

Technological innovation and Socioemotional wealth in family firm research: literature review and proposal of a conceptual framework

Abstract

Purpose - There are currently two issues that generate growing interest among specialized scholars within the family business field: technological innovation and socioemotional wealth. While it is true that both topics are highly popular among researchers, the joint study of both perspectives is scarce. Thus, the aim of this paper is to analyse the interrelationships between technological innovation (TI) and socioemotional wealth (SEW) in the context of family firms.

Design/methodology/approach - This literature review systematically analyses the findings of 25 journal articles focusing on TI and SEW, published between 2012 and 2018.

Findings - The findings reveal an integrative approach, identifying different variables that relate TI and SEW. A conceptual framework is built in which these variables are incorporated into four categories (SEW, TI, moderating effects and performance). New lines of research emerge with the development of a conceptual model and the formulation of 6 propositions.

Practical implications – The conceptual framework can be useful as integrative summary of the factors that family business managers and directors should take into account to be successful in implementing innovative projects and strategies.

Originality/value – The study of TI from the SEW approach has emerged as a fruitful field of research in recent years, but the current knowledge of the role that SEW plays in family firms' TI is still scarce. This paper contributes to the family business literature by offering a conceptual framework of the SEW-TI relationship and new research avenues that will provide a better comprehension for scholars and specialists for future investigations in the field.

Keywords: Technological innovation, Socioemotional Wealth, Family business, Literature review.

1. INTRODUCTION

Technological Innovation (hereafter, TI) can be defined as the set of activities through which a firm conceives, designs, manufactures, and introduces a new product, technology, system, or technique (Freeman, 1976). TI has broadly aroused the interest of many scholars in recent years, emerging as a dominant perspective in business research (De Massis, Frattini, & Lichtenthaler, 2013). Several authors (e.g. Chrisman & Patel, 2012; Cruz-Cázares, Bayona-Sáez, & García-Marco, 2013; Diéguez-Soto, Manzaneque, & Rojo-Ramírez, 2016) have conducted various studies on how TI affects firms' performance, and specifically, family businesses' performance. A theoretical approach of great importance among family firm researchers is that related to Socioemotional Wealth (henceforth, SEW) (Berrone, Cruz, & Gómez-Mejía, 2012; Gómez-Mejía, Haynes, Núñez-Nickel, Jacobson, & Moyano-Fuentes, 2007; Martínez Romero & Rojo Ramírez, 2016). The SEW approach is considered the most potential dominant paradigm in the family business field (Berrone et al., 2012). SEW has been conceptualized as the set of specific, exclusive and intrinsic characteristics that family businesses present and which makes them behave differently than their non-family counterparts (Berrone et al., 2012).

In spite of the recent advances within the family business field, and despite the importance of both TI and SEW, there is still a lack of understanding on the interrelationships among them. On the one hand, with regard to TI, aspects such as innovation inputs, i.e. R&D investments (Block, 2012; David, Hitt, & Gimeno, 2001; Munari, Oriani, & Sobrero, 2010), outputs and innovative activities (De Massis, Di Minin, & Frattini, 2015; De Massis et al., 2013; Röd, 2016), determinants and dimensions of innovation (Padilla-Meléndez, Dieguez-Soto, & Garrido-Moreno, 2015) have been analysed. On the other hand, in the case of SEW, attention has been focused on aspects such SEW dimensions (Berrone et al., 2012), SEW levels (Li & Daspit, 2016; Miller, Wright, Le Breton-Miller, & Scholes, 2015), its relation with emotional value (Astrachan & Jaskiewicz, 2008; Martínez Romero & Rojo Ramírez, 2016) and even its role as

a moderating variable (Scheppers, Voordeckers, Steijvers, & Laveren, 2014; Vandekerckhof, Steijvers, Hendriks, & Voordeckers, 2015).

Notwithstanding the growing number of articles devoted to TI and SEW, there are not many of them that jointly analyse these two issues. Moreover, there are few authors who have collected information on how SEW interacts with TI, revealing controversial results (Chrisman & Patel, 2012; Diéguez-Soto et al., 2016; Kammerlander & Ganter, 2015). Hence, the purpose of this study is to review the existing literature on jointly TI and SEW by addressing the following research question: What factors or variables have a significant influence on the existing relationship between SEW and TI? In order to provide a clearer picture, four categories of variables have been recognized: SEW, TI, moderating effects and performance, which are subsequently consolidated in a framework.

From a methodological perspective, this study uses a systematic literature review and oriented research following the procedure recommended by Tranfield, Denyer and Smart (2003). This paper must certify that the existing research is condensed in the most complete, rigorous and transparent manner possible.

Thus, the present study offers two important contributions. First, to the best of the authors' knowledge, this is the first paper that provides an integrative overview of the joint study of SEW and TI in the family business field. Particularly, this study improves our comprehension regarding the role SEW plays in family firms' TI. In such a way, by adding insights from the SEW approach, contemplated as the potential dominant paradigm in the family business field (Berrone et al., 2012), to the TI research field, also considered an emerging dominant perspective in business research (De Massis et al., 2013), we contribute to both, the family business and the innovation knowledge areas. Second, by synthesizing existing research, we recognized and describe the main future research avenues in the field, emphasizing the most discussed topics in previous studies and identifying research gaps based on them. This is

particularly valuable to guide future research on TI based on the SEW perspective, which might substantially contribute to the development of the field. Furthermore, we have opened up numerous future directions in the field that will lead to a better understanding of the relationship between SEW and TI.

The paper is structured as follows: first of all, a fundamental theoretical section is developed in which the TI and SEW approaches are individually analysed. Second, the methodology section shows the procedure followed to conduct the review. Subsequently, an analysis of the relationships between the identified variables is conducted, revealing a total of 6 propositions. Then, a conceptual model is proposed offering a holistic view of the formulated propositions and future research avenues. Finally, the limitations of this paper are explained and the potential lines of research for future studies are discussed.

2. THEORETICAL FOUNDATIONS

2.1. Technological Innovation in Family Businesses

Today, we live in a world where there is great competitiveness in the business network. Most of the firms around the globe are SMEs and operate in an environment of uncertainty, where the political and economic conditions are constantly changing. Family businesses represent a large proportion of the business structure (Family Firm Institute, 2015; Instituto de la empresa Familiar, 2015) and consequently, they are the ones that mainly bear all these difficulties. However, over time family businesses have shown to be able to face all these problems with the necessary guarantees to continue subsisting. One of the capacities that businesses need to grow, evolve and reinvent themselves for the future is innovation.

TI is a fundamental determinant for economic growth meanwhile family businesses are considered the most significant organizational forms in the world's economies (Diéguez-Soto

et al., 2016). In addition, family businesses make a substantial contribution to job creation and to boosting the gross domestic product worldwide (Family Firm Institute, 2015).

Because of the abovementioned reasons, over the last years there has been a wave of studies analysing TI in the context of family businesses (e.g. Chrisman & Patel, 2012; De Massis, Audretsch, Uhlaner, & Kammerlander, 2018). However, the existing results are mixing and consequently, a deeper understanding of the innovative behaviour of family businesses is required (De Massis et al., 2013; Duran, Kammerlander, van Essen, & Zellweger, 2016; Fuetsch & Suess-Reyes, 2017).

In this vein, to explain the peculiar innovative behaviour of family firms, Chrisman, Chua, De Massis, Frattini, and Wright (2015) proposed the ability and willingness paradox. This paradox states that family firms have superior ability (discretion to act) but lower willingness (disposition to act) to perform TI than their non-family counterparts. De Massis, Kotlar, Chua and Chrisman (2014) defined ability as the discretion of the family to direct, allocate, add to, or dispose of a firm's resources, while they define willingness as the favourable disposition of the involved family to engage in distinctive behaviour. As ability and willingness are necessary but individually insufficient conditions (De Massis et al., 2014), both are required for innovation readiness (Holt & Daspit, 2015).

On the one hand, the family willingness to innovate is highly influenced by SEW considerations (Berrone et al., 2012; Gómez-Mejía, Cruz, Berrone, & De Castro, 2011). The aversion to follow investment strategies that would dilute the family's control of the firm may reduce the willingness to make such investments (Urbinati, Franzo, De Massis, & Frattini, 2017). Then, to avoid losses of control, and thereby SEW constraints, family businesses invest less in R&D than non-family businesses (Block, 2012; Chen & Hsu, 2009; Chrisman & Patel, 2012).

On the other hand, as stated above, family businesses are characterized by a greater ability to pursue innovation as a result of their knowledge stocks, knowledge combination and their long-term orientation (Patel & Fiet, 2011; Röd, 2016) in comparison to their non-family counterparts. In this vein, family involvement is positively associated with long-term thrust (Cassia, De Massis, & Pizzurno, 2011), which in turns leads to family members' commitment to the firm, influencing innovation outputs (Chirico & Salvato, 2016). Moreover, family businesses are characterized by parsimony (Carney, 2005), which implies that family wealth is used to assure resources efficiency. Furthermore, family businesses are endowed with even superior tacit knowledge (Von Krogh, Ichijo, & Nonaka, 2000) and therefore, allow a more effective leveraging of the firm's unique resources and a more efficient conversion of R&D expenses into TI (Diéguez-Soto et al., 2016). In short, family business have a greater ability to transform innovation inputs into innovation outputs (Duran et al., 2016).

Although the ability and willingness paradox is a powerful framework to explain the heterogeneous innovation behaviour of family firms (Hauck & Prügl, 2015), there are still controversial suggestions on how noneconomic goals, and specifically SEW, drive innovation management (Fitz-Koch & Nordqvist, 2017; Li & Daspit, 2016; Padilla-Meléndez et al., 2015).

2.2. Socioemotional Wealth

Businesses usually face decisions that are measured in terms of financial wealth. However, recent studies (e.g. Berrone et al., 2012; Martínez Romero & Rojo Ramírez, 2017; Vandekerckhof et al., 2015), suggest that family businesses have other non-purely economic objectives that could distort their financial goals (Chrisman & Patel, 2012).

Due to the overlap between firm and family values (Gómez-Mejía et al., 2011; Klein, Astrachan, & Smyrnios, 2005), some authors have focused on the emotional endowments of family firms, constituting a new research stream known as Socioemotional Wealth (SEW)

(Berrone et al., 2012; Gómez-Mejía et al., 2007). This relatively new approach suggests that family businesses would be willing to lose some of their financial wealth in order to preserve non-financial or emotional wealth (e.g. family control, influence, succession, or blood ties).

Berrone et al. (2012) described SEW as the most important differentiator of family businesses. These authors considered that SEW determines the distinctive behaviour of these firms. Although there is currently no universally accepted definition of this concept (Martínez-Romero & Rojo-Ramírez, 2016), for the purposes of this study, SEW is defined as the non-financial aspects of the firm that meet the family's affective needs, such as identity, the ability to exercise family influence, and the perpetuation of the family dynasty (Gómez-Mejía et al., 2007).

Gómez-Mejía et al. (2007) described how family owners make strategic decisions with the ultimate intention of preserving their SEW. These authors accepted that family businesses, paradoxically, could be both risk willing and risk adverse at the same time, depending on two types of risk: performance hazard risk and venturing risk. Gómez-Mejía and colleagues empirically evidenced that family businesses will make riskier decisions if they contribute to the preservation of their SEW. Furthermore, they identified SEW in family firms in a variety of related forms, such as perpetuating family name, values, control, and employment; need for belonging, affect, and intimacy; preservation of family firm social capital; ability to exercise authority; preservation of the family dynasty; continuous with the family lifestyle; and, the fulfilment of family obligations based on blood ties rather than on strict criteria of competence and the opportunity to be altruistic to family members.

Likewise, Gómez-Mejía, Makri, and Kintana (2010) empirically demonstrated that to avoid control losses, family businesses tend to diversify less than their non-family counterparts. The authors showed that diversification reduces SEW and therefore, the influence that the family exerts on the family business. In a similar vein, Zellweger, Kellermanns, Chrisman, and Chua

(2011) showed that family businesses take decisions based on emotional aspects instead of pure financial criteria. Moreover, Vandekerckhof et al. (2015) evidenced that SEW and emotional considerations outweigh purely financial criteria in family businesses' decisions.

The research conducted by Berrone et al. (2012), stated that SEW is an exclusive aspect for family businesses which marks the distinctive behaviour of these firms. Furthermore, they contributed to previous literature by identifying five major SEW dimensions: Family control and influence, Identification of family members with the firm, Binding social ties, Emotional attachment of family members, and Renewal of family bonds to the firm through dynastic succession, and labelled them as FIBER. They also proposed a set of items to try to measure the different SEW dimensions.

Miller and Le Breton-Miller (2014) revealed that the notion of SEW encompass a set of family business owners' preferences. Besides, Miller et al. (2015) stated that most family businesses are distinguished by their SEW preferences and that such preferences are contradictory. These SEW preferences include non-economic goals ranging from fulfilling family desires in terms of employment to establishing a good reputation in the community where they are located. The blending of all these non-economic goals may hinder the firm's ability to generate financial resources, thus threatening the firms' survival for future generations.

Although different articles have been recently developed linking the SEW approach with diverse areas of knowledge: business management (Gallizo, Mar-Molinero, Moreno, & Salvador, 2017; Schulze, 2016), diversification (Gómez-Mejía et al., 2007; Gómez-Mejía et al., 2010), business valuation (Zellweger & Dehlen, 2012), performance (Cruz, Justo, & De Castro, 2012; Martínez Romero & Rojo Ramírez, 2017; Rojo Ramírez & Martínez Romero, 2017) and innovation (Filser, De Massis, Gast, Kraus, & Niemand, 2017; Gast et al., 2018; Hauck & Prügl, 2015), more research is needed regarding the role SEW plays in family firms' TI.

3. METHODS

Following the research process used for systematic reviews recommended by Tranfield et al. (2003), the review process was divided into three main stages: (1) planning the review, (2) conducting the review, and (3) reporting and dissemination. This process has been widely used in family business literature (Fuetsch & Suess-Reyes, 2017; Röd, 2016; Suess, 2014). Having projected the proposed methods of this review, the stage is set to identify relevant studies using explicit and reproducible selection criteria (Tranfield et al., 2003).

This literature review is restricted to peer-reviewed academic journal papers in English, being the period of study from 2012 to 2018. The main source of information chosen was papers from academic journals because they are considered to provide a corroborated source of knowledge (Podsakoff, MacKenzie, Bachrach, & Podsakoff, 2005), omitting books, book chapters and other non-refereed publications.

Regarding data collection, the following databases were used: *ISI Web of Knowledge*, *Emerald*, *Ebsco*, *Proquest (ABI)*, *Science Direct*, *Scopus* and *Wiley*. The databases allowed us to introduce and combine many terms by applying search strings to obtain quality articles for the purpose of our study. We conducted several searches in abstracts and citations of papers, looking for reviewed articles published in the period of study.

Considering the diversity of meanings incorporated in the term “innovation” and given that scholars could have used this concept in different forms, we employ a number of terms that let us approximate the meaning of innovation covered by our research in order to maximize the inclusion of relevant studies. Our initial search in the abovementioned databases was conducted using the following keywords and applied them as search terms: ("Family firm" or "Family business"); "Socioemotional Wealth"; "SEW"; "Innovation"; "Technological"; "Performance"; "Noneconomic goals"; "Family CEO"; "Family Ownership"; "Family involvement"; "R&D

investments"; "Heterogeneity"; "Inputs" and "Outputs". To not limit our search, all published and accessible papers matching the selected criteria were taken into account for review. Moreover, different combinations of the above concepts were then tested throughout the papers content (e.g. innovation inputs and SEW or technological innovation and noneconomic goals). Finally, we considered that to be potentially included in the review, the title of the article had to contain "innovat*", "R&D", "technolog*", or "socioemotional", and in the abstract "family firm/family business", "innovation", or "Socioemotional wealth". Subsequently, to avoid leaving important papers out of the analysis and to minimize bias against relevant papers published recently, we searched the Family Business Review, the Journal of Family Business Strategy, and the Journal of Family Business Management since all three are prestigious and recognized journals in the family business field.

The 2012-2018 period was chosen because the most important papers dealing with innovation from the theoretical approach of SEW were published from 2012 onwards. The initial filtering performed based on the key concepts in the title and abstract of the papers returned a total of 42 papers. Paper's abstracts were then reviewed and it was noted that 21 did not really address the relationship between TI and SEW, because the term "Socioemotional Wealth" did not appear in all papers, neither in the title nor in the abstract. After this second filtration, a sample of 22 papers was obtained. To overcome this limitation of lack of papers, we considered to include the Behavioral Agency Model term (Wiseman & Gómez-Mejía, 1998), that is the theoretical approach from which SEW emerged (Gómez-Mejía et al., 2007). Accordingly, 25 papers made up the final sample used for the study. Then, the content of the 25 papers were read in more detail to gather information about the authors, the year, the size and description of the sample, the innovation approach used, the theories applied (Behavioral Agency Model and/or Socioemotional Wealth) and the main results of the studies. They were considered

relevant and therefore "fit for purpose" in terms of helping to answer the research question. As a result, table 1 was built (Annexes).

4. FINDINGS: ANALYSIS OF VARIABLES AND FACTORS RELATING TI AND SEW

The findings of this literature review show a growing interest in studying TI from the SEW perspective. Before 2012, there is a lack of research on the relationship between TI and SEW. Since then, the number of papers dealing with this subject has increased, especially in 2015 and 2016, when 14 of the 25 papers chosen for this review have been published. Therefore, it is obvious that this is a very recent topic and that in the last six years has acquired an enormous relevance among scholars in the family business field. The 25 identified articles were published in 13 different academic journals, with 5 papers published in journals specializing in family businesses, as can be seen in table 2. "Journal of Product Innovation Management" contained most of the articles. Empirical studies use samples mainly from Europe and Asia. Regarding the methodological dimension, table 3 shows that most of the papers used quantitative methodologies. Table 4 refers to the type of industry in which the family businesses under study are active. Manufacturing was the most studied industry.

(Insert Table 2, Table 3 and Table 4 here)

The analysis of the 25 studies on TI from the SEW approach identified in our review, leads to the recognition of several recurrent topics. In order to arrange extant research on the matter, a framework including the main identified variables is developed. The framework recognizes the three major steps of TI (innovation inputs, activities, and outputs) (De Massis et al., 2013), some moderating effects on these relationships, as well as SEW and performance, as determinants and outcomes of TI respectively (see figure 1).

(Insert Figure 1 here)

Following the framework developed in Figure 1, we analysed the relationships between the identified variables, suggesting a total of 6 propositions that can be useful for scholars and professionals in the family business field.

4.1. Prior research relating SEW and Innovation inputs

Innovation inputs (see table 5), such as R&D investments, have substantial importance on innovation management because they might be considered the first step that researchers and practitioners should take into account to achieve a better understanding of TI.

Despite the long-term benefits that R&D investments generate, family firms generally invest less in R&D (Block, Miller, Jaskiewicz, & Spiegel, 2013; Brinkerink & Bammens, 2017; Chrisman & Patel, 2012). At this respect, R&D investments do not produce immediate innovation results (Laverty, 1996), so family firms tend to reduce them in an attempt to avoid threats that may affect their SEW (Chrisman et al., 2015). Chrisman and Patel (2012) studied R&D investments, arguing that they represent an immediate risk for SEW, but adding that they are important for firm viability (David et al., 2001). Chrisman and Patel also evidenced that the variability of R&D investments in family businesses is greater than in non-family businesses due to conciliation differences between family and economic goals. In this sense, family firm behaviour is distinctively influenced by the non-economic goals pursued by family owners and managers. Family reasons to preserve their SEW have an important influence on firm management, leading to different strategic orientations (De Massis et al., 2014), such as their propensity to innovate (Gast et al., 2018). Gómez-Mejía et al. (2014) showed that SEW produces significant differences in the way family business invest in R&D with respect to non-family businesses, to the extent that an increase of such investments would reduce family managers control over the firm. Patel and Chrisman (2014) demonstrated that family business are able to reconcile their economic and non-economic goals by investing in exploitative R&D projects that increase sales more reliably rather than by conducting exploratory investments that

could lead to even greater sales, but with an increased risk included. Sciascia et al. (2015) based on a sample of 240 Italian SMEs, supported the theoretical argument that the overlap between family wealth and firm equity strongly influences the innovative behaviour of the owner family in the context of SMEs, because it determines to a great extent the degree of eagerness to preserve the family SEW. The family members' desire to preserve family control and influence over the firm tends to delay strategic decision-making, negatively affecting both the adoption of innovative activities and the adoption of new technologies (Souder, Zaheer, Sapienza, & Ranucci, 2017). In a similar way, Li and Dasgupta (2016) examined how the scope of family governance and the type of SEW objectives jointly influence innovation strategies in family businesses. In the particular context of their study, the authors deconstructed the SEW in two types: restricted SEW and extended SEW, that allow a better understanding of the family business' innovative behaviour. These authors stated that families with extended SEW intentions are more likely to accept higher risks in making innovation investments (e.g. R&D Investments) than families with more restricted SEW, inasmuch as the former has a more long-term benefit orientation than the latter. Then, SEW plays a crucial role in the understanding of R&D investments.

Based on the abovementioned arguments, it can be stated that:

Proposition 1: SEW is negatively related to R&D investments

(Insert Table 5 here)

4.2. Prior research relating TI and firm performance

The distinctiveness of the family firm's innovation outputs (see table 6) is an overlooked topic in extant research (Röd, 2016). The form that an innovation takes (product service, process, or business model) and its magnitude (incremental or radical) have been established as typologies of innovation outputs (Crossan & Apaydin, 2010; Röd, 2016).

The achievement of TI outcomes have been widely established as a critical factor of superior long-term performance (Blundell, Griffith, & Van Reenen, 1999; Cruz-Cázares, Bayona-Sáez, & García-Marco, 2013) that leads to performing better than competitors do (De Massis, Frattini, Pizzurno, & Cassia, 2015). However, there is no consensus on whether TI actually improves family businesses' performance. Llach and Nordqvist (2010) explained that innovative behaviour is a complex issue that has important consequences for the family business survival, and a better understanding of its dimensions and effects on firm performance is required. Price et al. (2013) showed that the union between innovation and knowledge could lead to an improvement in family businesses' performance. Dieguez Soto et al. (2016) showed that firm performance is higher when TI results are greater and better. These authors also argued that family businesses that produce more TI are not necessarily those performing better, being this positive effect of TI outcomes with respect to performance limited to certain conditions (Fuetsch & Suess-Reyes, 2017). In this vein, Cruz-Cázares et al. (2013) stated that empirical results are inconclusive in the innovation and firm performance relationship. Cruz-Cázares and colleagues also established that the key to improving firm performance is the efficiency with which TI is developed, inspired by the idea that innovation inputs engender innovation outputs. Therefore, determining the effect of TI on family businesses' performance is highly necessary (Llach & Nordqvist, 2010).

Based on the abovementioned, the following proposition is suggested:

Proposition 2: TI outcomes are positively related to firm performance.

(Insert Table 6 here)

4.3. Prior research regarding moderating effects on the SEW-TI-Performance relationships

In this category (see table 7), we contemplate the moderating effects that are considered key elements in the SEW-TI-Performance relationships.

4.3.1. Family/Non-Family CEO

CEO's familiarity (Family / Non-Family CEO) emerges as an important moderator that might help to determine the level of R&D investments that family businesses perform. When the CEO is a family member, family businesses show higher SEW and they try to maintain and improve their emotional endowment (Kammerlander & Ganter, 2015). Kammerlander and Ganter considered that family CEOs possess high levels of SEW endowment and that some CEO's specific noneconomic goals, such as power and control, determine their innovation behaviour. They also showed that family CEO's differences in underlying values and motivations can be related to SEW dimensions. Serrano-Bedia, López-Fernández, and Garcia-Piqueres (2016) claimed that family CEOs present a tendency to enjoy a long tenure and this trend may lead to the development of more conservative and reluctant risk attitudes. Furthermore, the family CEO usually has his or her personal assets concentrated in the firm, having control through property rights (Chrisman, Chua, & Litz, 2004). These behaviours are reflected in the family CEO's desire to maintain control over the firm and protect the family SEW. Ashwin et al. (2015) showed that if both CEO and chairperson of the board are family members, it will be complicated for directors to effectively monitor decisions taken by the controlling family. Duran et al. (2016) evidenced that family firms invest even less in innovation inputs when a family CEO leads the business. These circumstances result in lesser R&D investments and consequently lesser innovation. Conversely, in family businesses where the CEO is not a family member, riskier decisions are made and more purely financial objectives are pursued. Thus, it

is expected that the willingness to make R&D investments and innovative projects will be greater in family firms where there is a non-family CEO.

Therefore, the following proposition is suggested:

Proposition 3A: *The Family CEO reinforces the negative relationship between SEW and R&D investments.*

4.3.2. CEO's risk aversion/propensity

Linked to the previous moderating effect is the CEO's risk aversion/propensity that also has a significant influence on the relationship between SEW and the innovation level (Kraiczy et al., 2015; Gast et al., 2018;). Indeed, Kraiczy et al. (2015) considered this moderator essential in the explanation of innovative behaviour. De Massis et al. (2015) concluded that family businesses are characterized by acting in a risk-averse climate that permeates their innovation decisions. This situation seems to arise from the fact that family businesses are more focused on protecting the family financial security and guaranteeing the business life in the long-term. This long-term orientation is usually associated with higher risk aversion (Gast et al., 2018), which in turns, might hinder the initiation of innovative projects. In this vein, family businesses with a risk-averse CEO prefer to be focused on the pursuit of non-economic objectives, although paradoxically this involves making decisions that can be financially risky for the firm itself. The family businesses' risk aversion is also evident in their lack of entrepreneurial orientation (Garcés-Galdeano, Larraza-Kintana, García-Olaverri, & Makri, 2016), because, in most cases, they place SEW protection ahead of R&D decisions. At this respect, Garcés-Galdeano and colleagues considered SEW preservation as the main reason that makes family businesses more reluctant to undertake entrepreneurial or risky activities. Furthermore, Kraiczy et al. (2015) conceived the CEO risk-taking propensity as a CEO's willingness to allocate significant firm resources in order to take advantage of innovation opportunities. In this sense,

family businesses with a risk-willing CEO present higher levels of R&D investments, leading to excellent innovative results. In order to maintain and improve their economic and non-economic utilities in the long term and remain competitive, family businesses are willing to assume the risks related to innovation (Classen, Carree, Van Gils, & Peters, 2014), thus, sacrificing part of their SEW.

To summarise the abovementioned reflections, the following proposition is suggested:

***Proposition 3B:** The CEO's risk aversion reinforces the negative relationship between SEW and R&D investments*

4.3.3. Performance Hazard

A third variable that might influence the direct relationship between R&D investments and SEW is performance hazard. Prior literature (Chrisman & Patel, 2012; Patel & Chrisman, 2014) suggests that when performance is below aspiration levels, jeopardizing their own survival, family businesses tend to temporarily give priority to financial goals over non-financial ones. In this sense, family businesses would be willing to accept a greater performance hazard (Gómez-Mejía et al., 2007), incurring in the execution of a greater number of innovative activities, in case their SEW is threatened. Therefore, when performance falls below aspiration levels, family managers and owners are expected to change their strategies from lower-risk R&D investments and reliable sales, to other options with greater potential and higher risk (Patel & Chrisman, 2014). Chrisman and Patel (2012) showed that when performance is below aspiration levels, family firms tend to make more R&D investments, whereas with performance above aspiration levels, the R&D investments of these firms usually decrease. For their part, Gómez-Mejía et al. (2014) have utilized the notion of performance hazard to achieve a better understanding of the family businesses' heterogeneous behaviour with regard to R&D investments. Gómez-Mejía and colleagues obtained mixed results with respect to the effect of

performance hazard on the relationship between R&D investments and institutional investors. These greater preferences for risk leads to a more innovative behaviour, conducting to a higher level of R&D investments in detriment of SEW preservation. Indeed, whether the business does not survive there would be neither financial nor family wealth.

To summarise these findings, the authors suggests the following proposition:

Proposition 4: *Performance hazard weakens the negative relationship between SEW and R&D investments.*

4.3.4. Family Generation

Family generation has emerged as an important factor in the family firm context. Family owners and CEOs have the particular ability to build strong social ties with their customers, suppliers and other stakeholders that are preserved and transferred through generations (Miller & LeBreton-Miller, 2005).

Family generation, as a moderating variable, is a determining factor in the relationship between R&D and TI (Kraiczy et al., 2015; Memili, Fang, & Welsh, 2015). In this vein, R&D investments are reflected into higher TI results in first-generation family firms than in later generational family firms. The fact that family influence diminishes in second and subsequent generations, limits the capacity of these firms to create and appropriate value (Memili et al., 2015), conducting to lower innovation results. In the first generation, family businesses tend to assume greater risks, seeking the best innovative results that allow them to pass a successful business onto future generations. Moreover, family businesses where ownership is concentrated in one generation are able to achieve higher performance levels through innovative activities than firms whose ownership is shared by several generations due to intergenerational conflicts (Kellermanns, Eddleston, Sarathy, & Murphy, 2012). In this vein, Kraiczy et al. (2015) evidenced how the CEO's propensity to take risks has a positive effect on the new product

portfolio innovativeness, being this effect stronger on family businesses in the early generations.

On the other hand, previous literature has also emphasized the importance of innovation for the long-term survival of any firm (Filser et al., 2017). This long-term orientation can also lead later generation family businesses to take greater risks in order to preserve their economic and non-economic advantages (Classen et al., 2014) through an improved innovative capacity. The combination of their long-term orientation, CEO's long-term tenure and strong family ties created over generations, have a significant influence on the family businesses ability to develop innovative activities (Gast et al., 2018; Patel & Fiet, 2011). Moreover, the transfer of tacit knowledge between family members predecessors and successors, based on a relationship of mutual trust, is the perfect context for capturing and internalizing the knowledge needed to innovate (Filser et al., 2017). In this vein, Hauck and Prügl (2015) established that collaboration between different family generations and the greater involvement of the successors provide an ideal environment for the development of innovative activities.

Thus, because of the existing controversial results, the moderating role of generational stage on the R&D-TI relationship requires further research.

The family generation is also a transcendental factor that allows to a better understanding of the TI-performance relationship. When family businesses are in the first generation, the link between TI and performance is stronger than when family firms are in the second or later generation (Memili et al., 2015). Memili and colleagues also demonstrated that first-generation family firms might have advantages in profit appropriation from innovation activities. First-generation family businesses present a more pronounced long-term orientation. This is because first-generation family firms are very committed to the idea of transmitting a successful business to future generations. At this respect, innovative activities have been conceived as a vital capacity for the firm long-term survival (Cruz & Nordqvist, 2012; Filser et al., 2017),

which can lead family businesses to take additional risks in order to improve their innovation capacity (Classen et al., 2014). Furthermore, over time and generations, family members' goals may be inconsistent or changeable. These disagreements regarding family goals could hamper innovation (Miller et al., 2015) and could also adversely affect economic goals. However, both types of goals (economic and family) might be compatible in some specific contexts, i.e. discontinuous technological changes, and they may be mutually reinforced (Kammerlander & Ganter, 2015). This reconciliation would contribute to obtain a higher performance based on the TI outcomes, because of the strong family desire to ensure the business survival for next generations.

Thus to summarise these reflections, the following two propositions are suggested:

Proposition 5A: *The positive relationship between R&D and TI outcomes is systematically moderated by the family generation*

Proposition 5B: *The positive relationship between TI outcomes and performance is negatively moderated by family generation.*

4.3.5. Family Management

Finally, family management has also been analysed as a moderating variable in the innovation research field. Kotlar, De Massis, Frattini, Bianchi, and Fang (2013) considered that family management has a great impact on innovation decisions and, more specifically, on the acquisition of external technology. Dieguez Soto et al. (2016) perceived family management as a fundamental driver of the willingness and ability to influence the TI efficiency, which increases the likelihood of greater success in generating continuous TI and long-term performance. Manzaneque, Ramírez, and Diéguez-Soto (2017) showed that family management moderates in a positive way the relationship between the human and structural capital efficiency, and the TI outcomes achievement. Ashwin et al. (2015) showed that family

managers remain in the firm longer than professional managers. This long tenure in the firm, in addition to their attachment to the business, helps to create an atmosphere of trust, commitment and community in the organization. This situation encourages greater innovation outcomes and ultimately higher firm performance.

Family management has been proved to influence the relationship between R&D and TI outcomes. When the family business is managed by the family in a high proportion, its ability to achieve continuous TI results decreases on the basis of R&D investments (Diéguez-Soto et al., 2016). At this respect, Diéguez-Soto and colleagues established that family involvement in management negatively moderates the efficiency in the transformation of R&D expenses into TI outcomes. Liang et al. (2013) stated that family involvement in managerial teams may weaken the positive relationship between R&D investments and innovation outcomes. Besides, the recent study of Manzaneque et al. (2018) corroborated a negative moderating effect of family management on the transformation of R&D expenditures into TI outputs.

On the other hand, Matzler, Veider, Hautz, and Stadler (2015) showed that family management has a negative effect on the innovation input, but a positive impact on innovation output. Moreover, Duran et al. (2016) found that family businesses with a high presence of family managers, present a higher conversion rate of the innovation inputs to innovation outputs and Meroño-Cerdan, López-Nicolás, and Molina-Castillo (2017) also confirmed that family-managed firms achieve higher innovation outputs despite they invest less in R&D than their nonfamily-managed counterparts. Similarly, Diéguez-Soto, Garrido-Moreno, and Manzaneque (2018) revealed that family management exerts a positive effect in the relationship between innovation inputs and process innovation outcomes. Conversely, Block (2012) suggested that the fact of being a family-managed firm has no impact on the productivity of R&D.

Thus, in the light of the most recent literature, results concerning the moderating role of family management on the R&D-TI relationship are mixed and inconclusive.

Family management also influences the direct relationship between TI and firm performance. In general, family-managed firms are more proficient and make better use of their innovation resources, resulting in increased business performance (Diéguez-Soto et al., 2018). Family involvement in management makes firms more willing and able to achieve greater long-term performance from TI outcomes (Diéguez-Soto et al., 2016). This is due to the unique characteristics of family managers, such as a high commitment with the firm, tacit knowledge, their desire to establish quality relationships with different stakeholders and their ability to optimally manage the company's limited resources (Duran et al., 2016). Furthermore, although family businesses tend to pursue non-economic goals, they are aware that not focusing decisively on TI outcomes to improve firm performance can jeopardize the firm SEW. At this respect, family managers may consider the achievement of inefficient TI outcomes as a threat to both their ability to produce economic returns and their SEW (Gómez-Mejía et al., 2011). The lack of commitment to their TI outcomes and the potential threat to their SEW endowment would produce negative consequences on the achieved performance (Zellweger & Dehlen, 2012).

To synthesize these findings, the next propositions are suggested:

Proposition 6A: *The positive relationship between R&D and TI outcomes is systematically moderated by family management.*

Proposition 6B: *The positive relationship between TI outcomes and performance is positively moderated by family management.*

(Insert Table 7 here)

5. CONCEPTUAL MODEL AND FUTURE RESEARCH AVENUES

The following conceptual model (see figure 2) offers an overall view of the 6 propositions developed in the earlier section. As we previously commented, the findings on the four

identified categories, TI, moderating effects, SEW and performance were partially ambiguous and mixed. Moreover, some research avenues arise from the abovementioned controversial results. These research lines and gaps do not intend to be exhaustive, but to serve as a framework to guide future studies on the subject.

(Insert Figure 2 here)

The conceptual model presents direct relationships between variables such as SEW, R&D investments, TI outcomes and performance, and the effect of diverse moderating variables (family/non-family CEO, CEO's risk aversion/propensity, performance hazard, family generation and family management) on those relationships already established in prior literature. Proposition 1 emphasizes that higher levels of SEW inevitably lead to lower R&D investments, on the basis of family's strong desires of avoiding risks that might jeopardize SEW; meanwhile Proposition 2 states a positive relationship between TI and firm performance.

Proposition 1 might be moderated by the family/non-family CEO (P3A), the CEO's risk aversion/propensity (P3B) and performance hazard (P4). The two first moderators (family CEO and CEO's risk aversion) are shown to strengthen the negative relationship between SEW and R&D investments. However, further research is needed to achieve a better understanding of CEOs' heterogeneous behaviour in family firms. With regard to performance hazard and its effect on the established SEW-R&D relationship (P4), it seems clear that family businesses tend to temporarily prioritise financial goals over non-financial objectives when firm performance falls below aspiration levels. Nevertheless, an in-depth examination of why under these particular conditions family businesses tend to conduct more innovative projects is required.

The analysis of the first proposition leads to deepen into the SEW approach to further investigate TI. Although the SEW multidimensional nature is widely accepted in the previous

literature (e.g. Berrone et al., 2012; Martínez Romero & Rojo Ramírez, 2016), seminal studies relating SEW and TI considerations, treated SEW as a unidimensional construct (Chrisman & Patel, 2012; Gómez-Mejía et al., 2014; Patel & Chrisman, 2014). With regard to SEW dimensions, little is known about the specific effect of family control and influence, identification of family members with the firm, binding social ties, emotional attachment and renewal of family bonds through dynastic succession on TI. A recent qualitative study conducted by Fitz-Koch and Nordqvist (2017) revealed that SEW dimensions positively affect the TI capabilities of the owning family. These authors established that the unique socio-cultural context in which family business operate, builds the appropriate conditions (e.g. strategic commitment to innovation activities based on a long-term perspective) that allow family firms to develop strong technology-based innovation capabilities. Nevertheless, prior research at this respect has been more focused on analyzing how SEW dimensions empirically and theoretically affect innovativeness (Filser et al., 2017; Gast et al., 2018), leaving the technological component aside. At this point, it is important to make a clear distinction between TI and innovativeness (Filser et al., 2017; Huang, Yang, & Wong, 2016; Ven & Rogers, 1988), due to both concepts refer to different issues within the innovation field. Specifically, TI is defined as the process by which entrepreneurs exploit opportunities to commercialize new products, services, processes, or business models (Drucker, 1985), whereas innovativeness is conceptualized as the ability or capacity to innovate (Mairesse & Mohnen, 2002). Thus, more research is needed to obtain a better comprehension of the impact that SEW dimensions exert on TI.

Furthermore, the well-established positive relationship between R&D investments and TI outcomes might be affected by the family generation (P5A) and the family involvement in management (P6A). With respect to family generation and its impact on the R&D-TI relationship (P5A), it seems evident that first-generation family firms obtain higher TI

outcomes from similar R&D investments than later generation family firms. The strong desire of passing a successful firm onto next generations and the ambition to create value, make first-generation family businesses more innovative. However, tacit knowledge dissemination, stronger family ties and the acknowledgement of the important role of innovation for the firm survival, are factors that improve the achievement of TI through generations. Consequently, the empirical evidence regarding the role of family generation on the abovementioned relationship is mixed, requiring further operationalization as well as additional empirical testing. Regarding the moderating impact of family management on the relationship between R&D investments and TI outcomes (P6A), it presents a systematic influence. On the one hand, family involvement in management has been established to negatively moderate the R&D-TI relationship. At this respect, diverse aspects such as difficulties in attracting and retaining highly qualified managers and employees, nepotism, among others could explain these results. On the other hand, family management has also been shown to positively affect the TI-R&D relationship. In this sense, characteristics such as family managers' social capital and high commitment to their firms reinforce the obtaining of TI from R&D. Therefore, due to the inconclusive influence of family management on the R&D-TI relationship, further research and empirical studies are required to shed light into this issue.

Finally, the positive relationship established between TI and firm performance (P2) may also be moderated by family generation (P5B) and by family management (P6B). In this case, family generation negatively moderates the TI-performance relationship. First-generation family firms are very conscious of the importance of innovation for the firm survival. In this sense, their desire to transmit a successful business and the fact of maintaining a good balance between their economic and family goals, allow them to obtain higher performance from innovation results. However, when the business is passed on to later generations, these positive effects seem to diminish considerably. Moreover, regarding the moderating effect of family

management, the prior research revealed a positive influence of family involvement in management on the relationship between TI and performance. Nevertheless, empirical evidence on both topics is scarce, so further operationalization is required, as well as future empirical testing.

6. DISCUSSION AND CONCLUSIONS

The family business importance in all the economies around the world has not been overlooked (La Porta, Lopez-De-Silanes, & Shleifer, 1999). Many reasons exist to believe that both TI and SEW are factors that determine and influence the family firms' behaviour. Despite the increased research activity in the family business field, there is still no consensus regarding the role SEW plays in family firms' TI and how the latter leads to the achievement of long-term performance (Diéguez-Soto et al., 2016).

By conducting this study, we have provided a global overview of the existing research that analyses TI from the SEW approach. Moreover, we have proposed a framework that reflects the links established between the four identified categories, i.e. TI, moderating effects, SEW and performance, and we have determined the main research avenues on the field. Moreover, our study highlights some emergent and promising research lines and gaps. Indeed, several contributions arise from our investigation.

Firstly, to the best of our knowledge, this is the first literature review that integrates previous research relating TI and SEW. Thus, this study improves our comprehension regarding the role SEW plays in family firms' TI. A comprehensive overview of the 25 reviewed papers revealed that prior literature on this issue has primarily focused on the effect of SEW as a unidimensional construct in the TI process (innovation inputs, activities, and outputs). At this respect, the ability and willingness paradox (Chrisman et al., 2015; De Massis et al., 2014) states that noneconomic goals, and namely SEW, makes family firms less willing to perform TI but simultaneously more

able to achieve TI. On the one hand, the fact that family willingness to innovate is highly influenced by SEW concerns (Berrone et al., 2012; Gómez-Mejía et al., 2007; 2011), has been thoroughly analysed in the previous literature (e.g. Block, 2012; Chen & Hsu, 2009; Chrisman & Patel, 2012). On the other hand, the family ability to achieve innovative results has been demonstrated to be influenced by family members' tacit knowledge (Diéguez-Soto et al., 2016; Von Krogh et al., 2000), parsimony (Carney, 2005), and resources orchestration (Duran et al., 2016; Sirmon, Hitt, Ireland, & Gilbert, 2011), being all these elements directly associated to SEW. However, the specific impact of SEW on TI outcomes has been less investigated than the particular effect of SEW on TI inputs (Röd, 2016), while it is true that recent studies are focusing on this research gap (Diéguez-Soto et al., 2018; Manzanque et al., 2018; Meroño-Cerdan et al., 2017). In any case, what can be argued in the light of the existing literature is that, SEW considered as a whole, has a negative impact on the family firms willingness to innovate and thus, on TI inputs; meanwhile SEW, considered as a whole, has a positive impact on the family firms ability to innovate, and therefore, on TI outcomes. Finally, it is important to highlight that although recent research argues that SEW, as a unidimensional construct, drives innovation management (Fitz-Koch & Nordqvist, 2017; Li & Daspit, 2016; Padilla-Meléndez et al., 2015), the recognition of SEW as multidimensional construct considering the five dimensions proposed by Berrone et al. (2012) and their impact on TI, remains under-research. Although it is true that the multidimensional nature of SEW and its relation with innovation has recently received increased attention (Filser et al., 2017; Gast et al., 2018), existing research is critically silent with respect to the effect of the SEW dimensions on TI. At this respect, Filser et al. (2017) empirically analysed the effect of the different SEW dimensions on innovativeness, revealing that binding social ties, emotional attachment, and renewal of family bonds positively affect family firm innovativeness, while identification of family members with the firm has a negative effect on innovativeness. Likewise, Gast et al. (2018)

through a qualitative comparative analysis of 452 family SMEs, showed how the interaction of different SEW elements lead to the creation of innovation capacities. In this vein, it can be really interesting to extrapolate the considerations of the two abovementioned studies to the particular area of TI. Thus, we call for more research in this intriguing field inasmuch as it would allow to provide a better understanding of how SEW affects TI.

Secondly, based on an integrative framework, we recognize the main existing and emerging research avenues on the TI-SEW relationship, providing to the academic and the professional community an overview of both the family business and the innovation research fields. In such a way, this research enriches the extant literature in family firms, representing an important refinement in terms of theory development (Colquitt & Zapata-Phelan, 2007) as it examines the underexplored relationships between SEW, TI and firm performance, meanwhile it introduces new moderators in the abovementioned existing relationships.

Based on the previous literature, our six propositions synthesize the most prominent existing findings and identified those research gaps that require further investigation due to the lack of empirical research. For instance, although the prior research (e.g. Block, 2012; Chrisman & Patel, 2012) reveals a negative relationship between SEW and R&D (P1), the current knowledge on how some moderating variables affect this relationship, i.e. family/non-family CEO (P3A), CEO's risk propensity or aversion (P3B), and performance hazard (P4) is scarce and inconclusive. Furthermore, as stated above, more research is needed on the effect of specific SEW dimensions on R&D.

Moreover, with respect to the well-established R&D-TI relationship (Duran et al., 2016; Memili et al., 2015), more studies analysing the moderating effects of family generation (5A) and family management (5B) are needed, inasmuch as the existing results are mixing and ambiguous. In this vein, although most studies (Diéguez-Soto et al., 2016; Liang et al., 2013; Manzanque et al., 2018) have shown a negative moderating effect of family management on

the relationship between R&D and TI, positive and nonsignificant effects have also been revealed (Duran et al., 2016; Matzler et al., 2015; Meroño-Cerdan et al., 2017). Moreover, in the light of the most recent studies (e.g. Diéguez-Soto et al., 2018), it seems that the consideration of different innovation inputs and/or innovation outputs leads to different results. In this vein, recent calls for further research on the differential effect of family management and family generation on innovation inputs and/or innovation outputs have been made (e.g. Diéguez-Soto et al., 2018; Duran et al., 2016). Besides, as we abovementioned, there is also a lack of research analysing the effect of SEW on TI outcomes (Röd, 2016).

Furthermore, P2 reflects a positive relationship between TI and performance. Although this relationship seems clear (e.g. Cruz-Cázares et al., 2013), there is no consensus on whether TI actually improves family businesses' performance more than it does for the case of non-family businesses (Price et al., 2013). At this respect, it might be really interesting to further investigate whether family business innovation performance is higher or lower than that of their nonfamily counterparts. With regard to the moderating effects exerted by family generation (P6A) and family management (P6B) on the abovementioned relationship, there is still a profound lack of knowledge. Thus, more research is needed regarding under which conditions the abovementioned variables influence the TI-performance relationship.

Overall, further studies on all the proposed relationships are needed to achieve a better understanding of how SEW, and specifically SEW dimensions, affect strategic decisions concerning TI.

It is also important to highlight that our literature review reveals a preponderance of quantitative papers. However, the number of qualitative studies has increased in recent years (Fitz-Koch & Nordqvist, 2017; Kammerlander & Ganter, 2015; Miller et al., 2015), despite that in the business field, in general, and in the family business field in particular, there is scarce qualitative research (De Massis et al., 2013). In this sense, the use of qualitative methods would favour a

better explanation of contextual factors and a more integrating understanding of the existing results, as well as allow to answer the "how" and "why" questions that constantly emerge in the issue (Röd, 2016). Thus, case studies and qualitative research are highly necessary, as they gather those aspects that are not covered by empirical data and quantitative studies.

Finally, both the framework and the conceptual model may be useful in orienting future studies concerning innovation in family firms. The conducted analysis in this literature review could be a very valuable tool for researchers in the family business field, because it offers new insights that might guide future research on how SEW influences TI.

Thereby, this study presents an integrative focus, providing further evidence beyond prior published literature reviews, that focused individually on innovation (De Massis et al., 2013; Padilla-Meléndez et al., 2015; Röd, 2016) and SEW (Martínez Romero & Rojo Ramírez, 2016; Mensching, Kraus, & Bouncken, 2014) aspects.

6.1. Limitations

Despite the interesting results of our study, it is important to recognize its major limitations.

First, our study is mainly focused on innovation inputs and outputs, as these constitute the most frequently examined mechanisms in TI research. However, it might also be interesting to research innovation activities, as they constitutes one of the three steps of TI (Crossan & Apaydin, 2010; De Massis et al., 2013).

Second, it was observed that the TI and SEW literature is mostly dominated by Western countries. Nevertheless, given the development of Asian economies in recent years, this gap should be reduced in future research.

Third, the small sample of publications collected for review (N = 25) due to the unique consideration of papers from peer-reviewed academic journals. This restriction might have consequences on the developed model and propositions, making them more limited in scope.

6.2. Practical implications

This manuscript provides significant contributions to managerial practice. By offering a conceptual framework and a conceptual model, our study might help practitioners and consultants to be aware of the important role that SEW plays in the TI achievement. The obtained results from the propositions and the new identified research lines have clear consequences on family business management and strategic decision making.

At this respect, families conducting their own businesses must be able to identify decisions and actions concerning TI activities and strategies that may be affected by the desire of preserving the firm in the long-term. As a result of these emotional objectives, certain idiosyncratic characteristics arise that might positively or negatively influence the implementation and organisation of TI. Our literature review has shown that depending on the type of goals that families prioritise, i.e. financial, emotional or both, the achieved TI will be distinct, and thus, the obtained performance. We have also identified a set of variables that act as moderators in the SEW-TI-performance relationships. In this vein, consultants and practitioners must know those moderating variables in order to make appropriate strategic choices that allow an adequate implementation of innovative projects.

In summary, this study offers a clearer view of the TI phenomenon from a SEW perspective, contributing to both the family business and the innovation research fields by identifying the main analysed aspects up to now and by providing an agenda for future research. Moreover, the derived conclusions from our study will help family firm decision-makers, advisors, and policy makers in a practical manner to advance in this promising field.

REFERENCES

- Ashwin, A. S., Krishnan, R. T., & George, R. (2015). Family firms in India : family involvement, innovation and agency and stewardship behaviors. *Asia Pacific Journal of Management*, 32(4), 869–900.
- Astrachan, J. H., & Jaskiewicz, P. (2008). Emotional Returns and Emotional Costs in Privately Held Family Businesses: Advancing Traditional Business Valuation. *Family Business Review*, 21(2), 139–149.
- Berrone, P., Cruz, C., & Gómez-Mejía, L. R. (2012). Socioemotional Wealth in Family Firms: Theoretical Dimensions, Assessment Approaches, and Agenda for Future Research. *Family Business Review*, 25(3), 258–279.
- Block, J. H. (2012). R&D investments in family and founder firms: An agency perspective. *Journal of Business Venturing*, 27(2), 248–265.
- Block, J., Miller, D., Jaskiewicz, P., & Spiegel, F. (2013). Economic and Technological Importance of Innovations in Large Family and Founder Firms: An Analysis of Patent Data. *Family Business Review*, 26(2), 180–199.
- Blundell, R., Griffith, R., & Van Reenen, J. (1999). Market share, market value and innovation in a panel of British manufacturing firms. *The Review of Economic Studies*, 66(3), 529–554.
- Brinkerink, J., & Bammens, Y. (2017). Family Influence and R&D Spending in Dutch Manufacturing SMEs: The Role of Identity and Socioemotional Decision Considerations. *Journal of Product Innovation Management*, (First online). <http://doi.org/10.1111/jpim.12428>
- Carney, M. (2005). Corporate Governance and Competitive Advantage in Family-Controlled Firms. *Entrepreneurship Theory and Practice*, 29(3), 249.
- Cassia, L., De Massis, A., & Pizzurno, E. (2011). An Exploratory Investigation on NPD in Small Family Businesses from Northern Italy. *International Journal of Management and Social Sciences*, 2(2), 1–14.
- Chen, H., & Hsu, W.-T. (2009). Family Ownership, Board Independence and R&D Investment. *Family Business Review*, 22(4), 347–362.
- Chirico, F., & Salvato, C. (2016). Knowledge internalization and product development in family firms: When rational and affective factors matter. *Entrepreneurship Theory & Practice*, 40(1), 201–229.
- Chrisman, J. J., Chua, J. H., De Massis, A., Frattini, F., & Wright, M. (2015). The Ability and Willingness Paradox in Family Firm Innovation. *Journal of Product Innovation Management*, 32(3), 310–318.
- Chrisman, J. J., Chua, J. H., & Litz, R. A. (2004). Comparing the agency costs of family and non-family firms: Conceptual issues and exploratory evidence. *Entrepreneurship Theory and Practice*, 28(4), 335–354.
- Chrisman, J. J., & Patel, P. C. (2012). Variations in R&D investments of family and nonfamily firms: Behavioral agency and myopic loss aversion perspectives. *Academy of Management Journal*, 55(4), 976–997.
- Classen, N., Carree, M., Van Gils, A., & Peters, B. (2014). Innovation in family and non-family SMEs: an exploratory analysis. *Small Business Economics*, 42(3), 595–609.
- Colquitt, J. A., & Zapata-Phelan, C. P. (2015). Trends in Theory Building and Theory Testing: a Five-Decade Study of the Academy of Management Journal. *Academy of Management Review*, 50(6), 1281–1303.
- Crossan, M. M., & Apaydin, M. (2010). A Multi-Dimensional Framework of Organizational Innovation: A Systematic Review of the Literature. *Journal of Management Studies*, 47(6), 1154–1191.
- Cruz-Cázares, C., Bayona-Sáez, C., & García-Marco, T. (2013). You can't manage right what you can't measure well: Technological innovation efficiency. *Research Policy*, 42(6–7), 1239–1250.
- Cruz, C., Justo, R., & De Castro, J. O. (2012). Does family employment enhance MSEs performance?: Integrating

- socioemotional wealth and family embeddedness perspectives. *Journal of Business Venturing*, 27(1), 62–76.
- Cruz, C., & Nordqvist, M. (2012). Entrepreneurial orientation in family firms: a generational perspective. *Small Business Economics*, 38(1), 33–49.
- David, P., Hitt, M. A., & Gimeno, J. (2001). The Influence of Activism by Institutional Investors on R&D. *The Academy of Management Journal*, 44(1), 144–157.
- De Massis, A., Audretsch, D., Uhlaner, L., & Kammerlander, N. (2018). Innovation with Limited Resources: Management Lessons from the German Mittelstand. *Journal of Product Innovation Management*, 35(1), 125–146.
- De Massis, A., Di Minin, A., & Frattini, F. (2015). Family-Driven Innovation: Resolving the Paradox in Family Firms. *California Management Review*, 58(1), 5–19.
- De Massis, A., Frattini, F., & Lichtenthaler, U. (2013). Research on Technological Innovation in Family Firms: Present Debates and Future Directions. *Family Business Review*, 26(1), 10–31.
- De Massis, A., Frattini, F., Pizzurno, E., & Cassia, L. (2015). Product innovation in family versus nonfamily firms: An exploratory analysis. *Journal of Small Business Management*, 53(1), 1–36.
- De Massis, A., Kotlar, J., Chua, J. H., & Chrisman, J. J. (2014). Ability and willingness as sufficiency conditions for family-oriented particularistic behavior: Implications for theory and empirical studies. *Journal of Small Business Management*, 52(2), 344–364.
- Diéguez-Soto, J., Garrido-Moreno, A., & Manzaneque, M. (2018). Unravelling the link between process innovation inputs and outputs: The moderating role of family management. *Journal of Family Business Strategy*, (First online). <http://doi.org/10.1016/j.jfbs.2017.11.007>
- Diéguez-Soto, J., Manzaneque, M., & Rojo-Ramírez, A. A. (2016). Technological Innovation Inputs, Outputs and Performance: the Moderating Role of Family Involvement in Management. *Family Business Review*, 29(3), 327–346.
- Drucker, P. (1985). *Innovation and entrepreneurship: Practice and principles*. New York: Harper & Row.
- Duran, P., Kammerlander, N., van Essen, M., & Zellweger, T. M. (2016). Doing more with less: Innovation input and output in family firms. *Academy of Management Journal*, 59(4), 1224–1264.
- Family Firm Institute. (2015). Global Data Points.
- Filser, M., De Massis, A., Gast, J., Kraus, S., & Niemand, T. (2017). Tracing the Roots of Innovativeness in Family SMEs: The Effect of Family Functionality and Socioemotional Wealth. *Journal of Product Innovation Management*, (First online). <https://doi.org/10.1111/jpim.12433>
- Fitz-Koch, S., & Nordqvist, M. (2017). The Reciprocal Relationship of Innovation Capabilities and Socioemotional Wealth in a Family Firm. *Journal of Small Business Management*, 55(4), 547–570.
- Freeman, C. (1976). *The economics of industrial innovation*. London: Pinter.
- Fuetsch, E., & Suess-Reyes, J. (2017). Research on innovation in family businesses: are we building an ivory tower? *Journal of Family Business Management*, 7(1), 44–92.
- Gallizo, J. L., Mar-Molinero, C., Moreno, J., & Salvador, M. (2017). Family business and value-added distribution: a socioemotional wealth approach. *Academia Revista Latinoamericana de Administración*, 30(1), 2–22.
- Garcés-Galdeano, L., Larraza-Kintana, M., García-Olaverri, C., & Makri, M. (2016). Entrepreneurial orientation in family firms: the moderating role of technological intensity and performance. *International*

- Entrepreneurship and Management Journal*, 12(1), 27–45.
- Gast, J., Filser, M., Rigtering, J. P. C., Harms, R., Kraus, S., & Chang, M. (2018). Socioemotional Wealth and Innovativeness in Small- and Medium-Sized Family Enterprises : A Configuration Approach. *Journal of Small Business Management*, (First online). <https://doi.org/10.1111/jsbm.12389>
- Gómez-Mejía, L. R., Campbell, J. T., Martin, G., Hoskisson, R. E., Makri, M., & Sirmon, D. G. (2014). Socioemotional Wealth as a Mixed Gamble: Revisiting Family Firm R&D Investments With the Behavioral Agency Model. *Entrepreneurship: Theory and Practice*, 38(6), 1351–1374.
- Gómez-Mejía, L. R., Cruz, C., Berrone, P., & De Castro, J. (2011). The Bind that Ties: Socioemotional Wealth Preservation in Family Firms. *The Academy of Management Annals*, 5(1), 653–707.
- Gómez-Mejía, L. R., Haynes, K. T., Núñez-Nickel, M., Jacobson, K. J. L., & Moyano-Fuentes, J. (2007). Socioemotional Wealth and Business Risks in Family-controlled Firms: Evidence from Spanish Olive Oil Mills. *Administrative Science Quarterly*, 52(1), 106–137.
- Gómez-Mejía, L. R., Makri, M., & Kintana, M. L. (2010). Diversification Decisions in Family-Controlled Firms. *Journal of Management Studies*, 47(2), 223–252.
- Hauck, J., & Prügl, R. (2015). Innovation activities during intra-family leadership succession in family firms: An empirical study from a socioemotional wealth perspective. *Journal of Family Business Strategy*, 6(2), 104–118.
- Holt, D. T., & Daspit, J. J. (2015). Diagnosing Innovation Readiness in Family Firms. *California Management Review*, 58(1), 82–96.
- Huang, Y., Yang, M., & Wong, Y. (2016). The effect of internal factors and family influence on firms ' adoption of green product innovation. *Management Research Review*, 39(10), 1167–1198.
- Instituto de la empresa Familiar. (2015). *The Family Business in Spain (2015)*. Madrid (Spain): Instituto de la Empresa Familiar.
- Kammerlander, N., & Ganter, M. (2015). An attention-Based View of Family Firm Adaptation to Discontinuous Technological Change: Exploring the Role of Family CEOs' Noneconomic Goals. *Journal of Product Innovation Management*, 32(3), 361–383.
- Kellermanns, F. W., Eddleston, K. A., Sarathy, R., & Murphy, F. (2012). Innovativeness in family firms: A family influence perspective. *Small Business Economics*, 38(1), 85–101.
- Klein, S. B., Astrachan, J. H., & Smyrnios, K. X. (2005). The F-PEC Scale of Family Influence: Construction, Validation, and Further Implication for Theory. *Entrepreneurship Theory and Practice*, 29(3), 321–339.
- Kotlar, J., De Massis, A., Frattini, F., Bianchi, M., & Fang, H. (2013). Technology acquisition in family and nonfamily firms: A longitudinal analysis of spanish manufacturing firms. *Journal of Product Innovation Management*, 30(6), 1073–1088.
- Kraiczy, N. D., Hack, A., & Kellermanns, F. W. (2015). What makes a family firm innovative? CEO risk-taking propensity and the organizational context of family firms. *Journal of Product Innovation Management*, 32(3), 334–348.
- La Porta, R., Lopez-De-Silanes, F., & Shleifer, A. (1999). Corporate Ownership Around the World. *The Journal of Finance*, 54(2), 471–517.
- Laverty, K. J. (1996). Economic “short-termism”: The debate, the unresolved issues, and the implications for management practice and research. *Academy of Management Review*, 21(3), 825–860.

- Li, Z., & Daspit, J. J. (2016). Understanding family firm innovation heterogeneity: A typology of family governance and socioemotional wealth intentions. *Journal of Family Business Management*, 6(2), 103–121.
- Liang, Q., Li, X., Yang, X., Lin, D., & Zheng, D. (2013). How does family involvement affect innovation in China? *Asia Pacific Journal of Management*, 30(3), 677–695.
- Llach, J., & Nordqvist, M. (2010). Innovation in family and non-family businesses: a resource perspective. *International Journal of Entrepreneurial Venturing*, 2(3), 381–399.
- Mairesse, J., & Mohnen, P. (2002). Accounting for Innovation and Measuring Innovativeness: An Illustrative Framework and an Application. *American Economic Review*, 92(2), 226–230.
- Manzaneque, M., Diéguez-Soto, J., & Garrido-Moreno, A. (2018). Technological innovation inputs, outputs and family management: Evidence from Spanish manufacturing firms. *Innovation: Management, Policy & Practice*, (First online). <https://doi.org/10.1080/14479338.2018.1444491>
- Manzaneque, M., Ramírez, Y., & Diéguez-Soto, J. (2017). Intellectual capital efficiency, technological innovation and family management. *Innovation: Management, Policy and Practice*, 19(2), 167–188.
- Martínez Romero, M. J., & Rojo Ramírez, A. A. (2016). SEW: Temporal Trajectory and Controversial Issues. *European Journal of Family Business*, 6(1), 1–9.
- Martínez Romero, M. J., & Rojo Ramírez, A. A. (2017). Socioemotional wealth's implications in the calculus of the minimum rate of return required by family businesses' owners. *Review of Managerial Science*, 11(1), 95–118.
- Matzler, K., Veider, V., Hautz, J., & Stadler, C. (2015). The Impact of Family Ownership, Management, and Governance on Innovation. *Journal of Product Innovation Management*, 32(3), 319–333.
- Memili, E., Fang, H. C., & Welsh, D. H. B. (2015). Value creation and value appropriation in innovation process in publicly-traded family firms. *Management Decision*, 53(9), 1921–1952.
- Mensching, H., Kraus, S., & Bouncken, R. B. (2014). Socioemotional wealth in family firm research- A literature review. *Journal of International Business and Economics*, 14(4), 165–172.
- Meroño-Cerdan, A., López-Nicolás, C., & Molina-Castillo, F.-J. (2017). Risk aversion, innovation and performance in family firms. *Economics of Innovation and New Technology*, 27(2), 189–203.
- Miller, D., & Le-Breton-Miller, I. (2005). *Managing for the Long Run: Lessons in Competitive Advantage from Great Family Businesses*.
- Miller, D., & Le Breton-Miller, I. (2014). Deconstructing Socioemotional Wealth. *Entrepreneurship Theory and Practice*, 38(4), 713–720.
- Miller, D., Wright, M., Le Breton-Miller, I., & Scholes, L. (2015). Resources and Innovation in Family Businesses: The Janus-Face of socioemotional preferences. *California Management Review*, 58(1), 20–41.
- Munari, F., Oriani, R., & Sobrero, M. (2010). The effects of owner identity and external governance systems on R&D investments: A study of Western European firms. *Research Policy*, 39(8), 1093–1104.
- Padilla-Meléndez, A., Dieguez-Soto, J., & Garrido-Moreno, A. (2015). Empirical research on Innovation in Family Business: literature review and proposal of an integrative framework. *Review of Business Management*, 17(56), 1064–1089.
- Patel, P. C., & Chrisman, J. J. (2014). Risk abatement as a strategy for R&D investments in family firms. *Strategic Management Journal*, 35(4), 617–627.
- Patel, P. C., & Fiet, J. O. (2011). Knowledge combination and the potential advantages of family firms in searching

- for opportunities. *Entrepreneurship: Theory and Practice*, 35(6), 1179–1197.
- Podsakoff, P. M., MacKenzie, S. B., Bachrach, D. G., & Podsakoff, N. P. (2005). The influence of management journals in the 1980s and 1990s. *Strategic Management Journal*, 26(5), 473–488.
- Price, D. P., Stoica, M., & Boncella, R. J. (2013). The relationship between innovation, knowledge, and performance in family and non-family firms: an analysis of SMEs. *Journal of Innovation and Entrepreneurship*, 2(14), 14.
- Röd, I. (2016). Disentangling the family firm's innovation process: A systematic review. *Journal of Family Business Strategy*, 7(3), 185–201.
- Rojo Ramírez, A. A., & Martínez Romero, M. J. (2017). Required and obtained equity returns in privately held businesses: the impact of family nature—evidence before and after the global economic crisis. *Review of Managerial Science*, (First on line). <http://doi.org/10.1007/s11846-017-0230-7>
- Schepers, J., Voordeckers, W., Steijvers, T., & Laveren, E. (2014). The entrepreneurial orientation–performance relationship in private family firms: the moderating role of socioemotional wealth. *Small Business Economics*, 43(1), 39–55.
- Schulze, W. (2016). Socio-emotional wealth and family: revisiting the connection. *Management Research: Journal of the Iberoamerican Academy of Management*, 14(3), 288–297.
- Sciascia, S., Nordqvist, M., Mazzola, P., & De Massis, A. (2015). Family ownership and R&D intensity in small- and medium-sized firms. *Journal of Product Innovation Management*, 32(3), 349–360.
- Serrano-Bedia, A. M., López-Fernández, M. C., & Garcia-Piqueres, G. (2016). Analysis of the relationship between sources of knowledge and innovation performance in family firms. *Innovation: Management, Policy & Practice*, 18(4), 489–512.
- Sirmon, D. G., Hitt, M. A., Ireland, R. D., & Gilbert, B. A. (2011). Resource Orchestration to Create Competitive Advantage: Breadth, Depth, and Life Cycle Effects. *Journal of Management*, 37(5), 1390–1412.
- Souder, D., Zaheer, A., Sapienza, H., & Ranucci, R. (2017). How family influence, socioemotional wealth, and competitive conditions shape new technology adoption. *Academy of Management Journal*, 38(2), 1774–1790.
- Suess, J. (2014). Family governance - Literature review and the development of a conceptual model. *Journal of Family Business Strategy*, 5(2), 138–155.
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review. *British Journal of Management*, 14(3), 207–222.
- Urbinati, A., Franzo, S., De Massis, A., & Frattini, F. (2017). Innovation in Family Firms: A Review of Prior Studies and a Framework for Future Research. In A. Brem & E. Viardot (Eds.), *Revolution of Innovation Management* (Volume 2 I, pp. 213–246). Palgrave Macmillan UK.
- Vandekerckhof, P., Steijvers, T., Hendriks, W., & Voordeckers, W. (2015). The Effect of Organizational Characteristics on the Appointment of Nonfamily Managers in Private Family Firms: The Moderating Role of Socioemotional Wealth. *Family Business Review*, 28(2), 104–122.
- Ven, A., & M. Rogers, E. (1988). *Innovations and Organizations: critical Perspectives*. *Communication Research* (Vol. 15).
- Von Krogh, G., Ichijo, K., & Nonaka, I. (2000). *Enabling knowledge creation: How to unlock the mystery of tacit knowledge and release the power of innovation*. Oxford, United Kingdom: Oxford university press.

- Wiseman, R. M., & Gómez-Mejía, L. R. (1998). A Behavioral Agency Model of Managerial Risk Taking. *The Academy of Management Review*, 23(1), 133–153.
- Zellweger, T. M., & Dehlen, T. (2012). Value Is in the Eye of the Owner. *Family Business Review*, 25(3), 280–297.
- Zellweger, T. M., Kellermanns, F. W., Chrisman, J. J., & Chua, J. H. (2011). Family Control and Family Firm Valuation by Family CEOs: The Importance of Intentions for Transgenerational Control. *Organization Science*, 23(3), 851–868.

Table 2. Source journals of papers

Journal name	Number of papers	%	% Accumulated
Journal of Product Innovation Management	6	24,00%	24,00%
Academy of Management Journal	3	12,00%	36,00%
Innovation: Management, Policy and Practice	3	12,00%	48,00%
Journal of Family Business Strategy	2	8,00%	56,00%
Journal of Small Business Management	2	8,00%	64,00%
Family Business Review	2	8,00%	72,00%
Entrepreneurship Theory and Practice	1	4,00%	76,00%
Strategic Management Journal	1	4,00%	80,00%
California Management Review	1	4,00%	84,00%
Journal of Family Business Management	1	4,00%	88,00%
International Entrepreneurship and Management Journal	1	4,00%	92,00%
Management Decision	1	4,00%	96,00%
Asia Pacific Journal of Management	1	4,00%	100,00%
Total	25	100,00%	

Table 3. Method

Method	Number	Papers (%)
Quantitative	20	80%
Qualitative	5	20%
Total	25	100%

Table 4. Industry

Industry	Number	Papers (%)
Manufacturing	11	44%
Multi-industry	4	16%
High-tech industries	1	4%
Food and / or beverage	1	4%
Pharmaceutical industry	1	4%
Tourism industry	1	4%
Cable TV operators	1	4%
Not Available	5	20%
Total	25	100%

Table 5. Innovation inputs and SEW

Ashwin et al. (2015)	Hauck and Prügl (2015)
Block et al. (2013)	Kraiczyn et al. (2015)
Brinkerink and Bammens (2017)	Li and Daspit (2016)
Chrisman and Patel (2012)	Manzaneque et al. (2018)
Diéguez Soto et al. (2016)	Matzler et al. (2015)
Diéguez-Soto et al. (2017)	Memili et al. (2015)
Duran et al. (2016)	Miller et al. (2015)
Fitz-Koch and Nordqvist (2017)	Patel and Chrisman (2014)
Garcés-Galdeano et al. (2016)	Sciascia et al. (2015)
Gómez-Mejía et al. (2014)	Souder et al. (2017)

Table 6. TI outcomes and Performance

Ashwin et al. (2015)	Manzaneque et al. (2017)
Block et al. (2013)	Manzaneque et al. (2018)
Chrisman and Patel (2012)	Matzler et al. (2015)
Diéguez-Soto et al. (2016)	Memili et al. (2015)
Diéguez-Soto et al. (2017)	Patel and Chrisman (2014)
Duran et al. (2016)	Sciascia et al. (2015)
Garcés-Galdeano et al. (2016)	Serrano-Bedia et al. (2016)
Gómez-Mejía et al. (2014)	Souder et al. (2017)
Kotlar et al. (2013)	

Table 7. Moderating effects on the SEW-TI-Performance relationships

<u>Family/Non-Family CEO</u>	<u>CEO's risk aversion/propensity</u>
Ashwin et al. (2015)	De massis et al. (2015)
Duran et al. (2016)	Garcés-Galdeano et al. (2016)
Fitz-Koch and Nordqvist (2017)	Kraiczyn et al. (2015)
Kammenlander and Ganter (2015)	
Patel and Chrisman (2014)	<u>Performance Hazard</u>
Serrano-Bedia et al. (2016)	Chrisman and Patel (2012)
	Gómez-Mejía et al. (2014)
<u>Family Management</u>	Patel and Chrisman (2014)
Ashwin et al. (2015)	
Block et al. (2013)	<u>Family Generation</u>
Diéguez-Soto et al. (2016)	De massis et al. (2015)
Diéguez-Soto et al. (2017)	Hauck and Prügl (2015)
Kotlar et al. (2013)	Kraiczyn et al. (2015)
Manzaneque et al. (2017)	Li and Daspit (2016)
Manzaneque et al. (2018)	Memili et al. (2015)
Matzler et al. (2015)	

Figure 1 – Conceptual framework used for studying the interrelationships between TI and SEW

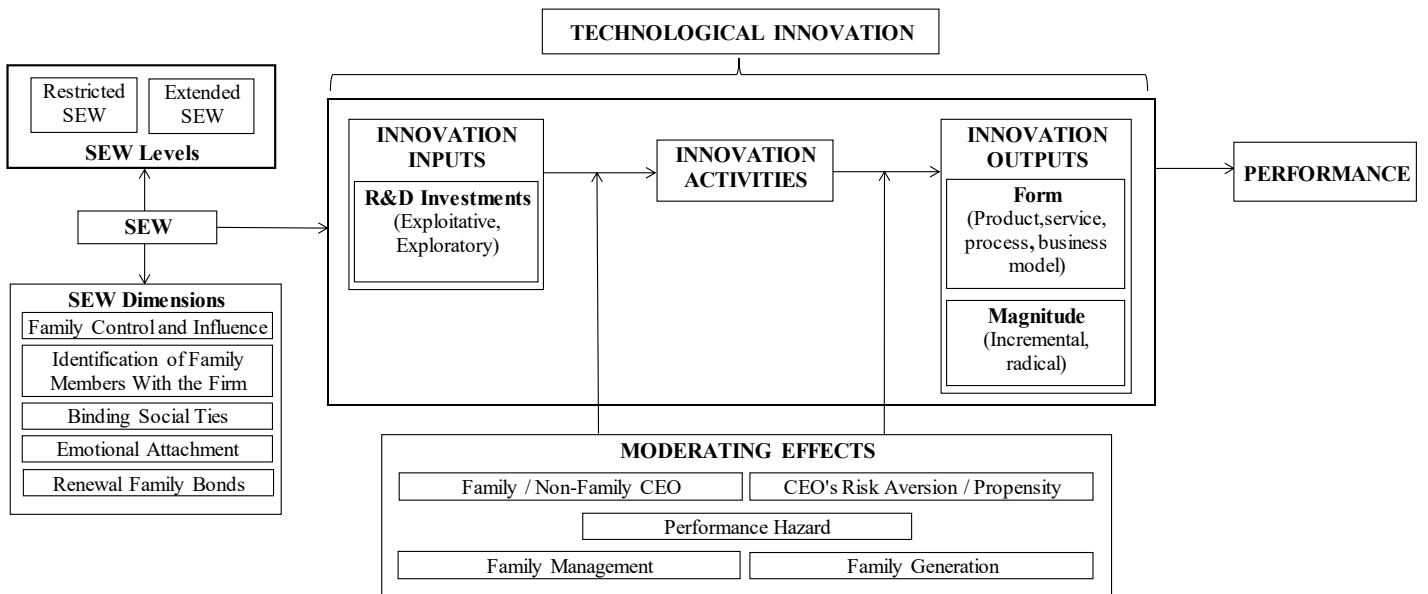
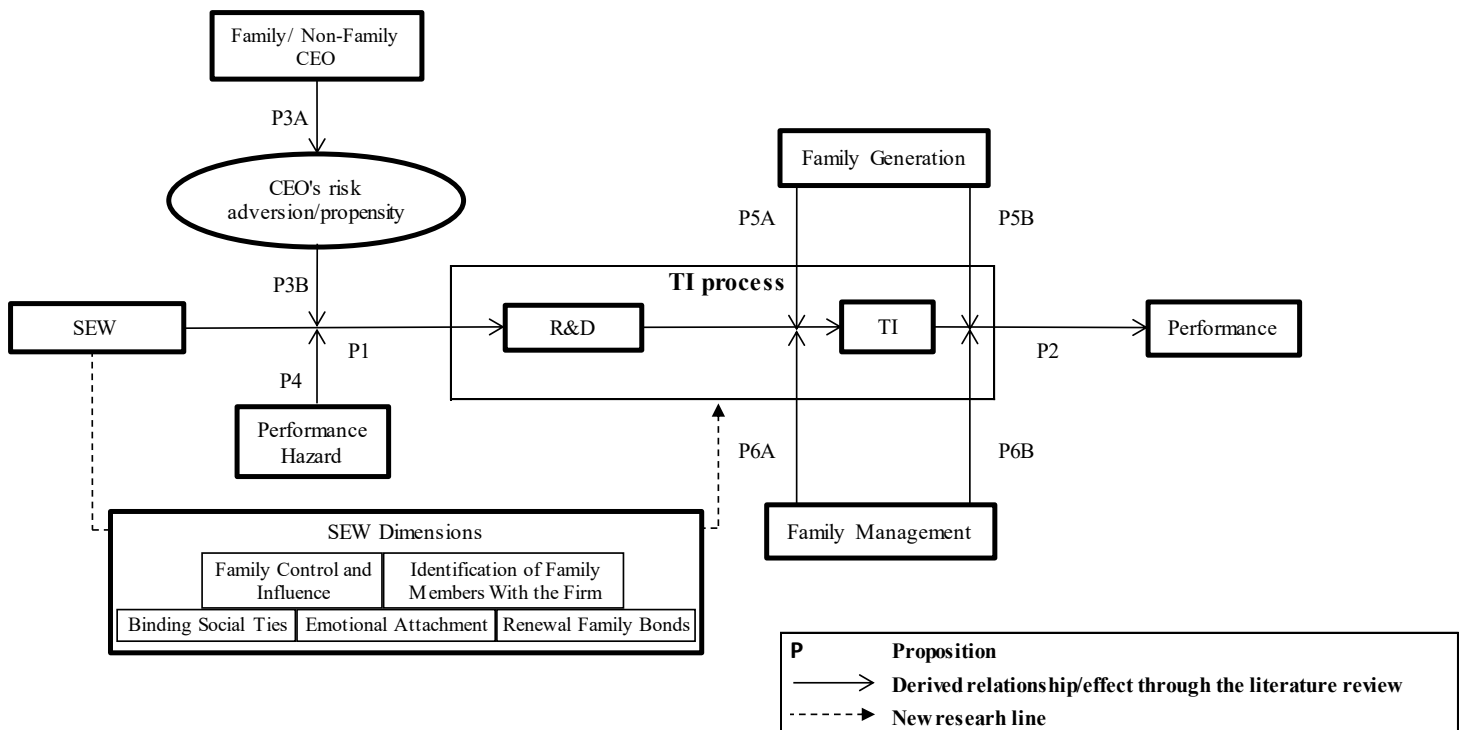


Figure 2 – Conceptual Model



ANNEXES

Table 1. Selected papers for the TI-SEW review

Author (s) and year	Sample description	Innovation approach	Theories (BAM-SEW)	Key findings
Ashwin et al. (2015)	172 Indian pharmaceutical firms	Innovation inputs (R&D investments) and outputs (patents received)	BAM	Family shareholding and having family members as both CEO and chairperson (duality) positively impact firm's R&D investments. Although family members with greater ownership and control can encourage R&D investments, they do not seem to significantly influence the firm's innovation outputs.
Block et al. (2013)	248 firms included in S&P 500 index	R&D spending and patent citations	SEW	By controlling R&D spending, founder-led firms obtain more patent citations and generate innovations of great economic and technological importance. Conversely, family-managed firms receive fewer patent citations and perform innovations with minor economic and technological importance, even when R&D spending is controlled
Brinkerink and Bammens (2017)	365 Privately held manufacturing SMEs	R&D investments	SEW	The general association between family business status and R&D expenditures is negative. This negative effect is explained by the family firms' concern with extended preservation. Moreover, concerns about the organization's reputation and organizational values and traditions partially compensate for the negative impact of the extended preservation mechanism
Chrisman and Patel (2012)	964 Manufacturing firms in the Standard & Poor's S&P 1500 index	R&D investments	BAM, SEW	Family businesses usually invest less in R&D than non-family businesses, but the variability of their investments will be greater. In risky situations, when the firm's performance is below aspiration levels, family and economic goals in family businesses tend to converge.
De Massis et al. (2015)	10 Italian multi-industry firms	Product innovation process	BAM	Family businesses differ from non-family businesses in terms of product innovation strategies and organization of the innovation process. Three main areas are identified in which the characteristics of the product innovation process are grouped: strategy, organization and climate.
Diéguez-Soto et al. (2016)	551 Spanish manufacturing SMEs	R&D investments and continuous technological innovation intensity	SEW	Family management reduces the willingness and capacity of family businesses to achieve continuous technological innovation based on R&D intensity. Family management increases the willingness and ability of family businesses to achieve long-term performance from the results of technological innovation.
Diéguez-Soto et al. (2018)	922 Spanish manufacturing firms	Input mix and process innovation	SEW	Whereas family businesses appear to be less innovative with respect to process innovation than non-family businesses, their conversion rate is higher. Family managers' implication leads to a stronger relationship between innovation inputs and process innovation, increasing the relative capacity to transform different innovation inputs into process innovation outputs.
Duran et al. (2016)	-	Innovation inputs and outputs	BAM, SEW	Family businesses invest less in innovation activities than non-family businesses. These firms have particular characteristics that allow them to effectively deploy their resources and to transform innovation inputs into innovation outputs. Furthermore, the authors showed that the relationship between family businesses and innovation input/output depends on country-level factors, namely the level of minority shareholder protection and the educational level of the country's workforce.

Fitz-Koch and Nordqvist (2017)	1 Manufacturing firm of agricultural machines	Technology-based innovation capabilities	SEW	A positive and reciprocal relationship between technological innovation capabilities and SEW is identified. This mutual relationship within the family business is synergistic, resulting in synergies between financial wealth and SEW. The authors draw on the multidimensional concept of SEW (five dimensions) and focus on dynamic capabilities describing the ability to innovate as the capacities of detection, capture and transformation.
Garcés-Galdeano et al. (2016)	401 Spanish manufacturing firms	Technological intensity of the sector	BAM, SEW	Family businesses have less entrepreneurial orientation than non-family businesses. The existing gap in entrepreneurial orientation between family and non-family businesses is reduced in technology-intensive industries, while in times of economic hardship it has no relevance.
Gómez-Mejía et al. (2014)	610 High technology industry firms	R&D investments	BAM, SEW	In high-tech sectors, family businesses are less likely to invest in R&D than non-family businesses. Increasing institutional ownership and related diversification will make family businesses more likely to invest in R&D. The increase of these two variables, in turn, influences weakening the (negative) relationship between family ownership and R&D. Finally, performance hazard increases the impact of institutional ownership and related diversification on R&D.
Hauck and Prügl (2015)	81 Family firms	Innovation activities	SEW	Family adaptability and family members' proximity to their businesses are positively associated with the perception of the succession phase as an opportunity for innovation. Conversely, the intergenerational authority and the history of family ties are negatively linked to the perception of the succession phase as a proper time frame for innovation
Kammerlander and Ganter (2015)	7 firms in the German consumer goods industry	Discontinuous technological changes	BAM	Depending on the specific family goals pursued by the family CEO, substantial deviations arise that mark heterogeneous behaviour of family businesses, which makes it difficult to understand why they operate in such a different way when faced with a discontinuous technological change or innovation. Moreover, economic and non-economic goals can be compatible and jointly achieve medium- and long-term objectives.
Kotlar et al. (2013)	1,540 Spanish private manufacturing firms	External technology acquisition	BAM	The external acquisition of technology affects the SEW of the family that controls the firm. These acquisitions lead family businesses to relinquish some of the discretionary power over innovation activities to external parties, which results in a loss of control. Family businesses managers may perceive this situation as a barrier to achieving non-economic goals.
Kraiczy et al. (2015)	114 German manufacturing family SMEs	New product portfolio Innovativeness	BAM, SEW	The percentage of family members in the management team has a negative effect on the relationship between the CEO's risk propensity and new product portfolio innovativeness. The interaction between the risk propensity and family generation in charge of the firm also results in a positive effect on the new product portfolio innovativeness.
Li and Daspit (2016)	-	Innovation strategies	SEW	Risk orientation, innovation goals and knowledge diversity of family businesses vary depending on the degree of (high or low) family involvement in corporate governance and the type of SEW (restricted or extended) objective pursued by the family.
Manzaneque et al. (2017)	3,231 paired firm-year observations of Spanish manufacturing firms	Technological innovation outputs/outcomes	SEW	Both human and structural capital efficiency help to improve the firm's ability to achieve TI outputs. Intellectual capital is an important input in the innovation process. Family management increases the willingness and the ability to accomplish TI from human and structural capital efficiency.

Manzaneque et al. (2018)	1,027 Spanish manufacturing firms	Technological innovation, R&D intensity and R&D personnel	SEW	The analysis of the effects of family management on the conversion rate of three different technological innovation inputs (R&D intensity, R&D personnel and external networks), reveals that family management reduces efficiency in the conversion of R&D expenses into technological innovation outcomes.
Matzler et al. (2015)	134 German publicly traded firms for the innovation input estimation and 136 German publicly traded firms for the innovation output	Innovation inputs (R&D Intensity) and outputs (patents)	SEW	Family involvement in management and governance has a negative impact on the innovation input and a positive influence on innovation output. The active involvement of family members in the management and supervision of the business, leads to greater effectiveness of these firms in their innovation efforts.
Memili et al. (2015)	285 Listed firms included in the S&P 500 index	Innovation inputs (R&D Intensity) and outputs (patents)	SEW	Family firms in the first generation are more successful than second-generation or later-generation family businesses, both in value creation and value appropriation (the SEW being a key factor in both) which often translates into more innovative behaviour.
Miller et al. (2015)	7 Firms from different sectors	Innovation demands and approaches	SEW	The different innovative approaches identified (entrepreneurial Innovators, conservative Innovators, tardy Innovators and turnarounds—successful and not firms) from the dichotomized perspective of the SEW (“feeding parochial family desires” and “creating an evergreen organization.”), allow to conclude that it is of enormous importance that family businesses have to distinguish between those socio-emotional preferences and objectives that generate, on the one hand, the creation of resources necessary to ensure innovation and, on the other hand, the resources that discourage it.
Patel and Chrisman (2014)	847 Manufacturing firms included in S&P 1500 index	Nature of R&D investments	BAM, SEW	When performance exceeds aspirations, family businesses make exploitative R&D investments that lead to more reliable and less risky sales levels. On the contrary, performance below aspirations leads to exploratory R&D investments that result in potentially higher but less reliable sales levels.
Sciascia et al. (2015)	240 Italian SMEs	R&D intensity	BAM, SEW	In the context of SMEs, the relationship between family ownership and R&D intensity is negative when a high amount of family wealth is invested in the firm and on the contrary, it is positive when the amount of family wealth invested in the business is low.
Serrano-Bedia et al. (2016)	76 Spanish family firms	Innovation performance and activities	SEW	The relationship between the use of knowledge sources and innovation performance is affected by the moderating effect of family characteristics (CEO tenure, CEO founder duality and family involvement). All these characteristics exert negative moderating effects about the link between use of knowledge and innovation performance. Thus, the family firm dimension tends to mitigate the positive effects of using various types of knowledge sources on innovation performance.
Souder et al. (2017)	79 cable-TV firms	New technology adoption	SEW	A negative relationship between family ownership and technology adoption is shown. This relationship is especially important when family owners hold a minority instead of a majority position. For other part, small managers with diverse goals (e.g. SEW preservation), can delay strategic decision-making, due to their great effort to maintain control and influence over the firm. This particular behaviour leads to a negative effect on innovation and the adoption of new technologies in minority family businesses.

