

Resilience in Business: A Bibliometric Analysis

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ABSTRACT

Business resilience has received much attention in this decade because it is an essential and effective means of overcoming various shocks, thereby increasing business desirability. However, it always experiences adjustments from time to time, because environmental changes are bound to occur. For this reason, resilience-forming features continue to develop over time. The main purpose of this paper is to present a map of the evolution of academic work and critical trends, as well as a snapshot of future research on business resilience. This study uses a bibliometric approach to process a total of 722 articles published between 1990 and early 2023 and indexed by SCOPUS. The results show increasing interest in business resilience research from year to year and 2022 it shown to have the highest number of published business resilience articles. The United States is the country that produces the most extensive business resilience research in the world. The authorship result also shows the influential authors within the field. Furthermore, based on the co-word analysis of the research results, the formation of five clusters goes towards describing the latest topics in business resilience research. Based on these five clusters, research trends are proposed to guide potential areas for further research related to research domains that are important to study, extreme situations that affect business, dynamic capabilities that must be possessed and various types of capital that companies must have in dealing with the various conditions. This research can ensure that researchers have inclusive insights on this topic.

Keywords: Organizational resilience, Business, Bibliometric analysis, VOSviewer.

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INTRODUCTION

Business activities are increasingly developing across the globe, making them more vulnerable and complex. This condition occurs due to various factors, such as economic, social, political and even natural conditions. Therefore, it is inevitable that businesses experience different shocks and crises in their development. In fact, some companies can turn a crisis into an opportunity, but quite a few businesses die in the face of a crisis. The question then arises: why are some businesses successful in dealing with shocks while others are not? Various empirical and theoretical studies show that resilient businesses will be flexible, agile and always innovative, so they are adaptive to face various situations and conditions.^[1-3] Currently, research related to business resilience is being increasingly explored by scientists. Resilience is an essential concept for business continuity in an environment that is constantly changing and unpredictable.

In general, business resilience is seen as the ability of an organization to survive and recover its original condition or improve on its original condition.^[4,5] This is closely related to

the organization's ability to adapt and adjust its capabilities and resources to make them relevant in various conditions. The resilience of a business will provide confidence to various parties, including customers, business partners and other interested parties.^[6] Dutta^[7] stated that increasing trust between partners can improve customer experience, indicating that business resilience fosters trust and positively impacts customer relationships. For this reason, business resilience will increase its reputation in the eyes of stakeholders. A resilient business is the key to ensuring that a business will continue to exist, develop and provide added value in the long term. This is a strong foundation for sustainable growth. Setiawan *et al.*^[8] underlined that business resilience provides capabilities and directs behaviour and knowledge to create sustainability after facing a crisis. This indicates business success^[9] and a person's primary goal in doing business.

Even though it is recognized that business resilience is essential, this concept has developed over time. The concept of business resilience is quite broad and has various variables that continue to develop. Therefore, a bibliometric investigation is needed to present the breadth of literature regarding this concept. This technique is crucial to show the range of knowledge that continues to develop regarding a particular theme. Bibliometric methods also allow researchers to carry out quantitative and qualitative analyses of past literature. The current study aims to (1) examine the essential characteristics of the literature, such as



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the number of most cited articles and the most published journals, (2) examine the strength of the research related to collaboration between authors and the countries most concerned, (3) analyse the structure knowledge and domain of this topic, indicating the most important keywords, (4) and make recommendations for further research. By summarizing the latest literature, reviewers, academics and policymakers will benefit from new perspectives and guidance regarding organizational resilience. This is because further study directions will be provided and academics can learn a lot about their research on business resilience, which helps formulate better research on business resilience.

The current paper will be presented in several stages, as follows. Section 2 will show the literature review, while Section 3 will give the methodology. Section 4 presents the results and discussion, while Section 5 presents future research directions. Finally, in section 6, the conclusions and managerial implications of these findings will be offered.

LITERATURE REVIEW

Research on business resilience began in the 1990s. At that time, researchers explored more about the factors that form resilience. However, there are slight differences between resilience research in Western and Eastern countries. Eastern countries focus more on the strength of cultural values as the basic strength that forms resilience.^[10,11] Meanwhile, in Western countries, the focus is more on the power of innovation.^[12,13] In the following ten-year period, there were developments in business resilience research. An issue that is often raised regarding business resilience is the importance of utilizing information technology.^[14,15] In this period, the world was experiencing changes towards a technological revolution.

For this reason, technology needs are considered important for the resilience of a business to be able to compete. Furthermore, relating to the scale of a business, Small and Medium Enterprises (SME) are a domain of interest for research.^[16,17] This is due to the increasing development of SMEs throughout the world. It is also a sector that supports the people's economy. Therefore, family businesses are the domain most explored in business resilience research. This is considered relevant because of the vulnerability of family businesses in the third generation. Many researchers are interested in conducting resilience research in the family domain.^[18-20]

A surge of research interest in business resilience was seen from 2011 to 2020. Research by researchers ranged from the individual level to the organizational level. Research conducted by Hallak *et al.*^[21] looked at the importance of self-efficacy in forming business resilience. Apart from that, research from Branicki *et al.*^[22] demonstrated that the resilience of an entrepreneur greatly determines the resilience of his business. Furthermore, from organizational factors, it was identified that a company's internal resources also greatly influence organizational resilience, for example, social capital, relational capital and financial capital.^[23-26]

Further, support from employees and the use of technology and information are also the focus of studies on organizational business resilience from 2011 to 2020.

In 2021, business resilience is concentrated on the current crisis. An extraordinary situation drove this focus: the COVID-19 pandemic. At the time, the world experienced not only health problems but global economic problems. That condition has a huge impact on business resilience around the world. The domain that was of great interest to research at that time was hospitality^[27-31] as it is known that tourism is a business that is very vulnerable to various shocks, such as COVID-19. Therefore, many researchers are interested in solving the business resilience problems that occur. Topics that are widely associated with business resilience in this period are leadership^[32-34] and a company's dynamic capabilities.^[35-37] The increasing expansion of research topics related to business resilience shows that business resilience is always a very important topic to study. That is relevant because business resilience is dynamic and is strongly influenced by various factors at the individual, organizational and external environmental levels.

Apart from adapting various issues in business resilience, the research methods used are also experiencing developments. Several methods have been used to deepen the study of business resilience. One of them is the Systematic Literature Review (SLR) method to summarize previous studies on resilience^[38-40] SLR can support the detection of area that can be developed further. However, SLR is susceptible to validity threats, such as publication bias and study selection and data extraction bias, which directly influence the results.^[41] Another method that has been used is meta-analysis. In research conducted by Iftikhar *et al.*,^[42] a theoretical framework was built regarding the relationship between resilience, its antecedents and company performance. Therefore, the meta-analysis method they used is likely to guide future researchers and practitioners in developing resilience strategies for organizations. Besides, this method is important for consolidating past empirical findings and generating new theories^[43] by using information such as sample size and reliability estimates to validate conclusions.^[44] However, they only included similar papers. Therefore, for some variables, the data were insufficient for meta-analysis. Additionally, meta-analysis cannot address heterogeneity between studies, leading to misleading results.^[45]

From reviewing various literature, we conclude that an appropriate technique is needed to provide objectivity in presenting the extensive literature on business resilience. This can be accommodated by bibliometric analysis. Bibliometric analysis is one quantitative approach to synthesizing previous research findings. By carrying out a process of synthesis, it can describe, assess and monitor published research to present a systematic and objective review process. This improves the quality of reviews^[46] It is more practical and easier to examine and analyse an unlimited

number of papers^[47] and scales from the micro to the global level.^[48] In addition, it can also prevent subjective judgments from the narrative literature review method because it has a functional role in the literature review by mapping the research fields directly extracted from documents.^[46] In previous research, a form of literature mapping called bibliographic mapping was presented by Martina Linnenluecke.^[49] However, the research carried out was only limited to 2015. So, it was not able to accommodate the changes that occurred in the business environment in the following years. This study, therefore, addresses these important questions: (1) What are the evolving evolutionary trends in the field of business resilience? (2) Who are the leading writers in this field? (3) Which countries, journals, or agencies are leaders in this field? (4) What are the main keywords in this field?

METHODOLOGY

Methods

In identifying and extracting data for the bibliometric review, this research refers to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.^[50] According to the guidelines from PRISMA, there are three steps taken by the researcher. The first is the stage of identifying articles related to the research topic. The current research extracts data from the SCOPUS database to obtain bibliographic records related to organizational resilience. Researchers consider using the Scopus database because it is the largest database of abstracts and citations from peer-reviewed literature. Hence, it is trustworthy, authoritative and frequently used to search literature.^[51] It should be explained that in this method, journal articles obtained from the Scopus database are only used as data because they have undergone a rigorous review process provided by several experts in their fields before being published in academic journals. In this first process, after we had determined the appropriate database, we then performed search queries related to our research topic with the aim of obtaining relevant articles. Data was downloaded on December 7, 2022. The search query is TITLE-ABS-KEY ("organi*" OR "firm" AND "RESILIENCE"). By using this search string to search the Scopus database, 1,663 academic papers were obtained, with a range of publication years from 1991 to early 2023. We used all the articles in the database because we wanted to show the development of the number of articles from the beginning of resilience business writing to the time we downloaded the article. Even though the data was downloaded at the end of 2022, several articles from 2023 have been included in the database.

The second and third stages of the PRISMA guidelines are screening data and eligibility data.^[52] In this stage, the process was carried out simultaneously, where the researcher glanced at the data downloaded from the Scopus database. Researchers read the titles and abstracts of literature to eliminate irrelevant literature and then adjusted the search parameters research needs,

such as choosing the required subject areas, namely business, management and accounting only. The process resulted in 800 potential articles. Furthermore, the document type chosen by the researcher is article only, considering the novelty and originality of the research results produced. For this reason, researchers excluded other documents such as books, book chapters and articles in press. By limiting this, 726 articles remained. The final step in sorting the appropriate articles was to limit the language of the articles. In this study, only articles in English were selected. The total number of eligible articles is 722 articles. The selected articles were saved in CSV form and then analysed using VOSviewer software version 16.11. Specific searches are performed as shown in Table 1.

This study uses a bibliometric analysis consisting of three schemes. The first co-authorship analysis shows collaboration patterns between individuals and countries.^[53] There are several steps in co-authorship analysis: taking scientific publications, visualizing the network and calculating metrics and interpreting the results.^[54] In a co-authorship network, nodes represent authors or countries and such nodes would be connected when they share authorship of a paper.

The second scheme is co-word analysis, which examines the current condition of the research topic. This scheme explores the relationship between keywords by looking at the co-occurrence of keyword pairs. Several procedures are carried out in co-words: calculating the frequency of keywords and detecting and removing duplicate and misspelled items. Afterwards, keywords with a frequency of less than eight were removed because it implies only a few researchers pay attention to them.^[55] Next, high-frequency keywords were selected and the keywords would then be collected into groups. The final step was to interpret the topic knowledge structure represented by the social network analysis. The third scheme of bibliometric analysis is co-citation analysis. The analysis is defined as the frequency of two documents cited together by at least one document published later. The co-citation analysis process is divided into four steps: (1) identification of relevant academic papers, (2) calculation of similarity between pairs of reference papers through counting co-citations, (3) calculation of co-citation of papers using similarities. values and (4) interpretation of results.^[56] The entire process starting from data collection and analysis, is presented in Figure 1.

RESULTS AND DISCUSSION

Research Trend

Trend analysis of the literature describes the literature on organizational resilience in the scope of business starting in 1991. The trend began to develop in 2010, continued to increase and peaked in 2022 (Figure 2). Research in 2022 has shot up drastically, with the percentage of articles collected being 30.89%. This happened because in 2022, various businesses in the world were attacked by the COVID-19 tragedy. The event presented very

difficult challenges for the existence of businesses throughout the world because COVID-19 not only concerns health issues but also greatly affects the world economy. The high death rate due to this incident prompted the government to suppress the spread of the COVID-19 by implementing various restrictions on social activities.^[57] That situation disrupted global supply chains and businesses due to difficulties in obtaining raw materials.^[58] Travel restrictions, lockdowns and economic uncertainty have also caused consumer purchasing power to decline, resulting in many businesses losing potential consumers.^[59] This condition resulted in many businesses being unable to survive the situation.

For this reason, the issue of resilience is very important and of interest to researchers in the business sector. Furthermore, in 2023, there will still be little research on organizational resilience.

Table 1: Scopus data retrieval process.

Retrieval of set subject	Search for Set Contents and Results
Database	Scopus
Search Type	("organi*" OR "firm" AND "resilience")
Type of literature	Article
Language Type	English
Time Span	1991-2023
Search Time	7 December 2022
Number of Article	722 articles

Because the search was carried out at the end of 2022, very few articles from 2023 are still detected in the database.

Country-wise and organization leading country

Figure 3 shows the leading countries in business resilience studies. Based on this Figure 3, the United States and the United Kingdom are the two countries that produce the most publications on business resilience. These resulted in 172 and 149 articles, respectively. Italy followed with 79 articles, China with 58, Australia with 57 and India with 54. Other important countries are France (46 articles) and Germany (45 articles). America and England are two countries that have very competitive economies, even in the global market. Therefore, business resilience is an issue that is urgently needed to support their competitiveness and ensure the sustainability of their businesses. These two countries are also developed and have a significant impact on the world economy. Therefore, business resilience in these two countries has strong global consequences. Apart from that, what attracts attention is that developing countries such as India also produce numerous articles on business resilience. As developing countries, they want to learn a lot about business resilience to make them ready to face global competition.

Furthermore, as is known during the COVID-19 pandemic crisis, the United States, China, India, France and Germany were the countries with the highest number of COVID-19 cases in the world.^[60] That condition impacted the economy and businesses in particular. Doing a lot of research on business resilience can

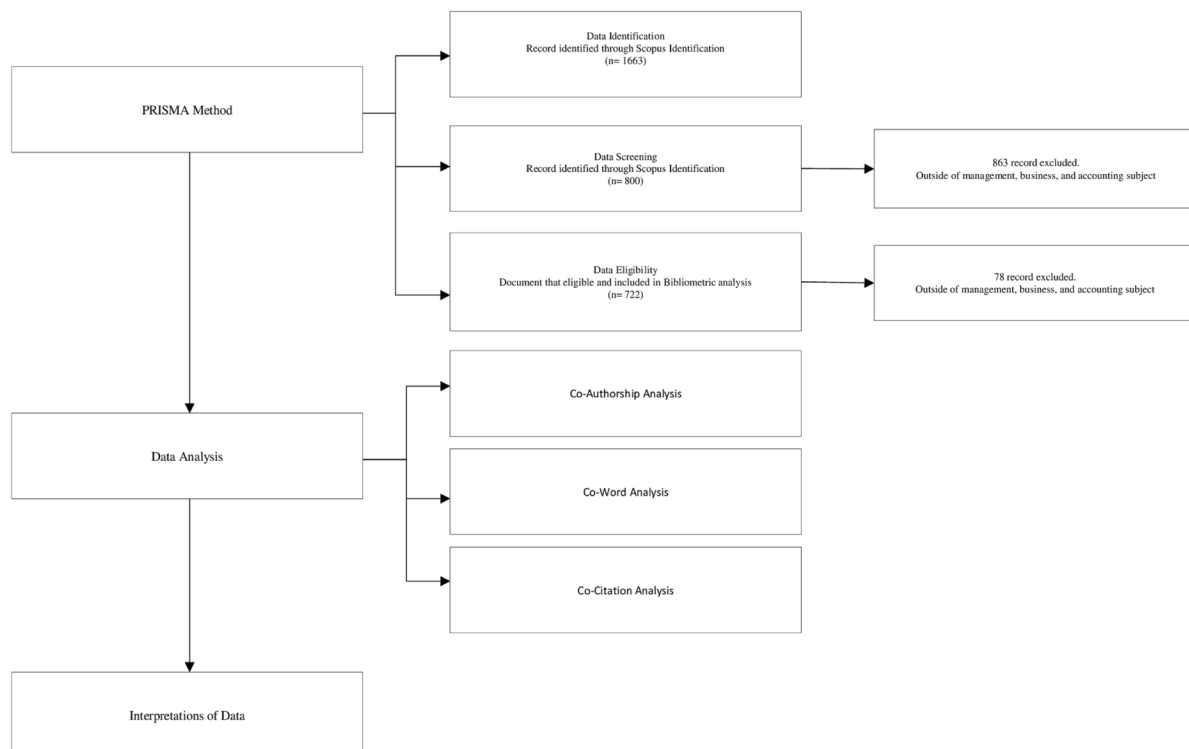


Figure 1: Research Methodology.

help these countries revive their economies, which have slumped due to the COVID-19 pandemic.

Figure 4 shows the leading journals in the field of business resilience. The results show that the International Journal of Production Economics is the leader in business resilience research, with 27 articles. The Journal of Operations and Production Management and the International Journal of Production Research followed with 19 articles each. The Journal of Business Venturing has 17 articles; International Journal of Logistics Management has 15 articles; Industrial Marketing Management has 14 articles; IEEE Transactions on Engineering Management has 13 articles. Benchmarking and Business Strategy and the Environment each contain 12 articles. Meanwhile, the International Journal of Physical Distribution and Logistics Management, Team

Performance Management: An International Journal and the International Journal of Physical Distribution and Logistics Management each produced ten articles. All journals that publish articles on business resilience are journals in economics, business and strategy.

Author contribution, citation and text analysis

Co-Authorship

Next are the results of the co-authorship analysis illustrating the authors and countries participating in organizational resilience research for business. Figure 5 shows the co-authorship network created by VOSviewer to visually display collaboration between authors. Based on the illustration in Figure 5, several authors

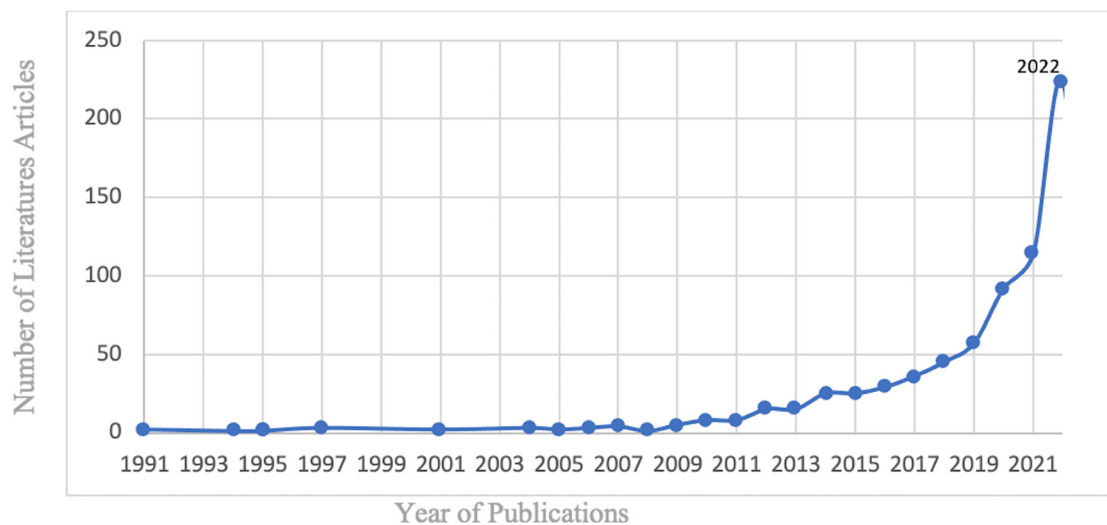


Figure 2: Trends in business resilience research from 1991 to 2022 (Source: Authors).

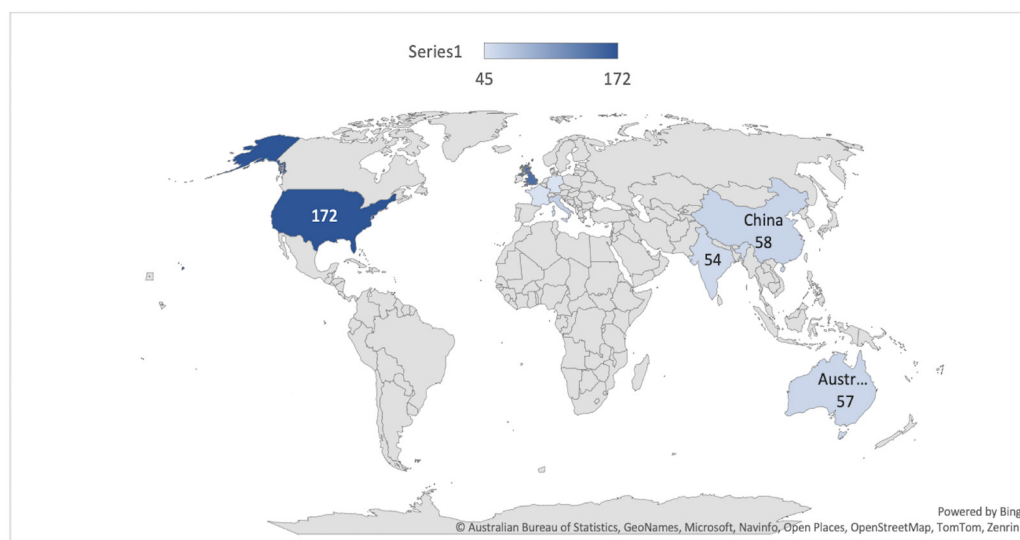


Figure 3: Country-wise analysis (Source: Authors).

have formed a network related to organizational resilience. As seen in Table 3, the two most productive authors, based on the number of publications, are Duarte Alonso A and Ivanov D, with six documents each. Other authors considered active in writing about organizational resilience in the business sector are Ali I, Blackhurst J., Li Y. and Stevenson M. They each wrote five articles. Table 2 illustrates the most productive authors writing about organizational resilience, especially for business research.

Based on Table 2, it can also be explained that Duarte Alonso A. and Ivanov D. are two writers with a high interest in business resilience. Duarte Alonso, who has written about organizational resilience from 2016 to 2022, writes more about how companies

build resilience by relying on their internal resources.^[61-63] The authors highlight that large companies, MSMEs, family companies and others must have resilience and the ability to survive in various challenging conditions. This resilience can be done in multiple ways, for example, by relying on networks, innovating and utilizing the company's internal resources.

Furthermore, the most quotations were obtained by Blackhurst, J., with 1546 quotations. The article that is widely cited in the writings of Blackhurst and his colleagues is directly related to corporate resilience, entitled "Firm's Resilience to Supply Chain Disruptions: Scale Development and Empirical Examination"^[64] with 455 citations. This research examines the factors contributing



Figure 4: Source Analysis (Source: Authors).

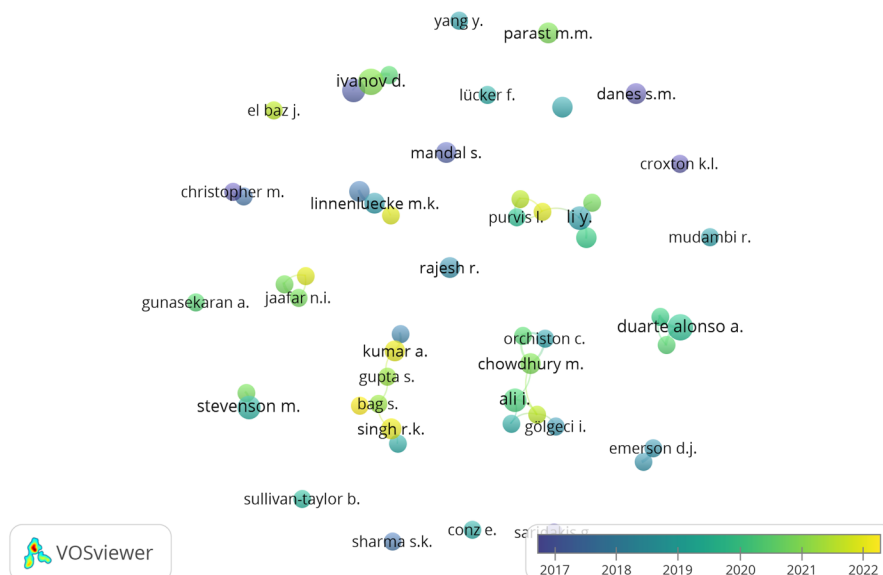


Figure 5: Network Visualizations of Co-Authorship (Source: VOSviewer).

to developing company resilience to supply chain disruptions. In general, Blackhurst focuses more on supply chain resilience variables that have implications for company resilience, such as the company's ability to reconfigure resources, the smart systems used and risk management.^[64-69]

Furthermore, this analysis also identifies countries actively involved in resilience research. Understanding the high concentration of resilience research for business, the results of this research help investigate research domain patterns and trees.^[70,71] Figure 6 shows the country network analysis. Based on Figure 6, the United States and the United Kingdom are the two countries that contribute the most to organizational resilience research because they have the largest nodes, with 172 and 149 articles,

Table 2: Most Productive Authors on Organizational Resilience for Business Research.

Author	Documents	Citations
Duarte Alonso A.	6	201
Ivanov D.	6	941
Ali I.	5	160
Blackhurst J.	5	1546
Li Y.	5	147
Stevenson M.	5	207

respectively followed by Italy, with 61 articles. The final ranking of the top 10 is occupied by New Zealand, with 25 documents.

Furthermore, Table 3 presents details of the top 10 countries that have most actively written about organizational resilience over the past three decades. Based on the number of articles produced, the United States is the main contributor to organizational resilience research. The main topic in research in the United States is supply chains. Apart from that, they also discussed the role of leaders in an organization. How a leader brings his company to greatness or even vice versa reaches its lowest point.^[72-74] Leaders are the driving force for a company.^[75-78] The research domain that interests researchers in the US is family business. The uniqueness of a family business is that, on the one hand, they are family and on the other hand, they are business partners. Maintaining the relationship between the roles of family and business partners is a challenge in family businesses,^[20,79-82] even in crisis conditions. Resilience is the main thing maintained by members of business families to remain sustainable. This theme is attractive to researchers in the US.

Meanwhile, the United Kingdom is ranked second in countries actively researching organizational resilience. The supply chain is also an exciting theme for researchers in this country. Apart from that, technology and information are also their focus. Technology is considered a tool to combat obsolescence and increase efficiency,

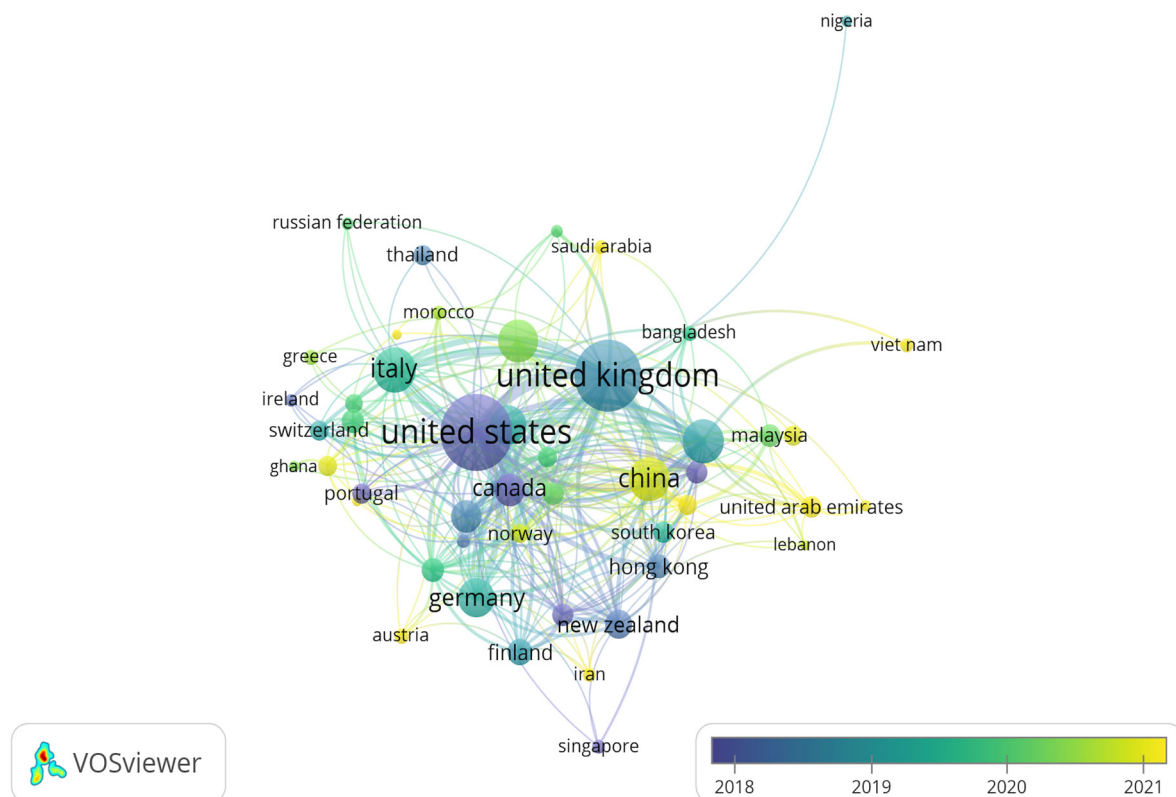


Figure 6: Network Visualization of Co-Authorship Analysis by Countries (Source:VOSviewer).

Table 3: Countries Analysis of Organizational Resilience for Business Research.

Country	Documents	Citations
United State	172	8926
United Kingdom	149	4888
Italy	61	1358
China	58	862
Australia	57	1525
India	54	693
France	46	2331
Germany	45	2308
Canada	32	1704
Spain	31	860
New Zealand	25	1119

especially for small businesses.^[83] Further, in situations where people cannot meet face to face, such as during the COVID-19 pandemic, technology is crucial so that business can continue operating.^[83-85] Technology is one of the coping strategies that companies need to survive in all conditions.^[86] However, quite a few United Kingdom researchers have discussed various capital and government regulations, especially when facing the COVID-19 pandemic situation, which has attacked various businesses throughout the world.^[87-89] This State Researcher is also concerned with the sustainability of SMEs. Small capital and a less extensive network than large companies, even MNCs, make it vulnerable to shocks.^[90] The advantage is that narrow bureaucracy makes this business agile.^[91-93] For this reason, many UK researchers are looking at how they build resilience.

Based on the many documents collected, the United States and the United Kingdom are the main contributors to organizational resilience research. Likewise, with the number of citations to resilience research, the United States and the United Kingdom are the two countries whose research is widely cited by authors in various countries. The number of citations recorded from the two countries is 8926 and 4888, respectively. This number shows that research in both countries is credible and trustworthy.

European countries such as France and Germany produce research widely cited by researchers from various parts of the world. However, the articles delivered are few, namely 46 articles from France and 45 articles produced by Germany. Their citation values are 2331 and 2308 citations, respectively. In France, topics related to organizational resilience also focus heavily on supply chains. Further, resilience in family businesses has also attracted the attention of writers in France.^[94-96] The interests of French researchers are similar to those of researchers in the United States. However, researchers in Germany, although their writing is very diverse, mostly explore technology as a way to overcome environmental turbulence and build resilience. They also talk a

lot about supply chains and organizational learning as a way to survive.^[97]

Co-Word

The co-word analysis revealed 2172 keywords from the 722 selected articles. In these 2172 keywords, there were several errors, such as inconsistent sentences and duplicate items such as "COVID-19" and "COVID-19 pandemic". We fixed the error by determining the correct sentence, such as "COVID-19 pandemic". The next process was to filter words based on their frequency, with a minimum limit of 8. This meant that if fewer than eight words appeared, then the word would be eliminated. After carrying out the filtering process, 25 high-frequency keywords were obtained, which were used as data in the research. The top five high-frequency keywords are presented in Table 4, where "resilience" is ranked first and "COVID-19 pandemic" is ranked second with frequencies of 227 and 120, respectively.

Next, VOSViewer creates a co-occurrence network, namely connections between 25 high-frequency keywords. Figure 7 visualizes social network analysis, where each node represents each member of the network. The sizes of the nodes represent the frequency of events: the larger the node, the higher the frequency. As seen in Figure 7, "resilience" and "COVID-19 pandemic" have the largest nodes. Furthermore, as can be seen in Table 4, "resilience" has the highest frequencies which is 227. It is followed by "COVID-19 pandemic" with frequencies of 120.

Next, VOSviewer generates clusters of 35 high-frequency keywords. Five clusters were formed as shown in Table 5. Four parameters were applied to determine the clusters.^[98] The first parameter was the clustering resolution, defined as the resolution parameter to determine the resolution parameter to in turn determine the specific level of clustering detail. Second was the normalization parameter, which performed LinLog/modularity normalization. The next one was the minimum cluster size. The minimum number of items in each cluster was one. The last was the maximum number of iterations. The maximum number of performances by the VOSviewer software was ten.

The five clusters formed from the data processing process with VOSviewer describe the current state of organizational resilience research. This cluster is presented in Table 5. Cluster 1 is named for extreme situations/crises and disasters. Organizational resilience is an effort made by a company to face various situations. Crises and disasters, industrial revolutions and political situations are various factors that can shake organizational resilience.^[99,100] Business activities and corporate business environments are becoming more complex and unstable and corporate crises have become inevitable in organizational development.^[101,102] Recently, at the beginning of 2020, the world was faced with the COVID-19 virus, which rocked not only the economy but also the health of world citizens. As a result of this virus, economies around the world have been paralyzed. This condition is the toughest

shock for business people and a challenge for their survival and development.^[103] Today, studying resilience has become increasingly important for organizational survival in turbulent, chaotic and unpredictable environments. This has become a hot topic and has attracted scholarly attention.^[104] Thus, the study of organizational crises surrounding organizational resilience is essential, providing a new perspective and a useful supplement to relevant studies on crisis management in theory and potentially providing ideas for crisis resolution for organizations in deep crisis practice.

The second cluster is dynamic capability. Very rapid environmental changes require the dynamic capabilities of organizational actors to survive. This capability aims to understand the sustainability of competitive advantage in a rapidly changing context, taking into account a company's resources and capabilities to match its environment.^[105] This capability supports organizations in

adapting to the business environment and structurally through innovation and collaboration with other companies, organizations and institutions.^[106] In the "knowledge age," companies must respond quickly to external changes even when conditions are chaotic and unpredictable. Economic instability and business discontinuity require organizational agility and resilience. Terms such as Flexibility, Focus, Organization, Positive and Proactive appear to be common features that cut across research in this area. If we talk about competitiveness through resources, the key concept is dynamic capability, which is described as an organization's ability to integrate, build and reconfigure external and internal competencies to face rapid environmental changes and increase competitiveness.^[106,107]

The third cluster is capital. One important component in building resilience is capital. In their empirical research Nancy A. Brown *et al.* and Sydnor-Bousso *et al.*^[108-110] found that economic capital, social capital, human capital, physical capital, natural capital and cultural capital are determinants that help the hotel industry build resilience. Other research states that stakeholder collaboration is important to organizational resilience.^[111] Researchers have looked at ways to explore different characteristics, constructs and capitals, ultimately describing different elements of disaster resilience.^[112-114] Resilience to disasters can depend on various forms of capital before a disaster.^[115] "The essence of using the capital approach is that capital consists of the components necessary for the sustainable economic development of

Table 4: Top Five High Frequency Keyword Related to Organizational resilience to business.

Keyword	Frequency
Resilience	227
COVID-19 Pandemic	120
Supply Chain Management	85
Organizational resilience	55
Performance	38

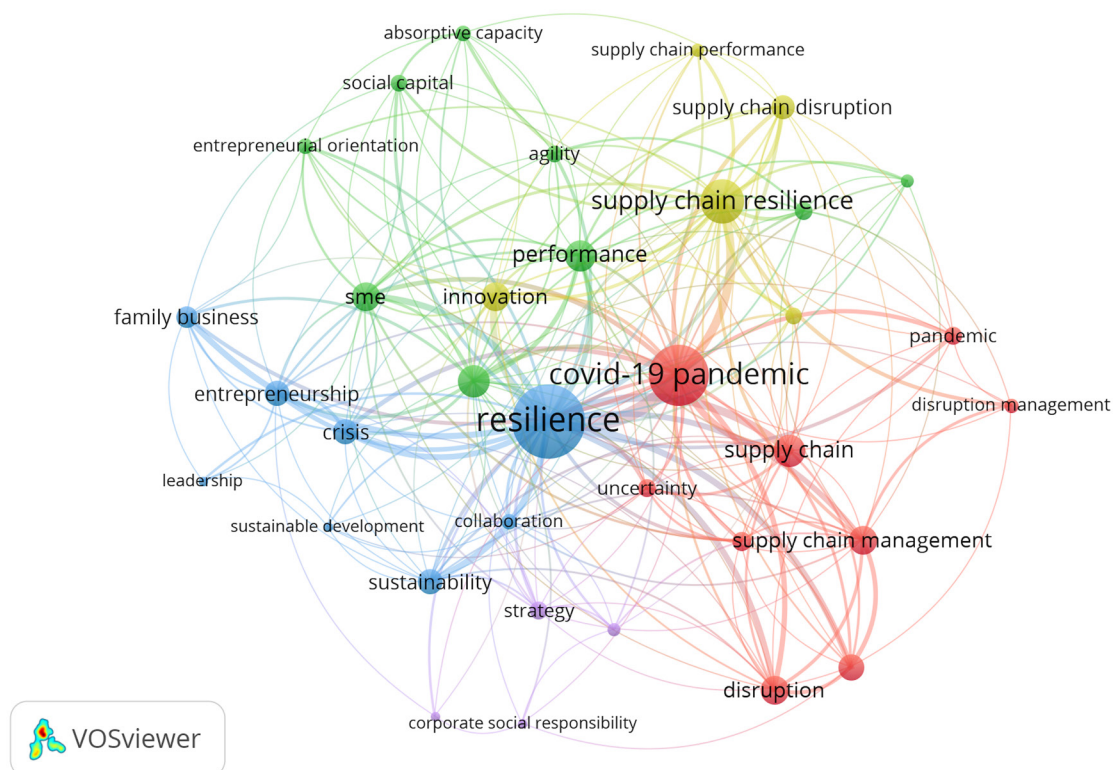


Figure 7: Network Visualization of Co-Word Analysis (Source: VOSviewer).

society".^[116] A disaster-specific capital approach can improve "our understanding of how businesses are impacted by disasters and what factors may play a key role in recovery and resilience".^[110]

The fourth cluster is the supply chain, a network between the company and its suppliers. In 2020, when the COVID-19 pandemic occurred, supply shortages of many goods became one of the most prominent topics in the media, policy discussions and everyday conversations. The demand structure has changed drastically. The supply side saw factories closing and store shelves empty.^[117] From the demand side, it is also worrying. Disruptions in international transport and border closures limit the availability of imported perishable goods^[118] and leave consumers facing supply shortages. Resilience and risk management are important to study in more depth when a "black swan" event occurs, such as the COVID-19 pandemic. With its global impact and long duration, this pandemic has changed the demand structure more significantly than the supply structure and has even affected the financial system. Unlike other disruptions, the COVID-19

pandemic came without contingency plans or previous experience.^[119] No industry is immune to pandemic-related disruptions.^[120,121]

The fifth cluster is related to competitive advantage. In several studies, competitive advantage is one of the reasons why organizations survive in all conditions.^[122,123] With an increasingly dynamic and complex market environment,^[101] crises and competition faced by companies have occurred everywhere.^[102,124] Gaining and maintaining a competitive advantage in a turbulent environment has become a concern of strategic management and a very urgent task for companies today.^[125,126] Organizational resilience is an important organizational capability resulting from interactions between the organizational environment and resources.^[5] Resilient organizations can anticipate potential threats, understand and respond effectively to crises and adapt to change, ensuring business continuity, sustainability and future success.^[127] Therefore, organizational resilience that integrates

Table 5: Cluster of Organizational resilience.

Sl. No.	Number of Keywords	Selected Keyword	Issue
1	9	COVID 19 pandemic; disruption; disruption management, pandemic; risk; risk management; supply chain; supply chain management; uncertainty.	Extreme situations/disaster.
2	9	Absorptive capacity; agility; dynamic capability; entrepreneur orientations; knowledge management; organizational resilience; performance, SME; social capital.	Dynamic capability.
3	8	Collaboration; crisis; entrepreneurship; family business; leadership; resilience; sustainability; sustainability development.	Capital.
4	5	Innovation; supply chain disruption; supply chain performance; supply chain resilience; supply chain risk management.	Supply chain.
5	4	Competitive advantage; corporate social responsibility; economic crisis; strategy.	Competitive advantage.

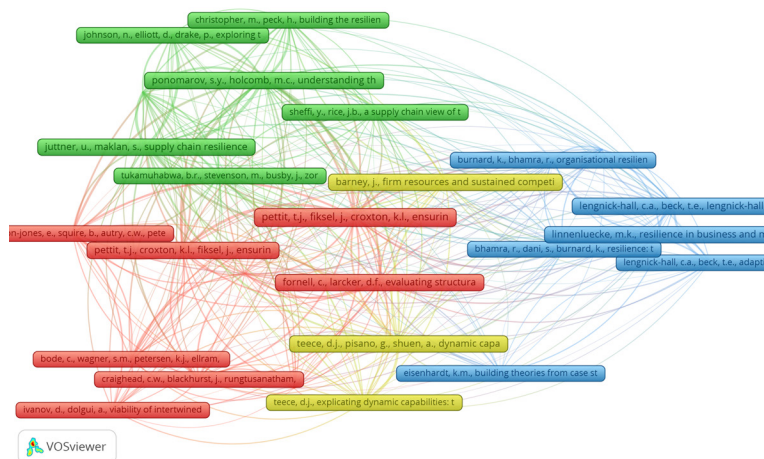


Figure 8: Network Visualization of References in Co-Citation Analysis (Source: VOSviewer).

competency and resource-based perspectives is an important means for companies to gain competitive advantage.

These five clusters have been hot topics in business resilience for decades. This study's findings also show that business resilience research topics are developed from previous bibliometric research by.^[49] This previous research stated that the resilience topics that emerged from 1977 to 2014 were an organizational response to external treatment, corporate reliability, employee strengths, the adaptability of business models and design principles that reduce supply chain vulnerabilities and disruptions. For this reason, the current topics that did not appear in previous research but appear in this research are dynamic capability, capital and competitive advantage. In other words, this article provides updated information regarding current topics, especially during the COVID 19 pandemic. Then, the research status for each cluster is presented to guide potential areas for further research.

Co-Citation

Co-citation analysis is a condition when two papers are cited simultaneously by a third paper.^[56] This section explains

references in co-citation analysis and journals in co-citation. References in co-citation analysis are very important because they can identify a particular domain's structure and development path.^[128] In conducting the analysis, we used co-cite as a type of analysis with cited references as the unit of analysis. Selecting 20 as the minimum number of citations for an author result in a threshold of 26 out of 50307 cited references. Figure 8 illustrates the co-citation patterns of papers cited at least twenty times. To further clarify the most cited papers, we summarize them in Table 6. These are the top five most cited authors related to organizational resilience in the business domain.

The most cited paper related to organizational resilience is the article from Pettit, Fixel and Croxton titled "Ensuring Supply Chain Resilience: Development Of A Conceptual Framework."^[129] developed a Supply Chain Resilience Assessment and Management (SCRAM TM) measurement. This research was done considering the series of events and disasters experienced by the world that disrupt the company's stability. For this reason, a measurement was developed to manage the risk of an uncertain future. The result can increase the ability to survive, adapt and grow in turbulent change.

Table 6: The Top Five Most Co-Cited Document Related to Organizational Resilience in Business Research

Cited References	Title	Year	Citations
pettit, t.j., fiksels, j., croxton,k.l.	Ensuring supply chain resilience: Development and implementation of an assessment tool	2013	51
ponomarov, s.y., holcom, m.c.	Understanding the concept of supply chain resilience	2009	49
Juttner, u., maklan, s.	Supply chain resilience in the global financial crisis: an empirical study	2011	46
teece, d.j., pisano, g., shuen, a.	Dynamic capabilities and strategic management	1997	43
linnenluecke, m.k.	Resilience in business and management research: A review of influential publications and a research agenda	2017	43

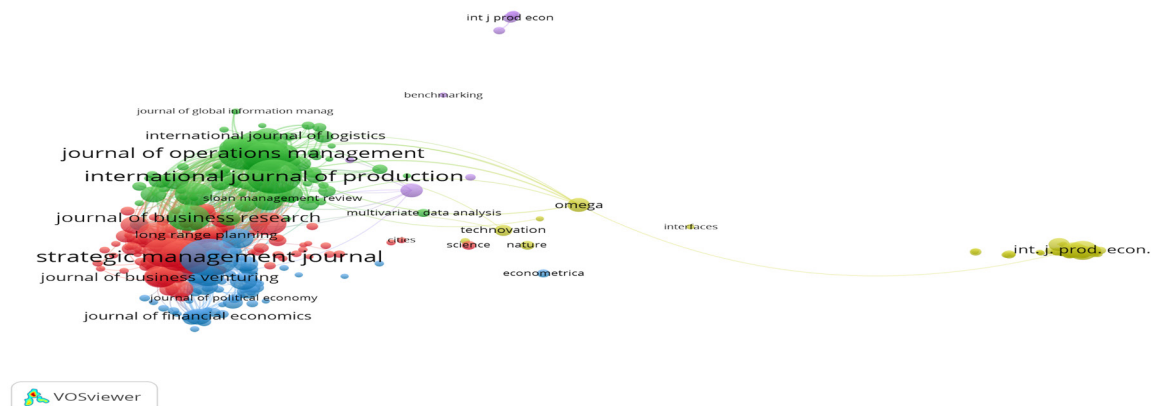


Figure 9: Network Visualization of Sources Co-Citations Analysis (Source: VOSviewer).

Table 7: The Top Five Most Co-Cited Sources of Organizational Resilience in Business Research.

Author	Citation
Strategic of Management Journal	1202
International Journal of Production Research	1012
Journal of Production Management	824
Academy of Management Journal	724
International Journal Production Economics	701

Furthermore, the article that is widely cited is the writing from Ponomarov and Holcomb^[130] titled "Understanding the Concept of Supply Chain Resilience." This paper presents an integrated perspective on business resilience by reviewing the literature extensively across several disciplines. The findings from his research are the key elements in forming supply chain resilience and the relationships between these elements. The article that received the third-highest number of citations was written by Jüttner and Maklan^[131] who also reviewed supply chain resilience. They empirically explored and identified the relationship between supply chain vulnerability and risk management. The results of this study prove that good risk management practices and risk management knowledge influence supply chain resilience. This situation happens because increasing flexibility, visibility, speed and collaboration capabilities will reduce vulnerabilities in the supply chain, thereby increasing resilience. The article with the fourth most quotes is entitled Dynamic Capabilities and Strategic Management, written by Teece *et al.*^[132] This article reviews the dynamic capabilities framework, which relies on processes and is shaped by the asset position of a company, as well as the evolutionary path adopted by a company. This means that strong companies will be able to create competitive advantages if they can identify new opportunities and organize them effectively and efficiently. Finally, an article from Linnenluecke^[49] reviews business resilience research trends that emerged from 1977 to 2014.

The focus is on the resilience line of inquiry, where resilience is an organization's response to external threats, the organization's reliability, the strength of employees, the ability of the business model to adapt and design principles that reduce vulnerabilities in the supply chain. The top three most cited articles show that the supply chain is an important variable concerning business resilience. Furthermore, dynamic capabilities are also important. Teece *et al.*^[132] article is widely cited in studying business resilience. Finally, an article from Linnenluecke^[49] provides a holistic understanding of important themes in business resilience research reviewed during a certain period. This article is widely

cited because it guides future researchers in studying business resilience.

The next type of co-citation analysis is a journal or source co-citation analysis. This analysis detects a subject's structure and characteristics.^[128] In conducting the analysis, we used co-cite as a type of analysis with the source cited as the unit of analysis. Choosing 20 as the minimum number of citations from a single source result in a threshold of 343 out of 14221 cited sources. Figure 9 shows a visualization network with 343 nodes, where the Strategic of Management Journal has the largest nodes. Furthermore, Table 7 shows the top five most cited sources or journals related to organizational resilience in business research.

Based on Table 7, the most cited publication for this research topic is the Strategic Management Journal. It has over 1,000 quotes. It was followed by the International Journal of Production Research, Journal of Production Management, Academy of Management Journal and International Journal of Production Economics, with less than 900 citations. These results show that the articles published in the five journals with the most citations have good credibility. It also reflects that business resilience is in the realm of strategy and production research.

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Direction for Future Studies

Several recommendations are proposed for further research based on the bibliometric analysis and discussion results. Researchers identified that business resilience research focuses more on supply chains in manufacturing companies.^[133-135] Therefore, further research on organizational resilience should also be carried out in the service industry, especially tourism. This domain is vulnerable to various issues, especially health and safety, affecting business resilience (e.g. Bhaskara and Filimonau).^[99] Furthermore, for future research, it is also recommended to examine extreme situations that trigger entrepreneurs to maintain their businesses.^[136-139] Because one condition will require different forms of resistance, further research is also recommended to explore dynamic capabilities as one of the organizational strengths in forming business resilience amidst ever-changing situations. It is known that dynamic capability is an ability that an organization has to always adapt in the face of change.^[140] This issue is closely related to business resilience. It is also recommended that businesses further examine the types of capital that should be used to build business resilience. During

this time, more studies (e.g. Chowdhury *et al.* and Yu *et al.*).^[141,142] mixed the capital owned by the company without truly assessing the intensity of the crisis. For this reason and so the relevant stakeholders can better prepare for this, it is important to learn more about the right type of capital to deal with diverse conditions to create organizational resilience. In addition, further research must also examine the causal relationship between organizational resilience and competitive advantage. So far, research on these two concepts is still in the development stage,^[143] which indicates the importance of the relationship between these two concepts. More profound research into these two concepts is necessary because organizational resilience is not the final goal in a business but is a way or tool in realizing competitive advantage. Therefore, managing and developing sustainability and resilience must become integral to a country's business strategy. This way, further research will develop and provide new and fresh insights.

CONCLUSION

The main aim of this research is to analyse the new and hot topics regarding organizational resilience. Previous research has adopted systematic literature reviews and other articles to study business resilience. The current research differs from previous research because it first carries out a bibliometric analysis. Second, it examines newer literature (1990-early 2023) to reveal a map of the evolution of academic work, capture the latest issues related to the field of business resilience and provide a snapshot of the future state of the art of research. The bibliometric technique consists of three analyses: co-authorship, co-word and co-citation analysis. From the results of the analysis, there are several conclusions. First, research on business resilience has reached a growth stage and in 2022, it will record the highest number of publications. Second, the US and UK are the countries that produce the largest business resilience research in the world. Apart from actively making resilience writings, his writings are also the most frequently used references by writers worldwide. Furthermore, the International Journal of Production Economics is leading the way in publishing business resilience research. Again, co-authorship analysis shows that Duarte Alonso A. and Ivanov D. are the authors who are most active in writing on the topic of organizational resilience, as seen from the number of articles produced.

Further findings, based on co-word analysis, show 36 high-frequency keywords. These high-frequency keywords are divided into five clusters: extreme situation, dynamic capability, capital, supply chain and competitive advantage. These five clusters have been hot topics in business resilience for decades. The research status for each cluster is presented to guide potential areas for further research. In addition, based on co-citations analysis, the most frequently cited scientific articles written by Pettit *et al.*^[129] and Ponomarov and Holcomb^[130] are related to organizational resilience. Additionally, the Strategic

of Management Journal is the most commonly cited source. The results of this research also have significant implications for practitioners, government and academics. First, this research highlights the productivity of each country, author and journal in business resilience. The revelation will encourage policymakers and scholars to better understand and appreciate the role of each country, author and journal that publishes on this topic. Also, the ranking of each country in this field shows the relevancy of this topic to each particular country. This will open up insights for future researchers to explore countries that need more research on this topic. Apart from that, this research also provides several directions for future research based on the main keywords that have been clustered. That keyword could trigger further research in this area, thereby enriching and strengthening the topic of business resilience. Moreover, this research highlights the variables of dynamic capabilities, capital and competitive advantage as widely researched themes. The finding also provides an idea for businessman about the importance of exploring their dynamic capabilities, such as being innovative, creative and agile in using their resources. Finally, regarding policy, this research can be used as a consideration for the government in facilitating entrepreneurs, whether related to resources or regulations, when a crisis hits their business.

The limitation of the research is the literature data used. The data were only obtained from the Scopus database collection, which may cover only some available literature on organizational resilience. Future research should add other credible international databases, such as PubMed or Web of Science (WoS), to gain more comprehensive insights regarding organizational resilience. In addition, this research has yet to be able to explore the evolution of resilience research trends from year to year. For further research, it is recommended to use more detailed techniques and methods to continue an in-depth exploration of organizational resilience research refining the concept of resilience, the structure of measuring organizational resilience and enriching antecedents and consequences and their influence mechanisms.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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