


Explorers, Audacious, Hesitant, and Hermetics: N-Helix Dynamics and Collaboration Behavior in Latin America Family Firms

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Explorers, Audacious, Hesitant, and Hermetics: N-Helix Dynamics and Collaboration Behavior in Latin America Family Firms

Abstract

This research aims to explore the collaborative behavior of family firms based on their partners, the objective of cooperation, their market position, and the intensity of competition. This research used a N-Helix approach and implemented a multiple correspondence analysis in a sample of 127 Chilean family businesses of different ages, sizes, and industries. According to their collaboration behaviors, the data analysis proposes that family firms may be grouped into four clusters: explorers, audacious, hesitant, and hermetics. These clusters are defined principally by the number of collaborators and the goals of the collaboration. Additionally, Triple Helix and dyadic collaborative partnerships have been identified when exploring the cooperative behavior of family firms. These research findings have implications for understanding the dynamics of family firms' collaboration and analyzing the critical strategical issues found in family firms' collaborative behavior.

Keywords: family firms, N-Helix, collaboration behavior, strategic decisions, innovation, knowledge-based ecosystem

Exploradors, audaços, vacil·lants i hermètics: dinàmiques de N-Helix i comportament de col·laboració a les empreses familiars d'Amèrica Llatina

Resum

Aquesta recerca pretén explorar el comportament col·laboratiu de les empreses familiars en funció dels seus socis, l'objectiu de la cooperació, la seva posició en el mercat i la intensitat de la competència. Aquesta investigació emprà un enfocament N-Helix i implementa una anàlisi de correspondència múltiple en una mostra de 127 empreses familiars xilenes de diferents edats, mides i indústries. Segons els seus comportaments de col·laboració, l'anàlisi de dades proposa que les empreses familiars es puguin agrupar en quatre grups: exploradors, audaços, vacil·lants i hermètics. Aquests clústers es defineixen principalment pel nombre de col·laboradors i els objectius de la col·laboració. A més, s'han identificat associacions col·laboratives Triple Hèlix i diàdiques en explorar el comportament cooperatiu de les empreses familiars. Aquests resultats de la recerca tenen implicacions per entendre la dinàmica de col·laboració de les empreses familiars i analitzar els problemes estratègics crítics que es troben en el comportament col·laboratiu de les empreses familiars.

Paraules clau: empreses familiars, N-Helix, comportament col·laboratiu, decisions estratègiques, innovació, ecosistema basat en el coneixement

Exploradores, audaces, vacilantes y herméticos: dinámicas N-Helix y comportamientos de colaboración en empresas familiares de América Latina

Resumen

Esta investigación tiene como objetivo explorar el comportamiento colaborativo de las empresas familiares en función de sus socios, el objetivo de la cooperación, su posición en el mercado y la intensidad de la competencia. Esta investigación usa un enfoque N-Helix e implementa un análisis de correspondencias múltiples en una muestra de 127 empresas familiares chilenas de diferentes edades, tamaños e industrias. Según sus comportamientos de colaboración, el análisis de los datos propone que las empresas familiares pueden agruparse en cuatro grupos: exploradoras, audaces, vacilantes y herméticas. Estos clústeres se definen principalmente por el número de colaboradores y los objetivos de la colaboración. Además, se han identificado asociaciones de colaboración diádica y de triple hélice al explorar el comportamiento cooperativo de las empresas familiares. Los hallazgos de esta investigación tienen implicaciones para comprender la dinámica de la colaboración de las empresas familiares y analizar las cuestiones estratégicas críticas que se encuentran en el comportamiento colaborativo de las empresas familiares.

Palabras clave: empresas familiares, N-Helix, comportamiento colaborativo, decisiones estratégicas, innovación, ecosistema basado en el conocimiento

Introduction

Cooperative behavior in family firms has been capturing interest recently; however, research on collaborative preferences in these companies has lagged compared with other issues in the field (Feranita, Kotlar, and De Massis 2017). Family firms have unique characteristics that define their collaborative behavior—for example, the strong desire to retain control of business operations and preserve their socio-emotional wealth (Anderson, Duru, and Reeb 2012; Gomez-Mejia et al. 2014; Berrone, Cruz, and Gomez-Mejia 2012). Previous research has demonstrated that family firms are reluctant to participate in collaborative partnerships despite the benefits they may gain, such as capital, information, knowledge, and technology (Niето, Santamaria and Fernandez 2015; Feranita, Kotlar and De Massis 2017; Ibáñez 2021a). Furthermore, it is more difficult for family businesses to find partners for collaboration with whom they feel comfortable while not compromising their socio-emotional wealth (Cesinger et al. 2016).

Collaborative innovation has been recognized as a source of competitive advantage; it allows firms to improve their dynamic capabilities and add value to their strategic chain (Liao, Hu and Ding 2017; Moon, Mariadoss and Johnson 2019; Tajeddini and Ratten 2020; Zaridis, Vlachos and Bourlakis 2021). In this vein, the Triple Helix Model is a famous approach to understanding multiple-actor collaborations, specifically university-industry-government partnerships (Leydesdorff and Etzkowitz 1996; Etzkowitz 2003; Cai and Etzkowitz 2020). However, the Triple Helix is not a unique collaboration dynamic; there are dyad relationships (between two agents) and the N-Helix model—i.e., a partnership with n actors. To the best of our knowledge, there is no previous research relating the N-Helix model to the collaboration

strategies of family firms. There is an important gap in the literature related to the N-Helix and the dynamic of collaboration in family businesses (Calabrò et al. 2019; Baía and Franco 2023; Soler-Porta, Padilla-Meléndez and Rodríguez-Díaz 2019). To contribute to this field, this study seeks to answer the questions: How do family businesses behave in terms of their collaboration strategies? What strategic issues are involved in family business collaboration strategies? In this study, we consider the effect of a Latin American context on the N-Helix conceptual model.

This research implements a multiple correspondence analysis (MCA) to explore the collaborative behavior of the family firms based on their types and number of partners, the goal of the cooperation, their market position, and the intensity of competition. The data is retrieved from the 2017 Fifth Longitudinal Survey of Business (ELE5, for its acronym in Spanish: Quinta Encuesta Longitudinal de Empresas). The sample contains 127 Chilean family firms of different ages, sizes, and industries (INE 2017). According to their collaboration behaviors, the data analysis proposes that family firms could be grouped into four clusters: *explorers*, *audacious*, *hesitant*, and *hermetics*. These clusters are defined principally by the number of collaborators and the goals of the collaboration. Triple Helix and dyadic collaborative partnerships have been identified in family firms' cooperation behavior. The results suggest that Chilean family firms' N-Helix associations and collaboration goals are critical elements in developing partnership strategies.

The findings in this research have implications for understanding the dynamics of family firms' collaboration and analyzing the critical strategic issues family firms face when considering their collaboration behavior in the

Latin American context. The cooperative behavior in family firms is a developing field of research with many unanswered questions to explore. This research contributes new insights regarding strategic configurations in the family firms' partnership behavior, enriches the literature on N-Helix models in a family business context, and identifies a novel research direction in this field.

This document is organized as follows: Section two presents the theoretical framework, while the methodology design is explained in section three. Section four develops the results and discussion, followed by section five covering the conclusions of this paper.

Theoretical Framework

In the family business field, collaborative innovation has recently captured the interest of academia while showcasing the lack of comprehensive research in this area (Feranita, Kotlar and De Massis 2017). Family firms have different behavior towards innovative collaborations as compared to non-family firms because family businesses have distinctive characteristics that define their strategic decisions (Bigliardi and Galati 2018; Fernández-Roca and Gutiérrez 2017; Soler-Porta, Padilla-Meléndez and Rodríguez-Díaz 2019). The decision-making process in family firms is challenging to understand due to heterogeneity in the family business systems. In this vein, the strategic directions of family firms depend on the negotiation between three entities: owner, family, and business (Ramadani et al. 2020; Guillén-Gorbe and Escribá-Esteve 2021; Stanley et al. 2019). Thus, the decision-making should account for the owner's expectations, the needs of any family members, and the business's future success.

A central concern for the family business is to

retain control of their business operations, an endeavor that some see as a counter to the aim of collaboration (Anderson, Duru, and Reeb 2012; Gomez-Mejia et al. 2014). However, long-term orientation and the objectives of preserving family businesses' social-emotional wealth (SEW) may lead to collaborative activities if the long-term benefits are worth losing part of the firm's control through cooperation (Berrone, Cruz and Gomez-Mejia 2012). While collaboration can provide access to resources such as capital, information, knowledge, and technology, family firms may be reluctant to engage in strategic partnerships that interfere with retaining control of the firm (Ibáñez 2021a; Feranita, Kotlar and De Massis 2017; Nieto, Santamaria and Fernandez 2015).

The base system of shared family values, an essential SWE attribute, is a critical consideration when family firms make strategic collaboration decisions (Baía and Franco 2023). Thus, it is more difficult for a family business to find partners for collaboration with whom they feel comfortable while not compromising their SEW (Cesinger et al. 2016). Moreover, family firm collaborative behavior is primarily oriented to safeguard the SEW, where some businesses show a lack of willingness to use external sources of innovation, and others offer more confidence in exploring new alliances (Pittino et al. 2013; Nieto, Santamaria and Fernandez 2015; Stieg et al. 2018). In this vein, Kafaji (2020) proposes that firms take a corporate entrepreneurship strategy using internal collaboration and authority delegation to encourage employees to share new ideas for business growth. This finding suggests that some firms use their internal knowledge capabilities and innovation resources more than external sources. On the other hand, Ibáñez (2021a) found that not all family businesses have a limited scope for seeking collaborating partners because more

conservative family businesses are willing to explore beyond their existing networks for potential collaborative partners to engage in strategic activities. There is an important gap in the literature related to the N-Helix and the dynamics of collaboration in a family business (Calabrò et al. 2019; Baía and Franco 2023; Soler-Porta, Padilla-Meléndez and Rodríguez-Díaz 2019). To the best of our knowledge, there is no previous research regarding the N-Helix and the cooperation strategies of family firms.

The N-Helix model

The Triple Helix Model (THM) proposes that the interaction between university-industry-government is essential for promoting the conditions for innovation in a knowledge-based society (Etzkowitz 2003; Leydesdorff and Etzkowitz 1996; Cai and Etzkowitz 2020). Universities, industry, and the government differ in the characteristics and goals of their innovation activities. Universities are focused on producing new knowledge in scientific and technological fields; the government is interested in developing mechanisms for adapting and applying this new knowledge to the industry; the firms in the industries seek to exploit the innovation to improve their performance and competitiveness (Jeong 2014; Bărbulescu and Constantin 2019; Vătămănescu et al. 2022; Spriggs et al. 2013). The THM emphasizes that the driver of economic development is the production and transfer of socially-organized knowledge and the three actors (university-industry-government) contribute to the generation of wealth, novelty production, and normative control (Vaivode 2015; Carayannis and Campbell 2010; Del Giudice, Carayannis and Maggioni 2017). In addition, the THM is not a unique collaboration dynamic; there are dyadic relationships (between two agents) and the N-Helix model – i.e., a partnership with n actors.

Previous research suggests that N-Helix cooperation positively affects business innovation, and the strategic advantages of cooperation emerge from interfirm collaboration and collaboration with universities and the government (Hernández-Trasobares and Murillo-Luna 2020; Natário, Almeida-Couto and Fernandes-Roque-de-Almeida 2012). Thus, the N-Helix is a driver for cooperative networks and has positive consequences for regional development and competitiveness (Farinha, Ferreira, and Gouveia 2016; Fischer et al. 2018; Kobarg, Stumpf-Wollersheim, and Welpé 2018). Moreover, N-Helix actors can significantly benefit from knowledge or technology transfers by accessing better resources to impact their initiatives (Ibáñez et al. 2022). However, some companies prefer to maintain control of their innovation activities and exploit their benefits as much as possible instead of sharing knowledge with other actors (Mascarenhas, Marques, and Ferreira 2020). In this vein, the N-Helix collaborations depend on several factors—e.g., an actor's willingness to cooperate, institutional efficacy of agents, geographical distance between participants, and the relationship between development activities and knowledge production (Mukherji and Silberman 2021; Carboni and Medda 2021; Dzisah and Etzkowitz 2008).

Strategic considerations in collaborative relationships

Collaborative innovation has been recognized as a source of competitive advantage because, through the partnership, the firms can improve their dynamic capabilities and add value to their strategic chain (Liao, Hu, and Ding 2017; Moon, Mariadoss, and Johnson 2019; Zaridis, Vlachos and Bourlakis 2021; Tajeddini and Ratten 2020). However, the collaboration relationships in N-Helix are exposed to various risks, such as opportunism, unobservable effort,

incomplete information transfers, and power asymmetries (Williamson 1985; Eeckhoudt, Gollier, and Schlesinger 2005; Costello 2013; Lo and Hung 2017). Thus, increasing the number of partners increases these risks in collaborative relationships leading most firms to prefer involvement in bilateral cooperation rather than N-Helix (Henttonen and Lehtimäki 2017; Kilenthong, Hultman, and Hills 2016; Martin, Romero, and Wegner 2019). Therefore, the strategic considerations regarding competition intensity and market position are strongly related to a firm's willingness to be involved in a collaborative relationship (Lundqvist 2018; De-Lima and Dâmaso 2019). Additionally, the competitive pressures may lead to acquisitions and merges; Williams, Young, and Coffey (2017) suggest that the more partners a firm had, the more likely it was to be acquired by a partner than an unrelated firm or competitor. These dynamics run counter to the aim of a family business to retain their control of the company and preserve the SEW. Therefore, it is reasonable that family firms avoid collaboration relationships such as N-Helix in environments with highly competitive intensity. Moreover, some companies avoid cooperation with competitors because innovative firms may fear the leakage of proprietary knowledge to rivals (Belderbos et al. 2018).

A basis for the collaborative alliance is trust and reputation, and the firms must be willing to share knowledge and strategic resources in a mutually beneficial way (Rybnicek and Königsgruber 2019). The companies better positioned in the market tend to have a better reputation than businesses with low market participation. An essential aspect of reputational advantages is the distribution of power in collaborative relationships; thus, the firms with better market positions have more power to influence collective decisions to their

advantage within the partnership (Dewulf and Elbers 2018; Saito and Ruhanen 2017; Lo and Hung 2017). According to the theory of family business reputation, family identity is an asset with a high strategic value that provides advantages for the positioning of these firms (Deephouse and Jaskiewicz 2013; Alonso-Dos-Santos, Llanos-Contreras and Farías 2019; Bravo et al. 2017; Melero-Polo and López-Pérez 2017). Therefore, the reputational advantages of family firms may improve their confidence in a better market position and their capacity to retain power and control in a collaborative relationship (Dick, Wagner, and Pernsteiner 2021; Neckebrouck, Meuleman, and Manigart 2021).

Another critical strategic consideration in collaborative partnerships is the collaboration goals. The collaboration goals depend on the firms' needs and the capacity of the knowledge-based environment to satisfy those needs. The knowledge accumulated between N-Helix agents may be non-technological innovations—e.g., market-oriented innovations, such as alliances for new marketing strategies, promotion of the business, new product/service development, and improved distribution systems (Mascarenhas, Marques, and Ferreira 2020). On the other hand, the typical goal of N-Helix collaboration is technological innovation, which includes activities such as technological development, technology transfer, and technical assistance (Etzkowitz 2003; Jeong 2014; Mascarenhas, Marques, and Ferreira 2020).

The primary motivation to be involved in collaborative strategy and innovation activities is to monetize these initiatives to improve the firm's performance. In the family firm system, their primary goals that equal success are to maintain the business and pass it on to future generations. In this vein, family firms may not

be very different from non-family businesses. Ibáñez (2021b), using a sample of Chilean firms, found that companies involved in N-Helix partnerships with market goals have better performance than firms that do not collaborate. In turn, Vătămănescu et al. (2022) suggest that high market competition intensity positively influences innovative firm performance, business interest in competitive exchange of knowledge, and willingness to be involved in a direct partnership. Additionally, Spriggs et al. (2013) found that the concentrated family firm ownership combined with a high network collaborative orientation improves the relationship between innovation capability and firm performance. The authors propose that this link is enhanced by dispersed family firm ownership combined with low network collaborative orientation. These findings confirm that family firms' collaboration behavior is a context-based strategy depending on the family firm system, collaboration goals, and market conditions.

Methodology

This research implemented a multiple correspondence analysis (MCA) to explore the collaborative behavior of the family firms based on their partners, the objective of cooperation, their market position, and the intensity of competition. The MCA was estimated using a principal variable method of normalization and extracting two dimensions. The model also includes three supplementary variables that represent firm characteristics: age, size, and industry. Thus, the MCA is a suitable method for measuring the association between multiple categorical variables and graphically representing these relationships.

The data is retrieved from the 2017 Fifth Longitudinal Survey of Business (ELE5). This

database is the most complete instrument for representing the Chilean business ecosystem because it contains information from 6,480 firms (INE 2017). The sample was selected using only family firms, specifically those businesses owned 85% or more by family members. The observations with missing values for interest variables were discarded, and the final sample contains 127 Chilean family firms with different ages, sizes, and industry characteristics. Chile is a very attractive context to explore cooperative behavior in family firms in the Latin American context. Chile has a well-developed environment for collaborative business models that includes specific R&D programs promoted by the government and the scientific communities (CORFO 2021).

Principal variables in the study are N-Helix collaboration by number and type of agent, the objective of cooperation, market position, and competition intensity. The manager of the firm provides the information by answering the questionnaire of ELE5 survey. The N-Helix collaboration is measured by the statement, '*Indicate if your company is currently involved in any cooperative relationship with any of these actors.*' The options available are Government, Industry, University, and None; the manager can select more than one option. The collaboration's objective is measured by the statement, '*Indicate the reasons why the company has established partnerships with other companies.*' The possibilities are market goals (marketing, promotion, new product development, distribution), technology goals (technological development, technology transfer, technical assistance), and none. Again, the manager can select more than one option. The variable market position is measured using the sentence, '*On a scale of 1 to 5, where one is not very important, and five is very important, indicate how relevant (in terms of sales volume)*

you consider your company to be compared to all your competitors.' Finally, the variable of competition intensity is measured using the sentence, 'On a scale of 1 to 5, where one is low, and five is high, refer to the number of competitors your company faces.'

Auxiliary variables are age, measured by five ascendant categories; size, measured by four categories established by the Ministry of Economy of Chile according to sales volume; and industry, classified in 13 economic sectors. Descriptive statistics are reported in Table 1.

TABLE 1. DESCRIPTIVE STATISTICS

Variable	Min	Max	Share	Mean	S.D.
N-Helix	1	3		2.64	0.626
Competition Intensity	1	5		3.77	1.229
Market Position	1	5		3.19	1.167
Size	1	4		1.83	1.167
Age	1	5		2.47	1.104
Primary Sector			0.31		
Secondary Sector			0.24		
Tertiary Sector			0.45		
Market Goal ^a			0.30		
Technology Goal ^a			0.18		
Mixed Goal ^a			0.53		
Family Firms Collaborating			0.28		
Family Firms Not Collaborating			0.72		

Note: S.D. = Standard Deviation.

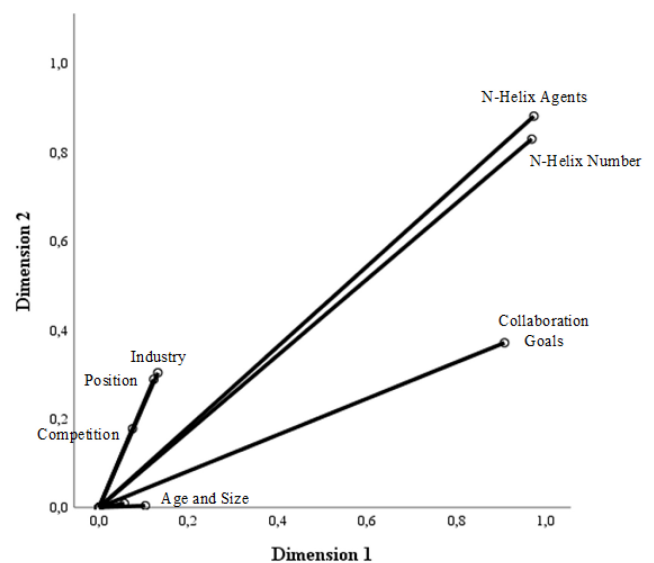
^a Share of the companies that collaborate.

Sources: Own elaboration.

Results

According to discriminant measures, the model extracts two dimensions. The first dimension explains 0.609 of the inertia, while the second dimension explains 0.509 of the inertia. The categories grouped in the first dimension show a Cronbach's α of 0.840, and in the second dimension, the Cronbach's α is 0.759. Thus, the total inertia explained by the model is 1.118. Appendix 1 shows the model's fit measures, and Appendix 2 provides the transformed correlation matrix and discriminant measures. The discriminant map (Figure 1) indicates that the N-Helix (Triple Helix and Dyad) dimensions and collaboration goals are the most explicative variables in the model because they are situated further from the origin.

FIGURE 1. DISCRIMINANT MAP

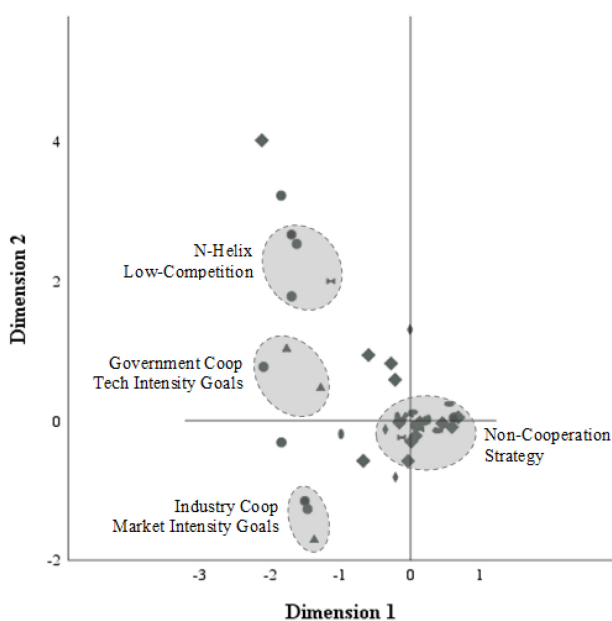


Sources: Own elaboration.

Figure 2 shows that there are four strategic groups related to collaboration strategies in family firms. The first group defines a strategic profile based on Triple Helix collaboration and perception of the low competition in the market. The second group is characterized by cooperation with only the government and technology-intensive goals. The third strategic profile is defined by collaboration with only those in the industry and market-intensive goals. Finally, the fourth group represents a non-collaborative strategy. Figure 3 shows how family firms are situated in four positions according to proximity with each dimension. The map of the firm's position can identify locations A, B, C, and D. Each of these positions have different levels of proximity to each strategic profile defined above.

To identify the proximity of family firms with each strategic profile, the map of strategic groups and map of firms' positions overlap. Figure 4 shows both maps combined in a single map that indicates the concentration of firms in

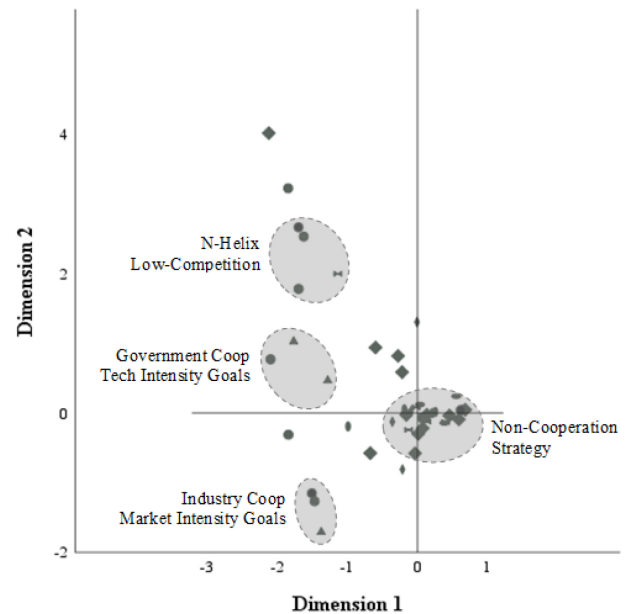
FIGURE 2. MAP OF CATEGORIES ASSOCIATION



Sources: Own elaboration.

each strategic profile. The integrated map distinguishes four clusters of companies I, II, III, and IV, defined by their proximity to strategic profiles of collaboration. Cluster I show the

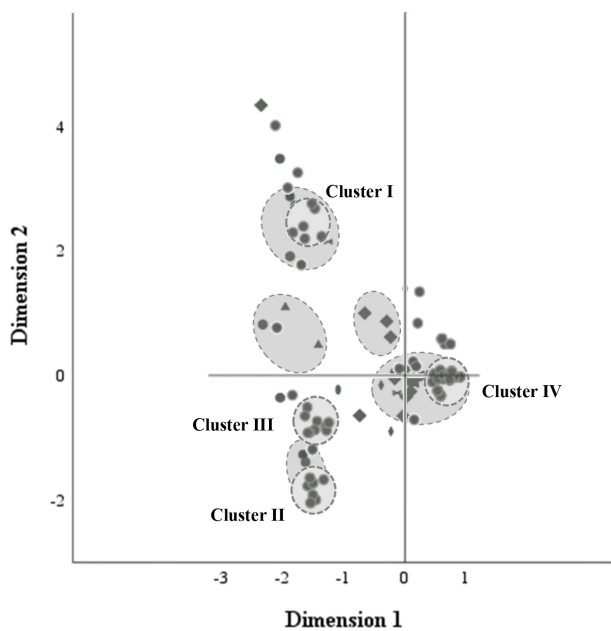
FIGURE 3. MAP OF THE FIRMS' POSITIONS



Sources: Own elaboration.

family firms involved in N-Helix collaborations in a low-competition environment. This cluster is a well-defined group and embedded in the first strategic profile (N-Helix+Low-Competition). The family firms included in this cluster may be *explorers*. Cluster II grouped the family firms involved in a dyadic inter-firm collaboration (industry partner) with market-oriented innovation goals. This cluster is a well-defined group and embedded in the third strategic profile (Industry+Market Goals). The family firms in cluster II may be *audacious*. Cluster III is not embedded in a defined strategic profile; however, it is close to the third strategic profile and the *audacious* cluster. The family firms in cluster III may be *hesitant*. Finally, cluster IV is embedded in the non-collaborative strategy profile and may be called *hermetics*.

FIGURE 4. MAP OF THE FIRMS' POSITION BY CATEGORIES



Sources: Own elaboration..

Discussion

This research aims to explore the cooperative behavior of family firms by assessing their strategic business relationships, precisely the type and number of partners, collaboration goals, market positions, and the intensity of competition. Multiple correspondence analysis is conducted to answer two research questions formulated: How do family businesses behave in terms of their collaboration strategies? What strategic issues are involved in the collaboration strategies of family businesses? The sample contains 127 Chilean family businesses with different characteristics included in the ELE5 database (INE 2017). The findings propose that family firms in the sample show four collaborative behavioral patterns: *explorers*, *audacious*, *hesitant*, and *hermetics*, based on type and number of partners, collaboration goals, and perceived competition intensity. Additionally, the results suggest two types of cooperative associations that Chilean family firms engage in: dyadic and Triple Helix partnerships.

The high discriminant power of N-Helix and collaboration goals is an interesting demonstration of the heterogeneous behavior of family firms in terms of collaboration strategies. Although family firms are reluctant to be involved in collaborative relationships, the pattern of these collaborations is a differentiating element among family businesses (Nieto, Santamaria, and Fernandez 2015; Feranita, Kotlar, and De Massis 2017; Ibáñez 2021a). Moreover, perceptions regarding a firm's competition and market position are very similar between family firms, suggesting that market conditions may not determine their overall perception of competition.

Family firm collaboration behavior

This research proposes four behavioral patterns that define the collaborative strategies of family firms: *explorers*, *audacious*, *hesitant*, and *hermetics*. The *explorer* behavior suggests that family firms are engaged in collaborative relationships with multiple partners and do not associate with specific collaboration goals (i.e., technological or market innovations) (Henttonen and Lehtimäki 2017; Pittino et al. 2013). The *audacious* behavior refers to family firms willing to share their market knowledge with competitors and members of their value chain (Lo and Hung 2017; Puranam, Alexy, and Reitzig 2014). The *hesitant* behavior implies that family firms are not involved in a collaborative partnership; however, they are close with the industry collaboration ecosystem oriented towards market innovation goals (Bigliardi and Galati 2018; Ibáñez 2021a). Finally, the *hermetics* behavior shows family firms that do not engage in collaborative partnerships.

The significant concentration of family firms in the *hermetic* cluster confirms previous findings regarding the prevalence of non-cooperative

patterns in family businesses (Calabrò et al. 2019). However, despite the *hermetic* group not showing any inclination towards cooperative relationships, the *hermetic* family firms may undertake technological and non-technological innovation strategies without sharing them with other companies. The same thing occurs with the *hesitant* cluster; the *hesitant* family firms are undecided on collaboration but can undertake innovation strategies behind closed doors (Nieto, Santamaria, and Fernandez 2015; Feranita, Kotlar, and De Massis 2017). Firms can take internal corporate entrepreneurship strategies in this vein, i.e., encourage employees to share new ideas via internal collaboration activities and authority delegation (Kafaji 2020).

The Triple Helix collaboration strategy in family firms

One type of collaboration strategy in Chilean family firms is defined by collaboration with a university-industry-government, known as a THM (Leydesdorff and Etzkowitz 1996; Etzkowitz 2003). In this vein, the type of collaboration that the family firms may undertake in the Chilean business ecosystem can be with the industry: business federations, neighboring company partnerships, and interfirm cooperation; with the university: technology consortia and university R&D programs; and with the government: regional government committees and productive promotion systems (INE 2017). This collaboration strategy is complemented with the perception of low competition intensity and is compatible with the explorer behavior.

The association between the high number of collaboration partners and low competition intensity suggests that, in a non-aggressive business environment, family firms may perceive a low risk by forming collaborative alliances. Therefore, they are more willing to

engage in multiple partnerships to share their knowledge and resources if they believe that their partners will not threaten the benefits of the collaboration or their SEW (Bigliardi and Galati 2018; Pittino et al. 2013; Belderbos et al. 2018). There are no specific collaboration goals in this strategy—i.e., the family firms in this group may be more willing to undertake exploration-oriented alliances towards technological and non-technological goals (Pittino et al. 2013).

The dyadic collaboration strategies in family firms

Another collaboration strategy in Chilean family firms involves the partnership between two agents or a dyadic collaboration: the family firm and one partner. In a dyadic partnership with the government, the collaboration goal is technological innovation—i.e., technological development, technology transfer, and technical assistance. Traditionally, government involvement in cooperation is related to financial support and regulatory mediation between universities and industries, and it is not recognized as an active actor in knowledge creation (Yee, Chong, and Kendall 2015; Gachie 2020; Rosenfeld 1996; Feldman and Kelley 2006). However, this study findings suggest that the government may have a more influential role in its partnerships with Chilean family firms. In this vein, Mascarenhas, Marques, and Ferreira (2020) propose that governments may have direct participation in innovation and do not only act as a financier or legislators. Furthermore, the absence of universities in the strategic collaboration profiles detected in this study may indicate that the government takes the institutional and the incubator role of technological innovation that emerges from the firms.

The dyadic collaboration between family firms and industry is associated with market-

oriented goals—i.e., alliances for new marketing strategies, sharing promotions, new product development, and improved distribution efficiency. This is a remarkable finding because inter-firm collaboration for shared market knowledge may be considered the riskiest type of cooperation (Belderbos et al. 2018; Lo and Hung 2017). The dyadic collaborative strategy (sharing market knowledge) is compatible with the *audacious* behavior. In this vein, the reputational advantages of a family business may place it in a desirable position with regards to the industry, which may allow it to have a broader range of potential partners with whom it can collaborate (Deepphouse and Jaskiewicz 2013; Neckebrouck, Meuleman, and Manigart 2021). In the dyadic relationship with industry, family firms may engage in cooperative behavior with known partners, including suppliers, distributors, and customers (vertical collaboration), or enter into collaborative arrangements with competitors (horizontal collaboration) (Lewis, John, and Martin 2015).

Heterogeneity in the collaborative behavior of family firms

The heterogeneity observed in this research on the family firms' collaborative behavior could be attributed to differences in family business systems, i.e., depending on specific configurations of owner-family-business subsystems (Gersick et al. 1997; Westhead and Howorth 2007; Müller and Sandoval-Arzaga 2021). In this context, issues influenced by the generation in charge, family management, and family values may impact the cooperative behavioral strategies adopted by different family firms. Additionally, the Chilean business ecosystem may influence the collaborative behavior of family firms in several ways. In Chile, there are various collaborative R&D programs funded by the government and other institutions and a favorable market

environment for forming partnerships (CORFO 2021). Therefore, the findings of this research cannot be generalized and offer a first approach to studying N-Helix dynamics in the context of family firms in Latin America.

The family firms may not be very different from non-family firms in terms of aims to achieve better performance. In this vein, the collaborative strategies and innovation activities are mechanisms to improve the business's performance (Spriggs et al. 2013; Vătămănescu et al. 2022; Ibáñez 2021b). Also, the decision-making process on partnerships and innovation depends on the family firms' capability to monetize the benefits of these initiatives. Although previous research has demonstrated that the family firms are reluctant to interfirm collaboration, this study detected an audacious behavior pattern, where family firms collaborate with other companies and do it in the riskiest way, i.e., sharing market knowledge and activities. Also, family firms may be *explorers* and involved in partnerships with various actors and following more than one collaboration goal.

These family firms' non-traditional behaviors (*audacious* and *explorer*) remain the Gomez-Mejia, Neacsu, and Martin (2019) suggestions that family businesses are willing to assume a level of risk that allows them to survive and avoid financial and socio-emotional losses. Moreover, when socio-emotional wealth is threatened, family businesses can take excessive levels of risk, such as *audacious* or *explorer* behavior.

Conclusions

The collaborative behavior of family firms is a little-explored topic in the literature. Principal insights in the current discussion in the field are that the lack of willingness to cooperate

between family firms and other institutions may be explained by a fear of losing control of the company and its SEW. Although family firms are reluctant to form collaborative alliances, this research shows that innovation strategy is a source of differentiation for those businesses. The different clusters identified—*explorers*, *audacious*, *hesitant*, and *hermetics*—may contribute to understanding the collaboration strategies of different family firms' structures and disclose the main collaboration goals behind these strategic decisions.

This research contributes to our understanding of family firms by providing new insights into their collaboration behavior and identifying strategic issues related to their choices. By examining the role of competitive intensity and the market position of family firms, this study concludes that these perceptions are very similar between businesses and are weakly related to strategic patterns of partnerships. This is a remarkable finding because it suggests that other strategic conditions may influence the family firms' collaboration behavior, such as risk preferences, the developmental level of the knowledge-based ecosystem, or the specific innovation needs of these companies. Although the family firms are concentrated in the *hermetic* cluster, identifying another three profiles (*explorers*, *audacious*, and *hesitant*) reveals that these firms are sometimes willing to undertake Triple Helix and dyadic collaborative alliances to improve their ability to reach their individual technological and non-technological innovation goals. The non-specific collaboration goals in *explorers'* behavior may indicate that family firms undertake exploration-oriented alliances with technological and non-technological innovation aims. A surprising finding in this work is the low presence of universities in the partnership preferences of family firms and that the

government plays an active role in dyadic cooperative relationships aimed at technological innovation.

Some limitations are detected in this research and may open new avenues for future research. The sample is limited to Chilean family businesses; however, future works can replicate this study in different countries to consider diverse development levels and distinct cultural contexts. For example, this research may benefit from empirical approaches to determine the influence of each family firm's collaborative behaviors (*explorers*, *audacious*, *hesitant*, and *hermetics*) on company performance, such as profits, innovation indicators, and a firm's control. Another interesting way is identifying the drivers and challenges influencing the collaborative behavior of family firms and how the actors of the N-Helix partnership can contribute to the growth and competitiveness of these firms.

Contributions and implications

This research makes two main contributions to family firms' theory. First, the family firms' heterogeneity may explain the different collaborative behavior observed, i.e., the collaboration strategy is a context-based phenomenon that depends on the family business system and external conditions. In this vein, the findings suggest four different collaborative behaviors displayed by family firms in the Chilean ecosystem: *explorers*, *audacious*, *hesitant*, and *hermetics*. These behaviors depend on the number and types of partners and collaboration goals. Therefore, the suggestion that family firms are reluctant to be involved in a partnership may be an incomplete understanding of these business decision-making processes that may lead to heterogeneous collaborative behavior patterns.

The second theoretical contribution of this research is extending the N-Helix approach to family business collaboration strategies. The variety of family firms' collaborative behaviors may emerge from the number and types of partners. The different N-Helix partnership configurations observed introduce a new avenue to analyze family firms' cooperation decisions on strategic issues involving risky sharing of knowledge and resources as market-oriented collaboration activities. Although this research is limited to Chilean context and suggestions do not generalize, this study's insights may open new possibilities to test the findings in other scenarios.

From a practical point of view, this research's findings have implications for Chilean N-Helix collaborators, public policy, and practitioners. The results reveal a gap in universities' participation in N-Helix partnerships with family firms. The universities may seek opportunities to improve their active role in the knowledge-based ecosystem to support family businesses and reinforce the mechanisms that promote university-industry cooperation, such as technology transfer, industry-oriented knowledge production, and technical assistance. The government may increase the R&D programs promotion among *hesitant* and *hermetics* family firms to encourage their participation in the knowledge-based ecosystem. The owners and managers of family firms, especially in the *hesitant* and *hermetic* clusters, may seek suitable partners in the knowledge-based environment, exploiting the reputational advantages to attract the best partners candidates for collaboration. Furthermore, the reputational advantages of a family business may place it in a desirable position within the industry, which may allow it

to have a broader range of potential partners with whom it can collaborate. The Chilean family firms may benefit from partnerships to develop and improve their innovation capabilities and increase their innovation and financial performance.

APPENDIX 1. FIT MEASURES

Dimension	Cronbach's α	Variance accounted for		
		Total (eigenvalue)	Inertia	% Variance
1	0.840	3.046	0.609	60.910
2	0.759	2.545	0.509	50.898
Total		5.590	1.118	
Mean	0.803	2.795	0.559	55.904

Sources: Own elaboration.

APPENDIX 2. TRANSFORMED CORRELATION MATRIX AND DISCRIMINANT MEASURES

	N-Helix Agents	Cooperation Goals	N-Helix Number	Competition Intensity	Market Position	Size ^a	Age ^a	Industry ^a
N-Helix Agents	1.000							
Collaboration Goals	0.929	1.000						
N-Helix Number	0.998	0.928	1.000					
Competition Intensity	0.195	0.165	0.218	1.000				
Market Position	0.260	0.212	0.265	-0.015	1.000			
Size ^a	0.243	0.235	0.247	0.007	0.048	1.000		
Age ^a	0.323	0.311	0.318	-0.015	0.161	0.042	1.000	
Industry ^a	0.352	0.333	0.354	0.223	0.090	0.012	0.050	1.000
Dimension	1	2	3	4	5			
Eigenvalue ^b	3.046	1.014	0.846	0.092	0.002			
<i>Discriminant measures</i>								
Dimension 1	0.988	0.907	0.973	0.075	0.122	0.057	0.103	0.132
Dimension 2	0.829	0.370	0.880	0.177	0.288	0.009	0.004	0.303
Mean	0.899	0.639	0.927	0.126	0.205	0.033	0.054	0.217

Notes. ^a Auxiliary variable. ^b Excluding auxiliary variables.

Sources: Own elaboration.

References

- Alonso-Dos-Santos, Manuel, Orlando Llanos-Contreras, and Pablo Farías. 2019. "Family Firms' Identity Communication and Consumers' Product Involvement Impact on Consumer Response." *Psychology & Marketing* 36(8): 791–98. <https://doi.org/10.1002/mar.21212>.
- Anderson, Ronald, Augustine Duru, and David Reeb. 2012. "Investment Policy in Family Controlled Firms." *Journal of Banking & Finance* 36(6): 1744–58.
- Baía, Elisabeth, and Mário Franco. 2023. "Interfirm Cooperation and Engagement Barriers in a Family Business Context." *International Journal of Organizational Analysis* 31(2): 368–86. <https://doi.org/10.1108/IJOA-03-2021-2686>.
- Bărbulescu, Oana, and Cristinel Constantin. 2019. "Sustainable Growth Approaches: Quadruple Helix Approach for Turning Braşov into a Startup City." *Sustainability* 11(21): 6154. <https://doi.org/10.3390/su11216154>.
- Belderbos, René, Victor Gilsing, Boris Lokshin, Martin Carree, and Juan Fernández-Sastre. 2018. "The Antecedents of New R&D Collaborations with Different Partner Types: On the Dynamics of Past R&D Collaboration and Innovative Performance." *Long Range Planning* 51(2): 285–302. <https://doi.org/10.1016/j.lrp.2017.10.002>.
- Berrone, Pascual, Cristina Cruz, and Luis Gomez-Mejia. 2012. "Socioemotional Wealth in Family Firms: Theoretical Dimensions, Assessment Approaches, and Agenda for Future Research." *Family Business Review* 25(3): 258–79.
- Bigliardi, Barbara, and Francesco Galati. 2018. "Family Firms and Collaborative Innovation: Present Debates and Future Research." *European Journal of Innovation Management* 21(2): 334–58. <https://doi.org/10.1108/EJIM-05-2017-0054>.
- Bravo, Rafael, Jesús Cambra, Edgar Centeno, and Iguácel Melero. 2017. "The Importance of Brand Values in Family Business." *Journal of Evolutionary Studies in Business* 2(2): 16–43. <https://doi.org/10.1344/jesb2017.2.j029>.
- Cai, Yuzhuo, and Henry Etzkowitz. 2020. "Theorizing the Triple Helix Model: Past, Present, and Future." *Triple Helix* 7(2–3): 189–226. <https://doi.org/https://doi.org/10.1163/21971927-bja10003>.
- Calabrò, Andrea, Mariangela Vecchiarini, Johanna Gast, Giovanna Campopiano, Alfredo Massis, and Sascha Kraus. 2019. "Innovation in Family Firms: A Systematic Literature Review and Guidance for Future Research." *International Journal of Management Reviews* 21(3): 317–55. <https://doi.org/10.1111/ijmr.12192>.
- Carayannis, Elias, and David Campbell. 2010. "Triple Helix, Quadruple Helix and Quintuple Helix and How Do Knowledge, Innovation and the Environment Relate to Each Other?: A Proposed Framework for a Trans-Disciplinary Analysis of Sustainable Development and Social Ecology." *International Journal of Social Ecology and Sustainable Development* 1(1): 41–69. <https://doi.org/10.4018/jesed.2010010105>.
- Carboni, Oliviero, and Giuseppe Medda. 2021. "Innovative Activities and Investment Decision: Evidence from European Firms." *The Journal of Technology Transfer* 46(1): 172–96. <https://doi.org/10.1007/s10961-019-09765-6>.
- Cesinger, Beate, Mathew Hughes, Helge Mensching, Ricarda Bouncken, Viktor Fredrich, and Sascha Kraus. 2016. "A Socioemotional Wealth Perspective on How Collaboration Intensity, Trust, and International Market Knowledge Affect Family Firms' Multinationality." *Journal of World Business* 51(4): 586–99. <https://doi.org/https://doi.org/10.1016/j.jwb.2016.02.004>.
- CORFO — Corporación de Fomento de la Producción. 2021. "Bienvenidos a La Gerencia de Innovación." Programas de Apoyo a La

- Innovación. 2021. Accessed July 1. <https://www.corfo.cl/sites/cpp/area/movil/innovacion>
- Costello, Anna. 2013. "Mitigating Incentive Conflicts in Inter-Firm Relationships: Evidence from Long-Term Supply Contracts." *Journal of Accounting and Economics* 56(1): 19–39.
- De-Lima, Jorge, and Marlene Dâmaso. 2019. "Inter-Organizational Relations among Schools: Collaboration Rather than Competition." *Educational Management Administration & Leadership* 47(2): 259–74. <https://doi.org/10.1177/1741143217739356>.
- Deephouse, David, and Peter Jaskiewicz. 2013. "Do Family Firms Have Better Reputations Than Non-Family Firms? An Integration of Socioemotional Wealth and Social Identity Theories." *Journal of Management Studies* 50(3): 337–60. <https://doi.org/10.1111/joms.12015>.
- Del Giudice, Manlio, Elias Carayannis, and Vincenzo Maggioni. 2017. "Global Knowledge Intensive Enterprises and International Technology Transfer: Emerging Perspectives from a Quadruple Helix Environment." *Journal of Technology Transfer* 42(2): 229–35. <https://doi.org/10.1007/s10961-016-9496-1>.
- Dewulf, Art, and Willem Elbers. 2018. "Power in and over Cross-Sector Partnerships: Actor Strategies for Shaping Collective Decisions." *Administrative Sciences* 8(3): 43. <https://doi.org/10.3390/admsci8030043>.
- Dick, Markus, Eva Wagner, and Helmut Pernsteiner. 2021. "Founder-Controlled Family Firms, Overconfidence, and Corporate Social Responsibility Engagement: Evidence From Survey Data." *Family Business Review* 34(1): 71–92. <https://doi.org/10.1177/0894486520918724>.
- Dzisah, James, and Henry Etzkowitz. 2008. "Triple Helix Circulation: The Heart of Innovation and Development." *International Journal of Technology Management and Sustainable Development* 7(2): 101–15. https://doi.org/10.1386/ijtm.7.2.101_1.
- Eeckhoudt, Louis, Christian Gollier, and Harris Schlesinger. 2005. *Economic and Financial Decisions under Risk*. Princeton: Princeton University Press.
- Etzkowitz, Henry. 2003. "Innovation in Innovation: The Triple Helix of University-Industry-Government Relations." *Social Science Information* 42(3): 293–337. <https://doi.org/10.1177/05390184030423002>.
- Farinha, Luís, João Ferreira, and Borges Gouveia. 2016. "Networks of Innovation and Competitiveness: A Triple Helix Case Study." *Journal of the Knowledge Economy* 7(1): 259–75. <https://doi.org/10.1007/s13132-014-0218-3>.
- Feldman, Maryann, and Maryellen Kelley. 2006. "The Ex Ante Assessment of Knowledge Spillovers: Government R&D Policy, Economic Incentives and Private Firm Behavior." *Research Policy* 35(10): 1509–21. <https://doi.org/10.1016/j.respol.2006.09.019>.
- Feranita, Feranita, Josip Kotlar, and Alfredo De Massis. 2017. "Collaborative Innovation in Family Firms: Past Research, Current Debates and Agenda for Future Research." *Journal of Family Business Strategy* 8(3): 137–56.
- Fernández-Roca, Francisco, and Fernando Gutiérrez. 2017. "What Is a Family Business?" *Journal of Evolutionary Studies in Business* 2 (2): 1–15. <https://doi.org/10.1344/jesb2017.2.j028>.
- Fischer, Bruno, Paola Schaeffer, Nicholas Vonortas, and Sergio Queiroz. 2018. "Quality Comes First: University-Industry Collaboration as a Source of Academic Entrepreneurship in a Developing Country." *The Journal of Technology Transfer* 43(2): 263–84. <https://doi.org/10.1007/s10961-017-9568-x>.
- Gachie, Wanjiru. 2020. "Higher Education Institutions, Private Sector and Government Collaboration for Innovation within the Framework of the Triple Helix Model."

- African Journal of Science, Technology, Innovation and Development* 12(2): 203–15. <https://doi.org/10.1080/20421338.2019.1631120>.
- Gersick, Kelin E., John Davis, Marion Hampton, and Ivan Lansberg. 1997. *Generation to Generation: Life Cycles of the Family Business*. Boston: Harvard Business School Press.
- Gomez-Mejia, Luis, Joanna Campbell, Geoffrey Martin, Robert Hoskisson, Marianna Makri, and David Sirmon. 2014. "Socioemotional Wealth as a Mixed Gamble: Revisiting Family Firm R&D Investments with the Behavioral Agency Model." *Entrepreneurship Theory and Practice* 38(6): 1351–74.
- Gomez-Mejia, Luis, Ionela Neacsu, and Geoffrey Martin. 2019. "CEO Risk-Taking and Socioemotional Wealth: The Behavioral Agency Model, Family Control, and CEO Option Wealth." *Journal of Management* 45(4): 1713–38.
- Guillén-Gorbe, Tomás, and Alejandro Escribá-Esteve. 2021. "Heterogeneity in Family Firms." *Harvard Deusto Business Research* 10(1): 26–52. <https://doi.org/10.48132/hdbr.334>.
- Henttonen, Kaisa, and Hanna Lehtimäki. 2017. "Open Innovation in SMEs." *European Journal of Innovation Management* 20(2): 329–47. <https://doi.org/10.1108/EJIM-06-2015-0047>.
- Hernández-Trasobares, Alejandro, and Josefina Murillo-Luna. 2020. "The Effect of Triple Helix Cooperation on Business Innovation: The Case of Spain." *Technological Forecasting and Social Change* 161(December): 120296. <https://doi.org/10.1016/j.techfore.2020.120296>.
- Ibáñez, María José. 2021a. "Inter-Firm Marketing Collaboration in Family Businesses: The Role of Risk Aversion." *Journal of Small Business Strategy* 31(2 SE-): 53–61. Retrieved from <https://libjournals.mtsu.edu/index.php/jsbs/article/view/1781>.
- Ibáñez, María José. 2021b. "Insights from N-Helix to Practitioners. How Many Helices Are Enough, and Who Are the Best Partners?" *Academia Letters Article* 2640. <https://doi.org/10.20935/AL2640>.
- Ibáñez, María José, Maribel Guerrero, Claudia Yáñez-Valdés, and Sebastián Barros-Celume. 2022. "Digital Social Entrepreneurship: The N-Helix Response to Stakeholders' COVID-19 Needs." *The Journal of Technology Transfer* 47: 556-79. <https://doi.org/10.1007/s10961-021-09855-4>.
- INE – Instituto Nacional de Estadística. 2017. *Quinta Encuesta Longitudinal de Empresas*. Santiago de Chile: Ministerio de Economía.
- Jeong, Seongkyoon. 2014. "Strategic Collaboration of R&D Entities for Technology Convergence: Exploring Organizational Differences within the Triple Helix." *Journal of Management & Organization* 20(2): 227–49. <https://doi.org/10.1017/jmo.2014.31>.
- Kafaji, Mohammed. 2020. "Delegation and Collaboration Practices to Embrace Innovative Ideas for Business Growth in Small to Medium Enterprises." *International Journal of Entrepreneurship* 24(1): 1–8.
- Kilenthong, Pitsamorn, Claes Hultman, and Gerald Hills. 2016. "Entrepreneurial Orientation as the Determinant of Entrepreneurial Marketing Behaviors." *Journal of Small Business Strategy* 26(2): 1–21.
- Kobarg, Sebastian, Jutta Stumpf-Wollersheim, and Isabell Welp. 2018. "University-Industry Collaborations and Product Innovation Performance: The Moderating Effects of Absorptive Capacity and Innovation Competencies." *The Journal of Technology Transfer* 43(6): 1696–1724. <https://doi.org/10.1007/s10961-017-9583-y>.
- Lewis, Kate, Byrom John, and Grimmer Martin. 2015. "Collaborative Marketing in a Premium Wine Region: The Role of Horizontal Networks." *International Journal*

- of *Wine Business Research* 27(3): 203–19. <https://doi.org/10.1108/IJWBR-06-2014-0028>.
- Leydesdorff, Loet, and Henry Etzkowitz. 1996. "Emergence of a Triple Helix of University-Industry-Government Relations." *Science and Public Policy* 23(5): 279–86. <https://doi.org/10.1093/spp/23.5.279>.
- Liao, Shu-Hsien, Da-Chian Hu, and Li-Wen Ding. 2017. "Assessing the Influence of Supply Chain Collaboration Value Innovation, Supply Chain Capability and Competitive Advantage in Taiwan's Networking Communication Industry." *International Journal of Production Economics* 191(September): 143–53. <https://doi.org/10.1016/j.ijpe.2017.06.001>.
- Lo, Yi-Ju, and Tung Hung. 2017. "Is a Powerful Rival a Right Partner?" *Review of Managerial Science* 11(3): 661–90.
- Lundqvist, Bjorn. 2018. "Data Collaboration, Pooling and Hoarding under Competition Law." Faculty of Law, Stockholm University Research Paper, no. 61. <https://doi.org/10.2139/ssrn.3278578>.
- Martin, Domingo, Isidoro Romero, and Douglas Wegner. 2019. "Individual, Organizational, and Institutional Determinants of Formal and Informal Inter-Firm Cooperation in SMEs." *Journal of Small Business Management* 57(4): 1698–1711. <https://doi.org/10.1111/jsbm.12445>.
- Mascarenhas, Carla, Carla Marques, and João Ferreira. 2020. "One for All and All for One: Collaboration and Cooperation in Triple Helix Knowledge Cocreation." *International Regional Science Review* 43(4): 316–43. <https://doi.org/10.1177/0160017619889677>.
- Melero-Polo, Iguácel, and María López-Pérez. 2017. "Identifying Links between Corporate Social Responsibility and Reputation: Some Considerations for Family Firms." *Journal of Evolutionary Studies in Business* 2(2): 191–230. <https://doi.org/10.1344/jesb2017.2.j034>.
- Moon, Hakil, Babu Mariadoss, and Jean Johnson. 2019. "Collaboration with Higher Education Institutions for Successful Firm Innovation." *Journal of Business Research* 99(June): 534–41. <https://doi.org/10.1016/j.jbusres.2017.09.033>.
- Mukherji, Nivedita, and Jonathan Silberman. 2021. "Knowledge Flows between Universities and Industry: The Impact of Distance, Technological Compatibility, and the Ability to Diffuse Knowledge." *The Journal of Technology Transfer* 46 (1): 223–57. <https://doi.org/10.1007/s10961-019-09770-9>.
- Müller, Claudio, and Fernando Sandoval-Arzaga. 2021. "Conclusions, Lessons Learned, and New Avenues for Further Research." In *Family Business Heterogeneity in Latin America*, 125–44. Cham: Springer. https://doi.org/https://doi.org/10.1007/978-3-030-78931-2_7.
- Natário, Maria, João Pedro Almeida-Couto, and Carlos Fernandes-Roque-de-Almeida. 2012. "The Triple Helix Model and Dynamics of Innovation: A Case Study." *Journal of Knowledge-Based Innovation in China* 4(1): 36–54. <https://doi.org/10.1108/1756141121121208758>.
- Neckebrouck, Jeroen, Miguel Meuleman, and Sophie Manigart. 2021. "Governance Implications of Attracting External Equity Investors in Private Family Firms." *Academy of Management Perspectives* 35(1): 25–44. <https://doi.org/10.5465/amp.2017.0204>.
- Nieto, Maria, Luis Santamaria, and Zulima Fernandez. 2015. "Understanding the Innovation Behavior of Family Firms." *Journal of Small Business Management* 53(2): 382–99. <https://doi.org/10.1111/jsbm.12075>.
- Pittino, Daniel, Francesca Visintin, Massimo Bau', and Paola Mazzurana. 2013. "Collaborative Technology Strategies and Innovation in Family

- Firms." *International Journal of Entrepreneurship and Innovation Management* 17(1/2/3): 8. <https://doi.org/10.1504/IJEIM.2013.055226>.
- Puranam, Phanish, Oliver Alexy, and Markus Reitzig. 2014. "Whats 'New' About New Forms of Organizing." *Academy of Management Review* 39(2): 162–80.
- Ramadani, Veland, Esra Memili, Ramo Palalić, and Erick P. C. Chang. 2020. "Nature of Family Business." In *Entrepreneurial Family Businesses*, 1–28. Cham: Springer. https://doi.org/10.1007/978-3-030-47778-3_1.
- Rosenfeld, Stuart. 1996. "Does Cooperation Enhance Competitiveness? Assessing the Impacts of Inter-Firm Collaboration." *Research Policy* 25(2): 247–63. [https://doi.org/10.1016/0048-7333\(95\)00835-7](https://doi.org/10.1016/0048-7333(95)00835-7).
- Rybnicek, Robert, and Roland Königsgruber. 2019. "What Makes Industry-University Collaboration Succeed? A Systematic Review of the Literature." *Journal of Business Economics* 89(2): 221–50. <https://doi.org/10.1007/s11573-018-0916-6>.
- Saito, Hiroaki, and Lisa Ruhanen. 2017. "Power in Tourism Stakeholder Collaborations: Power Types and Power Holders." *Journal of Hospitality and Tourism Management* 31(June): 189–96. <https://doi.org/10.1016/j.jhtm.2017.01.001>.
- Soler-Porta, Mariano, and Antonio Padilla-Meléndez, and Beatriz Rodríguez-Díaz. 2019. "Innovation in Family Business and Cooperation: A Literature Review." *European Journal of Family Business* 9(1). <https://doi.org/10.24310/ejfbefjb.v9i1.6609>.
- Spriggs, Mark, Andy Yu, David Deeds, and Ritch Sorenson. 2013. "Too Many Cooks in the Kitchen: Innovative Capacity, Collaborative Network Orientation, and Performance in Small Family Businesses." *Family Business Review* 26(1): 32–50.
- Stanley, Laura J., Remedios Hernández-Linares, María Concepción López-Fernández, and Franz W. Kellermanns. 2019. "A Typology of Family Firms: An Investigation of Entrepreneurial Orientation and Performance." *Family Business Review* 32(2): 174–94. <https://doi.org/10.1177/0894486519838120>.
- Stieg, Philipp, Beate Cesinger, Gerhard Apfelthaler, Sascha Kraus, and Chang-Feng Cheng. 2018. "Antecedents of Successful Internationalization in Family and Non-Family Firms: How Knowledge Resources and Collaboration Intensity Shape International Performance." *Journal of Small Business Strategy* 28(1 SE-): 14–27. <https://libjournals.mtsu.edu/index.php/jsbs/article/view/1123>.
- Tajeddini, Kayhan, and Vanessa Ratten. 2020. "The Moderating Effect of Brand Orientation on Inter-Firm Market Orientation and Performance." *Journal of Strategic Marketing* 28(3): 194–224. <https://doi.org/10.1080/0965254X.2017.1293138>.
- Vaivode, Irena. 2015. "Triple Helix Model of University-Industry-Government Cooperation in the Context of Uncertainties." *Procedia - Social and Behavioral Sciences* 213(December): 1063–67. <https://doi.org/10.1016/j.sbspro.2015.11.526>.
- Vătămănescu, Elena-Mădălina, Andreea Mitan, Andreia Gabriela Andrei, and Alexandru Mihai Ghigiu. 2022. "Linking Coopetition Benefits and Innovative Performance within Small and Medium-Sized Enterprises Networks: A Strategic Approach on Knowledge Sharing and Direct Collaboration." *Kybernetes* 51(7): 2193–2214. <https://doi.org/10.1108/K-11-2020-0731>.
- Westhead, Paul, and Carole Howorth. 2007. "Types of Private Family Firms: An Exploratory Conceptual and Empirical Analysis."

- Entrepreneurship & Regional Development* 19(5): 405–31.
<https://doi.org/10.1080/08985620701552405>.
- Williams, David, Carlton Young, and Betty Coffey. 2017. “Acquisitions in the Biopharmaceutical IPO Market: Collaboration, Competition and Co-Opetition.” *Managerial and Decision Economics* 38(8): 1162–71.
<https://doi.org/10.1002/mde.2854>.
- Williamson, Oliver. 1985. “The Governance of Contractual Relations.” In *The Economic Institutions of Capitalism*, 68–84.
<http://www.jstor.org/stable/2138322>.
- Yee, Angelina, Aik Chong, and Graham Kendall. 2015. “Managing University-Industry Collaborations in Malaysia by Examining Its Critical Success Factors: A Dyadic Approach.” *World Review of Business Research* 5(3): 213–30.
- Zaridis, A., I. Vlachos, and M. Bourlakis. 2021. “SMEs Strategy and Scale Constraints Impact on Agri-Food Supply Chain Collaboration and Firm Performance.” *Production Planning & Control* 32(14): 1165–78.
<https://doi.org/10.1080/09537287.2020.1796136>.