Emerald International Journal of Entrepreneurial Behaviour & Research

Absorptive Capacity in Family Firms: Exploring the Role of the CEO

Journal:	*International Journal of Entrepreneurial Behavior & Research*
Manuscript ID	IJEBR-02-2023-0123.R4
Manuscript Type:	Research Paper
Keywords:	Family Firms, Knowledge transfer, Leadership

Absorptive Capacity in Family Firms: Exploring the Role of the CEO

ABSTRACT

Purpose: Absorptive capacity (AC), the ability to leverage external knowledge for innovation, helps explain the mixed findings on family firms' innovation performance. Our research focuses on the CEO's role—whether family or non-family, and founding or later generation—in influencing AC. We also explore how firm size and environmental dynamism affect these relationships, offering insights into varying AC levels among family firms.

Design/methodology/approach: OLS regression models were estimated to test the hypotheses using a sample of 364 family firms in Spain.

Findings: Family firms' absorptive capacity is greater when the CEO is a family member, and even more so when the family CEO belongs to the founding family generation. While AC diminishes in larger family firms this effect is mitigated when the CEO is a family member. The predicted moderating effect of environmental dynamisms is not supported by the analyses.

Originality: This paper adds insights about the drivers of heterogeneity in innovation among family firms, addressing recent calls for more nuanced views of how family members drive the strategic behavior of the business, and incorporating considerations of different types of family firms based on the identity of the firm CEO. The results overall support the theoretical claims, but also open up important questions for future studies.

Key words: Family firms; absorptive capacity; family CEO, family generation, heterogeneity

INTRODUCTION

Absorptive capacity (AC) – the ability to acquire, assimilate and exploit external knowledge (Cadiz *et al.,* 2009; Zahra and George, 2002) – is increasingly recognized as a key driver of innovation in family firms (FFs) (Kotlar, *et al.,* 2020). Research has shown that family businesses generally suffer from limited availability of internal innovation inputs (Chrisman and Patel, 2012), however they attain similar, and sometimes even superior innovation outputs compared to non-family firms (Aiello *et al.,* 2021; Duran, *et al.,* 2016). Intuitively, AC can help explain these puzzling results. However, family firms' innovation capabilities are highly heterogeneous, and existing research still provides very limited evidence concerning the specific family-related factors that can influence family firms' AC.

AC research has been mostly focused on widely held, professionally-managed firms, thereby often disregarding the important influence of firm owners and managers (Kotlar *et al.,* 2020). Given the growing recognition that (FFs are characterized by unique goals, resources and governance systems (Carney, 2005; Chrisman *et al.,* 2013), which altogether shape profoundly the way businesses engage and succeed in innovation endeavors (De Massis *et al.,* 2013), the lack of attention to the family-specific drivers of AC represents an important research gap in innovation scholarship. Family involvement is a common feature of companies operating in most countries and industries (La Porta *et al.,* 1999), and it has major impacts on business because family members in apical positions tend to display strong affective and social ties with the business, bringing those considerations to play a prominent role in their decision-making (Gómez-Mejía *et al.,* 2007). Moreover, literature has highlighted that FFs are highly heterogeneous, especially in relation to innovation behaviors and outcomes (e.g., Chrisman and Patel., 2012). In this regard, scholars have recently argued that knowledge management, and specifically the ability to combine

internal and external sources of knowledge, should be a central concern for enabling innovation in FFs (Su and Daspit, 2021). For these reasons, clarifying the factors that shape FFs' ability to leverage external sources of knowledge seems particularly timely.

This paper contributes to the family business innovation literature by shifting focus from the debate on the innovativeness of FFs compared to non-FFs to exploring internal capabilities that explain the observed difference between FFs' lower innovation inputs and higher outputs (Aiello et al., 2021). Specifically addressing the heterogeneity in FFs' AC, we investigate the role of their CEOs. CEO identity features, such as family/non-family membership and generational status, have been identified as crucial antecedents in family firm strategic decisions and performance. This study extends this literature to examine how these factors contribute to heterogeneity in AC among FFs.

We build hypotheses about the impact of family firm's CEO identity on AC building on a systematic analysis of the mechanisms through which family firm CEOs shape the behavior of the firm (Chrisman *et al.,* 2015): namely, their ability to inform decisions, and their emotional attachment to the firm. Based on the interplay between these theoretical mechanisms, we propose and test two specific hypotheses that explain FFs' heterogenous AC. Moreover, we explore the impact of boundary condition both at the internal (firm size) and the external (environmental dynamism) level of analysis.

Using a sample of 364 small high and medium-high tech Spanish FFs, we examined AC heterogeneity across FFs led by different CEOs. Results support hypotheses, revealing higher AC in FFs when the CEO is a family member, especially from the founding generation. AC in family firms generally varies with firm size, but this effect diminishes with a family member CEO. However, positive effects of a family member CEO remain unaffected by environmental dynamism. These findings contribute to understanding how

family CEOs drive innovation in family businesses, offering insights for future research on mixed results in family firm innovation.

The article includes a literature review on innovation and AC in FFs, followed by the development of hypotheses. It provides a detailed description of the sample, measures, and empirical analysis results. The concluding section discusses the theoretical and practical implications of the findings.

LITERATURE REVIEW

Absorptive Capacity Defined

Since Cohen and Levinthal's early work (1990), AC has emerged as a very influential concept in management and innovation research (Lane *et al.,* 2006; Volberda *et al.,* 2010). AC can be broadly defined as a firm's capability to identify, incorporate and exploit external knowledge in order to extend or renew existing knowledge stocks and use such resources to gain competitive advantage (Cohen and Levinthal, 1990). Scholars have shown that AC plays a critical role in enabling learning and innovation and is therefore an important means for improving and sustaining firm performance (Lane *et al.,* 2001).

Although sharing a common conceptual root, scholars have conceptualized AC in different ways. At the most basic level, early research has argued that AC is "largely a function of the firm's level of prior related knowledge" (Cohen and Levinthal, 1990: 128) and thus inherently linked to a firm's level of existing technical expertise and R&D capabilities. However, over time, scholars have increasingly recognized that AC can be better understood as a type of organizational capability. This view, today prevailing in the literature, conceives firms not just as "passive" recipients of external knowledge, highlighting the importance of active practices and processes aimed at interpreting external knowledge to fit the firm's existing knowledge stocks, structures and strategies (Lane *et al.,* 2006). The

focus has therefore shifted toward better understanding the firm-internal factors that produce heterogeneity in firms' AC (Jansen *et al.,* 2006).

The broad interest in such capability-based understanding of AC has further generated diverse conceptualizations of the construct. Griffith et al. (2003) expanded Cohen and Levinthal's (1990) definition of AC by emphasizing three interconnected dimensions: (1) identifying and filtering valuable information, (2) converting external knowledge into usable knowledge, and (3) applying the knowledge in new product/service/process development. This perspective, supported by Todorova and Durisin (2007) and implemented by Cadiz et al. (2009), highlights specific processes required to transform external knowledge into usable internal knowledge.

Another conceptualization of AC is the one developed by Zahra and George (2002), offering an alternative view of absorptive capacity (AC), dividing it into two dimensions. The first, potential AC, focuses on knowledge acquisition and assimilation, determining which external information enters the firm. The second, realized AC, involves transforming externally acquired knowledge into valuable outputs. This distinction clarifies distinct antecedents and tensions in developing firm capabilities for acquiring and exploiting external knowledge.

Although each of these research traditions and related work offers some differential advantages in order to understand how firms can develop and deploy their ability to leverage external knowledge for innovation, they all share an equal acknowledgement that AC is unequally distributed among firms, and that those differences matter substantially for firms' innovation outcomes. In trying to explain those differences, scholars have typically focused on antecedents related to the characteristics of firms' existing knowledge, environmental conditions and relationships with other firms (Lane *et al.,* 2006; Volberda *et al.,* 2010). For example, factors that have received considerable attention include the depth and breadth of

the firm's existing knowledge (Cohen and Levinthal, 1990; Lane et al. 2001), the competitive and regulatory setting (Van den Bosch *et al.,* 1999) and inter-firm agreements (Lane and Lubatkin, 1998). Only few scholars have started paying deeper attention to firm-level factors that affect AC. Tripsas and Gavetti (2000) revealed managers, facing limited environmental knowledge, use cognitive representations or dominant logics from historical experience for searches in new technological environments. Jansen et al. (2005) explored organizational factors, noting design principles like cross-functional interfaces, participation in decision-making, and job rotation enhance potential AC, while formalization and connectedness strengthen realized AC.

Notably, by focusing on widely held and professionally-managed firms, this research has taken the managers' identities, goals and incentives for granted, adopting an overly rational perspective in examining the decisions and processes related to external knowledge assimilation and exploitation. By contrast, the great majority of firms are characterized by concentrated family ownership and are led by managers who have a much broader span of control (Carney, 2005), who have distinct identities reflecting strong affective and social ties with the firm and its knowledge resources (Kotlar *et al.,* 2020), and are driven by non-economic goals such as creating a legacy for future family generations (Chua *et al.,* 1999). Altogether, these distinctive traits characterizing FFs ultimately imply that top managers operate in more complex social contexts (Verbeke and Kano, 2010) and are driven by both financial and socioemotional motives (Gómez-Mejía *et al.,* 2007). Accordingly, scholars in family business research have recently argued that existing research offers a too limited understanding of the role of family influence as a driver of AC.

AC and Innovation in FFs

The current lack of attention to the specific issues underpinning the development of AC in FFs is particularly troublesome, first because FFs are predominant in most countries and industries, including a large portion of the publicly traded companies in Western Europe (Faccio and Lang, 2002) and the US (Shleifer and Vishny, 1986), as well as the greatest majority of private firms around the world (La Porta *et al.,* 1999). But, even more importantly, family influence is often mentioned to act as a barrier to FFs' capability to update existing knowledge bases, both in the general management literature (Hansmann and Kraakman, 2001) and in family business-specific studies (Chrisman and Patel, 2012). By contrast, however, research has revealed a stunning discrepancy between FFs' innovation inputs and innovation outputs (e.g., see Aiello *et al.,* 2021). For example, according to Duran et al. (2016)'s meta-analysis covering 108 primary studies of innovation in FFs, there is a significant and persistent discrepancy between the (negative) effect of family involvement on innovation inputs and the (positive) effect on innovation output. This study, together with broader debates in the FF innovation literature (Chrisman, *et al.,* 2015) call for greater attention to the family-firm specific drivers of firms' ability to convert innovation inputs into valuable outputs, and for a deeper nuance in addressing the factors that might cause heterogeneity among FFs.

Prompted by recent debates and findings on family firms' heterogeneity, research has explored drivers relevant to AC. Specifically, studies on family involvement and R&D investments as indicators of a firm's prior knowledge set reveal nuanced perspectives. While some indicate a negative impact on R&D investments and lower overall AC in FFs (Chrisman and Patel, 2012), more detailed findings highlight varied R&D investment patterns. FFs may maintain low investments during satisfactory performance but significantly increase them during performance declines or in response to major threats (Chrisman and Patel, 2012).

Yet, although these findings suggest that FFs may have lower overall AC, Chrisman and Patel (2012) and others observe that this tendency is reversed whenever the family founder feels that family wealth is in danger. Indeed, research on strategic divestments has shown that family involvement facilitates strategic divestments of firm assets, suggesting that family involvement can also lead to a greater willingness to forego existing knowledge bases, which may lead to higher AC. Other studies corroborate these insights, for example Kotlar *et al.,* (2014), who found that FFs engage in lower technology acquisitions than non-FFs, except when performance is below aspirations or in the presence of technology protection mechanisms, suggesting again a negative effect of family influence on potential AC.

Recent literature, particularly Su and Daspit (2021), contributes valuable insights to the discourse on knowledge management in family firms (FFs). Soluk et al. (2021) argue that the strong attachment to the business, unique resources, and risk aversion in FFs can both enhance and hinder their dynamic capabilities in knowledge application. Patel and Fiet (2011) indicate FFs' advantages in assimilating new information with existing knowledge, promoting greater AC. Erdogan et al. (2020) note FFs' reluctance to adopt new knowledge, while De Massis et al. (2016) propose that integrating tradition with novel knowledge can spur innovative breakthroughs.

These findings affirm that knowledge management and related capabilities vary widely in FFs, adding complexity to understanding AC in FFs versus non-FF contexts. Recent studies, addressing this heterogeneity, highlight different factors. Boyd and Hollensen (2012) identify family owners' and managers' personal skills and stewardship attitudes as key drivers of AC in a family-owned airline. Ge and Campopiano (2021) suggest that inter-generational dynamics significantly influence FFs' ability to acquire and use external knowledge. Collectively, this research reveals the diversity in AC across FFs, emphasizing the critical role of family members' involvement.

HYPOTHESES DEVELOPMENT

In order to advance knowledge about the drivers of heterogeneity in AC across FFs, the paper departs from the recognition that FFs vary greatly from one another because family owners and their relatives hold executive roles in the business, and therefore exert a direct influence on firm structures and processes (Banalieva and Eddleston, 2011; Miller et al., 2014). According to this literature, the identity of family firm CEOs as either family or non-family members can be considered as a primary driver of FF heterogeneity (Chrisman *et al.,* 2005). Indeed, the strategic role of family CEOs is well acknowledged in the strategic management literature (Hambrick and Mason, 1984), and several family business scholars have argued that family firm CEOs have different levels of power to influence decision-making, as well as different levels of emotional attachment to the firm (Miller *et al.,* 2011), whose interplay can have a fundamental role in enhancing or limiting the FF's AC (Kotlar *et al.,* 2020). Accordingly, in what follows the paper develops hypotheses that explain FFs' heterogenous AC as a function of the identity of the leader in a family business, particularly if they are a member of the owning family and, in the case of family CEOs, whether he or she belongs to the founding or to a later generation of the family.

Family vs. Non-Family CEOs

Prior studies indicate that a family's control is highest when ownership and top management are family-restricted, particularly when the CEO is a family member (Banalieva and Eddleston, 2011). To effectively acquire, transform, and exploit external knowledge, the CEO, especially if a family member, must possess the authority to renew internal knowledge and explore new external sources (Zahra and George, 2002). Family

CEOs, with concentrated decision-making power, can relax constraints on acquiring external knowledge, bypassing formal procedures and embracing a broader range of information (Jansen et al., 2006). Their longer tenure and reduced exposure to consequences of unsuccessful decisions provide family CEOs with richer insights into the company, stakeholder needs, strategies, and strengths/weaknesses (Gomez-Mejia et al., 2003). Additionally, as family members, they can expedite decision-making, saving time and resources crucial for efficient external knowledge absorption, ultimately enhancing the family firm's absorptive capacity (Carney, 2005).

Family CEOs are also linked to greater emotional attachment to the firm (Zellweger et al., 2012). AC relies on leaders' willingness to integrate newly acquired knowledge into existing bases for innovation (Nag and Gioia, 2012). Due to their heightened emotional attachment and commitment, family CEOs are more inclined to navigate challenges in this integration compared to non-family counterparts (Kotlar et al., 2022). This integration demands a deep understanding of the firm, its knowledge resources, and flexibility in framing how external knowledge integrates effectively. Such conditions are more likely with family CEOs, who invest more time and effort in working with this knowledge compared to non-family CEOs. Family CEOs, intimately connected to the firm, can better navigate uncertainty about external knowledge usage. Therefore, their stronger emotional attachment is likely to drive them to view new knowledge as a viable strategy to enhance their emotional investment, positively influencing the family firm's AC.

Thus, taking into consideration the previous arguments the paper proposes that:

Hypothesis 1. A CEO who is a family member will have a positive impact on a family firm's AC, so that AC will be greater in FFs where the CEO is a family member.

Founding vs. Later-Generation Family CEOs

While we expect that family CEOs will benefit FF's AC, we also acknowledge that not all family CEOs are the same (Anderson and Reeb, 2003). Therefore, we further examine the fundamental difference between founding-generation and later-generation family CEOs.

Firstly, prior research suggests that both family CEOs' power and emotional attachment are commonly the highest in first generations FFs (Le Breton Miller and Miller, 2013), because they are usually dominated by an entrepreneur who has the ultimate control of the firm's decisions, and whose primary objective is to ensure the firm's viability and growth (Gersick *et al.,* 1997) in order to build a long-lasting legacy. Typically, FFs in the founding stage are young and small, and are thus more likely to see external knowledge as an opportunity to compensate for their inherent lack of resources by leveraging their family and business contacts. In sum, as both power and emotional attachment are greater when the CEO is a founding generation member of the family, authors might generally expect that the effects theorized in the first hypothesis to be stronger in founding generation, and thus AC to be higher, compared to FFs with a later generation family CEO.

Besides, founding-generation family CEOs are better positioned to mitigate potential drawbacks of excessive family power and emotional attachment, which can undermine the advantages outlined earlier (Kotlar et al., 2020). Excessive family power may lead to organizational "faultlines" (Minichilli et al., 2010) and "bifurcation biases" (Verbeke and Kano, 2012), endangering the role of middle managers and employees in applying newly acquired knowledge in daily routines and exchanging existing and new knowledge across the organization (Jansen et al., 2005). While higher power grants family CEOs more discretion, excessive power can prioritize authority over competence. For

instance, Cannella et al. (2015) demonstrate that family owners often limit outsider involvement in decision-making, disrupting collective learning processes and reducing knowledge levels. Such patterns are more likely in later-generation FFs, as founding-generation family CEOs prioritize sound business practices for survival and growth, rather than indulging short-term, family-centric whims (Le Breton Miller and Miller, 2013).

Likewise, founder FFs are often led by smaller family groups, like the nuclear family (Gersick et al., 1997), resulting in simpler family dynamics and a lower chance of extreme outcomes like conflict and nepotism. As existing knowledge shapes the search for new knowledge (Zahra and George, 2002), complexity, conflict, and nepotism risks may lead to path-dependence in later generation family CEOs, overvaluing existing knowledge assets and undervaluing external knowledge distant from their bases. However, firms must be willing to move away from current knowledge bases to absorb and utilize external knowledge. Thus, later generation family CEOs are more likely to face psychological biases against external knowledge, increasing the risk of cognitive traps, inertia, or "not-invented-here" syndromes (Cohen and Levinthal, 1990) that constrain a firm's absorptive capacity. In contrast, these issues are less likely in FFs with founding-generation family CEOs, who tend to act entrepreneurially, prioritizing legacy creation over preserving the past.

Altogether, these arguments suggest that:

Hypothesis 2. The positive impact of family CEO on a family firm's AC will be stronger when she/he belongs to the founding generation than when she/he belongs to the later generation.

Boundary Conditions: Firm Size and Environmental Dynamism

If having a family/non-family member, and founding/later generation, CEO, matters in explaining heterogeneous AC across FFs, influencing both positive and negative aspects of the firm's ability to acquire and assimilate external knowledge for innovation, it is important to understand how those effects may be constrained by boundary conditions (e.g., Makadok, Burton, and Barney, 2018). Identifying boundary conditions helps advance research on family firm innovation studies, not simply to extend our understanding of when a family firm is more or less likely to attain higher AC compared to other FFs, but also to further the practical implications of those insights. Identifying the contingency factors shaping the relationship between a family firm's CEO and its AC allows us to further test the core logic behind our main hypotheses, which are developed based on family CEOs power and emotional attachment to the family firm. Boundary conditions can be broadly categorized into internal and external factors (Makadok *et al.,* 2018). Internal boundary conditions refer to the factors determining the nature of the organization, hence we focus on firm size, which has been shown to play a major role in determining the nature of family firms' decision-making processes and outcomes (Miller, *et al.,* 2013). External boundary conditions refer to factors outside the firm, which can substantially influence a firm's motivation and ability to acquire knowledge and innovate (e.g., Roberts, 2015). Overall, FFs must navigate a complex set of internal and external boundary conditions in order to acquire knowledge from outside. By understanding and effectively managing these factors, FFs can maintain their unique strengths while also adapting to changes in the broader business environment.

The Role of Firm Size

The size of the family business is a variable that has been widely studied in the literature (Firfiray, *et al.,* 2018; Miller *et al.,* 2013), since it undoubtedly determines the

way in which the firm is organized and managed. We believe that this is an important internal factor that may exert effects when concerning the effect of a family CEO on the absorptive capacity of a family firm.

Generally, prior literature indicates that absorptive capacity is likely to be lower as the size of the business grows (Volberda et al., 2010). Such a negative relationship between firm size and AC highlights larger firms' inertia in using existing knowledge resources, their challenges in collaborating with external partners, as well as the constraining effects of a growing organizational bureaucracy (Damanpour, 1992). However, we have previously argued that family CEOs have the authority needed to relax constraints to the acquisition of new external knowledge, allowing the consideration of a wider range of external information and knowledge and a deeper understanding of the business needs. Moreover, we have argued that family CEOs' greater emotional attachment to the firm is likely to increase the flexibility in framing how external knowledge can be integrated within the firm. Accordingly, we may expect that the presence of a family CEO will relax the constraints associated with firm size on absorptive capacity, so that the effect of a family CEO will persist even in larger FFs. By contrast, we may expect that AC will decrease more sharply in larger FFs when the CEO is not a family member because they are more likely to experience difficulties in maintaining the same level of control and flexibility when the structure of the organization grows.

By extension of our previous arguments, we may also expect that the interaction between family firm CEO and firm size in shaping a family firm's AC is likely to be stronger in FFs led by a family CEO who belongs to the founding generation. Indeed, as argued before, family CEOs' power and emotional attachment are the highest in the first generation (Le Breton Miller and Miller, 2013), hence founding generation family CEOs

are likely to be best positioned to counterbalance the potential drawbacks of a growing organizational size, also compared to non-family CEOs.

In summary, we expect firm size to be an important boundary condition to the relationship between family firm CEO and AC, such that:

Hypothesis 3. Absorptive capacity diminishes in larger FFs, yet this negative effect is mitigated when a) the CEO is a family member and b) the family CEO belongs to the founding generation.

The Role of Environmental Dynamism

Environmental dynamism refers to the rate of change and instability of the external environment (Dess and Beard, 1984). Highly dynamic environments are characterized by continuous changes in technologies, variations in customer needs and preferences, and sharp variations in market demand. Prior research indicates that the competitive environment has a significant effect on a firm's AC (Lane et al., 2006; Volberda, *et al.,* 2010). Specifically, firms competing in stable environments will often focus on incremental innovation, whereas firms competing in dynamic environments will commonly try to develop more radical innovations (Lavie, *et al.,* 2010). Therefore, environmental dynamism is also likely to influence the level of absorptive capacity a firm needs to develop to meet its innovation goals (Roberts, 2015). For these reasons, it appears important to take environmental dynamism into account as an external boundary condition of the effect of different family firm CEOs on a family firm's AC.

According to our main hypotheses, family CEOs are likely to benefit a family firm's AC because of their superior power and motivation to acquire external knowledge that meets the firm's innovation needs. Family CEOs possess distinct advantages over non-family CEOs due to the firm-specific knowledge they acquire through socializing within

the firm from an early age, frequently even before assuming a formal role (Le Breton-Miller, *et al.,* 2004). Therefore, they tend to develop highly specific knowledge to the firm (Verbeke and Kano, 2012). Although this firm-specific knowledge and skills can be easily exploited for a number of purposes inside the firm that has developed them, they cannot be easily traded or applied to other contexts (Verbeke and Kano, 2010). Indeed, prior research suggests that firm-specific knowledge motivates family leaders to favor firm-specific investments (Chrisman *et al.,* 2014). For these reasons, the high specificity of family CEOs may act as a constraint to the family firm's ability to acquire external knowledge in highly dynamic environments.

This is likely to be particularly salient when the family CEO belongs to a later generation, whereas founding family CEOs largely rely on their vision, leadership, and intuitive decision making and are guided by a primary goal to secure critical resources for the viability and growth of the business (Le Breton-Miller and Miller, 2013). Therefore, founding generation family CEOs are likely to embrace a more entrepreneurial identity (Rogoff and Heck, 2003) and be less bound by their firm-specific knowledge in exploring and exploiting external knowledge in dynamic environments.

On the other hand, non-family CEOs have less specific knowledge and skills, which represents a challenge for them to deal with the complexity arising with the interplay of family and business systems in FFs (Mitchell, *et al.,* 2003). Nonetheless, the lower specificity of their knowledge and skills is likely to place them in a better position in order to identify and exploit relevant trends in the external context. Therefore, we may expect that non-family CEOs might be better positioned to cope with the dynamism of the external environment, being more aware of external trends and better able to leverage their external experience and network, compared to family CEOs, especially those belonging to the founding generation. Formally:

Hypothesis 4. Absorptive capacity in FFs increases in highly dynamic environments, yet this effect is mitigated when a) the CEO is a family member and b) the family CEO belongs to the later generation.

METHODS

Data collection

We conduct the analyses in a unique representative sample of Spanish small firms in high and medium-high technology manufacturing and service industries. This sample is particularly suitable to test these predictions for several reasons. First, technology sectors are characterized by a higher degree of uncertainty and stiff competition. Hence, in these sectors, the capacity to assimilate and exploit external knowledge is crucial for firms to renew their competitive advantage and, ultimately, sustain performance (Volberda *et al.,* 2010). Second, given the substantial influence of owners on firm outcomes in the case of small enterprises, we can expect family owner´s emotional goal to be especially salient in this context. Finally, the power and importance of the CEO in the decision-making process is even greater than in bigger firms, in which CEO power can be balanced by the power and supervision of the firm's board of directors. Thus, the influence of the CEO in firm level strategic decision is remarkably relevant.

Data collection begun with the identification, using the SABI database, of the population of Spanish small firms in these industries. First high and medium-high technology sectors (in both manufacturing and services industries) were spotted using the classification of the Organization for Economic Co-operation and Development and the National Bureau of Statistics. Based on this industry classification authors searched for firms between 10 and 50 employees, obtaining a total population of 10,565 firms. From

the total population, a random sample of 1,500 companies agreed to participate (14.2% of total population). The CEO of the company was responsible for responding to the questionnaire, as they possess a broad perspective on the company.

These primary data were complemented with secondary information obtained from the SABI database. The SABI database is the most comprehensive data set of firms in Spain. It contains information gathered from firm's balance sheets and profit and loss statements. From the initial 1,500 firms, economic and financial information was only available for 945 firms. From these 945 only 427 were FFs. Due to missing values in some of the variables in the model, authors were left with the mentioned sample of 364 family businesses.

Variables

Dependent variable

Absorptive capacity (AC). We employed the 9-item scale proposed and validated by Cadiz and colleagues (2009). It considers the assessment, assimilation and application elements of the AC construct (Zahra and George, 2002). Responses were provided in a 5-point Likert-scale (1=totally disagree, 5=totally agree). The score of the measure was computed as the mean value of the 9 items (appendix 1).

Independent Variables

Consistent with previous operationalization of FFs (Gomez-Mejia *et al.,* 2011) and given the small size of the companies in this sample, we consider a firm as FF if the family controls, directly or indirectly, more than 50 percent of the shares and at least one family member is present on the board of the directors.

To test our hypothesis, we measure first whether this FFs are run by a member of

the family (*CEO Family*). This variable takes 1 if the firms is run by a member of the family and 0 otherwise. Then, we also consider the generation and distinguish between family CEOs in which the founder is still present in the management of the family firm (*First gen*), and family CEOs belonging to the second or next generations. This variable takes 1 if firms are run by the founder, 0 otherwise.

Boundary conditions

We consider the influence of firm size and environmental dynamism. *Firm size* was measured out of the responses of the company CEOs to the question of whether their company is larger than the competitors. Responses were given in a 5-point Likert scale (1=totally disagree, 5=totally agree). To gauge environmental dynamism, we included 5 questions related to it in the questionnaire (changes in products, changes in marketing practices, changes in technology, actions of competitors and changes in customer demand). Answers were given on a 5-point Likert-scale (1=totally disagree, 5=totally agree). Exploratory factor analysis showed the existence of two factors: *Dyn 1* that captures the changes in technology and products and *Dyn 2* that reflects the changes in customer, marketing and competitors.

Control variables

The analyses further control for the respondents´ demographic characteristics. This approach accounts for the view of Upper Echelons theorists where a close relationship exists between a person's demographic characteristics, her cognitive bases and value, and in turn her strategic preferences and dispositions (Hambrick and Mason, 1984): *CEO tenure* is a continuous variable that captures the number of years of experience in the company. Experience *(CEO exp.)* is a continuous variable that captures

the number of years of labor experience in the same industry sector. *CEO age* is a variable that measures the age of the CEO of the firm. *CEO gender* is a variable that takes 1 if the CEO is a men or o if the CEO is a woman. Finally, *CEO education* is a variable that takes 1 if the CEO has business and management training, and 0 otherwise.

Multivariate analyses also control for other relevant firm features and industry conditions. S*ervice* is a dummy variable that takes value one when the firm belongs to a service sector and 0 when it belongs to an industry sector. Firm age (*Firm age*) is also common control variable in small firm research as it may capture differences in behavior and performance due to culture and generation issues. Firm age is computed as the difference between 2010, the year the survey was administered, and the year the firm was founded. *Patent* is a dummy variable that captures if the firms obtained patents in the last three years. *Network* aims at capturing the network of contacts of the firm and it is computed as the average response to a series of 10 items each one representing a different stakeholder. Respondents were asked to indicate, using a 5-point Likert-scale (1=Not important at all, 5= Very important), the importance of consulting firms, lawyers, public support agencies, accountants, banks, families, clients, suppliers, employees and political contacts. Capital availability (*capital*) is another variable that, using a 5-point Likert-scale, measures whether the availability of capital has been inadequate and a major impediment to successful business development. To capture the entrepreneurial dimensions of the firm we used the 13-item scale previously proposed and employed by Covin and Slevin (1989). Responses were used to appraise the five dimensions of the construct: *Innovation, Risk taking, Proactiveness, Autonomy, Aggressiveness*. Finally, we gauge firm's past performance *(PP)*. Firm's past performance is measured as the mean of the operating results (in thousands) of the last three years prior to the survey (2007-2009) divided by the number of the employees.

While having collected data from different sources may reduce concerns about a potential common method bias problem, the authors run, as an additional test, a single factor analysis on the survey instrument variables. Specifically, the Harman's Single Factor Test revealed a shared variance of 0.21 which falls considerably below the threshold of 0.50. Additionally, in the questionnaire we employed various response formats including zero-to-ten scale, five-point Likert scale, seven-point Likert scale, dummy variables, and others. Thus, we can discard the presence of any common method bias in our study.

Methodological approach

Given the nature of the dependent variable we estimate regression models to test the hypotheses. Specifically, we run a first regression model to test whether the level of AC depends on whether the CEO is a family member or not (hypothesis 1). Then, we estimate a second regression model to gauge how the level of AC is a function of whether the family CEO belongs to the founding generation or to the second and next generations of FFs (hypothesis 2). For hypotheses 3a to 4b, we run two additional regressions models that include the corresponding moderating variables.

We use robust standard errors in all the multivariate estimations to avoid concerns about heteroscedasticity (Garcés-Galdeano, Larraza-Kintana, Cruz, and Contín-Pilart, 2017). According to the values of the variance inflation factors the estimations are free of any multicollinearity problems.

FINDINGS

The descriptive statistics and correlations for the variables used in this study are reported in Table 1. The mean value of AC is 4.00 (on a scale from 1 to 5). The average CEO is

46 years old male, with almost 20 years of experience in the sector and a tenure of almost 14 years. A close look at the values shows that AC is positively correlated with family CEO and first-generation FFs. The table shows a positive and significant correlation between the AC and several control variables such as the age and experience of the CEO, innovation, proactiveness, network and the dynamism of the environment in terms of changes in technology and products. However, the table shows a negative and significant correlation between the AC and other control variables such as the gender of the CEO, the risk taken and the dynamism of the environment regarding changes in customer, marketing and competitors.

INSERT TABLE 1 HERE

Multivariate analyses are shown in Table 2. Model 1 shows the effect of all the control variables on AC. Model 2 includes the effect of family CEO. The results indicate, supporting hypothesis 1, that family CEOs have a positive and significant impact on the AC of FFs. Model 3 shows the effect of first generation's family CEO. This effect is also positive and significant, meaning that FFs where the founder is still present have higher AC as compared to FFs run by family CEOs who belong to the second or later generations. Thus, we find support for hypothesis 2.

INSERT TABLE 2 HERE

Models 4 and 5 are run to test the effect of boundary conditions. To that end they included the moderating effects of firm size and environmental dynamism. The results show that firm size does not make a difference in the AC of the family firm when the

family CEO is at the helm. This is consistent with the arguments underlying hypothesis 3a. However, we observe that AC in FFs increases with firm size in FFs guided by a non-family CEO. This difference can be seen clearly when we plot the whole influence of the family CEO variable in AC (see Figure 1). Importantly, figure 1 also displays, fully consistent with hypothesis 1, that independent of firm size absorptive capacity is greater in FFs run by a family CEO. In sum, we obtain mixed support for hypothesis 3a.

INSERT FIGURE 1 HERE

On the contrary, the coefficient of the interaction term between firm size and first-generation dummy is non-significant. Thus, we find no empirical support for hypothesis 3b which advanced that the absorptive capacity of FFs run by second or later generation family CEOs will be less influenced by firm size. Our results point towards a situation where family CEOs favor investments in absorptive capacity independent of the size of their companies.

While caution is in order, the results from Models 4 and 5 indicate that we fail to find support for hypotheses 4a and 4b. That is, the influence of the CEO identity analyzed in the paper on firm's AC is independent of the environment's dynamism.

Post hoc analyses

While our hypotheses align with prior research regarding the overarching concept of AC, it's essential to note the multidimensional nature of AC. To delve deeper into the connection between family firm CEOs and AC, we conducted a confirmatory factor analysis on the 9 items constituting the AC scale. The analysis revealed two primary factors. The first factor, represented by the initial five items in the scale (see appendix 1), pertains to the knowledge funnel determining which external information traverses the

firm's boundaries. These items capture potential AC, involving knowledge acquisition and assimilation as formalized by Lane and Lubatkin (1998) and Van den Bosch et al. (1999).

The remaining four items of the AC scale loaded fundamentally in the second factor. These four items refer to the transformation of the externally acquired knowledge into valuable outputs, and thus can be interpreted in terms of realized absorptive capacity. Following the standard procedure, the value of the firm's potential AC was computed as the average value those first five items of the 9 items scale and the value of the firm's realized AC was computed as the average value of the responses to the remaining four items (see appendix 1).

We ran the previous regression models on these two new variables and obtain results that are consistent with those found with the general variable but that at the same time give us new nuances on the impact of CEO family identity and CEO family generation on AC. Those results are summarized in Table 3 (see appendix 2). Model 1 shows the effect of the control variables to each dependent variable. Model 2 exhibits the results for hypothesis 1. As it can be seen, family CEOs have a significant influence in the potential dimension not on realized AC. Model 3 summarizes the results on the model specification used to test hypothesis 2. In this case, there is a clear positive and significant impact of first generation on realized AC in comparison to second generation FFs. However, there is not a significant impact of first generation on potential AC. Thus, these additional analyses confirm the hypothesized impact of different family firm CEOs on AC but suggest that such impact may vary with the phase of the process followed by the FF to absorb and apply new knowledge. As such, family CEOs seem to make a difference relative to their non-family counterparts in the identification of external knowledge and not in the integration and use of that knowledge. First generation family CEOs differ from

second and later generation CEOs in the effective application of new knowledge and not so much on its identification.

The interaction effects were also tested in this post hoc analysis with potential and realized variables. The results are in line with the previous analysis. As such, the influence of firm size weakens when the family CEO is at the helm, but only in the case of potential AC, being the interaction effect non-significant in the case of realized AC. The other interaction effects capturing the nuances created by boundary conditions in the main model are non-significant.

DISCUSSION

With this study, we have attempted to contribute to the literature on family business innovation by adding new insights and empirical evidence on the heterogeneity of absorptive capacity among FFs (Kotlar et al., 2020). Arguably, absorptive capacity is an important factor that can help explain the previously observed discrepancy in family firm innovation research between family firms' lower innovation inputs and higher innovation outputs (Duran et al., 2016). Previous research has often stressed that family firms' innovation behaviors are highly heterogeneous (Chrisman and Patel, 2012), but only very few studies have so far explicitly addressed the specific drivers of family firms' AC. We contributed to addressing this research gap by specifically focusing on the role of different family firm CEOs, namely family/non-family CEOs and founding/later generation family CEOs, demonstrating that this is an important factor to explain heterogeneity in AC across FFs.

Our empirical results, derived from a sample of small and medium FFs in Spain, provided a converging set of insights: FFs with a family CEO tend to exhibit higher AC compared to family businesses where a non-family CEO is at the helm, especially when

the family CEO belongs to the founding generation. These results resonate with previous literature suggesting that family CEOs have a greater emotional attachment to the company than external CEOs, which triggers continued investments in the firm's knowledge base (Nag and Gioaia, 2012), as well as greater power to make decisions without the necessity to reach a consensus with the rest of the members of the company, which collectively makes them better positioned than their non-family counterparts to cope with the uncertainty that is associated with the productive use of externally acquired knowledge.

Consistent with prior research, our results also supported the idea that family CEOs' power and emotional attachment are the highest in the first-generation FFs (Le Breton Miller and Miller, 2013), whereas the benefits of family CEOs for AC in FFs decrease in the second or later generations. Research on the relationship between firm age and absorptive capacity (AC) lacks consensus. Some argue that younger companies, unburdened by organizational inertia, show higher AC (Hannan and Freeman, 1984; Huergo and Jaumandreu, 2004), while others suggest a cumulative process favors AC in mature firms (Cohen and Levinthal, 1990). Our model adds nuance, highlighting the role of generations in FFs. This generational difference is tied more to the power and identification dynamics of family CEOs than the age of the organization

Finally, we showed that the effect of family firm CEOs on AC is contingent to contextual variables, which contribute to explaining further heterogeneity across FFs led by family CEOs. Consistent with our expectations, the family CEO effect on FFs' AC persists even in larger firms, but we also find that this is less of the case when the CEO belongs to the second or later generations. On the other hand, we did not find evidence supporting the idea that the positive effects of family CEOs are contingent to the level of environmental dynamism. These results complete our overall understanding of the effects

of family firm CEOs on family firms' AC by illuminating the boundaries and the empirical generalizability of our findings to different firm-internal and environment-external contexts.

Our results contribute to understanding the family-specific drivers of FF innovation and provide insights into the intra-organizational antecedents of AC (Volberda et al., 2010). The study advances current knowledge on how differences in family firm CEOs can impact the gap between internal innovation inputs and outputs. By examining the capability to acquire and exploit external knowledge, our research addresses call for more nuanced views on how the family influences strategic behavior in FFs. The CEO's family membership and generation significantly influence a family firm's AC, shaping its innovation activity and competitiveness. Our study sheds light on theoretical mechanisms, specifically power and emotional attachment, and reinforces existing knowledge on the drivers of innovation in FFs.

Our findings, supported by post-hoc analyses, uncover nuances in how family CEOs impact various dimensions of AC. Particularly, family CEOs notably influence potential AC, showcasing their swift decision-making in external knowledge acquisition. However, the impact on realized AC is positive but not statistically significant, suggesting intriguing avenues for future research. This underscores the significance of comprehending the socialization mechanisms that lead non-family CEOs to internalize family and company values as their own, influencing their inclination towards realized AC.

Another interesting idea is that the First-generation family CEOs may have an edge in utilizing tacit knowledge, potentially surpassing that of second-generation CEOs. This advantage arises from their deeper familiarity with the company and team. Examining the role of tacit knowledge in first-generation family CEOs could reveal their distinct

proficiency in effectively applying external knowledge. Further research is needed to understand the intricate dynamics involved in this phenomenon.

Practical implications for policy and practice

As pointed, AC is crucial for a company's survival, particularly in smaller firms, especially those in high-tech industries where knowledge management is vital for competitive advantages. Family CEOs, particularly first-generation ones, exhibit higher AC, driven by their emphasis on knowledge and their greater decision-making power with lower employment risk. To enhance AC in small FFs, policies emphasizing knowledge identification, reducing downside risk, and promoting knowledge-related activities, such as training programs and incentives for knowledge generation, can be effective.

Our research confirms that the CEO family membership plays a pivotal role in creating and maintaining a culture of innovation within an organization. But to exert an effective leadership these CEOs must obviously exhibit high professional management standards and combine a unique understanding of the family's values and history, with openness to new ideas and challenges. In this vein, family managers need to avoid what can hinder AC in FFs, such as the resistance to change, the intra-family conflicts or the excessive emphasis on tradition.

Limitations

This work has limitations that merit attention. Firstly, the cross-sectional nature of the data allows for correlations but limits the inference of causal relationships or effects over time. Careful language use has been employed to avoid implying causal inferences. Secondly, the exclusive inclusion of Spanish firms in the sample hinders generalizability to other countries due to country-specific cultural influences. Thirdly, focusing on small firms raises concerns about the relevance of results to larger enterprises. Fourthly, the

data set, constructed during an economic crisis 12 years ago, may limit generalizability, especially in dynamic industries. Despite these limitations, the study indicates the robustness of main hypothesized effects, as evidenced by control variables and non-significant interaction effects, instilling confidence in the validity of results across diverse environmental contexts. Finally, this study focuses solely on family firm CEOs, offering a simplified approach to defining leadership. While beneficial for data availability and capturing a core aspect of family leadership, future research should broaden its scope to include diverse family and non-family leaders. Exploring various aspects of family leadership, such as the presence of family members in top management or leadership roles beyond the CEO, can provide additional insights (Sperber and Linder, 2018). Researchers are encouraged to use varied measures of leadership, especially in the context of AC. For instance, studying effective leadership that promotes innovation, embraces risk, empowers individuals, and demonstrates clear communication skills can offer valuable insights.[1]

Future research

This study suggests future research to explore the analyzed issues in various cultural contexts and time periods. Investigating additional CEO features, like gender, family membership, age, and tenure, could provide valuable insights into differences among family businesses. Furthermore, examining the impact of AC on economic or innovation outcomes in diverse family businesses would be of interest to future researchers.

[1] We are grateful to one of the reviewers for highlighting these limitations and outline further opportunities to extend the concept of leadership in family firms.

Appendix 1

Absorptive capacity:

- In my company we are able to recognize what "new knowledge" is more valuable for our activity.
- In general, it is easy for us to decide which "new knowledge" is going to be more useful to cover the needs of our clients.
- We know enough about the technology we use to determine whether the "new knowledge" is appropriate and reliable.
- The know-how that our company possesses makes it easy to understand the "new knowledge" to which we have access
- It is easy to see the connection between the different knowledge or know-how possessed by the company's employees and/or teams.
- Most of the new technological developments that come to the company fit well with our current technology
- It is easy to adapt our work to use the new technical knowledge that we have access to
- In general, new technical knowledge can be quickly applied to our work.
- Our customers can immediately benefit from the new technical knowledge learned by the company.

Appendix 2

INSERT TABLE 3 HERE

REFERENCES

Aiello, F., Cardamone, P., Mannarino, L. and Pupo, V. (2021), "Does external Rand D matter for family firm innovation? Evidence from the Italian manufacturing industry", *Small Business Economics*, Vol. 57 No. 4, pp. 1915–1930.

Anderson, R. C. and Reeb, D. M. (2003)," Founding-family ownership and firm performance: evidence from the Sand P 500", *The journal of finance*, Vol. *58 No.* 3, pp. 1301-1328.

Banalieva, E. R. and Eddleston, K. A. (2011), "Home-region focus and performance of family firms: the role of family vs non-family leaders", *Journal of International Business Studies*, Vol. *42*, pp. 1060-1072.

Boyd, B. and Hollensen, S. (2012), "Strategic management of a family-owned airline: Analysing the absorptive capacity of Cimber Sterling Group A/S", *Journal of Family Business Strategy*, Vol. 3 No. 2, pp. 70–78.

Cadiz, D., Sawyer, J. E. and Griffith, T. L. (2009), "Developing and validating field measurement scales for absorptive capacity and experienced community of practice". *Educational and Psychological Measurement*, Vol. 69 No.6, pp. 1035–1058.

Cannella, A.A., Jones, C.D. and Withers, M.C. (2015), "Family- versus lone-founder-controlled public corporations: social identity theory and boards of directors", *Academy of Management Journal*, Academy of Management, Vol. 58 No. 2, pp. 436–459.

Calabrò, A., Minichilli, A., Amore, M. D. and Brogi, M. (2018), "The courage to choose! Primogeniture and leadership succession in family firms", *Strategic Management Journal*, Vol. *39* No.7, pp. 2014-2035.

Carney, M. (2005), "Corporate governance and competitive advantage in family–controlled firms", *Entrepreneurship Theory and Practice*, SAGE Publications Inc, Vol. 29 No. 3, pp. 249–265.

Chrisman, J.J., Chua, J.H. and Sharma, P. (2005), "Trends and directions in the development of a strategic management theory of the family firm", *Entrepreneurship Theory and Practice*, SAGE Publications Inc, Vol. 29 No. 5, pp. 555–575.

Chrisman, J. J., Chua, J. H., De Massis, A., Frattini, F. and Wright, M. (2015), "The ability and willingness paradox in family firm innovation", *Journal of Product Innovation Management*, Vol. *32* No. 3, pp. 310-318.

Chrisman, J.J. and Patel, P.C. (2012), "Variations in rand d investments of family and nonfamily firms: behavioral agency and myopic loss aversion perspectives", *Academy of Management Journal*, Academy of Management, Vol. 55 No. 4, pp. 976–997.

Chrisman, J.J., Sharma, P., Steier, L.P. and Chua, J.H. (2013), "The influence of family goals, governance, and resources on firm outcomes", *Entrepreneurship Theory and Practice*, SAGE Publications Inc, Vol. 37 No. 6, pp. 1249–1261.

Cohen, W.M. and Levinthal, D.A. (1990), "Absorptive capacity: a new perspective on learning and innovation", *Administrative Science Quarterly*, [Sage Publications, Inc., Johnson Graduate School of Management, Cornell University], Vol. 35 No. 1, pp. 128–152.

Cruz, C. and Nordqvist, M. (2012), "Entrepreneurial orientation in family firms: a generational perspective", *Small Business Economics*, Vol. 38 No. 1, pp. 33–49.

Damanpour, F. (1992), "Organizational size and innovation", *Organization studies*, Vol. 13 No.3, pp. 375-402.

De Massis, A., Frattini, F. and Lichtenthaler, U. (2013), "Research on technological innovation in family firms: present debates and future directions", *Family Business Review*, SAGE Publications Inc, Vol. 26 No. 1, pp. 10–31.

De Massis, A., Frattini, F., Kotlar, J., Petruzzelli, A.M. and Wright, M. (2016), "Innovation through tradition: lessons from innovative family businesses and directions for future research", *Academy of Management Perspectives*, Academy of Management, Vol. 30 No. 1, pp. 93–116.

Dess, G. G. and Beard, D. W. (1984), "Dimensions of organizational task environments", *Administrative science quarterly*, pp. 52-73.

Duran, P., Kammerlander, N., Van Essen, M. and Zellweger, T. (2016). "Doing more with less: Innovation input and output in family firms". *Academy of management Journal*, Vol. *59* No. 4, pp.1224-1264.

Erdogan, I., Rondi, E. and De Massis, A. (2020), "Managing the tradition and innovation paradox in family firms: a family imprinting perspective", *Entrepreneurship Theory and Practice*, SAGE Publications Inc, Vol. 44 No. 1, pp. 20–54.

Firfiray, S., Cruz, C., Neacsu, I. and Gomez-Mejia, L. R. (2018), "Is nepotism so bad for family firms? A socioemotional wealth approach". *Human Resource Management Review*, Vol. 28 No.1, pp. 83-97.

Garcés-Galdeano, L., Larraza-Kintana, M., Cruz, C. and Contín-Pilart, I. (2017), "Just about money? CEO satisfaction and firm performance in small family firms", *Small Business Economics*, Vol. 49 No. 4, pp. 825–839.

Ge, B. and Campopiano, G. (2021), "Knowledge management in family business succession: Current trends and future directions", *Journal of Knowledge Management*, Emerald Publishing Limited, Vol. 26 No. 2, pp. 326–349.

Gomez-Mejia, L.R., Cruz, C., Berrone, P. and De Castro, J. (2011), "The bind that ties: Socioemotional wealth preservation in family firms", *Academy of Management Annals*, Academy of Management, Vol. 5 No. 1, pp. 653–707.

Gómez-Mejía, L.R., Haynes, K.T., Núñez-Nickel, M., Jacobson, K.J.L. and Moyano-Fuentes, J. (2007), "Socioemotional wealth and business risks in family-controlled firms: Evidence from Spanish olive oil mills", *Administrative Science Quarterly*, SAGE Publications Inc, Vol. 52 No. 1, pp. 106–137.

Gomez-Mejia, L.R., Larraza-Kintana, M. and Makri, M. (2003), "The determinants of executive compensation in family-controlled public corporations", *Academy of Management Journal*, Academy of Management, Vol. 46 No. 2, pp. 226–237.

Griffith, T.L., Sawyer, J.E. and Neale, M.A. (2003), "Virtualness and knowledge in teams: Managing the love triangle of organizations, individuals, and information technology", *MIS Quarterly*, Management Information Systems Research Center, University of Minnesota, Vol. 27 No. 2, pp. 265–287.

Hambrick, D.C. and Mason, P.A. (1984), "Upper echelons: the organization as a reflection of its top managers", *Academy of Management Review*, Academy of Management, Vol. 9 No. 2, pp. 193–206.

Jansen, J.J.P., Van Den Bosch, F.A.J. and Volberda, H.W. (2006), "Exploratory innovation, exploitative innovation, and performance: effects of organizational antecedents and environmental moderators", *Management Science*, INFORMS, Vol. 52 No. 11, pp. 1661–1674.

Kotlar, J., De Massis, A., Fang, H. and Frattini, F. (2014), "Strategic reference points in family firms", *Small Business Economics*, Vol. 43 No. 3, pp. 597–619.

Kotlar, J., De Massis, A., Frattini, F. and Kammerlander, N. (2020), "Motivation gaps and implementation traps: The paradoxical and time-varying effects of family ownership on firm absorptive capacity", *Journal of Product Innovation Management*, Vol. 37 No. 1, pp. 2–25.

Lane, P.J., Koka, B.R. and Pathak, S. (2006), "The reification of absorptive capacity: A critical review and rejuvenation of the construct", *Academy of Management Review*, Academy of Management, Vol. 31 No. 4, pp. 833–863.

Lane, P.J. and Lubatkin, M. (1998), "Relative absorptive capacity and interorganizational learning", *Strategic Management Journal*, Vol. 19 No. 5, pp. 461–477.

Lane, P.J., Salk, J.E. and Lyles, M.A. (2001), "Absorptive capacity, learning, and performance in international joint ventures", *Strategic Management Journal*, Vol. 22 No. 12, pp. 1139–1161.

Lavie, D., Stettner, U. and Tushman, M. L. (2010), "Exploration and exploitation within and across organizations", *Academy of Management annals*, Vol. 4 No. 1, pp. 109-155.

Le Breton–Miller, I. and Miller, D. (2013), "Socioemotional wealth across the family firm life cycle: A commentary on family business survival and the role of boards". *Entrepreneurship Theory and Practice*, Vol *37* No. 6, pp.1391-1397.

Le Breton–Miller, I., Miller, D. and Steier, L. P. (2004), "Toward an integrative model of effective FOB succession", *Entrepreneurship theory and practice*, Vol. 28 No.4, pp. 305-328.

Makadok, R., Burton, R. and Barney, J. (2018), "A practical guide for making theory contributions in strategic management", *Strategic Management Journal*, Vol. *39* No. 6, pp. 1530-1545.

Miller, D., Le Breton-Miller, I., Lester, R. H. and Cannella Jr, A. A. (2007), "Are family firms really superior performers?", Journal *of corporate finance*, Vol. *13* No. 5, pp. 829-858.

Miller, D., Le Breton-Miller, I. and Lester, R.H. (2011), "Family and lone founder ownership and strategic behaviour: social context, identity, and institutional logics", *Journal of Management Studies*, Vol. 48 No. 1, pp. 1–25.

Miller, D., Minichilli, A. and Corbetta, G. (2013), "Is family leadership always beneficial?", *Strategic Management Journal*, Vol. 34 No. 5, pp. 553–571.

Miller, D., Le Breton-Miller, I., Minichilli, A., Corbetta, G. and Pittino, D. (2014), "When do non-family CEO s outperform in family firms? Agency and behavioural agency perspectives". *Journal of Management Studies*, Vol. *51* No.4, pp. 547-572.

Mitchell, R. K., Morse, E. A. and Sharma, P. (2003), "The transacting cognitions of nonfamily employees in the family businesses setting", *Journal of Business Venturing*, Vol. 18 No. 4, pp. 533-551.

Nag, R. and Gioia, D.A. (2012), "From common to uncommon knowledge: foundations of firm-specific use of knowledge as a resource", *Academy of Management Journal*, Academy of Management, Vol. 55 No. 2, pp. 421–457.

Roberts, N. (2015), "Absorptive capacity, organizational antecedents, and environmental dynamism", *Journal of Business Research*, Vol. 68 No. 11, pp. 2426-2433.

Soluk, J., Miroshnychenko, I., Kammerlander, N. and De Massis, A. (2021), "Family influence and digital business model innovation: the enabling role of dynamic capabilities", *Entrepreneurship Theory and Practice*, SAGE Publications Inc, Vol. 45 No. 4, pp. 867–905.

Sperber, S., and Linder, C. (2018). The impact of top management teams on firm innovativeness: a configurational analysis of demographic characteristics, leadership style and team power distribution. *Review of Managerial Science*, Vol. 12, pp. 285-316.

Su, E. and Daspit, J. (2021), "Knowledge management in family firms: a systematic review, integrated insights and future research opportunities", *Journal of Knowledge Management*, Emerald Publishing Limited, Vol. 26 No. 2, pp. 291–325.

Van den Bosch, F.A.J., Volberda, H.W. and de Boer, M. (1999), "Coevolution of firm absorptive capacity and knowledge environment: organizational forms and combinative capabilities", *Organization Science*, INFORMS, Vol. 10 No. 5, pp. 551–568.

Verbeke, A. and Kano, L. (2010), "Transaction cost economics (TCE) and the family firm", *Entrepreneurship Theory and Practice*, Vol. 34 No. 6, pp. 1173-1182.

Verbeke, A. and Kano, L. (2012), "The transaction cost economics theory of the family firm: Family–based human asset specificity and the bifurcation bias", *Entrepreneurship Theory and Practice*, Vol. 36 No. 6, pp. 1183-1205.

Volberda, H.W., Foss, N.J. and Lyles, M.A. (2010), "Perspective—Absorbing the concept of absorptive capacity: how to realize its potential in the organization field", *Organization Science*, Vol. 21 No. 4, pp. 931–951.

Zahra, S.A. and George, G. (2002), "Absorptive capacity: a review, reconceptualization, and extension", *Academy of Management Review*, Academy of Management, Vol. 27 No. 2, pp. 185–203.

Zellweger, T.M., Kellermanns, F.W., Chrisman, J.J. and Chua, J.H. (2012), "Family control and family firm valuation by family CEOs: The importance of intentions for transgenerational control", *Organization Science*, INFORMS, Vol. 23 No. 3, pp. 851–868.

Table 1: Mean, standard deviations, and zero-order correlations.

	MEAN	SD	1	2	3	4	5	6	7	8	9	10
1. AC	4,00	0,61	1									
2. CEO Family	0,55	0,50	0.1530***	1								
3. First_gen	0,31	0,46	0.1039**	0.4780***	1							
4. Firm size	2,66	1,21	0.1058**	0.0275	0.0234	1						
5. Dyn 1	3,41	1,52	0.1264**	0.0039	0.0316	0.0815*	1					
6. Dyn 2	3,51	1,59	-0.0179	0.0371	0.0574	0.0472***	0.1682	1				
7. CEO_tenure	13,43	9,35	-0.0104	0.2717***	0.3634***	0.0349	-0.0798	0.0389	1			
8. CEO_gender	0,73	0,44	-0.1143**	0.0399	0.1761***	0.0064	-0.0725*	0.0280	0.1526	1		
9. CEO age	45,75	10,66	0.0659*	0.1739***	0.4456***	-0.0088	0.0050	0.1401***	0.6178 ***	0.3183***	1	
10. CEO exp.	19,88	11,82	0.0863*	0.2903***	0.4380***	0.0392	-0.0172	0.0682***	0.6948 ***	0.2243***	0.7368***	1
11. CEO edu.	0,59	0,49	0.0218	-0.0818	-0.1417***	-0.0157*	0.0837	0.0325**	-0.0976	0.0377	-0.0637	-0.0778**
12. Innovation	3,70	1,78	0.1068**	-0.0206	0.0055	0.0039	0.2400***	0.0487	-0.0565	0.0621	-0.0036	-0.0767*
13. Risk taking	2,75	1,39	-0.0510	-0.0597	0.0090	-0.0102***	0.2537*	0.0738*	-0.0662	0.0071	0.0004	-0.0499
14. Proactiveness	4,08	1,49	0.0330	0.0023	0.0605	0.1994***	0.1924***	0.0345	0.0180	0.0578	0.0709*	0.0685*
15. Autonomy	4,66	1,39	0.0037	0.0472	-0.0539	-0.0387	-0.0474	-0.0565	0.0911 *	-0.0304	-0.0111	-0.0089
16.Aggressiveness	4,78	1,38	-0.0061	-0.0001	0.0277	-0.0485	-0.0570	0.0068	-0.0141	-0.0648*	0.0169	0.0011
17. Firm age	26,96	18,80	-0.0178	0.0348	-0.2417***	0.0770	-0.0704*	0.0510	0.2988 ***	0.0201	0.1266**	0.1365***
18. Patent	0,31	0,46	-0.0276	-0.0594	0.0055	-0.0665*	0.0585	0.0431	-0.0171	-0.0348	0.0043	-0.0205
19. Network	2,78	0,67	0.0842**	0.0726	0.0439	0.0918**	0.1125	0.0419	-0.0603	-0.0893*	-0.0591	-0.0423
20. Capital	2,93	1,51	-0.0505	0.0604	0.0340	-0.0285	-0.0041*	0.0761	-0.0367	0.0476	-0.0295	-0.0043
21. PP	0,00	0,02	0.0411	0.0056	0.0032	-0.0383	-0.0173	0.0133	-0.0020	0.0392	0.0049	0.0204

Significance levels are based on a two-tailed test, *: p<0.1; **: p<0.05; ***: p<0.01

Table 1: Mean, standard deviations, and zero-order correlations (cont.).

	11	12	13	14	15	16	17	18	19	20	21
11. CEO Edu.	1										
12. Innovation	0.1035**	1									
13. Risk Taking	0.0196	0.3244***	1								
14. Proactiveness	0.000	0.2957***	0.2395***	1							
15. Autonomy	-0.0485	-0.0319	-0.0801**	-0.0344	1						
16.Aggressiveness	-0.0361	0.0706*	-0.0613	0.0401	0.0943**	1					
17. Firm Age	0.0464	0.0097	-0.0628	0.0297	0.0444	-0.0239	1				
18. Patent	-0.0051**	0.1179**	0.1072*	0.0915	-0.0107	0.0811**	0.0331	1			
19. Network	-0.0377	0.0623	0.0607	0.0437	-0.0588	0.0179	-0.0133	0.0157	1		
20. Capital	0.0211	-0.0222	-0.0524	-0.0525	-0.0106	0.0190	0.0258	0.0142	0.1146**	1	
21. Pp	-0.0017	-0.0422	-0.0438	-0.0404	-0.0115	-0.0205	-0.0592	-0.0176	-0.0124	-0.1598***	1

Significance levels are based on a two-tailed test, *: p<0.1; **: p<0.05; ***: p<0.01

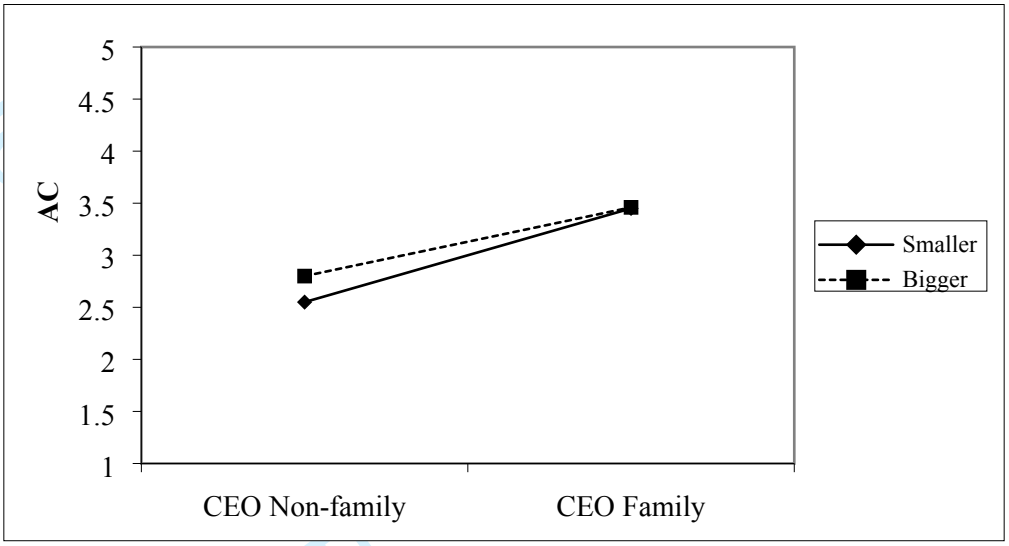
Table 2: Family CEO effect and First-generation CEO on Absorptive Capacity among family firms

	MODEL 1	MODEL 2	MODEL 3	MODEL 4	MODEL 5
Firm Size	0.0633**	0.0613**	0.0127	0.130***	0.0101
	(0.0291)	(0.0287)	(0.0380)	(0.0408)	(0.0584)
Dyn 1	0.0444**	0.0428*	0.00832	0.0839**	-0.0284
	(0.0223)	(0.0225)	(0.0256)	(0.0358)	(0.0406)
Dyn 2	-0.0103	-0.00945	0.0116	-0.0523	-0.00323
	(0.0204)	(0.0205)	(0.0247)	(0.0331)	(0.0371)
CEO tenure	-0.00812	-0.00916	-0.0146**	-0.00818	-0.0148**
	(0.00561)	(0.00566)	(0.00699)	(0.00568)	(0.00680)
CEO gender	-0.195**	-0.191**	-0.175*	-0.184**	-0.184**
	(0.0781)	(0.0787)	(0.0899)	(0.0780)	(0.0919)
CEO age	0.0110**	0.0112**	0.00973*	0.0107**	0.0101*
	(0.00447)	(0.00446)	(0.00582)	(0.00438)	(0.00567)
CEO exp.	0.00339	0.00235	0.00553	0.00255	0.00571
	(0.00452)	(0.00450)	(0.00598)	(0.00444)	(0.00598)
CEO edu.	0.0259	0.0360	0.0382	0.0432	0.0401
	(0.0640)	(0.0633)	(0.0814)	(0.0627)	(0.0819)
Innovation	0.0595***	0.0589***	0.0905***	0.0579***	0.0898***
	(0.0189)	(0.0188)	(0.0233)	(0.0184)	(0.0235)
Risk taking	-0.0436	-0.0406	-0.0679*	-0.0450	-0.0674*
	(0.0293)	(0.0292)	(0.0373)	(0.0294)	(0.0377)
Proactiveness	-0.0194	-0.0189	-0.0149	-0.0134	-0.0137
	(0.0249)	(0.0249)	(0.0283)	(0.0248)	(0.0288)
Autonomy	0.00964	0.00860	0.0590**	0.0135	0.0586**
	(0.0230)	(0.0228)	(0.0289)	(0.0226)	(0.0291)
Aggressiveness	-0.0346	-0.0326	-0.0490*	-0.0302	-0.0499*
	(0.0236)	(0.0234)	(0.0285)	(0.0235)	(0.0286)
Firm Age	0.000323	0.000320	0.00243	0.000210	0.00235
	(0.00183)	(0.00182)	(0.00294)	(0.00182)	(0.00283)
Patent	-0.113*	-0.107	-0.250***	-0.131**	-0.247***
	(0.0668)	(0.0670)	(0.0812)	(0.0661)	(0.0809)
Network	0.0326	0.0276	0.00381	0.0259	0.00752
	(0.0479)	(0.0475)	(0.0621)	(0.0476)	(0.0636)
Capital	-0.0222	-0.0253	-0.0488*	-0.0196	-0.0456
	(0.0242)	(0.0243)	(0.0285)	(0.0242)	(0.0281)
PP	0.945	0.767	12.23***	0.759	12.12***
	-1.842	-1.866	-4.328	-1.822	-4.215
CEO Family		0.133*		0.211	
		(0.0682)		(0.226)	
Firm Size*CEO Family				-0.120**	
				(0.0562)	
Dyn1*CEO Family				-0.0648	
				(0.0431)	
Dyn2*CEO Family				0.0636	
				(0.0427)	
First gen			0.181*		-0.165
			(0.107)		(0.305)
Firm size*First gen					0.00910
					(0.0716)
Dyn1*First gen					0.0674

					(0.0532)
Dyn2*First gen					0.0266
					(0.0499)
Constant	3.492***	3.446***	3.601***	3.240***	3.752***
	(0.339)	(0.340)	(0.472)	(0.350)	(0.512)
Observations	356	356	215	356	215
R-Squared	0.113	0.124	0.228	0.147	0.237

Significance levels are based on a two-tailed test, *: p<0.1; **: p<0.05; ***: p<0.01

Figure 1: Interaction effect between Family CEO and firm size.



Appendix 1: Table 3: Post-hoc analyses. Potential and realized Absorptive capacity

	MODEL 1		MODEL 2		MODEL 3		MODEL 4		MODEL 5	
	Potencial	**Realized**	**Potencial**	**Realized**	**Potencial**	**Realized**	**Potencial**	**Realized**	**Potencial**	**Realized**
Firm Size	0.0664**	0.0586*	0.0639**	0.0571*	-0.0149	0.0427	0.173***	0.0846	-0.0352	0.0501
	(0.0322)	(0.0338)	(0.0318)	(0.0336)	(0.0433)	(0.0424)	(0.0399)	(0.0545)	(0.0611)	(0.0744)
Dyn 1	0.0577**	0.0319	0.0565**	0.0310	0.0224	-0.0141	0.0929**	0.0867**	-0.0252	-0.0347
	(0.0249)	(0.0290)	(0.0249)	(0.0291)	(0.0296)	(0.0354)	(0.0376)	(0.0439)	(0.0432)	(0.0604)
Dyn 2	-0.00400	-0.0194	-0.00268	-0.0189	0.0215	-0.00382	-0.0449	-0.0616	0.0103	-0.0204
	(0.0222)	(0.0265)	(0.0221)	(0.0268)	(0.0267)	(0.0332)	(0.0355)	(0.0416)	(0.0381)	(0.0560)
CEO tenure	-0.00895	-0.00907	-0.0101	-0.00980	-0.0159**	-0.0144*	-0.00857	-0.00921	-0.0166**	-0.0143*
	(0.00627)	(0.00616)	(0.00629)	(0.00626)	(0.00786)	(0.00780)	(0.00612)	(0.00647)	(0.00771)	(0.00766)
CEO gender	-0.217***	-0.166*	-0.210**	-0.163*	-0.192**	-0.136	-0.202**	-0.154	-0.201**	-0.142
	(0.0823)	(0.0977)	(0.0827)	(0.0984)	(0.0950)	(0.127)	(0.0805)	(0.0986)	(0.0971)	(0.128)
CEO age	0.0117**	0.0103*	0.0117**	0.0104*	0.0113*	0.00853	0.0109**	0.0103*	0.0122**	0.00851
	(0.00462)	(0.00576)	(0.00463)	(0.00575)	(0.00606)	(0.00718)	(0.00460)	(0.00568)	(0.00598)	(0.00720)
CEO exp.	0.000648	0.00894	-0.000450	0.00831	0.00138	0.0106	-0.000452	0.00823	0.00148	0.0107
	(0.00463)	(0.00583)	(0.00460)	(0.00586)	(0.00590)	(0.00781)	(0.00447)	(0.00585)	(0.00587)	(0.00787)
CEO edu.	-0.0534	0.0874	-0.0420	0.0944	-0.00566	0.0775	-0.0292	0.101	-0.00159	0.0774
	(0.0678)	(0.0795)	(0.0673)	(0.0790)	(0.0881)	(0.101)	(0.0662)	(0.0790)	(0.0879)	(0.102)
Innovation	0.0431**	0.0875***	0.0420**	0.0870***	0.0698***	0.125***	0.0386**	0.0887***	0.0705***	0.124***
	(0.0201)	(0.0243)	(0.0199)	(0.0244)	(0.0251)	(0.0312)	(0.0192)	(0.0242)	(0.0259)	(0.0313)
Risk taking	-0.0318	-0.0624*	-0.0279	-0.0608*	-0.0655	-0.0676*	-0.0327	-0.0647*	-0.0652	-0.0665
	(0.0316)	(0.0334)	(0.0314)	(0.0332)	(0.0397)	(0.0409)	(0.0317)	(0.0332)	(0.0406)	(0.0413)
Proactiveness	-0.0302	-0.000708	-0.0307	-0.000609	-0.0262	-0.00118	-0.0218	0.00213	-0.0228	-0.00161
	(0.0289)	(0.0282)	(0.0289)	(0.0283)	(0.0347)	(0.0325)	(0.0286)	(0.0285)	(0.0354)	(0.0330)
Autonomy	-0.00694	0.0412	-0.00827	0.0404	0.0522	0.0638*	-0.00314	0.0458	0.0521	0.0635*
	(0.0251)	(0.0284)	(0.0247)	(0.0283)	(0.0320)	(0.0356)	(0.0247)	(0.0279)	(0.0319)	(0.0359)
Aggressiveness	-0.00230	-0.0788**	0.000206	-0.0776**	-0.0237	-0.0871**	0.00240	-0.0738**	-0.0246	-0.0879**
	(0.0240)	(0.0306)	(0.0238)	(0.0307)	(0.0289)	(0.0371)	(0.0242)	(0.0305)	(0.0289)	(0.0376)
Firm Age	0.00136	-0.000687	0.00140	-0.000689	0.00225	0.00267	0.00122	-0.000834	0.00217	0.00265
	(0.00176)	(0.00232)	(0.00175)	(0.00232)	(0.00274)	(0.00387)	(0.00175)	(0.00234)	(0.00266)	(0.00381)
Patent	-0.125*	-0.0966	-0.117	-0.0921	-0.291***	-0.175	-0.152**	-0.106	-0.290***	-0.171

	(0.0715)	(0.0841)	(0.0717)	(0.0845)	(0.0840)	(0.112)	(0.0703)	(0.0846)	(0.0833)	(0.112)
Network	0.0164	0.0553	0.00945	0.0519	0.00722	0.000443	0.00604	0.0519	0.0135	0.00143
	(0.0527)	(0.0582)	(0.0525)	(0.0580)	(0.0707)	(0.0714)	(0.0518)	(0.0586)	(0.0729)	(0.0728)
Capital	-0.0116	-0.0356	-0.0161	-0.0377	-0.0547*	-0.0446	-0.00917	-0.0325	-0.0499	-0.0432
	(0.0261)	(0.0296)	(0.0261)	(0.0296)	(0.0315)	(0.0361)	(0.0257)	(0.0299)	(0.0308)	(0.0367)
PP	1.547	-0.133	1.315	-0.237	9.115*	15.04**	1.235	-0.0728	8.701*	15.18**
	-1.997	-2.258	-2.054	-2.264	-4.893	-6.850	-1.962	-2.228	-4.710	-6.873
CEO Family			0.162**	0.0887			0.419*	-0.00916		
			(0.0709)	(0.0853)			(0.231)	(0.285)		
Firm Size*CEO Family							-0.188***	-0.0513		
							(0.0579)	(0.0706)		
Dyn1*CEO Family							-0.0600	-0.0871		
							(0.0468)	(0.0540)		
Dyn2*CEO Family							0.0623	0.0632		
							(0.0454)	(0.0547)		
First gen					0.127	0.261*			-0.348	0.0538
					(0.113)	(0.140)			(0.312)	(0.410)
Firm size*First gen									0.0423	-0.0103
									(0.0768)	(0.0870)
Dyn1*First gen									0.0881	0.0374
									(0.0594)	(0.0713)
Dyn2*First gen									0.0178	0.0314
									(0.0546)	(0.0670)
Constant	3.552***	3.321***	3.503***	3.296***	3.810***	3.364***	3.218***	3.120***	3.989***	3.473***
	(0.352)	(0.405)	(0.353)	(0.407)	(0.492)	(0.523)	(0.369)	(0.424)	(0.525)	(0.583)
Observations	361	360	361	360	217	216	361	360	217	216
R-Squared	0.091	0.125	0.105	0.128	0.182	0.212	0.141	0.138	0.194	0.214

Significance levels are based on a two-tailed test, *: p<0.1; **: p<0.05; ***: p<0.01