

Family-Driven Innovation: RESOLVING THE PARADOX IN FAMILY FIRMS

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This article presents an integrated, contingency perspective on family firm innovation called Family-Driven Innovation (FDI). The framework highlights the need for consistency between a family firm's strategic innovation decisions and its idiosyncrasies to achieve and sustain competitive advantage through innovation. This article also offers some directions for future research on FDI and serves as an introduction to this special section on family firms. (Keywords: Innovation, Innovation Management, Family Firms)

Family firms are the most ubiquitous form of business organization globally,¹ and the enduring influence of families on business and society is an essential part of any world economy.² In the USA, one-third of the S&P 500 firms are either controlled or owned by the founding family,³ and family firms account for 80-90% of private sector firms, generate 63% of national GDP, and employ 57% of the total workforce.⁴ In Europe, the importance of family firms is even greater.⁵ Family firms also significantly contribute to the growth of economies in South and East Asia, Latin America, and the Middle East,⁶ and recent empirical research has shown how the proportion of firms under family control significantly affects economic growth.⁷ Thus, scholars and practitioners are paying increasing attention to understanding the distinctive behavior of this form of business organization.

Decades of research on innovation on family firms have produced mixed results. Innovation is a vital source of competitive advantage⁸ and an important determinant of superior performance.⁹ However, family firm innovation is often characterized by a dual nature. On the one hand, family firms are conventionally seen as conservative, path-dependent, and ultimately less innovative than other types of organizations.¹⁰ On the other hand, statistics show that family owners control more than 50% of Europe's most innovative firms.¹¹ Consider, for example, the Mittelstand family firms in Germany, which are internationally renowned for their

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capacity to successfully focus on innovation in order to stay ahead of potential competitors in their technological niche market.¹² Family-owned companies such as Beretta, Miquel y Costas Group, Pollet, and Van Eeghen are well known for often being the first to embrace impactful innovations in their respective industries.

Recent scholarly work has suggested that innovation in the context of family firms is characterized by a paradox, which is manifested by family firms innovating less despite having the ability to innovate more than their non-family counterparts.¹³ This in turn has led to two key questions that both scholars and practitioners have recently attempted to address. How can family owners and managers resolve this paradox and thereby unlock the innovation potential of their organizations? More generally, how can they resolve this paradox and build competitive advantage through innovation?

This article serves to introduce the *California Management Review* special section on innovation in family firms. It also contributes to the current debate on family firm innovation by suggesting an integrated and contingency perspective¹⁴ and by proposing a model of competitive advantage through innovation in family firms. More specifically, it introduces the concept of *Family-Driven Innovation* (FDI), the internally consistent set of strategic decisions that allow a family firm to resolve the innovation paradox by ensuring a close fit between these decisions and the idiosyncratic characteristics of the family firm. Three contingency factors describe the characteristics of family firms and capture their heterogeneity. They are the *where*, *how*, and *what* of family firms that capture, respectively, the direction where the family firm wants to go (as expressed by the family owners' goals and intentions, i.e., their "willingness" to behave), the discretion the family firm has to move in that direction (which is a function of the structures, governance mechanisms, and decision-making processes that constrain the power of family owners, i.e., what we call "ability as discretion"), and the resources and capabilities that are needed or should be used for family owners to lead the firm toward that direction (what we call "ability as resources"). Similarly, strategic decisions in innovation can be mapped along the same *where*, *how*, and *what* contingency factors, which means deciding where the firm will find the knowledge resources it needs to innovate (e.g., within its existing knowledge base, in new knowledge domains, or searching over time), how the innovation process is managed (e.g., whether the firm follows an open or closed approach to innovation), and what the firm wants to innovate (e.g., whether it will prioritize products/services, processes, or business model innovation and whether more emphasis will be given to radical or incremental innovation).

While extant innovation research has investigated an abundance of firm-level drivers of innovation,¹⁵ the role of family involvement has only scarcely

been understood so far.¹⁶ Incorporating the role of family involvement and its effects in innovation studies is important for general management scholars, if they aim to advance knowledge on the most ubiquitous form of business organization worldwide.

Readers of this special section will find that the authors of the published articles have considered constructs such as: readiness to innovation, socio-emotional wealth, core assets and liabilities, external turbulence, and business model evolution as drivers that explain conflicting findings on innovation in family firms. Indeed, scholars have studied the effect of family involvement on a number of aspects of innovation—including R&D investments,¹⁷ discontinuous technology adoption,¹⁸ and external technology acquisition¹⁹—and have examined this effect in light of specific characteristics of family firms such as goals, governance, or resources, depending on the theoretical perspective adopted in each study. Our concept of FDI provides a framework to advance the theory and practice of innovation in family firms. In other words, we argue here that scholars and practitioners need an integrated reconceptualization of family involvement and innovation, rather than just examining selected aspects of innovation in family firms and drawing reckless conclusions based on a narrow set of information.

Paradoxical Effects of Family Involvement on Innovation

The vast research on innovation has thus far focused on firms where ownership and management are separate, without explicitly taking into account what happens when they are combined.²⁰ Unification of ownership and control is typical of family firms, and this endows family firms with distinctive incentives, authority structures, accountability norms, resources, and capabilities.²¹ These characteristics have an impact on how innovation takes place in family firms, and a growing body of research is providing evidence that innovation in family firms is different than in their non-family counterparts.²²

Existing research on this topic is nevertheless limited and has focused so far on the effect of family involvement on innovation inputs, activities, and outputs. The key findings are:

- Innovation inputs: Existing research is largely consistent in indicating that family firms generally invest less money in R&D compared to their non-family counterparts.²³
- Innovation activities: There are preliminary results suggesting that innovation activities are handled differently in family vs. non-family firms, but this area needs much more theoretical and empirical research effort to be completely developed.²⁴
- Innovation outputs: Findings are controversial here, with some studies showing that family firms are more innovative than non-family firms, while others suggest instead that the opposite is true.²⁵

Moreover, an interesting theme in this growing field of study involves the existence of some paradoxical effects in family firm innovation, which become manifest by family firms innovating less despite having the ability to do more.²⁶

Paradoxical Effects in the Development of Innovation

Research and practice suggest that the development of innovation increasingly requires leveraging external sources of knowledge to cope with the increasing costs for the creation of new knowledge.²⁷ While this strategic need is well documented in open innovation literature,²⁸ family involvement in a firm affects its willingness to engage in open innovation. Evidence indicates that in pursuing non-economic utilities, family firms develop strong concerns about potential loss of control.²⁹ Such concerns may complicate collaborative relationships with external partners when open innovation implies restricting the firm's control over the product's technological trajectory.³⁰ Therefore, the propensity to acquire knowledge outside the firm's boundaries is lower in family firms. At the same time, family firms have superior ability to identify opportunities and acquire knowledge from outside their boundaries because of their non-economic goals, long-term orientation, and discretion to engage with external stakeholders,³¹ and this accentuates the paradoxical effect.³²

Paradoxical Effects in the Adoption of Innovation

Adoption of innovation is the process through which a firm: first makes the decision to adopt a new product/service, process, or business model; and then starts using and integrating it into its processes and business activities.³³ Sociological models of innovation diffusion suggest that the decision to adopt an innovation is characterized by a high level of uncertainty.³⁴ Even when specifications and customer reports are known, and the cost of purchase and use is precisely known, the firm remains unsure about how the innovation will perform in practice, whether it is suited to the uses it has in mind, and whether it can be easily integrated into its existing operations. Under these circumstances, innovation adoption can put the non-economic utilities of family owners at risk as it reduces the firm's control over the way in which business activities are managed and organized. This implies that in the future the firm may be forced to operate under constraints to organizational actions that could have been avoided by not adopting the innovation. As a result, family firms are likely to show a lower propensity to adopt innovations compared to their non-family counterparts. However, once the firm has decided to adopt an innovation, the high discretion of family firms (due to their personalized control) lowers the barriers to the integration of the innovation and its actual use. Again, this leads to a paradoxical behavior. The uncertainty surrounding adoption is especially high when a firm is confronted with a discontinuous innovation.³⁵

Ultimately, creating and capturing the maximum value from innovation in family firms requires unlocking these paradoxical effects. Only by doing so will family firms be able to realize the potential of innovation for creating and sustaining competitive advantage over time. Throughout this special section in the *California Management Review*, the contributors show that this can be achieved by carefully aligning the strategic decisions a family firm takes in innovation with its idiosyncratic characteristics.

Introducing the Concept of Family-Driven Innovation

The FDI framework builds on contingency theory³⁶ and is defined as an internally consistent set of strategic innovation decisions that allow family firms

to resolve their innovation paradox by ensuring a close fit between these decisions and the characteristics of the family firm. Applying this perspective means that scholars and practitioners should:

- In a first step, they need to consider the *internal consistency* between the key contingency factors that identify the characteristics of family firms and capture their heterogeneity, as well as the internal consistency between the key contingency factors that capture the heterogeneity of innovation decisions.
- Then, they need to take into account the *fit* between the contingencies of heterogeneity of innovation decisions and the contingencies of heterogeneity of family firms.
- Finally, they should recognize that when there is a misfit between innovation decisions and family firm characteristics, creating a competitive advantage through innovation in family firms is unlikely. Conversely, if innovation decisions match the characteristics of the family firm, then FDI is possible and can lead to the creation of competitive advantage through innovation.

The FDI model is depicted in Figure 1.

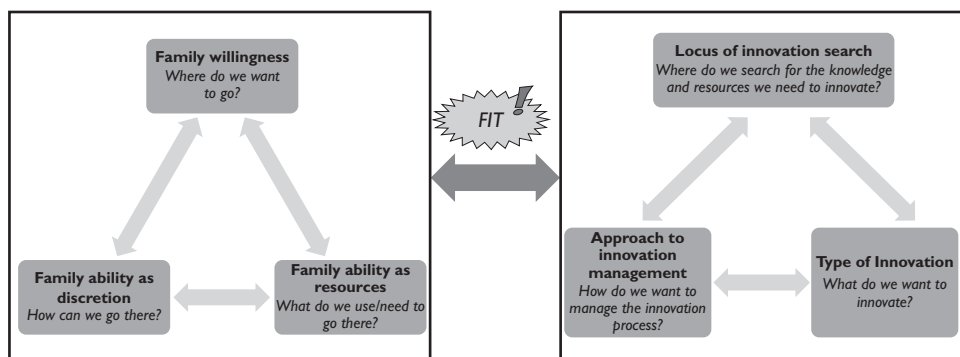
Heterogeneity of Family Firms

As noted, there are three contingency factors that can be used to describe the characteristics of family firms and capture their heterogeneity—the *where*, *how*, and *what* of family firms.

The Where of Family Firms

Family willingness is defined as the “favorable disposition of the involved family to engage in distinctive behavior. It encompasses the goals, intentions, and motivations that drive the family involved to influence the firm’s behavior in directions that are different from those pursued by firms without family involvement.”³⁷ It refers to the family owners’ goals and intentions in response to the question

FIGURE 1. A Model of Family-Driven Innovation



“Where do we want to go?” For example, some family firms may be more oriented to pursuing family-oriented goals such as family harmony, family social status, and family identity linkage, whereas others may be more oriented to pursuing non-family-oriented goals such as pure profit maximization.³⁸

The How of Family Firms

Family ability as discretion is defined as “the discretion of the [involved] family to direct, allocate, add to, or dispose of a firm’s resources. It also includes latitude in selecting the goals of the organization and in choosing among the range of feasible strategic, structural, and tactical decisions.”³⁹ The organizational authority arises from the family owners’ power and legitimacy, which is a function of the structures, governance mechanisms, and decision-making processes that regulate and constrain the discretion of family owners. It responds to the question: *“How can we go there?”* For example, the family’s strategic control of a firm’s assets relative to its ownership may be enhanced through the establishment of pyramids, cross-holdings, and dual voting class shares,⁴⁰ and the family may be able to bypass the board when making strategic decisions.⁴¹ On the other hand, powerful non-family stakeholders such as board members and shareholders may constrain the ability of family owners and managers to exercise their discretion to act. Moreover, the monitoring and incentive systems adopted in the family firm may constrain the managers’ freedom to pursue activities in the family owners’ interest instead of the business’s interest.⁴²

The What of Family Firms

Finally, there is also a resource-based component of ability that we call *family ability as resources*. It refers to the family’s power to act and the resources and capabilities that family owners need to deploy in order to pursue their goals and lead the firm in the desired direction. It responds to the question: *“What do we use/need to go there?”* For example, managerial power is constrained if the resources available to the firm’s dominant coalition are reduced.⁴³ This component of family ability mostly builds on the resource-based view,⁴⁴ which has emphasized the role of family firms’ unique resources and capabilities—in terms of higher or lower stocks of social, human, and financial capital⁴⁵—in building a competitive advantage.⁴⁶

Heterogeneity of Innovation Decisions

Innovation is a very complex concept that has received many alternative definitions and has been operationalized in many ways in the literature.⁴⁷ For the purpose of this study, we conceptualize innovation as the set of activities through which a firm conceives, designs, manufactures, and introduces a new product, service, process, or business model.⁴⁸

Research points to the critical importance of defining a clear innovation strategy for increasing a firm’s ability to use innovation to create competitive advantage.⁴⁹ The decisions that need to be taken to develop a proper innovation strategy respond to three key questions: *Where* do we search for the knowledge and resources we need to innovate? *How* do we want to manage the innovation process? *What* do we want to innovate?

The Where of Innovation Strategy

This decision refers to the directions in which a firm searches for the resources and knowledge it needs to feed its innovation process. A first critical strategic decision concerns the depth of the firm's search into its existing knowledge base⁵⁰ and finding the right balance between the exploration of novelty and the exploitation of existing knowledge.⁵¹ A second strategic decision involves search breadth and captures the extent to which a firm searches across multiple technology domains.⁵² Although it incurs higher costs than searching extensively within a narrower set of knowledge domains,⁵³ it can enable radical innovation.⁵⁴ A further strategic decision concerns the extent to which a firm uses knowledge elements from the past or from newly created technologies.⁵⁵ Knowledge from the past, which comes from the tradition of the firm or the tradition of the territory in which it operates, can be a valuable resource in innovation because its use fosters increased reliability, decreased risk of retaliation, and the uniqueness of innovation.⁵⁶ However, excessive reliance upon past knowledge creates the risks of path-dependence, inflexibility, and conservatism, and it can reduce a firm's capability to respond quickly to changing market needs.⁵⁷

The How of Innovation Strategy

This decision concerns the strategic approach that a firm applies in the development and exploitation of its innovations. The most important aspect is the degree of openness of the innovation process. Research on open innovation suggests that this has become a strategic priority for firms competing in high-pace, high-velocity industries to leverage both inbound and outbound flows of knowledge and technology to increase revenues and reduce the costs of their innovation process.⁵⁸ Of course, open innovation is not a "one size fits all" strategic approach and a firm has to decide what is the right degree of openness to be applied in its innovation process.⁵⁹ Using open innovation means systematically relying on external sources of knowledge and technology to accelerate internal development.⁶⁰ On the other hand, open innovation in the exploitation phase means systematically searching for opportunities to sell proprietary technologies outside the firm core business, through approaches such as out-licensing agreements, joint ventures, or new venture spin-offs.⁶¹ In addition to applying proprietary technologies for the development of new products/services, processes, and business models, this strategic approach allows the firm to gain additional monetary benefits that help increase the returns on innovation investments.⁶² An open strategy in the development and exploitation phases of the innovation process entails a reduction of the level of control that the firm can exert and exposes it to increased risks of appropriability and knowledge spillovers.⁶³

The What of Innovation Strategy

This refers to the different types of innovations that a firm can decide to invest in. A firm may choose to focus its efforts and resources to innovate its products/services⁶⁴ or to change its business model.⁶⁵ Often, business model innovations entail changes and modification to the products/services that a firm offers. Today there is increasing understanding that business model innovation represents

a very powerful source of competitive advantage, although it requires deeper changes to established routines and mental models. Another aspect regarding the *what* dimension of innovation is the distinction between product/service innovation or process innovation.⁶⁶ In the former, innovation concerns changes to its offer, which are highly and immediately visible to its clients. In the latter, innovation concerns improvements to the processes (e.g., operations, logistics, and administration), changes that are not immediately visible to its clients. This suggests that product/service innovation entails higher risks for the firm as it potentially has a direct impact on its market positioning and its identity in the eyes of its clients. Finally, the degree of change that characterizes a firm's innovation efforts relates to dichotomy between radical and incremental innovation.⁶⁷ With radical innovation, the level of risk stemming from a departure from existing organizational routines, as well as the resource commitments that such innovation entails,⁶⁸ is higher as compared to incremental innovation, and this is an important consideration in FDI.

Family-Driven Innovation and Competitive Advantage

FDI is a matter of achieving fit among the key drivers of heterogeneity of family firms—the involved family's *willingness*, *ability as discretion*, and *ability as resources*—and the key drivers of heterogeneity of innovation decisions—the *locus of innovation search*, the *approaches used to manage the innovation process*, and the *types of innovation in which the firm invests*. Creating fit among these contingency factors is of pivotal importance to resolving the paradox in family firm innovation, unlocking the innovation potential of family firms, and allowing them to build competitive advantage.

This emerges from a number of examples (from our consultancy and research experience) in both the innovation and family business fields. One of these is particularly illustrative of how FDI operates. A family firm that is among the worldwide leaders in vacuum technology struggled for years to implement an innovation strategy based on developing radically new products by searching for knowledge in new technology domains through a closed innovation model. This strategy was strongly supported by the Director of Corporate R&D, who convinced the Top Management Team (TMT) to invest in it. Unfortunately, this approach was largely unsuccessful and the firm suffered from a competitive disadvantage vis-à-vis its international competitors for several years.

The main reason underlying this failure was the lack of alignment between the strategy and the characteristics of the family firm itself, where the owners strongly prioritized the pursuit of non-economic goals instead of maximizing profitability results. This orientation proved itself incompatible with the idea of aggressively investing in radical innovation, even though the TMT had initially approved this plan. Moreover, the firm lacked the financial resources to invest in costly and risky R&D projects due to a parsimonious approach in the management of the family capital. The family owners were also concerned about keeping control over the firm and preserving the family identity, and this had led over the years to a lack of professionalization in middle management. These resource constraints meant that the firm was unable to invest the large amounts of money needed for internally developing new knowledge in unfamiliar technology domains.

After years of disappointing innovation results, the firm's performance improved when, after a process of intra-family succession, the new owners reduced the importance of non-economic goals and became more oriented toward achieving strong profitability results. This was now more consistent with the radical innovation strategy that the firm considered a critical cornerstone of successfully competing against larger players in the vacuum technology industry. At the same time, the Director of Corporate R&D started to implement an open approach to managing both the development and exploitation phases of the innovation process. This was key to circumventing the lack of financial resources and professionalization that in the past (when the firm worked according to the closed innovation model) had continued to characterize the firm and had hindered the development of new knowledge in distant technology domains.

Due to these changes, the family firm realized FDI—i.e., a close fit between the dimensions of its innovation strategy and its idiosyncratic characteristics. This resolved its innovation paradox and unlocked the potential of innovation to create competitive advantage.

Some Directions for Future Research on Family-Driven Innovation

In this article, we have developed an FDI model and argued that only by obtaining an appropriate fit between the family firm heterogeneity dimensions and the strategic innovation decision heterogeneity dimensions it is possible to overcome the paradox that hinders innovation in family firms and thereby unlock the innovation potential for competitive advantage in this particular organizational setting.

Of course, more theoretical and empirical research is needed to further elaborate on this model and test our contention that FDI has a positive impact on innovation and firm performance. The FDI framework developed in this article will hopefully serve as a useful tool for scholars to further our knowledge on innovation in family firms in an integrated and structured way. Some dimensions along which research on family-driven innovation could progress are summarized hereinafter (a table reporting some promising research questions for a research agenda on FDI can be downloaded at the following link: <http://www.diminin.it/?p=1974>):

- *Fit between willingness and innovation strategy.* In this area, future research should study the fit between the goals pursued by the family and the innovation strategy adopted by the family firm.
- *Fit between ability as discretion and innovation strategy.* Here scholars should study the fit between the mechanisms underlying family owner discretion to orient the behavior of the family firm and the innovation strategy adopted.
- *Fit between ability as resources and innovation strategy.* Along this dimension, future scholars should study the fit between the capabilities and resources of family owners and the innovation strategy adopted by the firm.
- *Fit between different dimensions of the innovation strategy in a particular family firm.* Here, future research should study the fit between different dimensions

of the innovation strategy under the effect of different contingency factors related to family firm heterogeneity.

- *Performance implications of the dimensions of fit.* Another area ripe for future research is the impact of different dimensions of fit of the FDI model on firm and innovation performance. This would allow collecting empirical evidence for the theoretical arguments developed in this article on the value of FDI in overcoming the innovation paradox characterizing family firms and unlocking their innovation potential.
- *Temporal dynamics in FDI.* Many scholars emphasize the time-variant nature of family firms and the importance of adopting a temporal perspective to understand family business behavior.⁶⁹ To the best of our knowledge, no study has investigated how the innovation behavior of family firms changes over time. Future research should therefore attempt to understand how family business innovation and particularly FDI change over time.

The Contributions

The point we want to make in this article is that this new comprehensive framework that we call FDI can guide future research and practice in the flourishing field of family firm innovation. The four articles in this special section illustrate the usefulness of the FDI framework. From their own individual perspectives, these four independent studies help us understand how FDI can be used to explain the mechanisms through which family firms build and sustain their competitive advantage through innovation.

First, the contribution in this issue of *California Management Review* by Miller, Wright, Le Breton-Miller, and Scholes ["Resources and Innovation in Family Businesses: The Janus-Face of Socio-Emotional Preferences"] clearly points to the idiosyncrasy of goal setting in family business. Their analysis builds on a comparison between socio-emotional wealth and speed of change in the environment to identify relevant dimensions for the fit of what we call the *where* dimensions of FDI (willingness of family owners and sources of knowledge resources for innovation) and the *what* dimensions (ability as resources of the family owners and types of innovation). The results of this contribution are summarized in a four-by-four framework that clearly identifies the tensions on the resources that become relevant for each of the four quadrants depicted.

Bogers, Boyd, and Hollensen ["Managing Turbulence: Business Model Development in a Family-Owned Airline"] follow with a single case study spanning 60 years and illuminating the contribution of family ownership, values, and rigidities to the evolution of a business model in a sector characterized by high turbulence. In so doing, this article clearly exemplifies one of the four quadrants depicted in Miller et al.'s framework and contributes to understanding the fit of the *what* dimensions (ability as resources of the family owners and types of innovation) and the *how* dimensions (ability as discretion of the family owners and approaches used to manage the innovation process) in the FDI framework.

Bennedsen and Foss ["Family Assets and Liabilities in the Innovation Process"] employ a resource-based view of strategy to identify the evolution of

family assets that have an impact on both the *where* dimensions of the FDI framework (willingness of family owners and sources of knowledge resources for innovation) and the *how* dimensions (ability as discretion of the family owners and approaches used to manage the innovation process). The point made in this article is that a dynamic tension exists and that what were previously identified as *family assets* can turn into *family liabilities* and limit the scope and range of innovation within family businesses.

Finally, Holt and Daspit ["Diagnosing Innovation Readiness in Family Firms"] introduce the concepts of *innovation readiness*, suggesting a move upstream from our analysis to explore the pre-conditions that generate FDI. This contribution adopts a theory-grounded approach to identify a mechanism that can guide the analysis of the fit of the FDI framework along the *where* dimensions (willingness of family owners and sources of knowledge resources for innovation).

Conclusion

This article demonstrates that innovation in the context of family firms is typically characterized by a paradox, manifested in family firms innovating less despite having the ability to do more. To solve this paradox and unlock the potential for innovation in family firms, a close fit is required between the heterogeneity of innovation decisions and the heterogeneity of the family firm's idiosyncratic characteristics.

We call this internally consistent set of strategic decisions Family-Driven Innovation. Scholars and business executives should take an integrated perspective to determine the contingencies of the *where*, *how* and *what* that capture the heterogeneity of innovation decisions and those capturing the heterogeneity of family firms, as well as taking into account the fit between these two sets of contingencies as a key mechanism through which family involvement in a business organization can lead competitive advantage through innovation.

The integrated framework outlined in this article is useful for organizing existing and future research into the intriguing topic of innovation in family firms. FDI is relevant not only for family firms—the predominant form of business organization around the globe—but also for our general understanding of innovation processes and the mutual influences between the type of corporate governance of organization and innovation.

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21. The involvement of family owners in management results in unique resources and capabilities (e.g., E. Gedajlovic and M. Carney, "Markets, Hierarchies, and Families: Toward a Transaction Cost Theory of the Family Firm," *Entrepreneurship Theory and Practice*, 34/6 (November 2010): 1145-1172). Different types of controlling owners may have different investment horizons, risk aversion, diversification plans, return aspirations, and governance structures, which are likely to affect innovation activities and outcomes (see, e.g., R.E. Hoskisson, M.A. Hitt, R.A. Johnson, and W. Grossman, "Conflicting Voices: The Effects of Institutional Ownership Heterogeneity and Internal Governance on Corporate Innovation Strategies," *Academy of Management Journal*, 45/4 (August 2002): 697-716). For instance, the pursuit of non-economic goals may reduce their willingness to undertake collaborative innovation projects (Kotlar, De Massis, Frattini, Bianchi, and Fang, op. cit.). Moreover, family involvement in ownership, management, and governance can result in developing unique resources that can then be leveraged in ways that affect innovation. For example, the unique characteristics of the social capital of family firms can affect their ability to use external knowledge sources during the innovation process or adopt functional structures rather than cross-functional teams to organize the innovation process (A. De Massis,

- F. Frattini, E. Pizzurno, and L. Cassia, "Product Innovation in Family versus Non-Family Firms: an Exploratory Analysis," *Journal of Small Business Management*, 53/1 (January 2015): 1-36.
22. See, e.g., Kotlar, De Massis, Frattini, Bianchi, and Fang, op. cit.
 23. Literature on family business innovation is largely consistent in showing that family firms invest less in R&D than non-family firms (see, e.g., J.H. Block, "R&D Investments in Family and Founder Firms: An Agency Perspective," *Journal of Business Venturing*, 27/2 (March 2002): 248-265). However, due to their long-term orientation, the variability of R&D investments is greater in family firms (Chrisman and Patel, op. cit.). A notable exception is Asaba's study (S. Asaba, "Patient Investment of Family Firms in the Japanese Electric Machinery Industry," *Asia Pacific Journal of Management*, 30/3 (September 2013): 697-715, DOI: 10.1007/s10490-012-9319-3) showing that family firms tend to invest more than their counterparts when financial factors and environmental uncertainty are controlled. Moreover, Sciascia and colleagues (S. Sciascia, M. Nordqvist, P. Mazzola, and A. De Massis, "Family Ownership and R&D Intensity in Small and Medium-Sized Firms," *Journal of Product Innovation Management*, 32/3 (May 2015): 349-360, DOI: 10.1111/jpim.12204) show that in SMEs, the relationship between family ownership and R&D intensity is contingent on the way the family invests its wealth. Family ownership is a negative correlate of R&D intensity when family wealth and firm equity overlap is high, implying that the more a family controls firm ownership, the less the SME is inclined to invest in R&D. Conversely, if the portion of family wealth invested in the firm is low, cautious behavior is replaced by a more innovative attitude resulting in higher R&D expenditure.
 24. Regarding the impact of family involvement on innovation activities, De Massis and colleagues (De Massis, Frattini, Pizzurno, and Cassia, op. cit.) analyze how and why the anatomy of the product innovation process differs between family and non-family firms. The analysis shows that due to their distinctive characteristics, family businesses differ with regard to product innovation strategies and organization of the innovation process. For instance, family firms use a functional organization in the innovation process, with high levels of decisional autonomy given to project leaders. Throughout this process, they rely on a higher number of collaborations with universities and public research centers, while the organizational climate is largely informal and unstructured. Conversely, non-family firms predominantly establish cross-functional teams to carry out these projects, with limited delegation of decisional authority to project leaders and a highly structured and formalized organizational climate. Kotlar and colleagues (J. Kotlar, A. De Massis, H. Fang, and F. Frattini, "Strategic Reference Points in Family Firms," *Small Business Economics*, 43/3 (October 2014): 597-619; J. Kotlar, A. De Massis, H. Fang, and F. Frattini, "Profitability Goals, Control Goals, and the R&D Investment Decisions of Family and Non-Family Firms," *Journal of Product Innovation Management*, 31/6 (November 2014): 1128-1145) offer other examples of studies on how family involvement affects innovation activities.
 25. Concerning how family involvement affects innovation outputs, the findings from existing research are controversial. Some studies show that family involvement is negatively associated with the quantity and quality of patents obtained (e.g., C.L. Chin, Y.J. Chen, G. Kleinman, and P. Lee, "Corporate Ownership Structure and Innovation: Evidence from Taiwan's Electronics Industry," *Journal of Accounting Auditing Finance*, 24/1 (January 2009): 145-175) while others show that family involvement positively affects innovation outputs (e.g., P. Westhead, "Ambitions, External Environment and Strategic Factor Differences between Family and Non-Family Companies," *Entrepreneurship & Regional Development*, 9/2 (1997): 127-158).
 26. See Chrisman, Chua, De Massis, Frattini, and Wright, op. cit.
 27. J. West and M. Bogers, "Leveraging External Sources of Innovation: A Review of Research on Open Innovation," *Journal of Product Innovation Management*, 31/4 (July 2014): 814-831.
 28. See here H. Chesbrough, W. Vanhaverbeke, and J. West, *New Frontiers in Open Innovation* (Oxford: Oxford University Press, 2014); E. Huizingh, "Open Innovation: State of the Art and Future Perspectives," *Technovation*, 31/1 (January 2011): 2-9.
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32. Kotlar, De Massis, Frattini, Bianchi, and Fang, op. cit.
33. T.H. Hannan and J.M. McDowell, "The Determinants of Technology Adoption: The Case of the Banking Firm," *The RAND Journal of Economics*, 15/3 (Autumn 1984): 328-335.
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35. Recent research (A. König, N. Kammerlander, and A. Enders, "The Family Innovator's Dilemma: How Family Influence Affects the Adoption of Discontinuous Technologies by Incumbent Firms," *Academy of Management Review*, 38/3 (July 2013): 418-441) suggests that family firms adopt discontinuous innovations later than their non-family counterparts, but when they decide to adopt them, implementation and integration happen more rapidly.
36. Lawrence and Lorsch, op. cit.
37. In introducing the concepts of *willingness*, *ability as discretion*, and *ability as resources*, we build on De Massis and colleagues' conceptualization of willingness and ability [A. De Massis, J. Kotlar, J.H. Chua, and J.J. Chrisman, "Ability and Willingness as Sufficiency Conditions for Family-Oriented Particularistic Behavior: Implications for Theory and Empirical Studies," *Journal of Small Business Management*, 52/2 (2014): 344-364] and claim that explicitly considering willingness and ability and taking into account their varying degrees in family firms enables arriving at a good understanding of the heterogeneity of family firms. It should be noted that De Massis and colleagues in their study recognize the existence of a resource-based component of ability, but only address ability as discretion.
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