposed that the internationalization – innovation relationship when it is contextualized within a family-firm setting, where family members are actively involved in the management, may be even stronger. Therefore, we hypothesize that:

H3: Family involvement in the management has a positive moderating effect by strengthening the impact of internationalization on innovation.

Figure 1 summarize the above-mentioned arguments: internationalization acts as a driver of innovation by entailing a positive influence on it and family management acts as a moderator in the relationship between them (see Figure 1). In the following section, we describe data and methodology to test the predicted relationships.

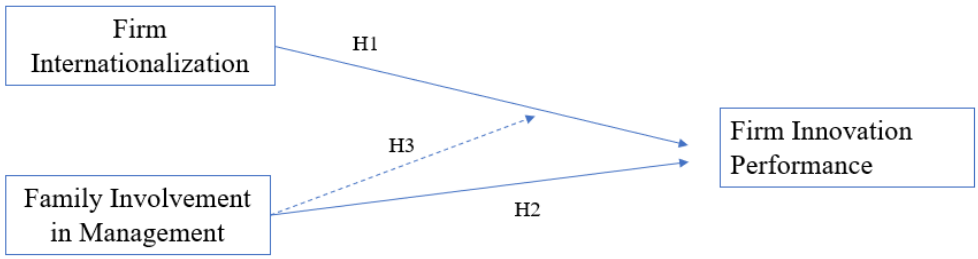

Figure 1 – Research framework

3 – Data and methodology

3.1 – *Sample and data*

We tested our hypothesis by using data from the annual Spanish Business Strategies Survey (SBSS), i.e. a longitudinal database of Spanish manufacturing firms that contains data from 1990 up to 2016. The survey is carried out yearly by SEPI Foundation which is financed by the Spanish Ministry of Industry. It is designed to gather data from a representative sample, by industry and by size, on different topics such as internationalization, innovation, market, performance and so on. Moreover, this database also distinguishes family firms from non-family ones and it has been used by a wide number of scholars for academic research in the field of innovation, internationalization and family business (Fernandez and Nieto, 2005; Kotlar et al., 2013; Nieto et al., 2015; Bianchi et al., 2016; Dieguez-Soto et al., 2016). Data used in this analysis were collected in February 2018 and they cover the period from 2008 to 2014. Throughout these seven years of observations firms can enter and exit from the survey, thus the nature of our panel data is quite unbalanced. Our initial sample includes 2,420 Spanish private firms and roundly 16,000 of observations from 2008 to 2014. However, due to some missing information regarding several firms and due to the restriction of our statistical model, we have lost some data. As a result, our final dataset consists of a final unbalanced sample of 9,463

observations. Table 2 presents industry and some sample descriptive statistics both for the full sample and for the subsample of the family firms.

3.2 – *Dependent variable*

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

3.3 – *Independent variables*

Family involvement in the management reflects family firms' unique bundle of resources, in particular those intangible resources such as the deep and tacit knowledge, experience, trust and commitment that influence strategic decision-making (Chua et al., 1999) such as innovation and internationalization. However, the SBSS survey does not include a direct measure of these unique intangible resources. It reports only the number of owner and owners' relatives who hold managing position. Therefore, according to previous studies and taking into account the family involvement in the firm, our measure of family management follows that used by Nieto et al. (2015) and by Dieguez-Soto et al. (2016). Hence, family management is calculated as a binary variable which considers both family ownership and at least one family member involved in the management. It takes value 1 in case of such an ownership and involvement in the management and value 0 it these two conditions are not satisfied, so referring to both passive family control (i.e. firms which are owned but not managed by family members) and non-family firms (nor owned or controlled by family members).

Furthermore, as an independent variable we also considered internationalization. Firms that aim to be successful over time at a certain point in their life cycle need to ensure their competitive advantage and to grow by leveraging on strategies such as innovation and internationalization. However, as suggested by Sullivan (1994) and also by other scholars, the degree of internationalization is a complex measure because it is obtained by the combination of different factors such as export sales in terms of a percentage of total sales, number of subsidiaries abroad, foreign assets as a percentage of total assets and so on. Thus, given the restricted nature of the data, in this study, we focus only on one of the most widely used measure of the degree of the internationalization that is the "export activity". So, following prior literature on internationalization and family business (Tsao and Lien, 2013; Fernandez and Nieto, 2005; Forcadell et al., 2017) we proxy internationalization by using the export intensity, calculated as the ratio of export sales to total sales.

3.4 – *Control variables*

In addition to the key variables for testing our hypotheses, we employ a variety of control variables that could influence the innovation performance of the firm. We control for size, measured by the number of employees' logarithm (Size). Indeed, larger firms are more likely to innovate and to

Industry	Percentage of firms	Avg. employees	Avg. number of product innovation	Avg. of export intensity	Percentage of firms	Avg. employees	Avg. number of product innovation	Avg. of export intensity
	Full sample (Obs. 10,520)				Family-managed firms (Obs. 3,538)			
1. Meat products	3,53%	260	0,76	12,26	3,62%	310	1,20	16,80
2. Food and tobacco	10,69%	167	1,02	11,48	13,93%	97	0,48	12,13
3. Beverage	1,97%	228	0,67	19,42	1,61%	110	1,26	33,26
4. Textiles and clothing	6,62%	76	0,98	16,26	8,45%	77	1,40	18,92
5. Leather, fur and footwear	2,87%	40	2,89	22,28	3,08%	40	4,14	25,87
6. Timber	3,87%	62	0,20	7,57	4,75%	29	0,16	3,72
7. Paper	4,04%	158	1,62	18,14	4,01%	49	2,61	10,10
8. Printing	4,35%	79	0,27	4,86	4,27%	37	0,35	4,42
9. Chemicals and pharmaceuticals	6,58%	225	2,81	34,04	4,15%	192	2,59	24,01
10.Plastic and rubber products	5,36%	239	0,92	20,90	6,19%	51	1,32	13,15
11. Nonmetal mineral products	8,15%	159	0,63	17,03	8,59%	85	0,63	19,67
12. Basic metal products	4,52%	241	2,95	28,18	4,15%	66	0,07	13,36
13. Fabricated metal products	10,76%	97	0,39	19,37	11,28%	55	0,15	13,44
14. Machinery and equipment	5,18%	147	1,55	45,51	5,46%	100	1,68	47,08
15. Computer products, electronics etc.	1,67%	640	2,78	35,74	0,99%	49	0,43	25,12
16. Electric materials and accessories	3,31%	274	2,60	34,33	1,78%	64	0,63	22,13
17.Vehicles and accessories	6,49%	639	0,69	42,16	3,14%	74	0,44	27,81
18. Other transport equipment	2,18%	588	0,37	35,08	1,02%	77	0,64	48,63
19. Furniture	5,10%	63	0,68	14,43	5,68%	76	0,75	18,87
20. Other manufacturing	2,78%	52	1,97	27,80	3,84%	28	2,24	22,26

Table 2 – Sample descriptive analysis

internationalize for two reasons: first, because these processes are considered as a natural step of growth and, second, because larger firms usually accumulate more resources compared to smaller firms and, in turn, they are more able to innovate and to internationalize. Thus, size is one of the most important control variables for testing the firm innovation behavior and internationalization (Becheikh et al., 2006).
Similarly, firms with different age may have different goals and resources (Age). Age reflects the firm experience and the learning accumulated over time (Kumar and Saqib, 1996), so we include firm age, calculated as the number of the years since firm foundation (Zahra, 2003).
Moreover, to accurately measure the effect of internationalization on innovation we control for R&D intensity, measured as the total expenditure in R&D to total sales (R&D intensity).
Empirical studies also highlight the relevance of the impact of foreign ownership on innovation (Díaz-Díaz et al., 2008). The latter may increase managerial capabilities of the firm and thus it may play a role for innovation behavior and internationalization. To control for this effect, the percentage of direct or indirect participation of foreign capital into the firm capital is also included (Foreign ownership).
Lastly, an additional variable that may account for innovation performance is product diversification (Diversification). As suggested by Santamaria et al. (2009) diversification, in this case, is calculated as a dichotomous variable that takes value of 1 if the firm main product represents less than 50% of sales and 0 otherwise.

3.5– *Interaction effect*

To assess the moderation effect of family management on the relationship between internationalization and innovation performance we follow the methodology by Dawson (2014), that is a two-way moderation tool.

Variable	**Definition**	**Calculation**
Innovation performance	Number of product innovations	Count data variable
Internationalization	Export intensity	Percentage of exports on total sales
Family involvement	Family firms where at least a family member has a managing position	Dichotomous variables that takes value 1 when the firm declares to be a family firm and at least one family member has managerial role and 0 otherwise
Age	Firm's age	Calculated as firm's foundation year from year *t*
Size	Number of total employees	Calculated as the natural logarithm of employees' number
R&D intensity	Expenditure on R&D performed by the company in year *t*	Calculated as R&D expenditures on total sales
Diversification	Percentage of the company's total sales that corresponds to the main product	Dichotomous variables that takes value 1 when the firm declares that its main product represents less than 50% of total sales and 0 otherwise
Foreign Ownership	Direct or indirect participation of foreign capital into the social capital of the company	Calculated as the percentage of direct or indirect participation of foreign capital into the firm's capital

Table 3 – Description of variables

Specifically, we test first the main effects of internationalization and family management, independently, on the innovation performance and then we observe if a moderation effect of family management on the relationship between internationalization and innovation exists. In order to test such a moderation, an additional variable, i.e. the interaction term, has been calculated as the product of the two independent variables: internationalization x family management.

Table 3 presents a summarized description of all variables described above.

3.6– *Data Analysis*

A negative binomial estimation model (Greene, 1999), suitable to predict innovation performance given the count data nature of the dependent variable, is used. The average number of product innovations, implemented by the firms of our sample, is equal to 1.16. Table 4 presents descriptive statistics and Table 5 reports the correlations among the variables.

Variable	Mean	Standard Deviation	Min	Max
Number of product innovations	1,16	8,17	0	299
Export intensity	22,82	29,16	0	100
Family management	0,34	0,47	0	1
R&D intensity	0,01	0,03	0	100
Number of employees	201,17	687,96	1	13.091
Age	33,38	19,62	0	179
Foreign ownership	14,22	34,17	0	100
Diversification	0,05	0,21	0	1

Table 4 – Means, Standard deviation, Min and Max values of the selected variables

	Correlations	1	2	3	4	5	6	7	8
1	Number of product innovations	1.000							
2	Export intensity	0.057**	1.000						
3	Family management	-0.014	-0.101**	1.000					
4	R&D intensity	0.051**	0.164**	-0.010	1.000				
5	Number of employees	0.057**	0.176**	-0.117**	0.126**	1.000			
6	Age	0.018	0.161**	0.026*	0.051**	0.147**	1.000		
7	Foreign ownership	0.077**	0.308**	-0.277**	0.034**	0.268**	0.145**	1.000	
8	Diversification	0.018*	-0.012	-0.010	0.046**	0.032**	0.044**	0.070**	1.000
	VIF (mean VIF: 1.45)		**1.19**	**1.10**	**1.05**	**1.13**	**1.08**	**1.28**	**1.01**

** and * represents statistical significance of 5% and 10%

Table 5 – Correlations

The variance inflation factor is calculated to check for the multicollinearity. According to Neter et al. (1989), individual VIF values greater than ten and average VIF values greater than six reflect multicollinearity problems. In our study values are within these limits, thus multicollinearity is not an issue.

4 – Empirical results

Table 6 reports the results of the regression model used to test our hypotheses. H1 proposes that internationalization proxied by export intensity influences positively innovation performance. Higher degree of internationalization enables firms with new resources for innovation purposes both in terms of new products and both in terms of upgraded ones. The effect of "export intensity" on innovation performance is significantly higher at p<0.01, thus strongly supporting H1. The results also show a positive and significant effect at p<0.01 of "family involvement in management" on innovation performance. Thus, H2 is supported.

	Coef.		***Std. Error***
Internationalization	0,00502	***	*0,0015*
Family involvement	0,30409	***	*0,0060*
Family Involv*Internationalization	0,00433	*	*0,0026*
Age	0,00551	***	*0,0019*
Size (ln_employees)	0,38450	***	*0,0327*
R&D intensity	8,15266	***	*0,9222*
Diversification	0,44031	***	*0,1210*
Foreign ownership	-0,00278		*0,0011*
Constant	-3,24763	***	*0,1763*
Year dummy	YES		
N. of observations	9.463		
N. of firms	2.175		
Log likelihood	-6775,6727		

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

Table 6 – Estimating number of product innovations (negative binomial regression)

The moderation effect predicted in H3 is tested by including the interaction term in the regression model. H3 proposes that "family involvement in the management" moderates the relationship between internationalization, namely the export intensity, and innovation performance. The results show that the moderation effect is significant at p<0.1. As hypothesized, the sign of the coefficient of the interaction term is positive, thus suggesting that family management strengthens the relationship between internationalization and innovation, which confirms H3. For a better explanation of the moderating effect of family management in Figure 2, we graphically represent the marginal effect of internationalization on innovation performance with and without family management. As supposed in our hypothesis, it shows that internationalization has a positive effect on innovation performance in both cases, with and without family management. Additionally, this positive effect is found to be larger when family members are actively involved in the management

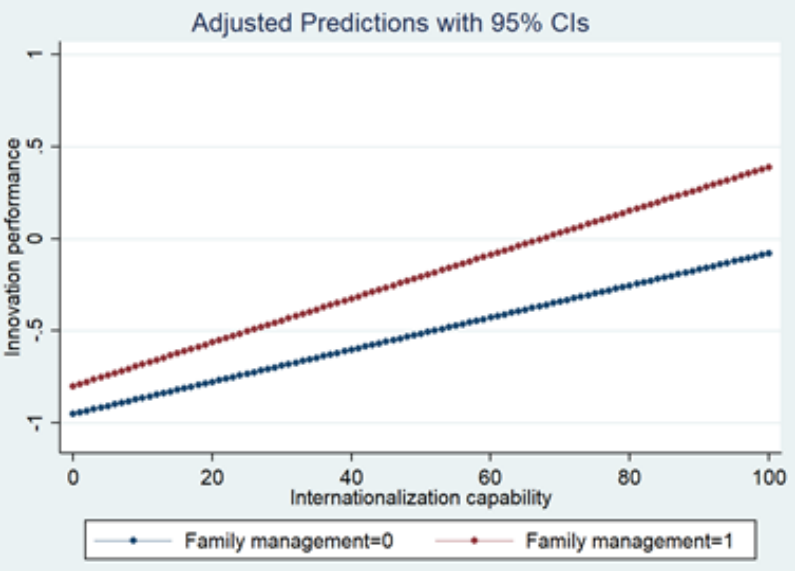

Figure 2 – Effects of family management on the innovation performance

As concerns the control variables our study also suggests that the higher diversified the firms is, in term of diverse products that cover its main market, and the higher is the number of innovative products achieved. This confirms that diversification generates relevant capabilities and thus opportunities to innovate (Santamaria et al. 2009). As in previous studies (e.g. Becheikh et al., 2006), age and size also affect positively innovation. In particular, referring to size and to industry variables, we have also attempted to run further analyses but due to the unbalanced nature of the dataset (e.g. the number of firms of different size and/or industry is very unbalanced among the different years in which data were collected) and the possible missing values we did not find consistent results. Lastly, the check of the possible role of the foreign ownership does not provide significant evidence.

	Family firms			**Non-family firms**		
	Coef.		***Std. Error***	**Coef.**		***Std. Error***
Internationalization	0,00886	***	0,00272	0,00544	***	0,00150
Age	0,00612		0,00414	0,00500	**	0,00217
Size (ln_employees)	0,58277	***	0,07294	0,35937	***	0,03747
R&D intensity	5,54913	***	1,45545	9,90882	***	1,19724
Diversification	0,48986	**	0,24483	0,39443	***	0,14066
Foreign ownership	-0,01804		0,00689	-0,00015		0,00111
Constant	-3,30731	***	0,31923	-3,33448	***	0,20547
Year dummy	YES			YES		
N. of observations	3,210			6,253		
N. of firms	897			1,595		
Log likelihood	-2163,3509			-4621,9072		

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

Table 7 – Estimating number of product innovations - Robustness check

In order to check the robustness of our model, we run further regression analyses. Specifically, we split the sample in family-managed firms and non-family firms, and we re-execute regressions within each group. The goal is to verify the impact of internationalization on innovation for each group. Table 7 reports findings on the internationalization - innovation relationship for family-managed firms and for non-family firms. Again, results show that internationalization has a positive and statistically significative impact on innovation both for family and non-family firms. However, it is important to note that the coefficient of internationalization variable within the family-firm group is slightly higher supporting as such our hypothesis about the importance of the family involvement in shaping the relationship between internationalization and innovation performance.

5 – Discussion

Our results concern three types of evidence: the first regards the positive relationship between internationalization and innovation performance; the second underlines the positive relationship between family involvement and innovation performance; the third, that is also the most original with respect to previous contributions, refers to the moderating role of family involvement on the relationship between internationalization and innovation. As we detail hereinafter all these results can be interpreted by relying on the resource-based theory.

As concerns the relationship between internationalization (measured by the firm's export activity) and innovation, in line with previous research, our results find a positive link. Specifically, our study about a sample of Spanish firms highlights that higher level of exports increase the number of innovative products of the firm. In this regard, already Salomon and Shaver (2005) posed in relation exporting and innovation by suggesting that exporters are more able to innovate as they quickly assimilate users' feedback and they offer improved products that meet foreign customer' needs (Filipescu et al., 2013). They adopted two measures of export activities, i.e. "export status" as a dummy variable that defines the propensity of the firm to export, and "export volumes" measured by total foreign sales. With respect to this work, in our study we measure the degree of internationalization through exports by adopting a more widely used indicator, that is the "export intensity" (Pla-Barber and Alegre, 2007; Filipescu et al., 2013), but we find a similar evidence. This result can be interpreted in the light of a resource-based perspective, by arguing that firms able to internationalize have better capabilities to assimilate and to exploit new knowledge, thus further enriching existing firm competencies and capabilities, which in turn allows to enhance innovation. More precisely, the underlying rationale could be as follows: higher levels of export activities, representing higher degrees of internationalization, mean that exporter firms have developed and accumulated a stock of qualified skills, thanks to their activity and interaction with customers in foreign markets, that in turn lead to also develop better capabilities to feed innovation with respect to those firms characterized by a lower export intensity.

Regarding the impact of family management on innovation, our results take into evidence a positive influence. In this case too, our findings are in line with those scholars' contributions that examine a positive impact of family involvement on innovation output (Kellermans, 2005; Eddleston et al., 2008; Matzler et al., 2015; Dieguez-Soto et al., 2016) with respect to those that instead found a negative impact. These results are supported by arguments on the family firms' unique bundle of resources, specifically the bundle of intangible resources such as the deep and tacit knowledge, the trust and commitment associated and obtained thanks to family members' goals and values.

Lastly, concerning the moderating role of family involvement on the relationship between internationalization and innovation, our results show that the positive relationship emerges as enforced in the family business setting, thus suggesting that family firms' peculiar resources and capabilities may act as a sort of leverage, able to enhance the influence of internationalization on

innovation. Indeed, Figure 2 shows that the relationship between internationalization and innovation performance is positive both for family and non-family firms. However, the slope of the line is greater for the family firms by putting into evidence that for equal levels of internationalization, innovation performance is greater for them. The greater slope of the family firms' line also indicates that the gap is growing more and more as the level of export intensity increases. All this evidence suggests the moderating role of the family involvement. Although, to our best knowledge, the specific interplay among internationalization, innovation and family involvement has been neglected by the extant literature, previous contributions grounded within the resource-based view provide the relevant foundations to interpret our findings (Habbershon et al., 2003; Sirmon and Hitt, 2003; Zahra, 2010; Chrisman et al., 2013; Kim and Gao, 2013). Indeed, the mentioned-above sort of leverage, made possible by family involvement, may find an explanation in the unique bundle of resource and capabilities characterizing family firms. The affective and strong commitment to the firm, the personal contacts with customers, the long-term trustful relationships with employees and suppliers, which define a high-level of social capital (Sirmon and Hitt, 2003), make family firms able (and more able than non-family firms) to quickly absorb new knowledge from foreign markets and to re-combine it with the existing knowledge, thus taking the greatest advantage from internationalization opportunities. In turn, this allows to feed innovation in a particularly positive way.

6 – Theoretical and practical implication

Our findings have theoretical and practical implications.

From a theoretical point of view our study contribute to the ongoing discussion of the influence of internationalization and family management on innovation. In particular, we enrich the current literature by investigating the interplay between internationalization and family management from a resource-based perspective and by providing evidence on whether the interaction between the two predictors affects innovation. To our best knowledge, this is the first research that analyzes the moderating role of the family management on the relationship between export intensity and product innovation and that provides theoretical explanation for this finding. We believe this is interesting as previous literature, despite it recognizes the importance of resources and capabilities in the internationalization-innovation relationship, has neglected to study the role of family management under a resource-based perspective. By relying on some recent studies, which recognize the cruciality of family-specific characteristics in attempting to explain a firm's behavior (e.g. Chua et al., 2012; Chrisman et al., 2013), it can be also supposed that some of the controversial findings characterizing the studies about internationalization-innovation relationship are due to the fact they neglect to consider the "family involvement" factor.

From a practical point of view, given the novel contribution on the family management moderating role, practitioners should encourage exporter family firms to better take care of and to exploit their intangible resources as these are precious to enforce the effect of internationalization strategies on innovation performance. Family owners and family members who manage the firm should be increasingly aware that family factors, such as personal contacts, affective commitment to the firm, high-quality and long-term trustful relationships with employees, suppliers and customers (i.e. social capital) are crucial to sustain internationalization, innovation and thus a firm's competitive advantage. At the same time, this awareness should encourage family members to put aside those behaviors that are too conservative (e.g. aversion to risk and resistance to change) and thus they are deleterious for a full exploitation of both tacit/internal knowledge and new external/acquired resources for innovation.

Lastly, policy makers should stimulate the internationalization of the family firms, considering that such firms seem to be characterized by particular potential capabilities to leverage the internationalization effect on innovation performance.

7 – Conclusions, limitations and agenda for further research

In conclusion, our findings confirm the importance of investigating and understanding the peculiar and unique resources characterizing family firms. Indeed, they are able to strengthen the influence of a strategic decision such as internationalization on firm innovation performance.

As a matter of fact, this study suffers of several limitations, mainly concerning the sample and the employed variables, which prevent the deep understanding of the studied relationships.

First, the sample relies only on Spanish manufacturing firms. Taking a cross-country and thus a multi-cultural perspective, further insights may emerge. Second, the employed variables are scarcely representative of the reality. Indeed, for instance, the definition of innovation could be enriched by including other dimensions and/or measures such as process innovation and patents, on which both internationalization and family involvement may exert a differentiated effect. Also, we employ only one measure regarding the degree of internationalization, that is export intensity. Future studies, focusing on a more composite proxy of internationalization and considering not only exports but also foreign profits, assets, number of subsidiaries in foreign markets, could offer a more complete picture of the relationships among the investigated variables. Third, the study relies only on secondary data sources and thus it is based on data availability: it is not possible to use a precise measure of family management (e.g. the percentage of family member in top management team with respect to total number of managers), which could allow to grasp more in detail the studied moderating role. For instance, a higher number of family member in management position could be detrimental for firm's strategy or external managers, who could bring further crucial competencies to the firms, could play a role in the internationalization-innovation relationship. Future research is also needed to include other variables that represent family influence such as family education level, family tenure within the family business, all factors that may cause differences in the moderating effect on internationalization-innovation relationship. Moreover, also the straight-line nature of the supposed relationships is questionable. Further analysis should concern a more fine-grained exploration of the relationship form, which could be curvilinear.

Lastly, as explained in the result section, the unbalanced nature of our sample has prevented the significance of further analysis about the role of the size and the industry. As concerns this issue too, next deeper insights are certainly needed.

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