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BIBLIOMETRIC ANALYSIS OF THE LITERATURE ON HOW FIRMS COPE WITH COVID-19

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ABSTRACT

Different firms and their supply chains faced many global impacts with the COVID-19 pandemic. The purpose of this paper is to analyse the scientific production about firms and the Covid-19 pandemic through bibliometric indicators associated with the most prolific journals, authors, documents, countries and institutions. IEEE Engineering Management Review and Industrial Marketing Management were the most relevant academic journals, which indicates the adaptation of businesses and supply chain resilience as major tendencies. Ivanov and Kraus are the most relevant authors. This paper contributes to the knowledge by mapping of scientific production regarding firms and COVID-19 and providing a basis for future studies that can help researchers and managers to minimise the effects of the current global crisis.

KEYWORDS: Covid-19, firms, bibliometric analysis.

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RESUMO

Com a pandemia da COVID-19, ocorreram impactos globais em empresas diversas e nas suas cadeias de suprimentos. Desse modo, o objetivo do estudo é analisar a produção científica sobre as empresas e a pandemia do Covid-19 por meio de indicadores bibliométricos associados às revistas, autores, documentos, países e instituições mais prolíficas. Os periódicos mais relevantes (IEEE Engineering Management Review e Industrial Marketing Management) apontam a adaptação dos negócios e a resiliência da cadeia de suprimentos como as principais tendências. Ivanov e Kraus são os autores de maior relevância. Esta pesquisa contribui para o conhecimento através do mapeamento da produção científica referente às empresas e o Covid-19, além de apresentar estudos futuros que podem auxiliar pesquisadores e gestores a minimizar os efeitos da atual crise global.

PALAVRAS-CHAVE: Covid-19, empresas, análise bibliométrica.

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1 INTRODUCTION

Due to its high contagious potential, COVID-19 spread rapidly across continents, leading countries to adopt protection measures, such as border closures (Zhu, Chou and Tsai, 2020). As a result, several firms faced global impacts (SEETHARAMAN, 2020) and their supply chains as a whole were affected (CAI & LUO, 2020). Problems in logistics, production stoppages, commercial blockages (Juergensen, Guimón & Narul, 2020) and supply chain disruption are examples of impacts commonly reported in the literature (e.g. Sharma, Luthra, Joshi & Kumar, 2020). Moreover, organisations' efforts were insufficient to avoid the imbalance between supply and demand (Ketchen Jr. & Craighead, 2020), especially in small and medium-sized firms (Waiho et al., 2020).

Academic literature on COVID-19 has been presenting studies focusing on particular themes regarding the business field. Changes in businesses are the most emphasised subject (Kraus et al., 2020; Manolova, Brush, Edelman & Elam, 2020). They focus mainly on small and medium-sized firms, relating them to the business model, changes in manufacturing, strategies of confrontation. In addition, they usually support managers' recommendations about the new normal in firms, assessing how to turn challenges into opportunities to ensure business survival. Studies on manufacturing are also frequent (Okorie et al., 2020; Juergensen, Guimón & Narula, 2020), addressing the major impacts, best practices for responding to disruptions and how to relocate operations. Supply chains consist of another commonly investigated theme (Liu, Lee & Lee, 2020; Golan, Jernegan & Linkov, 2020; Assunção, Medeiros, Moreira, Paiva & Paes, 2020), that focuses on the main impacts and resilience strategies for ensuring various sectors' integrity. The food sector has been gaining prominence (Shahbaz et al., 2020; Tsilika, Kakouris, Apostolopoulos & Dermatis, 2020). Protocols for safety and good implementation practices, strategic measures for coping and changes in purchasing behavior are the main contributions.

This diversity of topics related to the COVID-19 crisis addressed by academics is increasing exponentially, with evidence that it is gradually emerging as a debate in the business filed (Verma and Gustafsson, 2020). There are few published papers related to COVID-19 and firms using bibliometric analysis (Chahrour, 2020). Mapping the evolution of how the theme has been studied and which trends or needs will be more propitious for future research is one of the main contributions of this analysis (Ramanan, George, Chavan, Kumar & Jayasubha, 2020). Indeed, this methodology has been recently used to evaluate scientific productions (Ellegaard and Wallin, 2015), enabling the development of conceptual and intellectual structures (Aria & Cuccurullo, 2017). In this regard, this study provides theoretical support by adding information and bringing evidence that, although recent, is fundamental for organisations and academics in a period of a global crisis.

This study analyses the scientific production of firms and the Covid-19 pandemic through bibliometric indicators associated with the most prolific journals, authors, documents, countries and institutions. The interpretation of these indicators adds knowledge to the literature by numerically analysing information from publications in a specific area (Soares, Carneiro, Calmon & Castro, 2016).

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This section consisted of a presentation of the theme, its main problems and the study contributions. Thereafter, the development of the methodology used is described. In the third section, the main findings and results are discussed, answering the research questions. Finally, the most relevant considerations, study limitations and suggestions for future researches are presented.

2 METHODOLOGY

This research carried out a bibliometric analysis that enabled the statistical evaluation of the main information published in the literature that addresses the subject (Della Corte, Del Gaudio, Sepe & Sciarelli, 2019). Data collection employed a four-phases-protocol: planning, searching, screening and analysis (Tranfield et al., 2003).

The Scopus database was used to search for open access and peer-reviewed articles. Among the main databases, which support the analysis based on the Biblioshiny software, Scopus was chosen due to a greater number of results observed in the initial searches.

Keywords like 'Covid-19', 'performance', 'strategic', 'practices', 'opportunit*', 'cope', '"supply chain"', 'response', 'measure', 'enablers' and barriers were used. The asterisk (*) was inserted as a Boolean operator to find derived nouns, as well as their singular or plural. Altogether, 45 combinations were used, alternating the 15 selected keywords.

Searching process was performed in September 2020 and started with 1552 articles. Inclusion criteria were employed in the screening phase in order to select papers with evidence regarding how firms are copping COVID pandemic by implementing practices, business opportunities and strategies. Documents not related to this research focus, such as those belonging to the Medicine field, were excluded. The English language and the types of documents such as article, review and editorial were used as inclusion filters. Thus, 922 manuscripts were selected after the insertion of the filters, of which 429 were duplicated and removed. Hence, the initial sample consisted of 493 articles.

After reading the title and abstract, 409 articles were discarded: 39 studies were still mostly related to the field of medicine; 272 did not approach firms; four did not contemplate the theme in the context of Covid-19; and, finally, 84 of these articles talked about firms, however, they did not cover coping practices. Therefrom, five still had restricted access and were also eliminated. Consequently, 79 documents were selected for further reading. Of these, 41 were at odds with the research focus. As a result, 38 articles comprised the final collection for bibliometric analysis. Figure 1 shows the systematization of these steps.

The bibliometric analysis was performed by using the R-package bibliometrix software, which is the most up-to-date tool for systematically mapping literature data (Aria & Cuccurullo, 2017). Besides, it is commonly used in similar researches, such as Saikia et al. (2020) and Ramanan et al. (2020). The focus of this article embedded the quantitative analysis of the following data: main information, journals, documents - global and local, most local cited authors and affiliation,

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collaboration worldmap, collaboration network. The data will be evaluated according to the number of occurrences, as described in Table 1 below.

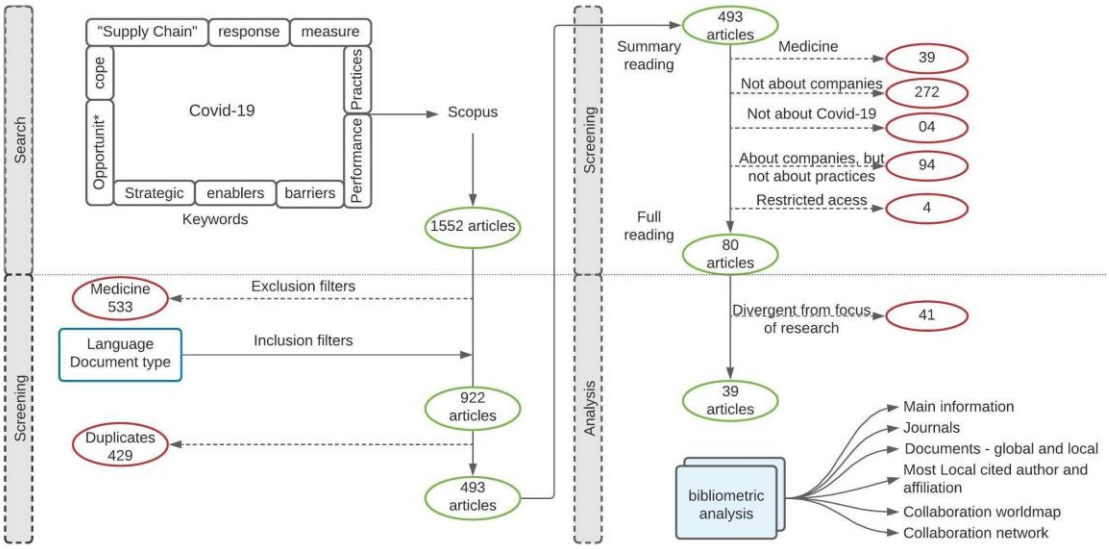

Figure 1: Summary of research development

Data	Description
Main information	Lists the main information from the sample of selected articles.
Journals	Publication sources of selected articles.
Most Cited Document (Global)	Indicates the most cited documents in the scholarly literature (based on how many times the article was cited by Scopus database) and the corresponding author.
Most local cited authors and affiliation	Assesses the most cited author within the selected sample of articles and their respective affiliation.
Collaboration worldmap	Displays the number of documents per country (indicated by the intensity of the colour) and collaborations between them (indicated by the lines) on a map.
Collaboration network	Indicates which authors are working collaboratively.

Table 1: Data collected and analysed. Fonte: Aria e Cuccurullo (2017)

This software is based on three essential stages: data import, bibliometric analysis and matrix elaboration (Aria & Cuccurullo, 2017). The Biblioshiny tool was jointly applied and consists of an application (Web System) linked to the Bibliometrix package (Ramanan et al., 2020). Biblioshiny enabled the use of graphic resources and the analysis of three fundamental structures for bibliometrics: conceptual structure, presenting the most discussed topics within a given content and

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the trends for future research; the intellectual structure, represented by the impact of the work of the main authors in the study area; and finally the social structure, bringing the relationship between authors, affiliation and the geographic distribution of the research (Aria & Cuccurullo, 2017).

Data was then imported from the Scopus database in bibtex format. The treatment (exclusion of duplicates, transformation to bibliographic matrix and generation of the spreadsheet) was made through the Rstudio software, as well as the loading of data into the biblioshiny application. The data (in .xlsx format) was then loaded, analysed and will be discussed below.

3 RESULTS AND DISCUSSION

3.1 Main information

The main information of the paper selected in this review is presented in Table 2, including the types of documents, content, number of authors and their collaborations. There is a predominance of articles carried out by empirical studies providing a description of the COVID-19 pandemic and business field. Regarding keywords, 186 different words were used, with a prevalence of terms such as 'Covid 19', 'coronavirus' and 'resilience'. It is evidenced that there is a lack of a pattern between words related to the pandemic. This can be an obstacle in literature review researches since the choice of combinations can determine the exclusion or inclusion of documents. However, the expression “resilience” may point out that it is the most investigated theme by researchers today. Few studies have addressed a review based on the already published reports on how the current situation is developing, which reinforces the gap in the related research literature.

As for the authors, there is a total of 133 of them distributed through all 39 articles, and only four documents had a single author. This result can infer a multidisciplinary and global theme that covers two different areas, such as the COVID 19 pandemic (aligned with the health field), and the business (associated with management). Indeed, the situation experienced in each location in greater detail can be better explored when investigated globally.

Main information	Total
DOCUMENT TYPES	
Article	35
Review	4
DOCUMENT CONTENTS	
Author's Keywords (DE)	186
AUTHORS	

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Authors	133
AUTHORS COLLABORATION	
Single-authored documents	4
Authors per Document	3.41

Table 2: Main Information

3.2 Journals

A publication source's relevance can be measured by several indexes and factors, such as the impact factor. The impact factor is a bibliometric method used for assessing the importance of scientific journals in their respective areas. According to the Journal Citation Reports, in mathematical terms, a journal's impact factor is calculated as the average number of citations of articles published during the previous biennium in a given year (Clarivate Analytics, 2020). Among the most relevant publication sources, observing the number of documents published, 'IEEE Engineering Management Review' can be emphasised, with four documents and an impact factor of 0.390 (according to the Academic Accelerator) (Figure 2). 'Industrial Marketing Management' was also relevant, with four and an impact factor of 4.695, and 'Sustainability' with three documents and an impact factor of 2.576.

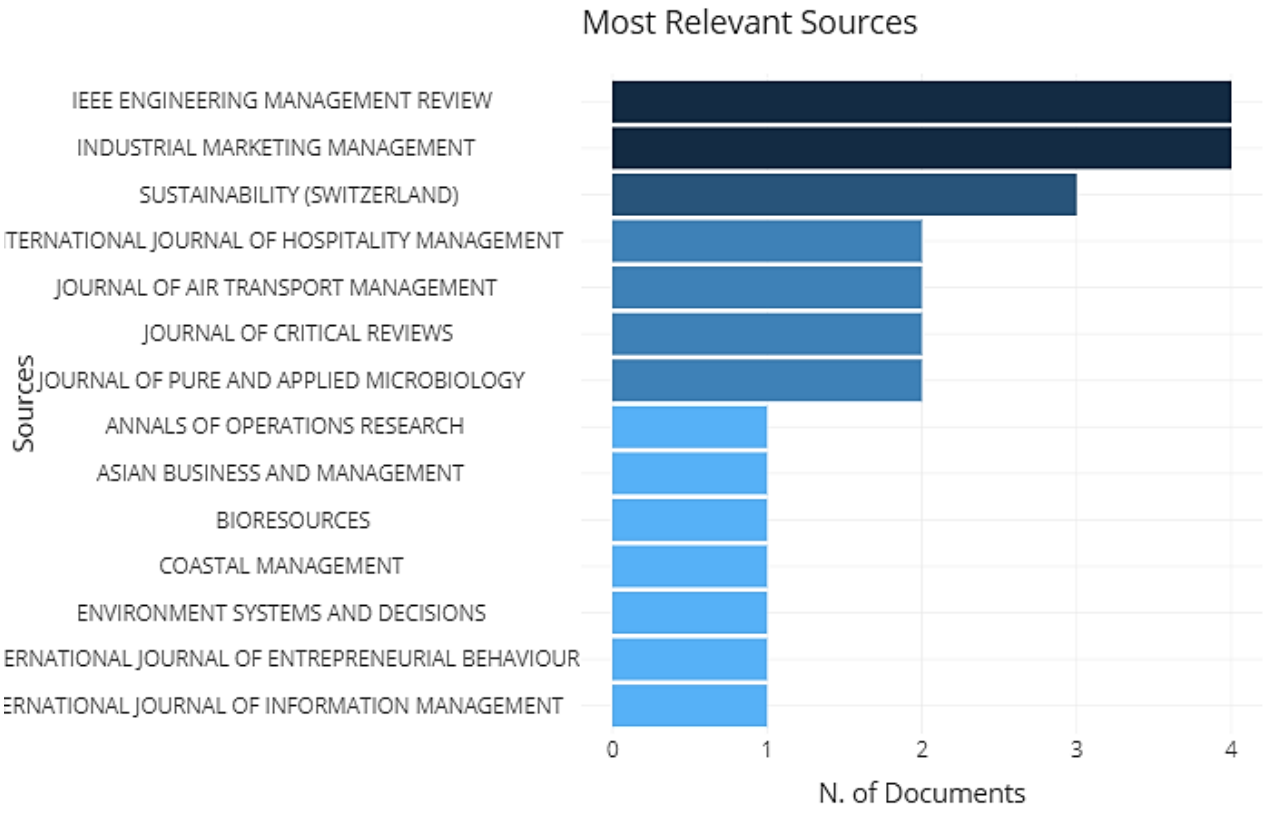

Figure 2: Most relevant publication sources

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Articles published in 'Industrial Marketing Management' mainly addressed the market, covering aspects regarding the current scenario analysis and how to shape new markets, for example. They lead the subject around crisis management and theories of strategic decision making, indicating strategic improvisation as a survival mechanism for organisations, and an analysis of the adoption of coopetition (collaboration and competition). Another debated topic is an analysis of how firms can navigate disruptive crises, emphasising on the differential effects on the products, services, and business, pointing out how they can become more resilient in the long run.

On the other hand, 'Sustainability' articles presented themes closely linked to the relationship between supply chain operations and the ongoing COVID-19 pandemic. They included analyses of lean, agile and agile strategies in supply chains, connections between scarcity and supply chain problems, lack of transparency and resilience and unsustainable just-in-time manufacturing.

Concurrently, 'IEEE' focuses on managers, decision-makers, professionals and legislators. It addresses observations about the “new normal”, indicating the main changes in the post-Covid-19 world, and managers’ role in the search for organisational extreme transformations. This source also analyses consumer buying behaviour in retail stores during the pandemic, indicating that consumers now have higher expectations regarding store safety, for example.

Even though the three most relevant publication sources previously analysed have different themes in their scope and documents, it is still possible to observe common themes between them. Business sustainability and crisis adaptations pervade all three journals and the search for the resilience of productive organisations.

3.3 Documents - global and local

Among the most globally cited documents, the one entitled “Viable supply chain model: integrating agility, resilience and sustainability perspectives — lessons from and thinking beyond the COVID-19 pandemic”, by Dmitry Ivanov, stood out with thirty citations on the Scopus database (Figure 3). In this paper, Ivanov (2020) presented the Viable Supply Chain (VSC) concept, which provided more specifically focus on viability, i.e., the ability of a supply chain to maintain itself and redesign the structures and planning. In this approach, viability is considered an underlying property encompassing three perspectives: agility, resilience and sustainability. Thus, the author stated that the VSC model might help firms to guide their decisions on the recovery and reconstruction of their SCs over the global crises, including the COVID-19 pandemic.

Then, Sascha Kraus with his work “The economics of COVID-19: initial empirical evidence on how family firms in five European countries cope with the corona crisis” had nine occurrences. The paper revealed that the crisis led to an attempt at digitalisation. It came from the firms' perspective when they brought in the new models of meeting and remote work, and the customer's perspective, who showed a greater acceptance of digital communication. Moreover, the results pointed out that most firms used a combination of different coping mechanisms after the crisis onset, and the authors described these changes as a significant but unintended cultural change.

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Maureen S. Golan presented six citations of her work “Trends and applications of resilience analytics in supply chain modelling: systematic literature review in the context of the COVID - 19 pandemic”. The paper focuses on supply chains and the impacts that interruptions can have on a global network scale. Its main idea is the importance of the resilience, and how more resilient chains might help strengthening other chains overcoming crises. The authors also point out that specific outage scenarios are used to develop and test supply chain resilience models.

On a similar note, Yipeng Liu also highlighted the importance of the resilience in combating the coronavirus crisis and stresses that the crisis has accelerated two trends for the future: the decoupling of China's supply chains and the relocation of strategic manufacturing operation outward from China. In addition, the author analysed strategic agility and entrepreneurship in this confrontation, mainly in China, South Korea and Singapore. He also debates the impact on business, government support for businesses and societies and implications for disruptions in the global supply chain.

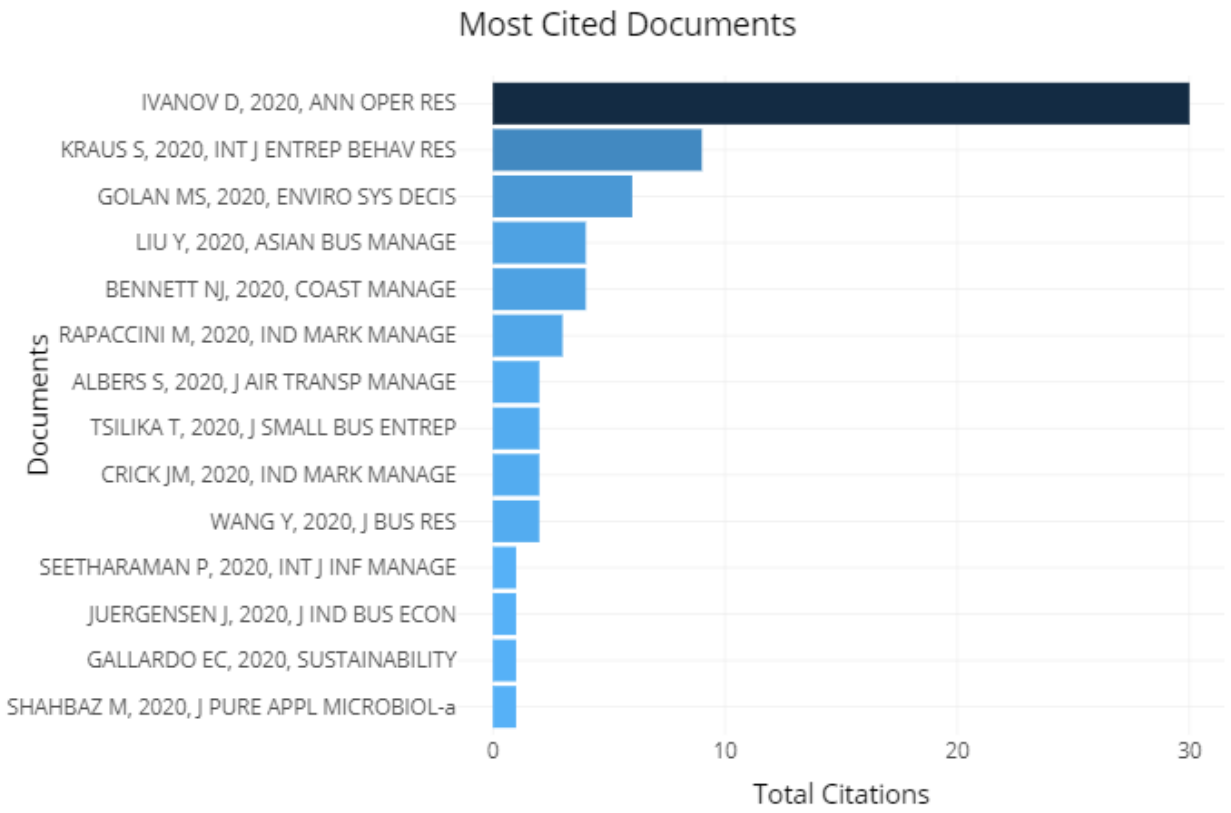

Figure 3: Most cited documents

In parallel, only one article was featured locally. The study “Food Safety and COVID-19: Precautionary Measures to Limit the Spread of Coronavirus at Food Service and Retail Sector” was the only one to fit in the parameter. The local citation was given by the same group of authors responsible for the article, including Shahbaz, Bilal, Moiz, Zubair & Iqbal (2020). This interaction was described in more detail in topic 3.6 (collaboration Network).

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The most globally cited articles predominantly provide information on two subjects: Supply chains and coping measures adopted by firms, both in the context of the covid-19 pandemic. This disruptive event brings up discussions regarding the resilience of supply chains, the impacts on global chains and China's decoupling. Nonetheless, there are concerns about the strategies adopted by firms to combat the effects of restrictions resulting from the pandemic and the adaptation to the new normal that has changed the habits of employees and customers.

3.4 Most local cited author and affiliation

Regarding authors' local citations, it alludes to the references covered in the 39 selected articles. Considering the number of citations, the main author, was Dmitry Ivanov, as shown in Table 3. The author is affiliated with the Department of Business Administration of the Berlin School of Economics and Law, and his works have the supply chain as the main focus. Although it received 60 references locally, only four documents from the sample mentioned it (Sharma, Luthra, Joshi & Kumar, 2020; Golan, Jernegan & Linkov, 2020; Okorie, Ramesh, Charnley, David, Patsavellas & Salonitis, 2020), one of them belonging to the author himself (Ivanov, 2020).

Rank	Most Local cited authors (References)	Occurrences	Affiliation
1	IVANOV D	60	Berlin School of Economics and Law
2	DOLGUI A	27	Ecole des Mines de Saint-Étienne
3	SOKOLOV B	20	Saint Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences
4	GUNASEKARAN A	14	California State University
5	DUBEY R	12	Liverpool John Moores University
6	CHRISTOPHER M	11	Cranfield School of Management
7	NENONEN S	11	University of Auckland Business School
8	STORBACKA K	11	University of Auckland Business School
9	CHOI T M	10	Arizona State University
10	EISENHARDT K	9	Stanford University

Table 3: Most locally cited authors and their affiliations

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The second most cited researcher was Alexandre Dolgui with 27 occurrences. He is a member of the Ecole des Mines de Saint-Étienne in France, responsible for the automation, production and IT department. The author has produced studies on manufacturing systems, assembly line balancing, scheduling operations management and supply chain. However, it was not included among the documents in the sample, probably due to the exclusion criterion, such as the time cut restriction to 2020; or including a supply chain, but not focusing on covid-19. The same four articles cited Ivanov (2020) also mentioned Dolgui, given that the two authors worked in a partnership.

Boris Sokolov was the third most referenced author. He is an associate at the Saint Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences. His primary researches focused on mathematical methods in scientific research, methods to support decision making in complex technical-organisational systems and mobile IT in supply chain management processes, among other areas. Still, Sokolov did not take part in the group of selected articles. Then, Angappa Gunasekaran is dean of the School of Business and Public Administration at California State University, presenting 14 local citations. Competitiveness of small and medium-sized firms, information technology and logistics and supply chain management are current interest topics to the author.

The most significant number of occurrences of the most cited authors resulted from only two studies in the sample. First, Golan, Jernegan and Linkov (2020) conducted a literature review about SC with an emphasis on trends and applications of resilience analysis in the pandemic context. Four different works by Dmitry Ivanov (Ivanov, 2017; Ivanov, 2018; Ivanov, 2019; Ivanov, 2020) and two by Alexandre Dolgui (Dolgui, Ivanov & Sokolov, 2018; Dolgui, Ivanov, Potryasaev, Sokolov & Werner, 2020) were reported repeatedly, which promoted an increase in the number of occurrences. Additionally, Ivanov's study (2020) cited 22 authorial works and another 14 with his co-authorship, including Dolgui and Sokolov. It would explain the preponderance in the number of total occurrences of the three most locally cited authors, representing a biased result for this type of analysis.

In an urgent and current scenario for firms, these contributions can explain the authors' outstanding amount of works. Moreover, this result portrays the relationship between an area of common research on the supply chain management, especially by Ivanov, Dolgui, Sokolov and Choi (Dolgui, Ivanov, Potryasaev, Sokolov, Ivanova & Werner, 2020; Dolgui, Ivanov & Sokolov, 2018; Ivanov, Das & Choi, 2018a), and Dubey and Gunasekaran (Altay, Gunasekaran, Dubey & Childe, 2018; Dubey, Gunasekaran & Childe, 2015).

Kathleen Eisenhardt, from Stanford University, is a well-known author on case study method. She was cited by some papers that adopted case study in the research design, such as Kraus et al. (2020), Seetharaman (2020), Nenonen and Storbacka (2020) and Hughes et al. (2020). In general, these authors covered studies about management, dynamic capabilities, strategic decision and adaptive organisational processes.

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Suvi Nenonen and Kaj Storbacka worked in a partnership, and their work is associated among the 39 selected articles. The authors made references to other personal articles, which then raised the total occurrences' quantitative data. It includes Nenonen, Storbacka and Windahl (2019), Storbacka and Nenonen (2011), Nenonen and Storbacka (2018) and Nenonen, Storbacka, Sklyar, Frow, and Payne (2020). The researchers performed in similar research fields, such as market modelling, market innovation and business models, explaining the scientific collaborations made. Both are faculty members of the University of Auckland Business School.

In short, six of the locally most cited authors were not included in the studied sample, as shown in Figure 4, namely: Dolgui, Sokolov, Gunasekaran, Dubey, Choi and Christopher. An explanation for this may be related to the bibliometric analysis' time frame, restricted to the year of 2020. Most of the papers published by these authors were from earlier years. Besides, as previously explained, the high number of citations' repetitions in a small number of articles increased the number of occurrences. A prime example is Ivanov (2020), where Dolgui alone is mentioned 15 times. Therefore, one cannot state that the most referenced authors in this study provides greater contributions to the topic. By all means, this is not correlated to the authors' significant contributions to scientific documentation. Hence, more documents need to be investigated to provide more robust results.

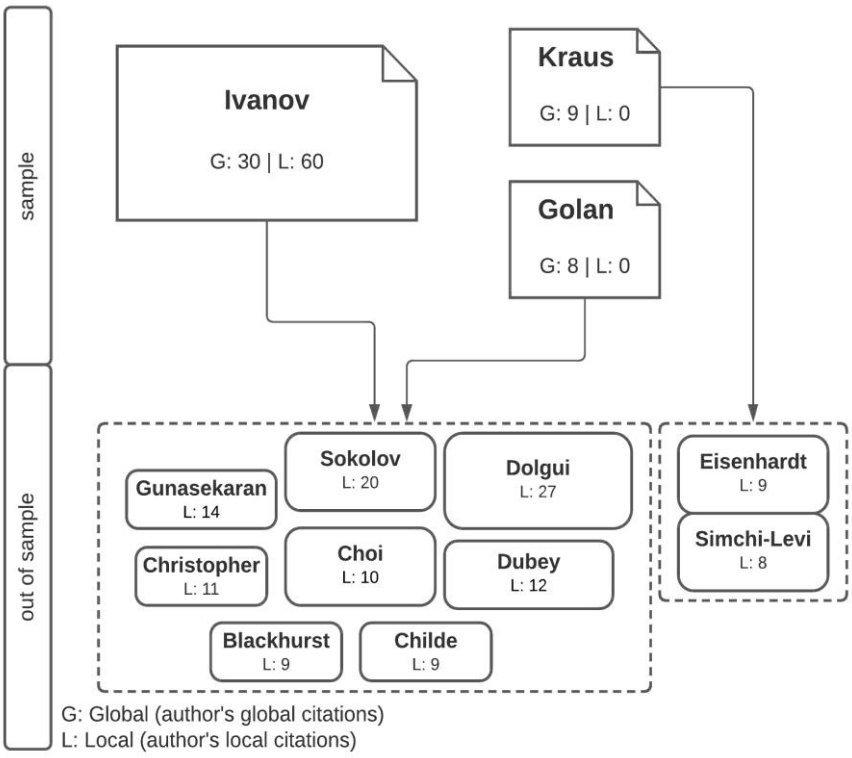

Figure 4: Relationship between the most cited articles and articles in the sample

Lastly, in terms of affiliations, different partnerships were identified between different universities. Most universities have maintained the equivalent of two publications, namely: Bursa

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Uludag University, Cranfield University Department Of Manufacturing, Curtin University, Doon University, Kazan Federal University, National University of Singapore, School of Engineering and Sciences, School of Life Science and Food Engineering, The University of Texas at Dallas Naveen Jindal School of Management, Universiti Putra Malaysia, University of Auckland, University of Maribor, University of Reading and University of Salerno. Thus, it was also not possible to assure which institution is more productive among the identified ones.

3.5 Collaboration worldmap

Taking into consideration the authors' and co-authors' affiliations (Figure 5), the United Kingdom stands out by presenting 15 collaborations with different countries. Italy came in second with nine collaborations, followed by China, with six collaborations. Papers with British co-participation were carried out with Spain affiliated authors (3 co-participations). Gallardo, Arroyabe and Arranz (2020) focused on occupational health and safety, analysing preventive safety practices taken by firms coping COVID-19. Filimonau, Derquil and Matute (2020), on the other hand, covered corporate social responsibility practices in order to guarantee resilience within the hotel industry firms. Meanwhile, Juergensen, Guimn and Narula (2020) studied the challenges and opportunities encountered by small and medium-sized European firms during the outbreak.

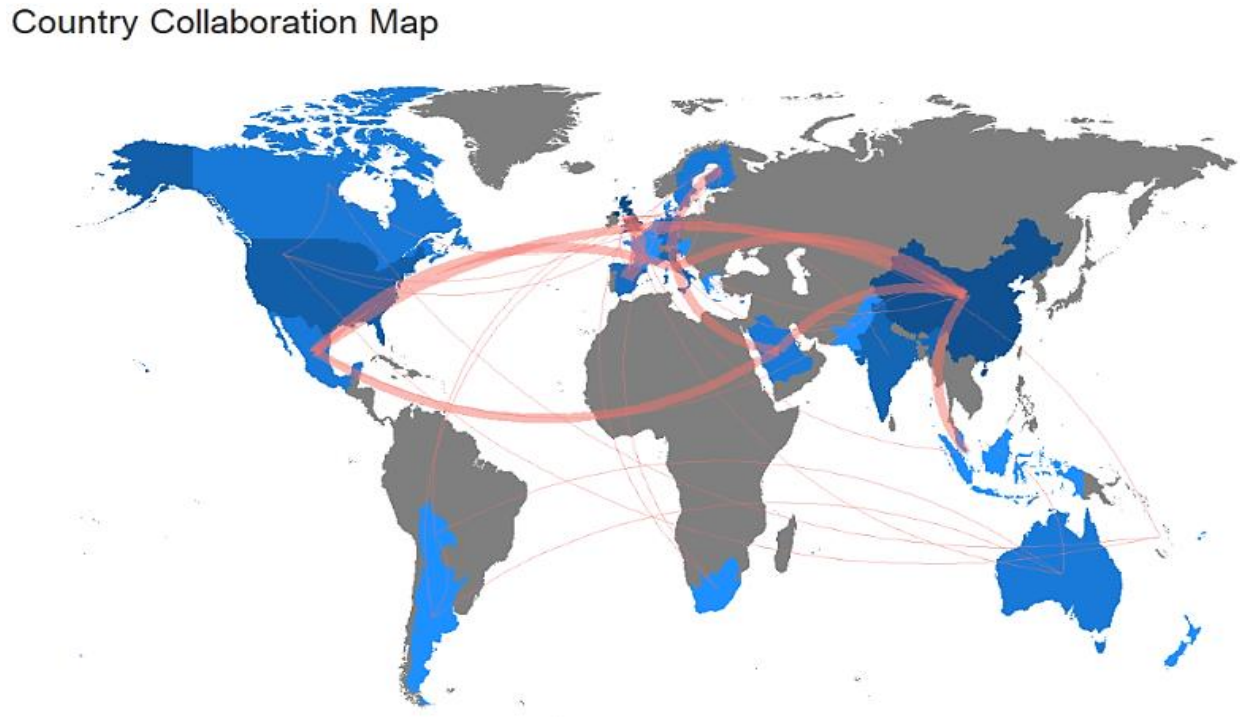

Figure 5: Map of collaboration between universities around the world

Interestingly, the focus on family businesses, and small and medium-scale firms appeared as a trend among studies in partnerships between developed countries. Kraus et al. (2020) conducted an empirical analysis in Austria, Germany, Italy, Liechtenstein and Switzerland when interviewing family businesses to understand how they had been dealing with the impacts of the crisis. Concurrently, in a partnership between institutions from the United States, Canada and Germany,

Bennet et al., (2020) brought an overview of the impacts on the small-scale fishing industry, and feasible responses to be taken by these firms. Also, researchers from institutions in the United States and Sweden collected data from small and medium-sized Swedish firms, where they studied possible investments that these could make to survive the crisis (HORGREN & WILLIAMS, 2020).

Furthermore, Zhu et al. (2020) presented based on a collaboration between Chinese and Singaporean academies an analysis of the impacts on supply chains linked to China, followed by recommendations for their mitigation. Lastly, in two collaborations with authors from institutions in Saudi Arabia, Mexico and Italy, the Chinese institute 'Huaiyin Insitute of Technology' presented studies aimed at preventive measures within the retail sector, and the manufacturing and food industries (SHAHBAZ et al., 2020a; SHAHBAZ et al., 2020b).

3.6 Collaboration network

The collaboration network presents which authors are working collaboratively. This collaboration is observed when the same group of authors is present in more than one study in the considered sample. A single group of collaborating authors is presented in Figure 6. The network is made by Iqbal, Bilal, Zubair, Moiz with Shahbaz, highlighted in the green network. The authors appear in two documents, published by the *Journal of Pure and Applied Microbiology*.

Figure 6: Collaboration network

The article “Food Safety and COVID-19: Precautionary Measures to Limit the Spread of Coronavirus at Food Service and Retail Sector” was cited in the work “Strategic Measures for Food Processing and Manufacturing Facilities to Combat Coronavirus Pandemic (COVID-19)”. Both of them were written by the same authors. The primary precautionary practices used for limiting the virus transmission in food and service sectors were evidenced. The main physical and routine changes were also discussed.

As shown above, collaborations between studies, especially when in the same area, can reveal which strategies are being adopted by sectors and responsible agencies to minimise the impacts on organisations in disruptive events.

4 CONCLUSIONS

Reaching several countries in late 2020 and early 2021, the pandemic’s second wave could further restrict and aggravate the negative effects on firms. This study examined research works focused on how firms are coping with the COVID-19 pandemic through a bibliometric analysis. Thus, this bibliometric analysis made it possible to map the main topics, namely: Quantitative parameters were assessed, such as the number of publications, most relevant sources of publication, most relevant documents, most locally cited authors, most locally cited references, and international collaboration. Those are its main contributions to scholarly literature.

In this review, the most prominent author was Dmitry Ivanov, both globally and in the most locally cited authors. His notable work was aligned with trends, and presented a new theorisation of the Viable Supply Chain, with great relevance for this disruptive moment.

The study developed by Sascha Kraus (2020) that reports how family businesses can survive the pandemic was also noteworthy, and lined up with the papers’ areas. However, it is not possible to state a reference author since, the citations are restricted to one or two articles, if compared to the total amount of the sample. Concerning the countries collaboration, Europeans stand out in proportion to the academic collaborations in the studies, presenting a significant focus on small and medium-sized local firms. The journals that contributed the most to the research were the IEEE Engineering Management Review and Industrial Marketing Management. Lastly, no academic institution was expressive regarding the number of publications.

The limitation of this research consists of the search for articles exclusively through the Scopus database. The inclusion of other bases such as Web of Science and Springer to expand the sample is highly suggested. Another obstacle was the restriction of the type of documents to “articles”. Finally, the mapping of trends in the studies provided scope for future research, such as supply chains, with a focus on resilience; changes in firms concerning the crisis coping mechanisms; manufacturing, especially in terms of adaptations in manufacturing practices in times of disruptive events; attention to the food sector, from the perspective of changing customer habits; and strategic measures for facilities and manufacturing.

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