



A Bibliometric Analysis of Dynamic Capacities in the Field of Family Firms (2009-2019)

María Paulina Brito-Ochoa^{a,b}, María Asunción Sacristán-Navarro^c, Eva Pelechano-Barahona^c

^aDoctoral student, Rey Juan Carlos University, Madrid, Spain

^bTitular Professor, Guayaquil University, Ecuador

^cDepartment of Business Economics, Rey Juan Carlos University, Madrid, Spain

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Abstract This paper examines the various contributions of scientific research about dynamic capabilities in the field of family businesses, using a bibliometric approach during the period 2009-2019. The volume of scientific publications found in the Web of Science (WOS) database was equal to 56 articles. The application of bibliometric methods and techniques has made it possible to reflect the evolution of the level of publications, active institutions, methodologies used, and the main research topics covered. Considering the results obtained, future lines of research are proposed that allow progress in the consolidation of the study of dynamic capacities in the field of family businesses as a scientific discipline.

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Un análisis bibliométrico de las capacidades dinámicas en el campo de las empresas familiares (2009-2019)

Resumen El presente trabajo examina las diversas contribuciones de la investigación científica en el tema de capacidades dinámicas en el campo de las empresas familiares, utilizando un enfoque bibliométrico durante el período 2009-2019. El volumen de publicaciones científicas hallado en la base de datos de la Web of Science (WOS) fue igual a 56 artículos. La aplicación de métodos y técnicas bibliométricas ha permitido reflejar la evolución del nivel de publicaciones, instituciones activas, metodologías empleadas y principales temas de investigación tratados. Teniendo en cuenta los resultados obtenidos, se proponen líneas futuras de investigación que permitan avanzar en la consolidación del estudio de capacidades dinámicas en el campo de las empresas familiares como disciplina científica.

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^{*}Corresponding author
E-mail: mp.brito.2018@alumnos.urjc.edu.ec

1. Introduction

During the last decade, interest in the use of dynamic capabilities theory in the field of Family firms has grown significantly, and the importance of this approach is related to the impact on innovation and business growth (Daspit, Long, & Pearson, 2019). Authors' studies (Collis, 1994; Eisenhardt & Martin, 2000; Teece, Pisano, & Shuen, 1997; Zollo & Winter, 2002) show that dynamic capabilities enable a firm to expand, modify, or create common capabilities through access and recombination of knowledge and favour success over time. From this approach, knowledge is considered to be the basis on which dynamic capabilities are sustained (Foss, 2005), which encourage learning and the generation of intangible resources in the organization (Teece et al., 1997; Teece, 2007).

Worldwide, Family firms represent more than two-thirds of all firms, becoming one of the fundamental pillars for economic and social development (Brent, Facette, & Coppola, 2019), their activity is an important booster of Gross Domestic Product (GDP) and a contributor to the growth of the employment level. Various studies have shown that Family firms are a particular type of business where the generation of dynamic capabilities can be developed in a distinctive way, based on the conditions of their knowledge, and learning management process. At present, there is evidence that suggests that, in the field of Family firms, research focused to the study of dynamic capabilities is scarce, as reported (Barros, Hernangómez, & Martin-Cruz, 2016; Brinkerink, 2018; Colombo, Koiranenn, & Chirico, 2006; Chirico & Nordqvist, 2010; Chirico, Nordqvist, Colombo, & Mollona, 2012; Chirico & Salvato, 2008, 2016).

Previous research accumulated ideas and strategies to better understand dynamic capabilities and Family firms. Zellweger et al. (2013) affirm that Family firms are stronger and survive hard times, because companies do not focus only on future months, but focus on future generations. Studies by Lumpkin, Brigham, and Moss (2010) show that a long-term orientation can be a source of positive results and a good performance of Family firms.

On the other hand, science has evolved rapidly, giving rise to new information technologies that are an incentive for researchers to seek new ways to analyse considerable amounts of information, giving rise to bibliometrics (Huggett, 2013). These methods can generate reliable and robust indicators that are useful for comparing or classifying large concepts (Góngora, 2010).

The purpose of this article is to provide an overview of dynamic capabilities research in the field of Family firms, performing a bibliometric analysis with the review of 56 articles identified in the WOS (Web of Science) between the period 2009 to

2019. The year 2009 has been taken as the starting point, since no bibliometric studies relating these two topics have been carried out since that year to date. With this study, it is expected to know those research, authors, and most influential publications that any researcher about dynamic capabilities and Family firms should know. The results of this analysis will show potential lines of research for future studies through word co-occurrence analysis and cluster identification.

The structure of the present work is as follows: first, a brief review of the literature is shown where the concept of dynamic capabilities is analysed individually, and then it is studied in the field of Family firms. Second, the results are shown in terms of activity indicators (number of most cited articles, evolution of article production, most productive journals, most productive authors and countries with the highest production), then, a description of the topics and lines of research addressed is made, supported by a bibliometric word co-occurrence analysis, where potential research areas are proposed, which could represent unexplored knowledge gaps. The last section shows the conclusions.

2. Review of the Literature

2.1. Dynamic capabilities

Colins (1994), Kogut and Zander (1992), and Pisano (1994) carried out interesting works regarding dynamic capabilities, but it was Teece (1997) who used this approach in the field of strategic management to encourage the birth of new competencies and thus, improve decision-making in changing environments. Rivera and Figueroa (2013) state that the reflections allow companies to obtain the skills to ensure their continuity over time considering variables such as: technology, intellectual property protection, invention of new business models, creation of intangible assets, open innovation, flexibility and decentralization. The dynamic capabilities are developed as a route that allows the continuous exploration of competencies according to the transformations in the environment, the integration of knowledge with the reality about performance in complex environments and the replacement of attributes for future growth and development (Rivera & Figueroa, 2013).

Based on the definition of Teece (1997), for whom dynamic capabilities are competencies or capabilities that allow the company to create new products and processes, thus responding to changing market circumstances. Collins (1994) considers that organizational capacities guide the rate of change of ordinary capacities (simply technologies) and Pisano (1994), for whom the ability to alter resources is the organizational background to

the strategic routines through which managers alter the resource base of the company to generate new value creation strategies.

Helfat (1997), Lee et al. (2002), Teece et al. (1997), and Zahra (2006) describe dynamic capabilities as a set of skills that the company has to integrate, build and reconfigure its internal and external competencies to adapt to situations in unstable environments and thus generate new competitive advantages. For their part, Helfat and Raubitschek (2000) explain that by learning from mistakes, companies can better adapt to the environment. Zajac, Kraatz, and Bresser (2000) explain that it is the capacity of the company to change when it needs to and where its results are much better.

Other authors such as Bowman and Ambrosini (2003), Griffith and Harvey (2001), Helfat and Peteraf (2015), Lampel and Shamsie (2003), Lavie (2006), and Rindova and Kotha (2001) emphasize that to achieve the distinctive capabilities it is necessary to combine resources and reconfigure to generate forceful changes in the firms in order to evolve and transform.

Today the theory of dynamic capabilities is focused on generating research for organization and strategic management; evolving in such a way that it has expanded to incorporate notions of strategic management, for example, in terms of business models (Chesbrough & Rosenbloom, 2002; Teece, 1986, 2010, 2014a, 2014b) innovation studies (value capture / appropriability) (Chesbrough & Rosenbloom, 2002), behavioural decision theory (error and bias detection and capture) and organizational behaviour (culture / leadership issues) (Arndt, Pierce, & Teece, 2017)

2.2. Dynamic capabilities in the field of family firms

As for the study of dynamic capabilities in the field of Family firms, this approach has contributed to overcome limitations in the study of other non-contextualized phenomena. For example, in the study of the creation of new businesses and corporate strategies (Bowman & Ambrosini, 2003); in the learning of new skills (Zollo & Winter, 2002); in the generation of R&D and innovation activities (Galunic & Eisenhardt, 2001; Helfat, 1997; McKelvie & Davidsson, 2009; Narayanan, Colwell, & Douglas, 2009; Tripsas, 1997; Tripsas & Gavetti, 2000; Verona & Ravasi, 2003). Thus, although the dynamic capability perspective is prominent in strategic management research, it remains an emerging perspective in the context of Family firms (Daspit et al., 2019).

Currently, there are some studies that have begun to examine the dynamic capabilities in the family business because it is an interesting scientific discipline. For example, Chirico and Salvato (2008)

propose that the capacities and willingness of a family business by integrating knowledge, they relate positively to dynamic capabilities and subsequent changes in lower-level capabilities. Furthermore, it is observed that dynamic capabilities affect trans-generational value in Family firms by altering business performance (Chirico & Nordqvist, 2010), and some use a dynamic capability approach to understand family business decision making. Barros, Hernangómez, and Martin-Cruz (2016), for example, use this view to map the effects of family involvement in strategic decision-making. Such progress indicates a promising development in the field of Family firms.

3. Methodology

3.1. Bibliometric analysis

The main bibliometric indicators used in this research are activity indicators and relationship indicators. The activity indicators are simple compilations of bibliographic references (such as authors, articles, key words, citations, among others), while the relationship indicators analyse the links and reproduction of certain key words in scientific articles. The latter shows co-occurrence studies with the purpose of finding potential lines of research (Arencibia & De Moya Anegón, 2008). Nowadays, the analysis of scientific publications in business management has become an important process when it comes to generating new knowledge and impact on scientific research. It is for this reason that bibliometric analyses are becoming increasingly important because they quantify scientific activity through mathematical and statistical methods to discover scientific gaps that give opportunity to new research (Camps, 2010).

3.2. Database selection

The study was contextualized in the dynamic capabilities in the field of Family firms, using a quantitative methodological perspective, with the application of a non-experimental, exploratory, retrospective and cross-sectional design of the scientific information published during the period 2009-2019 (11 years).

The first step was to obtain a database of articles to carry out the analysis. As shown in table 1, this study only considers the bibliographic records obtained from the Web of Science (WOS), because this database has a global geographical scope, high impact quality indicators and provides essential metadata such as: abstracts, references, number of citations, lists of authors, institutions, countries and the impact factor of the journal (Carvalho, Fleury, & Lopes, 2013).

For the analysis we considered an 11-year period, i.e., from 2009 to 2019 (obtained on May 19, 2020). We selected 2009 as the starting year

because we found a bibliometric study (Meirelles & Bueno, 2014) that analysed the study of dynamic capabilities until 2009 and left open the possibility of studying these capabilities in the field of Family firms. The selection of articles related to dynamic capabilities in the field of Family firms was made using a combination of terms such as (“Dynamic capabilit*”) AND (“family business*” OR “family firms*”) included (titles and keywords of the author). Subsequently, they were processed following some limitations such as (1) the criteria for inclusion of the analysis were to “articles” and “reviews”; and (2) documents included in the research areas “Business Economics”.

For the analysis of the results, the SciMAT tool was used, developed by the SECABA group of the University of Granada, which allows the construction of scientific maps and visualization of the evolution of a scientific area (Cobo, López-Herrera, Herrera-Viedma, & Herrera, 2012) which was used as a data manager to organize the activity indicators. The VOS Viewer tool was also used (Valenzuela, Merigó, Johnston, Nicolas, & Jaramillo, 2017; Van Eck & Waltman, 2010), a software tool for network analysis that helps to visualize the dynamics and structures of science. It was applied to perform coupling and concurrent keyword analysis to explore and examine in depth the intellectual structures of the field of research addressed.

Table 1. Choice of database¹

Database	Web of Science (WOS)
Geographic scope	Global scientific production
Characteristics	Quality indicators: JCR impact factor, quartile (importance of the journal), Number of citations
Search range	2009-2019
Search date	May 19, 2020
Search terms	TS=(("Dynamic capabilit*") AND ("family business*" OR "family firms*"))
Number of documents	56
Criteria for inclusion	Article
Analysis	Review
Research areas	Business Economics
Indexes	SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH, ESCI, CCR-EXPANDED, IC.

1. The search for information in WOS was run again using the word dynamic capability and including as research areas not only business economics, but also “business” “management” “business finance” which are also specific to the area. The result was 62 articles found, so it did not represent a significant difference at the time of the analysis.

4. Bibliometric Analysis

4.1. Most cited articles

According to the analysis of the WOS information, 56 articles have been published describing the relationship between dynamic capabilities in the field of Family firms. Table 2 shows the 10 articles with the highest number of citations in the WOS with their respective authors. A frequency analysis is also shown to know the citation percentage of each of the articles over time.

The most prominent article in terms of number of citations is that of De Massis, Frattini, and Lichtenthaler (2013) “Research on Technological Innovation in Family Firms: Present Debates and Future Directions” with a frequency of 17.22%. This article makes an exhaustive empirical analysis where it shows gaps in the research of the relationship between innovation (dynamic innovation capabilities) and the family business. The authors mention that there are opportunities for future research since the direct effects of the family and its participation in innovation activities and the moderating effects of family participation on the relationship between inputs and innovation activities, as well as on the relationship between innovation activities and products, have not been explored.

The second most cited article is that of Nordqvist and Chirico (2010) with 10.56%, “Dynamic capabilities and trans-generational value creation in family firms: The role of organizational culture”, which through an empirical study offers the first conclusions on the application of dynamic capabilities in the field of Family firms. Among these conclusions we find that family inertia depends on the characteristics of the family business, its culture, where paternalism and business orientation influence positively on family inertia and negatively, respectively.

The third article with more citations is that of Benavides-Velasco, Quintana-Garcia, and Guzman-Parra (2013): “Trends in family business research”, which through an analysis of 703 articles focused on the thematic categories ‘business’, ‘corporate finance’, ‘economy’ and ‘management’ aims to describe the patterns and trends in the literature on Family firms in order to identify potential areas for future research useful for advancing the consolidation of the field. Among its most important results, strategic thinking stands out, particularly the resource-based vision (Hoopes, Madsen, & Walker, 2003; Wernerfelt 1984) and the dynamic capabilities (Teece et al., 1997; Teece, 2007) that emerge as adequate theoretical perspectives to advance research on Family firms.

Table 2. Articles and authors of analysis

	Year	Title	Authors	No. of Citations	Frequency
1	2013	Research on technological innovation in family firms: Present debates and future Directions	De Massis, A., Frattini, F., Lichtenthaler, U.	181	17.22%
2	2010	Dynamic capabilities and trans-generational value creation in family firms: The role of organizational culture	Chirico, F., Nordqvist, M.	111	10.56%
3	2013	Trends in family business research	Benavides-Velasco, C. A., Quintana-Garcia, C., Guzman-Parra, V. F.	98	9.32%
4	2009	Agency, strategic entrepreneurship, and the performance of private equity-backed buyouts	Meuleman, M., Amess, K., Wright, M., et al.	87	8.28%
5	2016	Innovation through tradition: lessons from innovative family firms and directions for future research	De Massis, A., Frattini, F., Kotlar, J., et al.	71	6.76%
6	2018	Innovation with limited resources: Management lessons from the german mittelstand	De Massis, A., Audretsch, D., Uhlaner, L., et al.	51	4.85%
7	2016	Knowledge internalization and product development in family firms: When relational and affective factors matter	Chirico, F., Salvato, C.	44	4.19%
8	2013	Disentangling the effects of organizational capabilities, innovation and firm size on SME sales growth	Uhlaner, L. M., Van Stel, A., Duplat, V., et al.	37	3.52%
9	2015	Does family involvement foster or hinder firm performance? The missing role of family-based branding strategies	Gallucci, C., Santulli, R., Calabró, A.	36	3.43%
10	2016	Entrepreneurial exploration and exploitation in family business: A systematic review and future directions	Goel, S., Jones, R. J.	29	2.76%

As can be seen in Table 3 and 4, 52% of the articles (i.e., 29 articles) were coded as theoretical. Of these, the vast majority have been published since 2016, possibly in reaction to the scarcity described in previous periods. 48% of the articles (i.e., 27 articles) are empirical analyses, which shows that the authors have tried to combine in an equitable way the two types of articles in order to develop more research with theoretical and practical support.

The theoretical research was based much more on the systematic analysis of literature as seen in the

articles by Pikkemaat, Peters, and Bichler (2019) and Daspit et al. (2019), which were based on an updated review of literature in order to have theoretical support for future research. It can also be observed that the theoretical studies were much more dedicated to the development of concepts giving more importance and scientific evidence to the theories already established since 2009. Here we highlight the articles of Daspit et al. (2019) and of Fuentes et al. (2019) which analyse the theory and its evolution in relation to the criticisms made in previous reviews.

Empirical research highlighted quantitative studies using data sources such as the survey and existing databases. Among the works that stand out in this research are those of Meuleman et al. (2009) which was based on a list of 238 purchases backed by private capital in the United Kingdom between 1993 and 2003 and that of Nordqvist et al. (2012) which carried out a numerical integration in 50 time periods. It is also important to highlight the emergence of case studies in empirical studies such as Barros-Contreras et al. (2014) with the Grupo Yllera case and De Massis et al. (2016) with the illustrative cases of six long-term Family firms (Aboca, Apremare, Beretta, Lavazza, Sangalli and Vibram).

In summary, the theoretical studies add up to 29 articles of which 20 are based on concept development, 3 make a model proposal and 6 do a literature review. Likewise, the empirical studies total 27 articles, of which 23 are quantitative, 3 are qualitative and 1 is mixed. Of these 27, 10 use databases as a source of information, 13 use surveys, 2 interviews, 1 case study, and 1 survey and interview at a time. This type of analysis has

made it possible to identify the year from which both theoretical and empirical research took off in the field of dynamic capabilities in the field of Family firms (2016-2019).

4.2. Evolution of article production

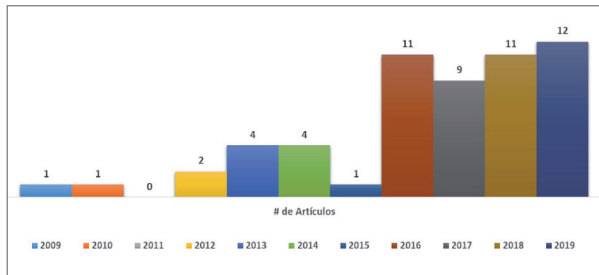
In order to examine the evolution of the production of articles on dynamic capabilities in the field of Family firms, 56 articles were analysed, of which 21% (i.e., 12 articles) were published in 2019, which is equivalent to 12 times the number of articles published in 2009, clearly suggesting a greater academic interest in the study of dynamic capabilities in the field of Family firms over the past 11 years (Figure 1). In fact, until 2015 academic publications linking these two topics were almost non-existent. In 2016, the number of articles published increased significantly, with 11 articles appearing that year (equivalent to 20%), which has marked a trend until 2019. From 2016 to 2019, there is an upward trend, accumulating 77% of the articles considered in the database, which indicates a greater interest by academics in the study of dynamic capabilities in the field of Family firms.

Table 3. Type of article and method of choice by year of publication

Type of article	Method	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total	Percentage
Theoretical	Concept development	-	-	-	1	1	2	-	1	6	5	4	20	36%
	Model proposal	-	1	-	-	-	-	1	1	-	-	-	3	5%
	Literature review	-	-	-	-	2	-	-	2	-	-	2	6	11%
	Total	0	1	0	1	3	2	1	4	6	5	6	29	52%
Empirical	Qualitative	-	-	-	-	-	-	-	1	-	-	2	3	5%
	Quantitative	1	-	-	-	1	2	-	6	3	6	4	23	41%
	Mixed	-	-	-	1	-	-	-	-	-	-	-	1	2%
	Total	1	0	0	1	1	2	0	7	3	6	6	27	48%
Total		1	1	0	2	4	4	1	11	9	11	12	56	100%

Table 4: Type of article and data source by year of publication

Type of article	Data source	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total	Percentage
Theoretical	Database	-	1	-	1	3	2	-	4	6	5	7	29	52%
	Total	0	1	0	1	3	2	0	4	6	5	7	29	52%
Empirical	Database	1	-	-	1	1	-	-	3	-	-	4	10	23%
	Survey	-	-	-	-	-	2	1	3	2	4	1	13	4%
	Interview	-	-	-	-	-	-	-	-	1	1	-	2	4%
	Case study	-	-	-	-	-	-	-	-	-	1	-	1	2%
	Survey-Interview	-	-	-	1	-	-	-	-	-	-	-	1	2%
	Total	1	0	0	2	1	2	1	6	3	6	5	27	48%
Total		1	1	0	3	4	4	1	10	9	11	12	56	100%

Figure 1: Scientific production 2009-2019

4.3. Most influential magazines

In the literature analysed, there is a concentration of productivity in a certain number of major journals. Table 5 shows the evolution of the most productive journals in the field of dynamic capabilities in Family firms. In this table, there have been excluded magazines that were not in the ranking of “Scimago Journal & Country Rank” and that therefore lacked H-Index and the Q-Quartile, there were also excluded the magazines whose publications lacked at least 2 cites. They were ordered according to the highest number of publications and the Hirsch index, or h-index, has been taken into account, which is a measure of the professional quality of authors and journals according to the number of times their scientific articles have been cited (Schreiber, 2015); thus, the Q-Quartile has also been taken into account, which is an indicator that serves to evaluate the relative importance of a journal within the total number of journals in its area (Mihajlov & Vejmelka, 2017). From these data both specialized magazines, from the business and strategy fields, as well as more generalist magazines, have published the most cited articles on dynamic capabilities in the field of Family firms. In this sense, the fact that research is published in a wide and diverse range of magazines counteracts with other more mature topics whose research is more concentrated in a reduced number of specialized magazines.

Within the ranking of most productive magazines with 240 citations obtained from the WOS, the magazine “Family Business Review” has 5 publications on these topics and a 19.22% of citations, being a magazine with H-Index of 87 and first quartile (Q1). Another magazine that also stands out with 170 citations is “Small Business Economics”, which has 4 publications, which is equivalent to 13.61% of citations with H-Index of 108 and is first quartile (Q1). The “Journal of Family Business Strategy” also stands out with 268 citations, which is equivalent to 21.46% with H-Index of 31 and is first quartile (Q1). It is also followed by the “International Small Business Journal” with 120 citations, which has 3 publications, with 9.61% with an H-Index of 71 and is a first Quartile (Q1).

In this analysis it is important to analyse that all the most productive magazines in these topics are first Quartile (Q1) in its great majority, which gives as a conclusion that they are magazines with a high degree of reputation in this area.

Tabla 5. Most influential magazines

JOURNALS	Publications	Citations	H-Index	Q-Quartil	Frequency
1 Family Business Review	5	240	87	Q1	19.22%
2 Small Business Economics	4	170	108	Q1	13.61%
3 Journal of Family Business Strategy	4	268	31	Q1	21.46%
4 International Small Business Journal-Researching Entrepreneurship	3	120	71	Q1	9.61%
5 Entrepreneurship Theory and Practice	2	131	121	Q1	10.49%
6 Journal of Small Business Management	2	34	94	Q1	2.72%
7 Global Strategy Journal	2	26	12	Q1	2.08%
8 Journal of Family Business Management	2	8	43	Q1	0.64%
9 International Entrepreneurship and Management Journal	2	10	41	Q1	0.80%

4.4. Most productive countries

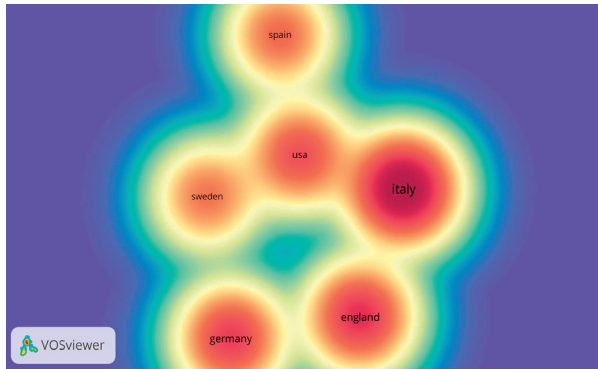
Figure 2 shows the most productive countries with the highest number of citations in the publications on dynamic capabilities in the field of Family firms. Among them, England stands out with 19 articles and 320 citations, followed by Spain with 15 articles and 195 citations, then Italy with 12 articles and 486 citations, the United States with 9 articles and 247 citations, Germany with 6 articles and 290 citations and Sweden with 5 articles and 177 citations.

In conclusion, England and Spain are the main producers of the sample documents, followed by other European countries, especially Italy and Germany. At the same time, the leading role of Italy should be highlighted, with a significant number of documents cited with international collaboration and references on these themes.

4.5. Most productive and most cited authors

In analysing the most productive authors in the field of dynamic capabilities in the field of Family firms, out of a total of 136 authors, 15 have written more than 1 article on these topics and

Figure 2: Most productive countries and highest number of citations.



only the authors De Massis, Frattini, Chirico, Nordqvist, Alonso and Kok bring together between 5 and 3 publications each (Table 6).

Table 6. Authors who have published more than 1 article, 2009-2019

#	Authors	# Publications	Times cited	h-index (Hirsch)
1	De Massis, Alfredo	5	331	43
2	Frattini, Federico	3	265	39
3	Chirico, Francesco	3	170	26
4	Nordqvist, Mattias	3	133	46
5	Alonso, Abel Duarte	3	1	29
6	Kok, Seng	3	1	7
7	Wright, Mike	2	158	141
8	Kotlar, Josip	2	86	24
9	Audretsch, David	2	72	135
10	Calabrò, Andrea	2	58	21
11	Jones, Oswald	2	15	37
12	Hernandez-Perlines, Felipe Martin-	2	8	13
13	Cruz, Natalia	2	9	21
14	Wang, Yong	2	11	12
15	O'Shea, Michelle	2	1	9

Table 6 shows the most representative authors in research on dynamic capabilities in the field of Family firms, where it can be seen that 15 of them have published a number equal to or great-

er than two articles in the period of analysis. It is also noted that the authors De Massis Alfredo and Frattini Federico are the most often cited and have the largest number of publications. This is in line with what was observed previously where the article “Research on Technological Innovation in Family Firms: Present Debates and Future Directions” is one of the most cited and referenced in this topic.

To measure more effectively the quality of the researcher, in addition to the count of citations received, the Hirsch h index has been estimated (Hirsch, 2005) and is included in table III. A scientist has an h index if he or she has published h papers with at least h citations each; thus, the h index is the balance between the number of citations in one or a few papers. The indicator acquires an ascending value as the citations received are distributed in the scientist's body of work.

In the area of study of dynamic capabilities in a specific field such as Family firms, the authors with the highest number of articles and citations received, also reach higher values of the h index; this shows their relevance in the area through various contributions.

4.6. Keyword co-occurrence

Keyword co-occurrence analysis produces a network of themes and their relationships that represent the conceptual space of a field (Cancino, Merigó, Coronado, Dessouky, & Dessouky, 2017; Martínez-López, Merigó, Valenzuela, & Nicolás, 2018). In graphic visualization, the size of a circle denotes the relevance of an element and network connections identify the most closely linked elements. The placement of the circles, the colours and the delimitation are used to group the items. The distance between two nodes is inversely proportional to the number of matches between keywords. Therefore, shorter distances suggest a greater match between keywords.

In the sample of 56 articles a total of 353 keywords were obtained. To simplify the knowledge representation only the keywords with a frequency of ≥ 3 (i.e. 50 keywords) were selected (a lower threshold would have resulted in a long list of keywords and complex maps that are difficult to visualize and interpret). Then the list of keywords was entered into the Vosviewer program which calculated the total strength of the matching links to other keywords.

Previously, and before visualizing the co-word network, the keywords ‘dynamic capabilities’ ‘family firms’ and ‘family firm’ were manually removed because they were related to most of the items. A total of 27 keywords were obtained. Figure 4 shows what the keyword co-occurrence network generated, resulting in three item clus-

ters. As expected, the keywords that are most repeated are dynamic capabilities and Family firms. The size of the tags and the diameter of the circles are shown to be proportional to the frequency and strength of the connections of the respective keywords. Each of the three clusters was named according to most of the keywords that formed it. The interpretation of the map considered the number of keywords within each cluster, the number of occurrences of each keyword and their interrelationship. The different aggregates revealed the actual contents and research topics of the documents (Table 7), as well as the different authors who highlighted these topics by each cluster. The clusters located in the centre of the maps indicated the thematic areas of greatest scientific activity:

- **Cluster 1:** “The performance of Family firms”, included 10 key words related to entrepreneurship, innovation, strategic management, and resource-based vision.
- **Cluster 2:** “The creation of value in Family firms”, Included 9 key words related to the

competitive advantage of the companies, the socio-emotional wealth of the companies, and the familiness which is the intangible value that the family brings to the company.

- **Cluster 3:** “The entrepreneurial orientation in Family firms”, Included 8 key words related to the approach of dynamic capabilities, the moderator role, knowledge transfer and strategic management.

Figure 4. Co-occurrence of keywords

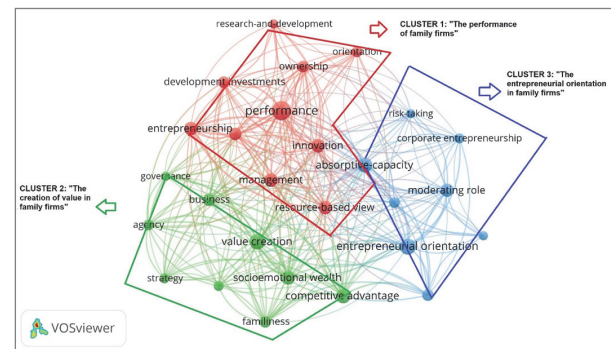


Table 7. Cluster, keywords, and authors

Clusters	Keywords	Authors	Most cited article
CLUSTER 1: “The performance of Family firms”	Development investments, Entrepreneurship, Innovation, Knowledge, Management, Orientation, Ownership, Performance, Research and development, Resource based view.	(Hernández-Perlina et al., 2019) (Meuleman et al., 2019) (Park et al., 2019) (Hernandez-Perlina, 2018)	“Agency, strategic entrepreneurship, and the performance of private equity-backed buyouts” (Meuleman et al., 2019)
CLUSTER 2: “The creation of value in Family firms”	Agency, Business, Competitive advantage, Familiness, Governance, Resources, Socioemotional wealth, Strategy, Value creation.	(Martínez-Romero et al., 2019) (Chirico et al., 2015) (Chirico et al., 2010)	“Dynamic capabilities and trans-generational value creation in family firms: The role of organizational culture” (Chirico et al., 2010)
CLUSTER 3: “Entrepreneurial orientation in Family firms”	Absorptive-capacity, Corporate entrepreneurship, Dynamic capabilities, Entrepreneurial orientation, Firm performance, Knowledge transfer, Model, Moderating role, Risk-taking, Strategic management.	(Hernández -Perlina et al., 2019) (Hernández -Perlina, 2018) (Rodrigo-Alarcón et al., 2018)	“Moderating effect of absorptive capacity on the entrepreneurial orientation of international performance of Family firms” (Hernández-Perlina, 2018)

5. Conclusions

Research on dynamic capabilities in the field of Family firms offers opportunities to better understand the complexity of family business and to advance in the consolidation of this discipline (Benavides et al., 2011). Therefore, it is an open knowledge gap for future research.

This research paper examined the literature based on 2009-2019, using publications available in the WOS database. The evolution of the study shows that the general trend has been upward, especially since 2016. Therefore, two different periods are distinguished: the initial period from 2009-2015 (Period 1), and the ascending period from 2016 to 2019 (Period 2).

Among the most cited works on these topics are: "Research on Technological Innovation in Family Firms: Present Debates and Future Directions" by De Massis, Frattini, Lichtenthaler and Ulrich in 2013 (181 times cited), "Dynamic capabilities and trans-generational value creation in family firms: The role of organizational culture" by Chirico and Nordqvist, 2010 (111 times cited) and "Trends in family business research" by Benavides-Velasco and Quintana-Garcia, 2013 (98 times cited). The most outstanding authors are also mentioned, which are De Massis, Alfredo (331 times cited with a Hirsch index of 43), then Frattini, Federico (265 times cited with a Hirsch index of 39) and Chirico, Francesco (179 times cited with a Hirsch index of 26). Among the most influential journals in these areas are: Family Business Review, Small Business Economics, and the Journal of Family Business Strategy. In conclusion and taking as reference the co-occurrence analysis of words, it is observed that the tendencies of the concept of dynamic capabilities in the field of Family firms are focused towards 3 clusters duly identified as: "The performance, the creation of value and the entrepreneurial orientation of Family firms", leaving as potential lines of research innovation, strategic agility and entrepreneurship.

Although this study is the first attempt to carry out a systematic review in academic research on dynamic capabilities in the field of Family firms, studies with these two variables have previously been carried out, but analysing them independently (Benavides et al., 2011; Meirelles & Bueno, 2014).

This article tries to give a clearer view of what are the predominant issues being researched today in the scientific community. Therefore, it provides a broader vision of research in this field and tries to contribute to a greater generation of literature on the dynamic capabilities approach in Family firms, which facilitates the work of academics, students and consultants who are looking for a knowledge gap on these topics.

Based on the limitations of the study, these results are expected to be complementary and informative for other literature reviews, since the study only collected data from the WOS database. Finally, the use of bibliometric methods has allowed to know more cited articles, types of studies with their respective data sources, evolution of the production of articles, more influential journals, more productive countries in the theme, productivity of authors and the analysis of co-occurrence of key words and main research topics discussed, in order to propose future lines of research in this field.

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