

Innovation in Family Businesses: A Bibliometric Analysis

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ABSTRACT

Purpose – This research aims to find out the general movement and gaps in the innovation studies in family businesses by connecting them with studies in mainstream innovation literature.

Design/methodology/approach – In this research, 926 documents published in 283 journals in the Web of Science database between 1997 and 2022 in the field of innovation in family businesses were analyzed. Bibliographic coupling analysis, co-citation analysis, co-word analysis, and trend analysis were carried out to evaluate the intellectual and conceptual structure of the field. Trends in the relevant literature were visually mapped by identifying journals, authors, research topics, and connections between them.

Findings – According to the results of the intellectual structure analysis, family participation, family culture, family ownership, and socio-economic wealth issues come to the fore. Co-citation analysis findings indicate that the concepts of performance and sustainability, which have a strong relationship with entrepreneurship, will be among the important research topics in the near future.

Discussion – The desire of family businesses to protect their assets causes them to avoid long-term risky innovation projects and their innovation speed to decrease. Family businesses tend to rely on external sources of knowledge and technology, focusing on incremental rather than radical innovation. This tendency stems from the typical organizational climate of low formality and risk aversion in determining strategic choices and functional organizational structures with high decision-making autonomy. Intergenerational innovation should be focused on to create innovation competencies in future generations.

1. INTRODUCTION

Innovation creates a significant impact in all areas of business, from business models to business development processes. The breadth of the effects of innovation requires its integration into business strategies. This situation directs researchers to study the innovative actions of family businesses. The fact that the innovation includes many components, such as technology, management, and process, increases the number of studies conducted in different disciplines regarding family businesses. The dynamic content of innovation has led to the need for more interest and research on family businesses. However, mainstream innovation literature has focused primarily on the technology component of innovation. In this respect, it is noteworthy that the number of studies focusing on innovation in family businesses is limited. At the same time, existing studies must provide more effective guidance in determining this field's main themes and trends.

Ownership structure, participation in management, and level of institutionalization are the essential inputs that impact the innovation actions of family businesses (Carnes & Ireland, 2013; Chrisman et al., 2015a). There are no clear conclusions regarding the relationship between family-specific antecedents and innovation outcomes. However, while most of the research in the field is conducted by family business researchers, family variables are ignored in the studies of mainstream innovation researchers (Chrisman et al., 2015a). The multidimensional nature of the relationship between the mainstream innovation field and the family business field has led researchers in the field of family business to investigate which antecedents enable (Beck et al., 2011; Gjergji et al., 2022; Kariyapperuma & Collins, 2021; Laforet, 2012) or hinder (Andersén, 2015; Habbershon & Williams, 1999; Tipu, 2023) innovation in family businesses. Negative aspects that restrict innovation in family businesses are their traditional organizational structures, risk aversion behavior, desire for control, and willingness to protect family wealth (Zahra et al., 2004; Calabro et al., 2019). With these qualities, family

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businesses can avoid risky innovative actions. On the other hand, long-term orientations and a structure that allows more than one generation to participate in the business encourage family businesses to put their innovation capabilities into practice (Habbershon et al., 2003; Kets de Vries, 1993). In addition, the fact that family culture and trust relationships promote creativity, which is a difficult resource to imitate, gives businesses a significant competitive advantage (Zahra et al., 2004; Dibrell & Moeller 2011).

Innovation literature has focused significantly on small and medium-sized businesses within the business population, exploring the challenges, advantages, and opportunities of innovation by firm size. Although there are significant similarities between small and medium-sized enterprises and family businesses, large-scale family firms have a significant share of this population (Anderson & Reeb, 2003). Therefore, integrating family business innovation literature with mainstream innovation literature provides significant benefits (Calabro et al., 2019). Synthesizing past research findings in the literature is one of the critical tasks in expanding the scope of a research field. Researchers use two traditional methods, systematic literature review and meta-analysis, to make sense of previous research results (Ozturk, 2021). Developments in scientific research, accelerated by the support of information and communication technologies, make it difficult for researchers to follow the literature in their field. This challenge requires the use of methods that reveal the effects of fundamental studies in the field and the fundamental structure of the field (Zupic & Cater, 2015). This need has given rise to the bibliometric analysis, which employs a quantitative approach to map developments in scientific fields (Cobo et al., 2011).

The support provided by the bibliometric method in the detection and visual mapping of evolutionary nuances in the spatial and temporal context provides significant contributions to theoretical progress (Palmatier et al., 2018). While the data used in bibliometric analysis are objective, their interpretations are often subjective (thematic analysis). The meticulous interpretation of unstructured data in bibliometric analysis facilitates deciphering cumulative scientific knowledge in the field. This method also reveals informal research networks (Vogel, 2012) and patterns (Zupic & Cater, 2015).

Determining future trends is a complex and time-consuming task for researchers. Clear conclusions about how innovation affects family businesses are crucial for researchers. Based on the strategic importance of innovation, this research guides in defining productivity in the field of innovation in family businesses, analyzing the performance of scientific elements, and revealing the evolutionary development of the field (Block & Fisch, 2020; Merigó et al., 2017). The bibliometric method was used in the research because it allows seeing in which direction the field under study is evolving and making recommendations based on realistic data (Tang et al., 2018). In addition, this study aims to achieve the following research objectives;

1. To reveal the contribution of authors, institutions, countries, and journals conducting research in innovation and family businesses to the scientific field and the importance of this contribution.
2. To determine the intellectual, social, conceptual structure and evolutionary dynamics of the field of innovation and family businesses
3. To guide current issues and future research in the field of innovation and family businesses

This study is organized in four stages. First of all, the data sources and the methods used are explained in detail. Secondly, bibliometric analysis was conducted and the findings were reported in detail. Then, current challenges and future directions in the field of research were outlined and recommendations were presented.

2. METHOD

2.1. Bibliometric design

In bibliometric research, citation analyses, productivity situations of individuals, institutions, and countries, and information products such as books, articles, and patents are analyzed. In these analyses, in addition to descriptive statistics, techniques such as citation analysis, co-citation analysis, keyword networks, and collaboration networks are used (Zupic & Cater, 2015; Cobo et al., 2011; Liu et al., 2015). Bibliometric research is a very convenient technique for seeing how the field under study changes and proposing new fields of study by identifying gaps in the literature. Bibliometric analysis, unlike other types of literature review such as meta-analysis, focuses on uncovering the structure within a field of research (Merigó et al., 2017; Cobo et al., 2011; Block & Fisch, 2020).

2.2. Data collection

The literature search was conducted according to inclusion and exclusion criteria from the Web of Science (WoS) database (Palmatier et al., 2018; Linnenluecke, 2017; Block & Fisch, 2020). In the research, a topic query was made that included all possible naming forms in which documents related to family businesses and innovation could be included. Comparisons between WoS and other databases (Scopus, Dimensions) reveal some advantages or uniquenesses of WoS. WoS provides broader years (Goodman & Deis, 2007) and more excellent coverage of English-language journals (Archambault et al., 2006). WoS also includes the most reliable and influential scientific studies in many disciplines (Zyoud et al., 2017). The issue of innovation in the family business was examined in three stages. The first phase is the initial period from 1997 to 2000. This period represents the first period in which the subject of innovation in family relations began to enter the literature. The second phase covers the period starting in the 2000s and ending in 2015. At this stage, the period when developments in information and communication technologies began to affect the business world is evaluated. The final phase started in 2015 and continues today and includes 5th generation mobile technologies, Internet of Things, artificial intelligence and robotic systems. The primary purpose of periodization is to determine the changes in the relevant phase (Deng et al., 2013).

Table 1. A systematic review of the data collection process

Keywords and boolean operators.	("Family business*" or "Family firms" or "Family enterprise" or "Family company" or "Family owned") and "Innovation"
Document Type	Article, Proceedings Paper
Language	English
Subject area	Business, management, and economics
Indexes	SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI
Timespan	1997-2022

All possible nomenclature forms were utilized to capture documents that accurately and comprehensively represent innovation and family business. As a result of searching for search terms within the title, abstract or keywords of the documents, a total of 1,248 studies were identified between 1997 and 2022. Subsequently, these studies underwent screening and filtering.

The research focused on articles and papers published in English within business, management, and economics. Book chapters lacking empirical data were excluded, as they were not peer-reviewed and fell under gray literature. After the initial filtering, 1,053 articles remained. A more detailed evaluation of these articles' titles, abstracts, and keywords resulted in the elimination of 127 studies that were outside the scope of the research, leaving 926 articles for analysis.

In the descriptive analysis of the research, metrics such as the number of articles and the number of citations were used to show the characteristics of the documents. Some scientific indicators were used (Mingers & Leydesdorff, 2015). Bibliographic coupling analysis was conducted to reveal the research trend on innovation in family businesses. Then, co-citation analysis was performed, allowing clusters of articles with similar content to identify different perspectives over time through intellectual structure analysis (Martini et al., 2017). Co-occurrence analysis was conducted with author keywords to analyze the field's conceptual structure and reveal the literature's appearance (Ruhanen et al., 2015; Fahimnia et al., 2015). The number of clusters revealed by data visualization, frequency of occurrence, connections between units of analysis, and number of citations have been demonstrated by network analysis (Low & Siegel, 2019; Aria & Cuccurullo, 2017; Van Eck & Waltmann, 2010). In addition, a trend analysis was carried out to determine the trend of innovation-related publications in family companies and the shifts in focus in this field.

3. RESULTS

3.1. Descriptive analysis

Figure 1 illustrates the evolution of publications and citations related to family business and innovation. Among the studies published in the WoS database, the first publication in the family businesses and innovation field was published in 1997. Studies in the field, which showed a steady increase from 1997 to 2005,

showed a rapid increase after these years when the seeds of Industry 4.0 and digital technologies began to be laid. Of the 926 articles included in the analysis between 1997 and 2005, 56 (6%) were published. Of these publications, 870 (94%) were published in the post-2005 period. The increase in the number of publications after 2015 shows that family businesses and innovation issues have attracted the attention of researchers (Figure 1).

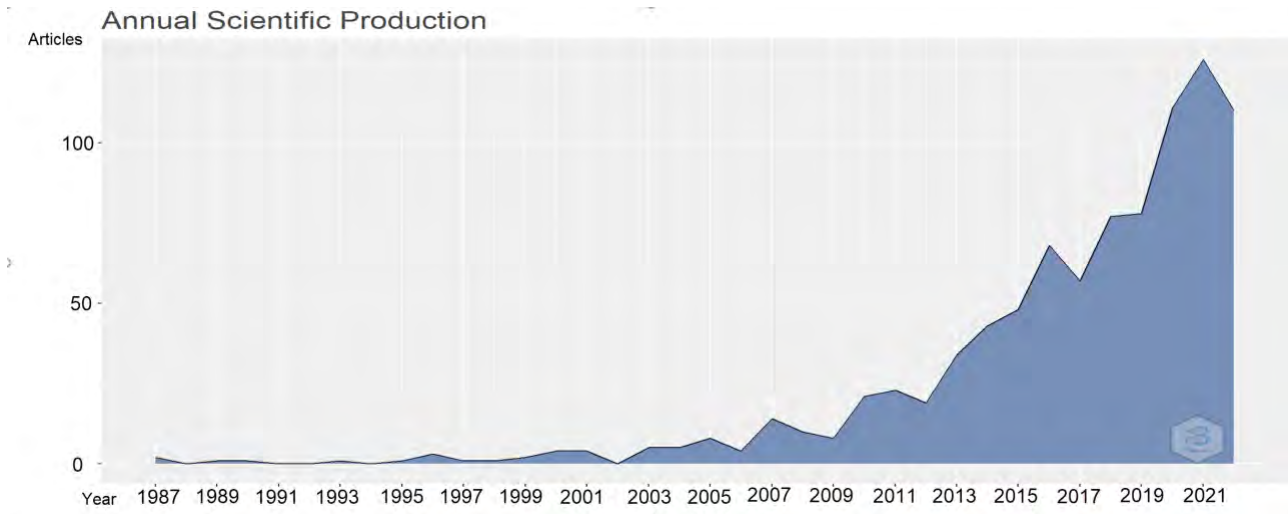


Figure 1. Number of articles published in the review period

Figure 2 depicts the regional distribution of articles published over different periods, highlighting the collaborative relationships between countries and regions. Research in this field is increasingly prominent in the United States, China, Continental Europe, and the United Kingdom, with a particularly strong cooperative relationship between the United States and Continental Europe.

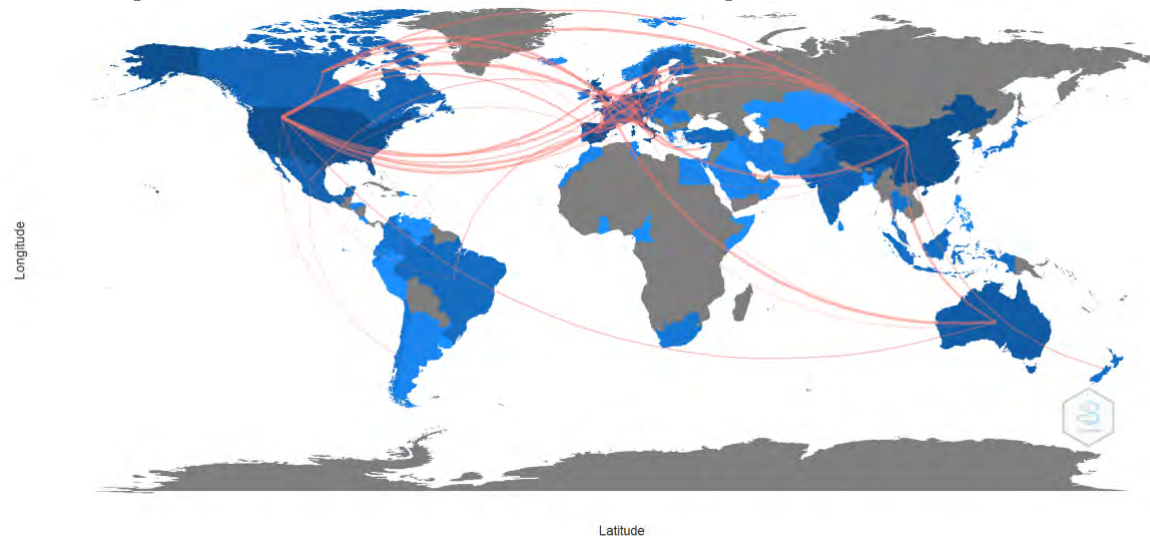


Figure 2. Cooperation relations between countries/regions

Table 2 lists the top ten articles with the highest number of citations, which is an essential indicator of the quality of academic publications. Most of these studies were carried out in the period after 2005. This shows that research on family businesses follows a parallel course with the development of innovative technologies in this period. It is noteworthy that the top two publications with the highest citations in innovation and family businesses are "entrepreneurship" and "risk-taking behavior." In addition, other articles that contribute to the field; focus on topics such as innovative technology, company resources, participation, and talent.

Table 2. Top ten papers with the highest number of citations

Authors	Title	Journals	Citations
(Naldi, Nordqvist & Wiklund, 2007)	Entrepreneurial orientation, risk-taking, and performance in family firms	Family Business Review	562
(Zahra, Hayton & Salvato, 2004)	Entrepreneurial risk-taking in family firms	Family Business Review	557
(Chua, Chrisman & Rau, 2012)	Sources of heterogeneity in family firms: An introduction	Entrepreneurship Theory And Practice	408
(Duran, Kammerlander & Zellweger, 2016)	Doing more with less: Innovation input and output in family firms	Academy of Management Journal	353
(Fernandez & Nieto, 2006)	Impact of ownership on the international involvement of SMEs	Journal of International Business Studies	335
(Zellweger, Sieger & Halter, 2012)	Should I stay or should I go? Career choice intentions of students with a family business background	Journal of Business Venturing	318
(Eddleston, Kellermanns & Sarathy, 2008)	Resource configuration in family firms: Linking resources, strategic planning and technological opportunities to performance	Journal of Management Studies	312
(Massis, Frattini & Lichtenthaler, 2013)	Research on Technological innovation in family firms: Present debates and future directions	Family Business Review	294
(Kellermanns & Eddleston, 2000)	Corporate entrepreneurship in family firms: A family perspective	Entrepreneurship Theory and Practice	291
(Chrisman, Chua & Wright, 2015a)	The ability and willingness paradox in family firm innovation	Journal of Product Innovation Management	241

Factor analysis was conducted using R Bibliometrics to determine the articles that contributed most to family businesses and innovation. Figure 3 shows the most influential articles in the field of family business.

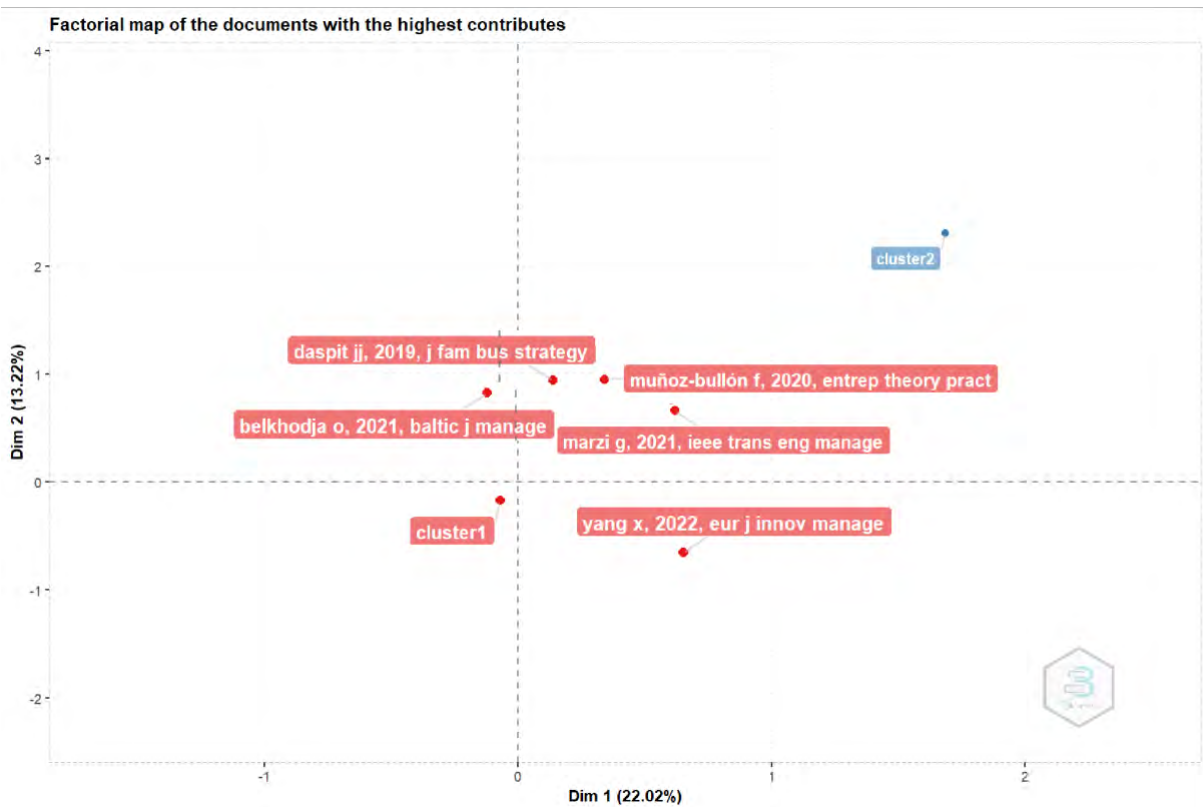


Figure 3. A factorial map of the documents with the highest contributions.

To evaluate the distribution of academic studies on family businesses and innovation, the top journals and countries are ranked by number of publications. Table 3 shows the journals and countries that have published ten or more articles. Journal of Family Business Management ranks first with 47 articles, while the Journal of Family Business Strategy ranks second with 34 articles. These are followed by the Journal of Family Business Strategy with 28 articles and the Journal of Business Research with 28 articles. Looking at the regional distribution of the published articles, Italy and China are the leading countries in the number of publications among the 79 countries that contributed to the field during the whole period. The statistical results show that most of the researchers researching the field of family businesses and innovation are from Italy. Of the 926 articles included in the analysis, 481 (52%) were produced with contributions from China, Continental Europe, and the USA.

Table 3. Top journals and countries/regions

Sources	Articles	Country	Articles
Journal of Family Business Management	47	Italy	115
Journal of Family Business Strategy	34	China	105
Journal of Business Research	28	Spain	84
Family Business Review	27	USA	77
Sustainability	22	U. K.	48
Entrepreneurship Theory And Practice	19	Germany	34
Small Business Economics	17	Australia	24
Journal of Product Innovation Management	16	Austria	21
Business Strategy and The Environment	15	India	21
Asia Pacific Journal of Management	13	France	18
European Journal of International Management	13	Canada	16
International Journal of Entrepreneurial Beh. & Res.	12	Poland	16
Journal of Small Business and Enterprise Development	12	Sweden	15
Technological Forecasting and Social Change	11	Netherlands	13
Academia-Revista Latinoamericana De Administracion	10	Malaysia	12

3.2. Bibliographic coupling analysis

Bibliographic coupling analysis organizes publications based on their shared references across different time periods. The summaries and keywords of the published articles are examined to identify the main topic of each cluster. In the coupling analysis, the number of units was determined as 5, the minimum cluster frequency was 3, the number of tags per set was 6, and different clusters were included. In Figure 4, each color corresponds to a different cluster. The size of the node indicates the frequency of the cited excerpts; larger nodes signify higher frequency. The X-axis measures the centrality of the cluster (Callon's Centrality index), while the Y-axis measures the cluster effect with the Average Normalized Local Citation Score (MNLCS).

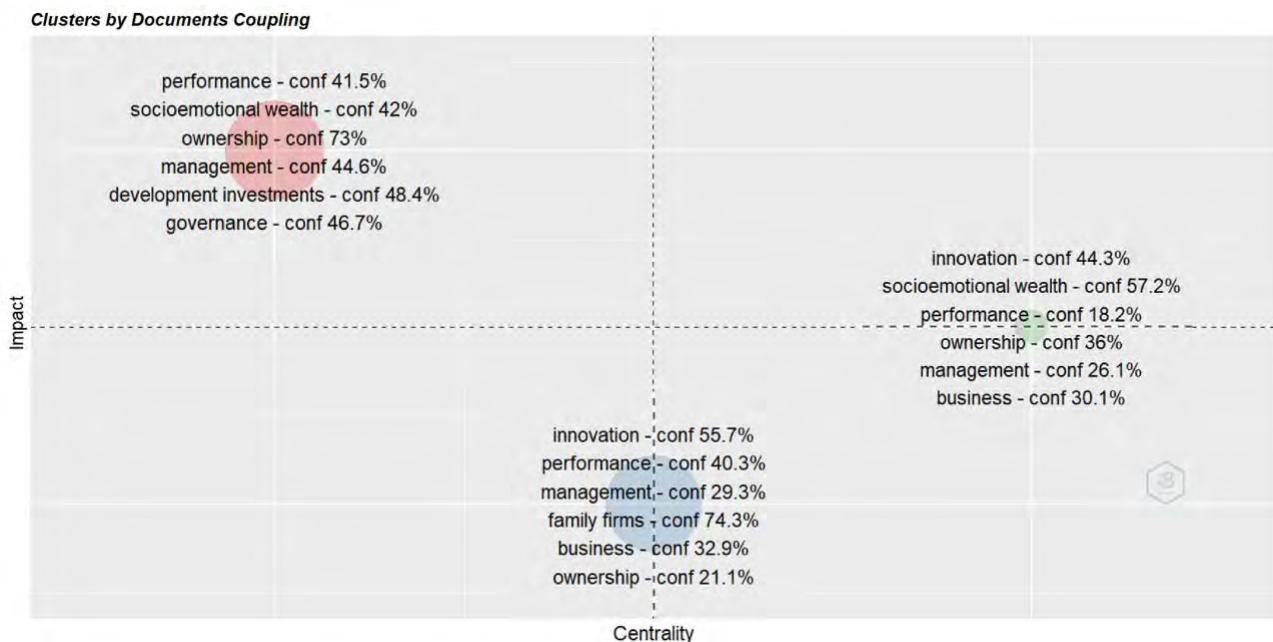


Figure 4. The coupling map of literature during

In the research, cluster analysis was conducted to determine how the publications on innovation in family businesses clustered. Accordingly, the publications were grouped into three clusters under review.

Cluster 1 Ownership. The keyword for the first cluster (red) is "ownership," which pertains to the ownership and management aspects of family businesses. Two-thirds of its businesses worldwide are family-owned, with family businesses accounting for 60% of the world's workforce and more than 70% of the global GDP (Visser & Van Scheers, 2020). The relationship between family businesses and risk is reflected in the publications on this subject, and the first two most cited articles are in the "ownership" cluster. This shows that researchers focus on entrepreneurial tendency, risk-taking, and performance in family businesses (Denison et al., 2004).

Cluster 2 Family Business and Innovation. The (blue) keyword for the second cluster is "innovation." The pace of development of technology makes innovation more critical, which leads to an increase in interest in innovation research in family businesses. One of the highlights of the second cluster is Calabro et al. (2019) innovation research. Another critical study on innovation in family businesses is the study conducted by Feranita et al. (2017), which examines how to innovate by leveraging know-how, technology, and knowledge from external sources to overcome resource constraints. Another critical study is the one by De Massis et al. (2018). Other notable studies have been done by Diaz-Moriana et al. (2020), Chrisman et al. (2015b), Casprini et al. (2017). In this research, innovation strategies in family businesses internalize information, reinterpret it and reflect it on innovation are examined.

Cluster 3 Socio-emotional wealth. The (green) keyword of the third cluster is "Socio-emotional wealth." the concept of socio-emotional wealth, which explains the differences in business behavior, emphasizes the satisfaction that family business owners derive from the non-economic aspects of the business (Gómez-Mejía et al., 2007). This cluster focuses on the connection between decision-making processes and non-financial aspects that meet the emotional needs of the family, such as the ability to use family influence. The concept of socio-emotional wealth, which explains the differences in business behavior, focuses on the satisfaction of

family business owners from the non-economic aspects of the business (Gómez-Mejía et al., 2011; Humphrey et al., 2021). Families derive socio-emotional wealth from various sources associated with their firms, such as having a family name, emotional commitment to the firm, and satisfaction with business employees (Gómez-Mejía et al., 2011; Newbert & Craig, 2017). Research on this topic shows that maintaining socio-emotional wealth is a priority for family businesses than pursuing financial goals (Zellweger et al., 2012; Stockmans et al., 2010).

3.3. Co-citation analysis

Co-citation analysis measures how often two studies are cited together, as well as the number of different articles, authors, and journals referenced in the same paper (Vogel, 2012; Zupic & Cater, 2015). As a result of the joint citation analysis carried out at the journal level regarding family businesses and innovation determined that 11,211 standard references were made to journals containing 926 articles in the sample. The minimum threshold in the analysis was determined as 50 citations. This suggests that a journal needs at least 50 citations to be included in the analysis. One hundred fifty-one journals meet this criterion and are divided into six clusters. Figure 5 presents the density visualization of the journal-level standard citation analysis. Cluster 1 (red) contains 59 journals; cluster 2 (Green) contains 29 journals; Cluster 3 (blue) contains 24 journals; cluster 4 (yellow) contains 21 journals; cluster 5 (purple) contains 16 journals, and Cluster 6 (turquoise) contains two journals. The most cited journals in six clusters on family business and innovation are, respectively: Entrepreneurship Theory and Practice (4544), Family Business Review (4180), Strategic Management Journal (2363), Academy of Management Journal (2199), and Journal of Business Venturing (1687).

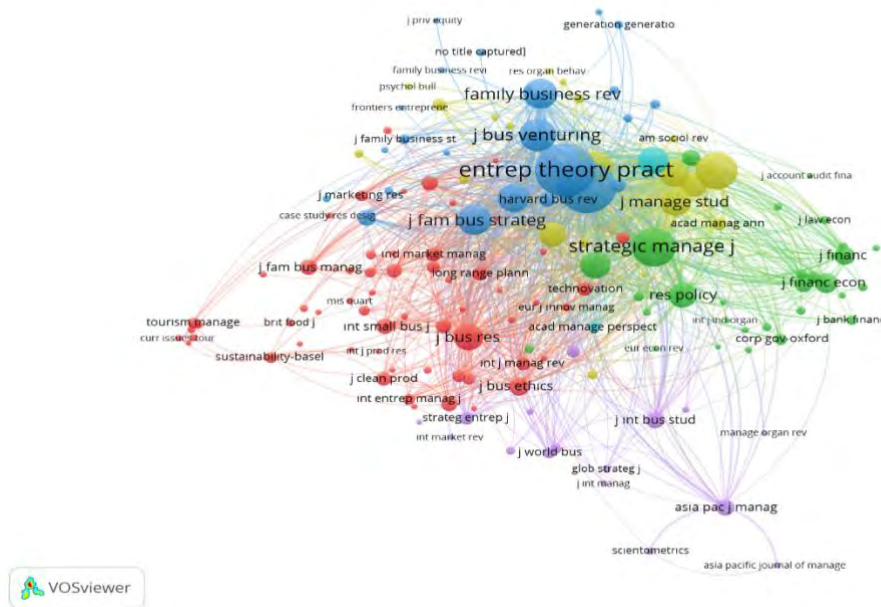


Figure 5. The source (journal) co-citation network of publications

According to the common citation analysis carried out at the reference level, there are 101 studies exceeding 50 threshold values out of a total of 36,916 citations. In Figure 6, the width of the circles indicates the total citation frequency of the publications, while the lines connecting the circles represent the density of citations to the 926 articles analyzed. The line thickness emphasizes the strength of the connection between the two documents, while the circle near the center represents a central and influential position in the citation network. The results of the joint citation analysis are presented in three clusters in Figure 6. Cluster 1 (red) consists of 44 publications, cluster 2 (green) consists of 35 publications, and cluster 3 (blue) consists of 22 publications. Accordingly, publications with 200 or more citations in three clusters; Gómez-Mejía et al., 2007 (289); Sirmon, 2003 (223); Chrisman, 1999 (219). This shows that the four publications form the basis of the family business and innovation research and that these publications will have a significant impact on future research.

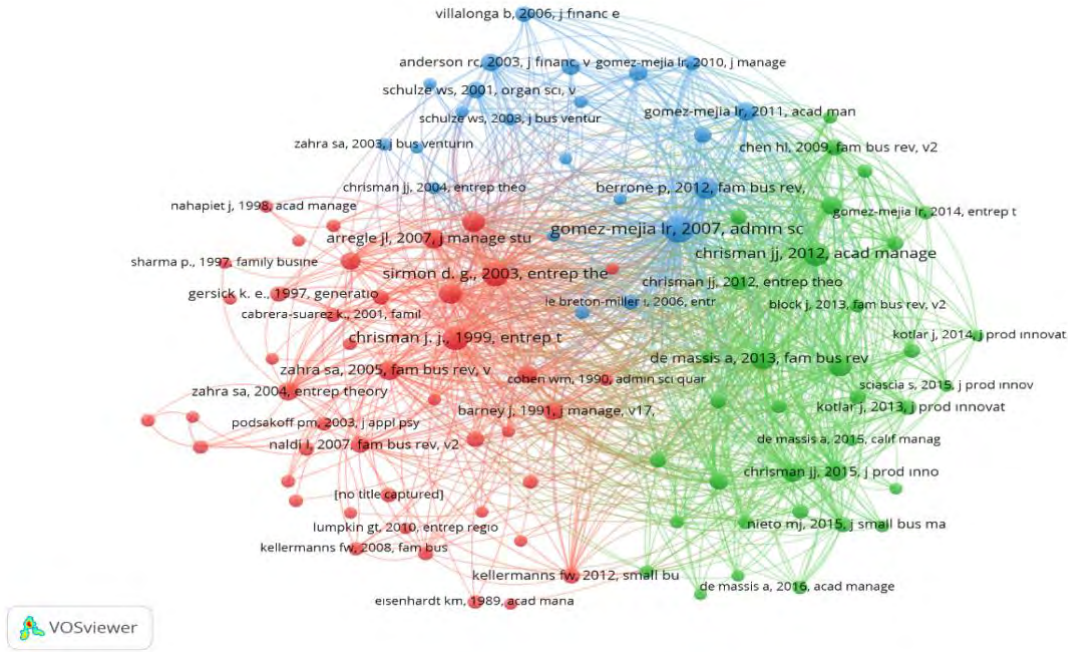


Figure 6. The reference co-citation network of publication

3.4. Trend analysis

Trend analysis was carried out to reveal the field's conceptual structure, examine the development of research topics over time, and examine the cognitive relationships between different research groups. In trend analysis, the minimum word frequency was determined as 10. Each year, the top four keywords were selected to show the topic trend in the field (Figure 7). The analysis results show that from the beginning to the mid-2010s, the conceptual structure in the field focused on the functional behaviors of family businesses, such as management, ownership, entrepreneurship, internationalization, and production. After 2015, especially in the last four years, research focused on the innovation-talent relationship. Research in this period; focuses on the ability to understand the value of new information, to internalize it, and to assimilate this information for commercial purposes. Another consideration of the relationship between innovation and talent is the ability to integrate, build and restructure internal and external capabilities to adapt to rapidly changing environments (dynamic capabilities).

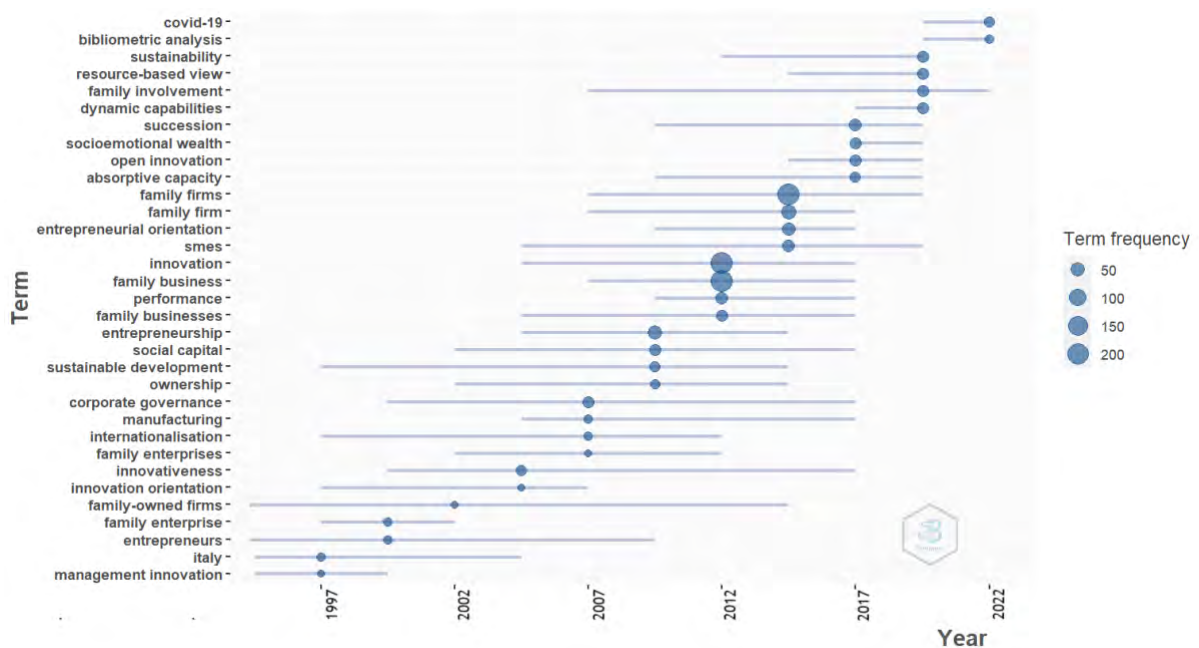


Figure 7. Trend topics between 1997-2022

The desire of family businesses to protect their wealth by avoiding risky innovation projects with long-term orientations negatively affects innovation (Munoz-Bullon & Sanchez-Bueno, 2011). Features such as risk aversion, rigidity, favoritism, conflicts between family members, decision-making ability, and family participation are the main variables that can affect innovation in family businesses (Bennedsen & Foss, 2015). Emotional attachments to existing assets and inflexible mental models frequently impede technology adoption and innovation (Roessl et al., 2010). Rigid mental models may arise from the founding generation or subsequent generations that need to be more innovative (Wright, 2017). Family businesses with the ability to innovate may be less willing to participate in technological innovations that impact strategic decisions (Chrisman et al., 2015b). This situation leads to heterogeneous innovative behavior in businesses. While families that promote innovation can explore numerous innovative ventures, the level of innovation tends to be moderate in companies led by consensual, moderate families, and low in firms managed by foster families (Sciascia et al., 2013).

Family firms exhibit differences in their product development processes owing to their unique resources, authority structures, orientations, and behavioral attitudes. (De Massis et al., 2013). In this context, family businesses often prioritize incremental innovation over radical innovation and tend to depend on external sources for information and technology. This tendency stems from the risk-averse organizational climate that determines strategic choices and organizational structures with high decision-making autonomy (De Massis et al., 2018). In order to create innovation competencies in subsequent generations, intergenerational innovation should be focused on. In family businesses, parents should provide the new generation with the opportunity for discovery and experience, even if it is risky. The basis of the intergenerational innovation process depends on the cooperation and interaction to be established between family members (Litz & Kleysen, 2001).

In family firms, family members identify strongly with the business and feel an emotional attachment to other family members (Kraus et al., 2018). Socio-emotional richness shaped by the different qualities of family members directly affects innovative behavior. Some characteristics such as niche focus, customer collaboration, preference for self-financing, long-term action, and superior employee relations are critical determinants of innovation under the theme of socio-emotional wealth (De Massis et al., 2018). Socio-emotional wealth allows family businesses to implement proactive strategic decisions involving innovation and risks (Kellermanns et al., 2012). The socio-emotional wealth that provides family involvement positively affects the growth of innovative capacity (Casillas et al., 2010) and supports the entrepreneurial spirit (Zahra et al., 2004). In this respect, strong ties between family members affect resource accumulation by increasing innovation initiatives (Khayesi et al., 2014).

4.2. Future trends

The network map of the innovation literature in family businesses shows that entrepreneurial orientation, performance, sustainability, and innovation are essential concepts. The long-term orientation of family businesses and the involvement of multiple generations in business affect entrepreneurship and innovation ability in family businesses (Craig & Dibrell, 2006; Le Breton-Miller & Miller, 2014; Zahra et al., 2004; Dibrell & Moeller, 2011). However, the higher hierarchical structure and lower adhocratic family culture in family businesses undermine individual initiative and lead family businesses to act less proactively. However, in the hyper-competitive environment where the shelf life of the products is shortened, using the initiative of the young generations for sustainability is of great importance for the sustainability of family businesses. Sustainability is economically crucial in an intensely competitive environment and terms of climate and environment (Sciascia et al., 2015). It is understood that the concept of "sustainable innovation", which emphasizes the interaction between innovation and sustainability, will be among the important research topics in the coming years. In contemporary organizations, innovation is critical to achieving sustainability (Mailer et al., 2020; Sciascia et al., 2015). It can be predicted that the following publications will focus on sustainable innovation. Ensuring the reproduction of resources is essential for sustainability in a competitive market (Lazaretti et al., 2020; Mauri-Castello et al., 2019). Innovative business organizations must be established to increase competitiveness and ensure sustainability in family businesses.

4.3. Limitations and recommendations for future research

Although this research provides a current overview of the work on innovation in family businesses, it has some limitations at the data source level. All of the evaluated publications were selected in the Web of Science database. During the data collection process, publications from other databases, such as Scopus, Dimensions, etc., were not included in the analysis (Echchakoui, 2020; Goodman & Deis, 2007, Mingers & Lipitakis, 2010). Since publications before 1997 could not be accessed in the selected database, publications before this period could not be included in the analysis. In addition, another limitation of the research is that it needs to be understood that the scope will be comprehensive because the social network analysis, which shows how there is cooperation between authors, institutions, and countries, has not been carried out (Anugerah et al., 2022; Su et al., 2020). In addition to all these limitations, the research is essential in showing innovation development in family businesses, their intellectual structure, and the general trend of research topics. This research, which aims to reveal the appearance of the innovation literature in family businesses and its likely future trends, shows that digital transformation should be handled at the level of information technologies, intellectual capital, know-how ability, human resources, and even organizational culture of the organization in the following studies. In addition, innovation needs to be examined with the dimensions of digital technology, digital maturity, and culture.

5. CONCLUSION

Research in family businesses and innovation has increased significantly, especially after 2013. The increased scientific productivity in the field in the last decade can be explained by the effect of Industry 4.0 and digital transformation, which refer to concepts such as the Internet of Things, simulation, autonomous robots, augmented reality, and cloud computing. In addition, it was concluded that the country that stands out in scientific productivity is Italy. This situation arises from the relative predominance of family businesses in Italy. In Italy, 43 of the hundred largest businesses are family businesses. In addition, there are 20 Italian family businesses in the Family Businesses 500 index, and one is among the first three businesses (Zellweger, 2023).

Among the most cited and productive journals in terms of the number of publications, there is a journal within the scope of mainstream innovation literature. This situation shows that integrating innovation literature and mainstream innovation literature in family businesses needs to be stronger. This low integration and relationship reveals a research gap in determining the types of innovation (product, process, management) in family businesses.

The study also carried out scientific field mapping, which enables the visualization of the relationship and collaboration network between scientific elements (authors, journals, publications, concepts) (Van Eck & Waltman, 2010). According to the bibliographic matching analysis, which reveals trends in the field, future priorities, and intellectual structure, it is seen that the issues of family involvement, culture, ownership, and socio-economic wealth come to the fore. This result shows that the field focuses on the effects of family-specific characteristics and resources on firm innovation and differs from the main innovation literature focused on digital transformation.

According to the journal-level co-citation analysis (Zupic & Cater, 2015), which determines the intensity and strength of the relationship between co-cited publications and journals, it is seen that journals covering entrepreneurship and management issues in family businesses predominate in the field. The co-citation analysis at the publication level shows that there is only one publication that has received the most co-citations within the mainstream innovation literature. According to the co-citation analysis conducted to determine the most important and new topics in the field and the relationships between these topics and to reveal the conceptual structure, entrepreneurial action is in a central position. Concepts such as performance and sustainability, which have strong relationships with this concept, are the field's main topics and research areas.

Sustainability is a prominent perspective for family businesses to sustain their lives healthily and for society to maintain goodwill towards family businesses. Sustainability can be achieved with the socio-emotional wealth of family businesses. Socio-emotional wealth can be monitored through works that reflect the emotions of being a family to stakeholders and society. From an emotional perspective, family businesses can adopt long-term strategies to benefit stakeholders, especially the family and society (Shepherd, 2016). Family businesses should focus on actions that refer to green innovation, making long-term and sustainable strategies

possible. In this respect, future research needs to investigate how green innovation strategies can effectively meet the socio-emotional needs of family businesses (Berrone et al., 2022).

Open innovation is another important issue that will ensure integration with mainstream innovation literature. Family businesses can gain a competitive advantage thanks to the external knowledge they can provide through open innovation (Chesbrough & Appleyard, 2007). The reduced risk associated with investing in externally developed technologies that have been tested in various applications may enhance family businesses' inclination toward open innovation (Clausen et al, 2012). The phenomenon that makes this trend possible is collaboration. However, family businesses avoid collaborative relationships due to concerns such as loss of control and socio-economic wealth (Gomez-Mejia et al., 2007; Pisano, 2015). The more rigid and conservative organizational structures of family businesses (Zahra et al., 2004) can hinder their inclination toward open innovation. In this respect, understanding which characteristics of family businesses can facilitate or hinder open innovation will be helpful for research in the field. In addition, the digital technology, digital maturity and culture dimensions of innovation should be examined by including documents in databases such as Scopus, Dimensions, etc.

References

- Andersén, J. (2015). The absorptive capacity of family firms: How familiness affects potential and realized absorptive capacity. *Journal of Family Business Management*, 5(1), 73-89.
- Anderson, R. C., & Reeb, D. R. (2003). Founding family ownership and firm performance: Evidence from the S&P 500. *Journal of Finance*, 58, 1301-1328. <https://doi.org/10.1111/1540-6261.00567>
- Anugerah, A. R., Muttaqin, P. S., & Trinarningsih, W. (2022). Social network analysis in business and management research: A bibliometric analysis of the research trend and performance from 2001 to 2020. *Heliyon*, 8(4), e09270. <https://doi.org/10.1016/j.heliyon.2022.e09270>.
- Archambault, É., Vignola-Gagné, É., Côté, G., Larivière, V., & Gingras, Y. (2006). Benchmarking scientific output in the social sciences and humanities: The limits of existing databases. *Scientometrics*, 68(3), 329-342.
- Aria, M., & Cuccurullo, C. (2017). Bibliometrics: An R-tool for comprehensive science mapping analysis. *Journal of Informetrics*, 11(4), 959-975. <https://doi.org/10.1016/j.joi.2017.08.007>
- Beck, L., Janssens, W., Debruyne, M., & Lommelen, T. (2011). A study of the relationships between generation, market orientation, and innovation in family firms. *Family Business Review*, 24(3), 252-272. <https://doi.org/10.1177/0894486511409210>
- Bennedsen, M. and Foss, N. (2015). Family assets and liabilities in the innovation process. *California Management Review*, 58, 65-81. <https://doi.org/10.1525/cmr.2015.58.1.65>
- Berrone, P., Duran, P., Gómez-Mejía, L., Heugens, P. P., Kostova, T., & van Essen, M. (2022). Impact of informal institutions on the prevalence, strategy, and performance of family firms: A meta-analysis. *Journal of International Business Studies*, 53(6), 1153-1177. <https://doi.org/10.1057/s41267-020-00362-6>
- Block, J., & Fisch, C. (2020). Eight tips and questions for your bibliographic study in business and management research. *Management Review Quarterly*, 70, 307-312. <https://doi.org/10.1007/s11301-020-00188-4>
- Calabro, A., Vecchiarini, M., Gast, J., Campopiano, G., De Massis, A., & Kraus, S. (2019). Innovation in family firms: A systematic literature review and guidance for future research. *International Journal of Management Reviews*, 21(3), 317-355. <https://doi.org/10.1111/ijmr.12192>
- Carnes, C. M. & Ireland, R. D. (2013). Familiness and innovation: Resource bundling as the missing link. *Entrepreneurship Theory and Practice*, 37, 1399-1419. <https://doi.org/10.1111/etap.12073>
- Casillas, J. C., Moreno, A. M., & Barbero, J. L. (2010). A configurational approach to the relationship between entrepreneurial orientation and growth of family firms. *Family Business Review*, 23(1), 27-44. <https://doi.org/10.1177/0894486509345159>
- Casprini, E., De Massis, A., Di Minin, A., Frattini, F., & Piccaluga, A. (2017). How family firms execute open innovation strategies: The Loccioni case. *Journal of Knowledge Management*, 21, 1459-1485. <https://doi.org/10.1108/JKM-11-2016-0515>

- Chesbrough, H. W., & Appleyard, M. M. (2007). Open innovation and strategy. *California Management Review*, 50(1), 57-76. <https://doi.org/10.2307/41166416>
- Chrisman, J. J. (1999). The Influence of Outsider-Generated Knowledge Resources on Venture Creation. *Journal of Small Business Management*, 37(4), 42-58.
- Chrisman, J.J., Chua, J.H., De Massis, A., Frattini, F., & Wright, M. (2015a). The ability and willingness paradox in family firm innovation. *Journal of Product Innovation Management*, 32, 310-318. <https://doi.org/10.1111/jpim.12207>
- Chrisman, J.J., Fang, H., Kotlar, J., & De Massis, A. (2015b). A note on family influence and the adoption of discontinuous technologies in family firms. *Journal of Product Innovation Management*, 32, 384-388. <https://doi.org/10.1111/jpim.12206>
- Clausen, T., Pohjola, M., Sapprasert, K., & Verspagen, B. (2012). Innovation strategies as a source of persistent innovation. *Industrial and Corporate Change*, 21(3), 553-585. <https://doi.org/10.1093/icc/dtr051>
- Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E., & Herrera, F. (2011). Science mapping software tools: Review, analysis, and cooperative study among tools. *Journal of the American Society for Information Science and Technology*, 62(7), 1382-1402. <https://doi.org/10.1002/asi.21525>
- Craig, J. B., & Dibrell, C. (2006). The natural environment, innovation, and firm performance: A comparative study. *Family Business Review*, 19, 275-288. <https://doi.org/10.1111/j.1741-6248.2006.00075.x>
- De Massis, A., Frattini, F., & Lichtenthaler, U. (2013). Research on technological innovation in family firms: Present debates and future directions. *Family Business Review*, 26, 10-31. <https://doi.org/10.1177/0894486512466258>
- De Massis, A., Frattini, F., Majocchi, A. and Piscitello, L. (2018). Family firms in the global economy: Toward a deeper understanding of internationalization determinants, processes, and outcomes. *Global Strategy Journal*, 8, 3-21. <https://doi.org/10.1002/gsj.1199>
- Deng, Z., Hofman, P.S. & Newman, A. (2013). Ownership concentration and product innovation in Chinese private SMEs. *Asia Pacific Journal of Management*, 30, 717-734. <https://doi.org/10.1007/s10490-012-9301-0>
- Denison, D., Lief, C., & Ward, J. L. (2004). Culture in family-owned enterprises: Recognizing and leveraging unique strengths. *Family Business Review*, 17(1), 61-70. <https://doi.org/10.1111/j.1741-6248.2004.00004.x>
- Diaz-Moriana, V., Clinton, E., Kammerlander, N., Lumpkin, G. T., & Craig, J. B. (2020). Innovation motives in family firms: A transgenerational view. *Entrepreneurship Theory and Practice*, 44(2), 256-287. <https://doi.org/10.1177/1042258718803051>
- Dibrell, C., & Moeller, M. (2011). The impact of a service-dominant focus strategy and stewardship culture on organizational innovativeness in family-owned businesses. *Journal of Family Business Strategy*, 2, 43-51. <https://doi.org/10.1016/j.jfbs.2011.01.004>
- Echchakoui, S. (2020). Why and how to merge Scopus and Web of Science during bibliometric analysis: The case of sales force literature from 1912 to 2019. *Journal of Marketing Analytics*, 8(3), 165-184.
- Fahimnia, B., Sarkis, J., & Davarzani, H. (2015). Green supply chain management: A review and bibliometric analysis. *International Journal of Production Economics*, 162, 101-114. <https://doi.org/10.1016/j.ijpe.2015.01.003>
- Fang, H., Kotlar, J., Memili, E., Chrisman, J. J., & De Massis, A. (2018). The pursuit of international opportunities in family firms: Generational differences and the role of knowledge-based resources. *Global Strategy Journal*, 8, 136-157. <https://doi.org/10.1002/gsj.1197>
- Feranita, F., Kotlar, J., & De Massis, A. (2017). Collaborative innovation in family firms: Past research, current debates, and agenda for future research. *Journal of Family Business Strategy*, 8(3), 137-156. <https://doi.org/10.1016/j.jfbs.2017.07.001>
- Gjergji, R., Lazzarotti, V., & Visconti, F. (2022). Socioemotional wealth, entrepreneurial behaviour and open innovation breadth in family firms: The joint effect on innovation performance. *Creativity and Innovation Management*, 31(1), 93-108. <https://doi.org/10.1111/caim.12478>

- Gómez-Mejía, L. R., Cruz, C., Berrone, P., & De Castro, J. (2011). The bind that ties: Socioemotional wealth preservation in family firms. *The Academy of Management Annals*, 5, 653-707. <https://doi.org/10.5465/19416520.2011.593320>
- Gómez-Mejía, L. R., Haynes, K., Núñez-Nickel, M., Jacobson, K. J. L., & Moyano-Fuentes, J. (2007). Socioemotional wealth and business risks in family-controlled firms: Evidence from Spanish olive oil mills. *Administrative Science Quarterly*, 52, 106-137. <https://doi.org/10.2189/asqu.52.1.106>
- Goodman, D., & Deis, L. (2007). Update on scopus and web of science. *The Charleston Advisor*, 7(3), 15-18.
- Habbershon, T. G., & Williams, M. L. (1999). A resource-based framework for assessing the strategic advantages of family firms. *Family Business Review*, 12, 1-25. <https://doi.org/10.1111/j.1741-6248.1999.00001.x>
- Habbershon, T. G., Williams, M. L. & Macmillan, I. C. (2003). Familiness: A unified systems perspective of family firm performance. *Journal of Business Venturing*, 18, 451-465.
- Hsu, L. C. & Chang, H. C. (2011). The role of behavioral, strategic controls in family firm innovation. *Industry and Innovation*, 18, 709-727. <https://doi.org/10.1080/13662716.2011.604474>
- Humphrey, R. H., Massis, A. D., Picone, P. M., Tang, Y., & Piccolo, R. F. (2021). The psychological foundations of management in family firms: Emotions, memories, and experiences. *Family Business Review*, 34(2), 122-131. <https://doi.org/10.1177/08944865211012139>
- Kallmuenzer, A. (2015). Agency theory and the family business. In: Mattias Nordqvist, Leif Melin, Matthias Waldkirch and Gershon Kumeto (ed.), *Theoretical perspectives on family businesses* (pp. 58-77). Cheltenham: Edward Elgar Publishing. <https://doi.org/10.4337/9781783479665.00011>
- Kariyapperuma, N., & Collins, E. (2021). Family logics and environmental sustainability: A study of the New Zealand wine industry. *Business Strategy and the Environment*, 30(8), 3626-3650. <https://doi.org/10.1002/bse.2823>
- Kellermanns, F.W., Eddleston, K.A., Sarathy, R., & Murphy, F. (2012). Innovativeness in family firms: A family influence perspective. *Small Business Economics*, 38, 85-101. <https://doi.org/10.1007/s11187-010-9268-5>
- Kets de Vries, M. F. R. (1993). The dynamics of family controlled firms: The good and the bad news. *Organizational Dynamics*, 21(3), 59-71. [https://doi.org/10.1016/0090-2616\(93\)90071-8](https://doi.org/10.1016/0090-2616(93)90071-8)
- Khayesi, J. N., George, G., & Antonakis, J. (2014). Kinship in entrepreneur networks: Performance effects of resource assembly in Africa. *Entrepreneurship Theory and Practice*, 38(6), 1323-1342. <https://doi.org/10.1111/etap.12127>
- Kraus, S., Kallmuenzer, A., Stieger, D., Peters, M. and Calabrò, A. (2018). Entrepreneurial paths to family firm performance. *Journal of Business Research*, 88, pp. 382- 387. <https://doi.org/10.1016/j.jbusres.2017.12.046>
- Laforet, S. (2012). *Innovation in small family businesses*. Edward Elgar Publishing.
- Lazaretti, K., Giotto, O. T., Sehnem, S., & Bencke, F. F. (2020). Building sustainability and innovation in organizations. *Benchmarking: An International Journal*, 27(7), 2166-2188. <https://doi.org/10.1108/BIJ-08-2018-0254>
- Le Breton-Miller, I. & Miller, D. (2014). Temporal considerations in studying family firms: Reflections on the study of organizational behavior in family business. *European Journal of Work and Organizational Psychology*, 23, 669-673. <https://doi.org/10.1080/1359432X.2014.907276>
- Linnenluecke, M. K. (2017). Resilience in business and management research: A review of influential publications and a research agenda. *International Journal of Management Reviews*, 19(1), 4-30. <https://doi.org/10.1111/ijmr.12076>
- Litz, R. A., & Kleysen, R. F. (2001). Your old man shall dream dreams; your young man shall see visions: Toward a theory of family firm innovation with help from the Brubeck family. *Family Business Review*, 14, 335-351. <https://doi.org/10.1111/j.1741-6248.2001.00335.x>
- Liu, Z., Yin, Y., Liu, W., & Dunford, M. (2015). Visualizing the intellectual structure and evolution of innovation systems research: A bibliometric analysis. *Scientometrics*, 103(1), 135-158. <https://doi.org/10.1007/s11192-014-1517-y>

- Low, M. P., & Siegel, D. (2020). A bibliometric analysis of employee-centered corporate social responsibility research in the 2000s. *Social Responsibility Journal*, 16(5), 691-717. <https://doi.org/10.1108/SRJ-09-2018-0243>
- Madanoglu, M., Altinay, L., & Wang, X.L. (2016). Disentangling the effect of family involvement on innovativeness and risk-taking: The role of decentralization. *Journal of Business Research*, 69, 1796-1800. <https://doi.org/10.1016/j.jbusres.2015.10.058>
- Mailer, D., Mailer, A., Aşçilean, I., Anastasiu, L., & Gavriş, O. (2020). The relationship between innovation and sustainability: A bibliometric review of the literature. *Sustainability*, 12(10), 4083. <https://doi.org/10.3390/su12104083>
- Martini, A., Neirotti, P., & Appio, F. P. (2017). Knowledge searching, integrating, and performing: Always a tuned trio for innovation? *Long Range Planning*, 50(2), 200-220. <https://doi.org/10.1016/j.lrp.2015.12.020>
- Mauri-Castello, J., Alonso-Gonzalez, A., & Peris-Ortiz, M. (2019). Applied innovation methodology: A proposal for a dynamic, sustainable environment for the generation of innovation and knowledge management practices in SMEs. In *Knowledge, Innovation and Sustainable Development in Organizations* (pp. 61-76). Springer, Cham. https://doi.org/10.1007/978-3-319-74881-8_5
- Merigó, J. M., Blanco-Mesa, F., Gil-Lafuente A. M., & Yager, R. R. (2017). Thirty years of the International Journal of Intelligent Systems: A bibliometric review. *International Journal of Intelligent Systems*, 32(5), 526-554. <https://doi.org/10.1002/int.21859>
- Mingers, J., & Leydesdorff, L. (2015). A review of theory and practice in scientometrics. *European Journal of Operational Research*, 246(1), 1-19. <https://doi.org/10.1016/j.ejor.2015.04.002>
- Mingers, J., & Lipitakis, E. (2010). Counting the citations: A comparison of Web of Science and Google Scholar in the field of business and management. *Scientometrics*, 85(2), 613-625.
- Muñoz-Bullón, F., & Sanchez-Bueno, M.J. (2011). The impact of family involvement on the R&D intensity of publicly traded firms. *Family Business Review*, 24, 62-70. <https://doi.org/10.1177/0894486510396870>
- Newbert, S., & Craig, J. B. (2017). Moving beyond socioemotional wealth: Toward a normative theory of decision making in a family business. *Family Business Review*, 30(4), 339-346. <https://doi.org/10.1177/0894486517733572>
- Ozturk, O. (2021). Bibliometric review of resource dependence theory literature: An overview. *Management Review Quarterly*, 71(3), 525-552.
- Palmatier, R. W., Houston, M. B., & Hulland, J. (2018). Review articles: Purpose, process, and structure. *Journal of the Academy of Marketing Science*, 46(1), 1-5. <https://doi.org/10.1007/s11747-017-0563-4>
- Pisano, G. P. (2015). You need an innovation strategy. *Harvard Business Review*, 93(6), 44-54.
- Roessl, D., Fink, M., & Kraus, S. (2010). Are family firms fit for innovation? Towards an agenda for empirical research. *International Journal for Entrepreneurial Venturing*, 2, 366-380. <https://doi.org/10.1504/IJEV.2010.037118>
- Ronda-Pupo, G. A., & Guerras-Martin, L. Á. (2012). Dynamics of the evolution of the strategy concept 1962-2008: A co-word analysis. *Strategic Management Journal*, 33(2), 162-188. <https://doi.org/10.1002/smj.948>
- Ruhanen, L., Weiler, B., Moyle, B. D., & McLennan, C. J. (2015). Trends and patterns in sustainable tourism research: A 25-year bibliometric analysis. *Journal of Sustainable Tourism*, 23(4), 517-535. <https://doi.org/10.1080/09669582.2014.978790>
- Sanchez-Famoso, V., Iturralde, T., & Maseda, A. (2015). The influence of family and non-family social capital on firm innovation: Exploring the role of family ownership. *European Journal of International Management*, 9, 240-262. <https://doi.org/10.1504/EJIM.2015.067853>
- Sciascia, S., Clinton, E., Nason, R., James, A., & Rivera, A. (2013). Family communication and innovativeness in family firms. *Family Relations*, 62, 429-442. <https://doi.org/10.1111/fare.12014>
- Sciascia, S., Nordqvist, M., Mazzola, P., & De Massis, A. (2015). Family ownership and R&D intensity in small- and medium-sized firms. *Journal of Product Innovation Management*, 32, 349-360. <https://doi.org/10.1111/jpim.12204>

- Shepherd, D. A. (2016). An emotions perspective for advancing the fields of family business and entrepreneurship: Stocks, flows, reactions, and responses. *Family Business Review*, 29(2), 151-158. <https://doi.org/10.1177/0894486516634943>
- Sirmon, D. G., & Hitt, M. A. (2003). Managing resources: Linking unique resources, management, and wealth creation in family firms. *Entrepreneurship theory and practice*, 27(4), 339-358.
- Stockmans, A., Lybaert, N., & Voordeckers, W. (2010). Socioemotional wealth and earnings management in private family firms. *Family Business Review*, 23(3), 280-294. <https://doi.org/10.1177/0894486510374457>
- Su, Y. S., Lin, C. L., Chen, S. Y., & Lai, C. F. (2020). Bibliometric study of social network analysis literature. *Library Hi Tech*, 38(2), 420-433. <https://doi.org/10.1108/LHT-01-2019-0028>.
- Tang, M., Liao, H., & Su, S.F. (2018). A bibliometric overview and visualization of the International Journal of Fuzzy Systems between 2007 and 2017. *International Journal of Fuzzy Systems*, 20(5), 1403-1422. <https://doi.org/10.1007/s40815-018-0484-5>
- Tipu, A. S. A. (2023). Organizational structure in family firms: A systematic literature review. *Journal of Strategy and Management*, 16(1), 76-91. <https://doi.org/10.1108/jsma-09-2021-0194>
- Van Eck, N.J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, 84, 523-538. <https://doi.org/10.1007/s11192-009-0146-3>
- Verbeek, A., Debackere, K., Luwel, M., & Zimmermann, E. (2002). Measuring progress and evolution in science and technology: The multiple uses of bibliometric indicators. *International Journal of Management Reviews*, 4(2), 179-211. <https://doi.org/10.1111/1468-2370.00083>
- Visser, T., & Van Scheers, L. (2020). How important is a family business to maintain a strong entrepreneurial orientation over time? *Management: Journal of Contemporary Management Issues*, 25(2), 235-250. <https://doi.org/10.30924/mjcmi.25.2.13>
- Vogel, R. (2012). The visible colleges of management and organization studies: A bibliometric analysis of academic journals. *Organization Studies*, 33(8), 1015-1043. <https://doi.org/10.1177/0170840612448028>
- Wright, M. (2017). Innovation and ownership variety. *Innovation: Management, Policy & Practice*, 19, 74-79. <https://doi.org/10.1080/14479338.2016.1233827>
- Zahra, S. A., Hayton, J. C., & Salvato, C. (2004). Entrepreneurship in family vs. non-family firms: A resource-based analysis of the effect of organizational culture. *Entrepreneurship Theory and Practice*, 28, 363-381. <https://doi.org/10.1111/j.1540-6520.2004.00051.x>
- Zellweger, T. (2023, December 9). *How the world's largest family businesses are outstripping global economic growth*. University of St.Gallen. <https://familybusinessindex.com/#dataanalytics>
- Zellweger, T., Kellermanns, F. W., Eddleston, K. A., & Memili, E. (2012). Building a family firm image: How family firms capitalize on their family ties. *Journal of Family Business Strategy*, 3(4), 239-250. <https://doi.org/10.1016/j.jfbs.2012.10.001>
- Zupic, I., & Cater, T. (2015). Bibliometric methods in management and organization. *Organizational Research Methods*, 18(3), 429-472. <https://doi.org/10.1177/1094428114562629>
- Zyoud, S. H., & Fuchs-Hanusch, D. (2017). A bibliometric-based survey on AHP and TOPSIS techniques. *Expert Systems with Applications*, 78, 158-181. <https://doi.org/10.1016/j.eswa.2017.02.016>