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A Bibliometric Analysis of Economic Resilience

Asma Bibi*1, Mohammad Ghaffary Fard2

1. MSc, Department of Economics, Faculty of Social and Behavioural Sciences, Ahlul Bayt International University, Tehran, Iran.

2.Assistant professor, Department of Philosophy, Ahlul-Bayt International University, Tehran, Iran. (Corresponding Author) Email: asmabb115@gmail.com

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ABSTRACT

Economic resilience is a well-known term in the worldwide economic debates, which directs the strength and aptness of countries to combat shocks and retrieve to normal condition. Leading economists have widely discussed its significance and relevance, particularly pursuing the global financial meltdown in 2007-08. This paper aims to investigate the body of publications developed around economic resilience, recognizing its evolution or change, the most academically interested countries, the more appropriate authors, and upcoming research sequences. To fulfill this paper's goals, the bibliometric analysis was applied to the publications, wherefore 355 documents fetched from 1986 through 2022 from the Scopus database were analyzed. The result suggests that the field of economic resilience has expanded every year. The US, UK, and China are among the top ten territories with the most increased production on the subject. The bibliometric report getting through VOSviewer software is observed that the topics of most compelling attraction have circled the economic resilience is corresponding to regional resilience, economic development, financial crisis, oil shocks, exchange rate shock, and sustainability. Moreover, this study will help researchers in the bibliometric analysis of economic resilience for forthcoming works on economic resilience.

KEYWORDS: Economic resilience, Biometric analysis, Scopus database, VOSviewer software

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1. Introduction

The "resilience" idea has attained high vogue in formulating economic policy objectives in the last few decades. Holling firstly introduced the image of resilience in 1973 in an ecological context. Holling described *resilience* "as a standard of systems' tenacity and capability to absorb transformations and disruptions and keeping the exact associations between residents or state variables. Resilience is concerned with persistence and resolutions of destruction" (Holling, 1973; Xu and Marinova, 2013).

Over the last few decade, the title "economic resilience" appeared as a well-known term in many research papers with impressive implicit implications. Therefore, it provoked researchers and policy-makers to strengthen their works to understand the economic system conditions. Because Economic resilience directs the strength and aptness of countries to combat shocks and retrieve fast to their possible normal conditions. Moreover, it is defined as "the ability of the state economic policies that can resist or recover the economic system from the consequences of such shocks" (Briguglio et al., 2008). Economic resilience is considered the ultimate tool for diminishing external vulnerabilities and diversifying nationwide acquisitions to deal with hazards.

It was understood that examinations of prior studies in a knowledge area contribute to its refinement by signaling the evolution process of its concepts and theories. The present study focused on identifying the main discussion issues in the publications on economic resilience and demonstrating their expansion over time. The bibliometric software VOSviewer has been used for these objectives, based on 355 articles published between 1985 and 2022, extracted from Scopus's scholarly database. In addition, Scopus social science area has been selected to carry out a bibliometric literature review on economic resilience. This selection yielded 355 academic and observed articles published in different journals from 1986 to 2022. In this phase of the study, metrics of production demography have been examined, such as time distribution, most cited articles, productivity by authors, and productivity by journals and their respective impact factors.

The research's fundamental motive is using a bibliometric analysis approach to pinpoint the evolution and change in economic resilience research. The paper comprises four sections: Section 2 illustrates the literature review of resilience, economic resilience, the evolution of resilience, and data analysis retrieved from the Scopus database. Section 3 presents the research methodology and data sources, including statistical overviews, sorting or ranking, and economic resilience outcomes' visualization mapping. Finally, the last section concludes with observations about the yields from this analysis, the limitations, and future directions.

Scopus database

Keywords search

Information Analysis

Downloading Information Information

Source: Rodríguez et al. (2020)

Figure 1. Research method process

Literature review

1.1. Concept of Resilience in different research

This segment summarizes the resilience definitions. Different resilience definitions were recognized in various fields of study, such as ecology, engineering, psychology, economics, organizational behavior, and others.

A vast number of studies have been carried out in various fields. In some areas, the word resilience has been utilized to mention the return rate to equilibrium upon a disorder. Others tend to analyze resilience

as bouncing back after disruptions or recovery time. In this way of looking at the word resilience, there is often an implicit focus on resisting change and controlling it to maintain stability (Folke et al., 2016). The etymology of "resilience" arrives from the Latin word 'resilience,' which means rebound, which corresponds to an entity's ability to recover or jump back from shocks or disruptions (Martin and Sunley, 2015; Modica and Reggiani, 2015).

Resilience can be described by some authors as the capability of an entity to recover quickly from difficulties typically from adverse external shocks. This concept of resilience has been used in various research study areas. Such as, in environmental policies and ecology. "for the first time resilience mainly discussed in ecosystems' as an ability to deal with natural disasters such as earthquakes, floods or droughts, storms, cyclones, and other natural and man-made disasters" (Martin and Sunley, 2015; Sabatino, 2019; Osman, 2021; and Soufi et al., 2021). Moreover, One standard description of resilience is "the stability of something to recover from or adjust easily to misfortune or change" (Ringwood et al., 2019).

Resilience is the system's ability to recover in a minimum time, with minimum cost (financial, human, workload, etc.) a specific functioning capacity on all measurements of its performance. Some factors of the resilience of a system can be considered by investigating its functionalities in several circumstances: (a) before a disruptive event, (b) during a disruptive event, and (c) after a disruptive event. During each situation, it is essential to (1) be able to assess the resilience at a given time, comprising in disruptive circumstances, and (2) to determine preventive measures for different scenarios, to enhance the outcomes of the resilience assessment (Kamissoko et al., 2019).

1.2. Concept of Economic resilience

Various analyses have been carried out, and various concepts have been raised to discuss economic resilience. Hallegatte (2014) listed concepts regarding economic resilience measurement and definition, while others described country-level economic resistance (Rose 2013).

In economics, resilience refers to the economic policies of states "that rescue from or adapt to adverse or damaging exogenous shocks and benefit from good positive shocks" (Briguglio et al., 2009). There are two central prerequisites for economic resilience:

- The capability to withstand or resist shocks.
- The capability to retrieve from the consequences of adverse shocks.

The capability of withstanding or opposing shocks is linked with the capability to absorb shocks to compensate the influence of shocks. "Economic resilience is basically the strength of an economy to lower susceptibilities, oppose shocks, and retrieve quickly" (A Caldera Sánchez et al., 2016).

M. Júnior and Hoffman (2021), in their study, the regional resilience which they performed by a bibliometric study and retrieved data from the web of science. They created a co-citation network using the Cite Space scientometry program from the primary base, assembled by 829 articles from 2010 to 2017. Their study concluded that different researches focused on the regional resilience scope and mostly indicated in the global economic and financial crisis-era 2008-2009.

R. Ignat et al. (2020), in their study the "economic resilience: bibliometric analysis," in which they conducted the bibliometric analysis by using the web of science (WoS) database for the period 2017-2020. The main objectives of their study are to identify the concept of resilience through different literature and to find the impact of new concepts on the published research on resilience. They concluded that the term resilience is the new and main topic during the COVID-19 pandemic. Further, they

concluded that the evolutionary concept of resilience changed from the technological approach to the ecological approach and then to the social approach.

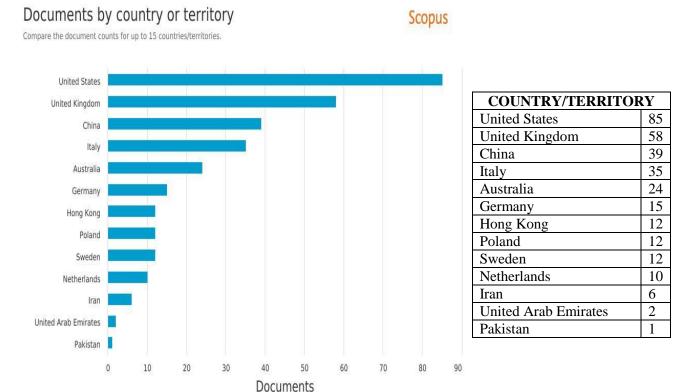
Our study is close to the study of R. Ignat et al. (2020) on some aspects. However, there are differences in our works; the first difference is the source of data collection; the source used by them for the data collection was the web of science (WoS) database for the period 2017- 2020. However, we used the Scopus database for the period 1985-2022. Secondly, the main difference is that we limited our data to social science and used 355 publications, while they used 322 publications. Moreover, the research topic is approximately the same as economic resilience, but mainly their focus was on the concept of resilience and its evolution, while our focus was on the trends and evolution of economic resilience.

The Most Active Countries, Institutions, and Authors

1.2.1. Most active countries

The most area covered by the European countries (UK, Germany, Italy, Poland, Sweden, Netherland), then by the Asia countries (China, Iran, UAE, Hong Kong, and Pakistan), and North America (US), and finally by Oceania (Australia), these were countries in the world; in terms of highly published articles in 1985-2022 on economic resilience in social science as shown in Figure 2.

Figure 2 Most productive countries rank in publishing articles related to economic resilience.



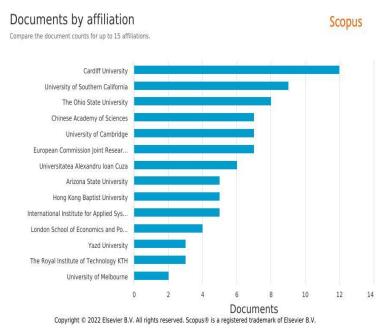
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1.2.2. Most active organization

Source: Scopus database.

Figure 3 indicates that on the highest level of 15 publishing organizations are universities in social science related to economic resilience. Out of these top 15 universities, the top three universities are: the

university of the UK (Cardiff University), University of California State (University of Southern California), the Ohio state university, and the bottom three universities are: Iran university (Yazd University), the Sweden University (the royal institute of technology KTH), and the Australian university (University of Melbourne).



AFFILIATION	
Cardiff University	12
University of Southern California	9
The Ohio State University	8
Chinese Academy of Sciences	7
University of Cambridge	7
European Commission Joint	7
Research Centre	
Universitatea Alexandro Ioan	6
Cuza	
Arizona State University	5
Hong Kong Baptist University	5
International Institute for	5
Applied Systems Analysis,	
Ladenburg	
London School of Economics	4
and Political Science	
Yazd University	3
The Royal Institute of	3
Technology KTH	
University of Melbourne	2

Figure 3 publications by affiliation.

1.2.3. Most Active Authors

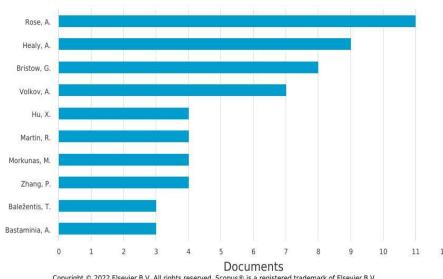
Figure 4 shows the ranking of the top ten authors based on their total number of publications in economic resilience. The top ten authors are Adam Rose, who published the most articles on economic resilience in social science, Adrian Healy, Gillian Bristow, Atrium Volkov, Xiaohiu Hu, Mangirdas Markunas Xiaodong Zhang, Tomas Baležentis, and Amir Bastaminia.

Figure 4 Documents by authors.

Documents by author

Compare the document counts for up to 15 authors.

Scopus



Author Name	
Rose, A.	11
Healy, A.	9
Bristow, G.	8
Volkov, A.	7
Hu, X.	4
Martin, R.	4
Morkunas, M.	4
Zhang, P.	4
Baležentis, T.	3
Bastaminia, A.	3

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Source: Scopus

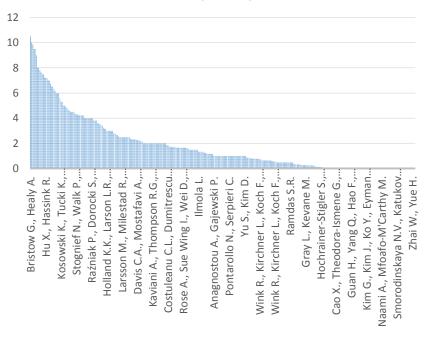
1.2.4. Most Cited Publications

In order to reveal the most influential publications on economic resilience. We arrange them according to the number of citations on economic resilience. Figure 5 shows the top ten authors who received more citations on their articles. Here for citation, we used the formula:

$$highest\ citation\ of\ authors\ publicatio = \frac{cited\ by}{(2022-published\ year)}$$

Figure 5 most cited publications





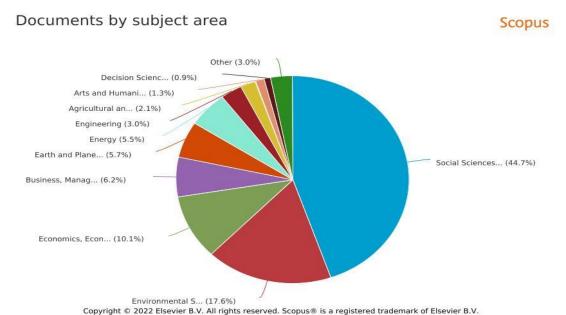
Authors	citation
Bristow G., Healy A.	10.5
Zhou Q., Zhu M.,	10
Qiao Y., Zhang X.,	
Chen J.	
Di Caro P.	9.8
Cellini R., Torrisi G.	9.5
Kitsos A., Bishop P.	9.5
Giannakis E.,	9
Bruggeman A.	
Cheng L., Zhang J.	8
Sedita S.R., De Noni	8
I., Pilotti L.	
Brown L.,	7.8
Greenbaum R.T.	
Gössling S., Ring A.,	7.6
Dwyer L., Andersson	
AC., Hall C.M.	

Source: Scopus database

1.2.5. Number of Publication in a different subject area

Figure 6 shows the different studies areas in which the authors worked on economic resilience. However, our study is limited to social science, containing 355 publications, 44.7% of the total.

Figure 6 publication in different fields of study

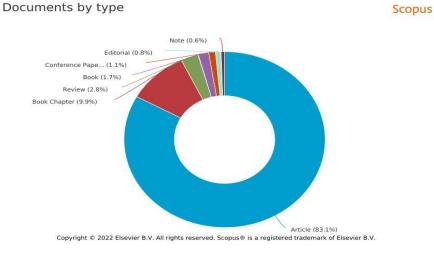


Source: Scopus database

1.2.6. Most Published Type of Documents

The most published documents are articles, 295 in number and about 83.1% of 355 publications; the entire book chapters are 35 out of 355 and about 9.9%. Similarly, the review articles are 10, and about 2.8%, books related to economic resilience in social science are only 6 and cover almost 1.7% of the total, in addition, the total conference papers published are 4 which cover 1.1 % and the editorial and note cover others, as shown in Figure 7.

Figure 7result on the document type.



DOCUMENT TYPE

Article 295

Book Chapter 35

Review 10

Book 6

Conference Paper 4

Editorial 3

Note 2

Source: Scopus database

2. Research Methods and data resource

2.1. Bibliometric Analysis

"Bibliometric analysis is a research method which delivers a quantitive summary of a research field" (Nerur et al., 2008; Luo et al., 2022). Bibliometric analysis has been described as one of the most acquainted and approved method by different literature reviews. This analysis is also considered an important instrument to determine scientific growth and development and estimate the quality of the research in a specified field (Rodríguez-Bolívar 2018). "This might include cluster overview, and procedures including citation analysis, co-citation analysis, bibliography coupling, coauthor analysis, and co-word analysis" (Luo et al., 2022). So, in short, we can say that bibliometric analysis provides an overview of prior studies.

"The bibliometric analysis comprises bibliometric performance indicators and scientific mapping" (Espinal et al., 2020). The foremost approach is identifying the work rate of authors, journals, and countries in the subject area. Meanwhile, the evolution of bibliometric networks for bibliographic coupling and co-occurrence of terms are permitted by the scientific mapping. However, to know and understand how documents, authors, and keywords are interconnected, either approach creates these opportunities and categorizes the domain and trends for upcoming studies. (Espinal et al., 2020).

Bibliometric analysis has been carried out to emphasize the idea of economic resilience in a better way. The query executed on the Scopus database had the following code: TOPIC: ("Economic resilience"), Timespan: 1985 – 2022. The query has been extracted in a CSV file and transferred to the VOSviewer, a specialized tool of bibliometric analysis. The file contains 355 publications concerning the topic of the economic resilience index in the Scopus index database. The collected data shows the number of publications, including citations per paper, publications by authors, and entire publications by institutions or organizations, and countries.

Furthermore, to know the interconnection between the publications, the software VOSviewer has been used, which shows different kinds of mappings or visualizations; it functioned to identify and extract the keywords in the articles. These keywords are arranged in a specific cluster form, as shown in Figure 11, Figure 12, and Figure 13. The appearance of two words simultaneously means that these words are correlated to each other, and correlated words may vary in strength and direction. Furthermore, the visualization map shows that the high-weighted keywords are more apparent or prominent than the low-weighted keywords. Basically, there are three kinds of visualizations: network visualization, overlay visualization, and density visualization.

2.1.1. Network visualization

By examining various keywords' sizes, the network visualization shows variations in the popularity of research. The different keywords size showed different levels of contributions in the field. The element's color represents the specific cluster relating to it; as shown in Figure 11, different clusters are shown by different colors to differentiate the various field of study. All these colored clusters permitted us to understand each cluster (V. Eck and Waltman, 2020; Luo et al., 2022).

2.1.2. Overlay visualization

The overlay visualization is also like network visualization showing colors, but overlay visualization has an incline effect. This type of visualization adds a time component also to the graphic interpretation of elements. Different periods show different colors (V. Eck and Waltman, 2020). The early elements indicated by the dark blue colors, the color will be prominent and intense yellow for the latest elements. Moreover, "the color' node is defined by each keyword's average period" (V. Eck and Waltman, 2020; Luo et al., 2022). For instance, if a keyword seemed 10 times in 2010 and 10 times in 2022, it will be placed in 2016. ((2010*10 + 2022*10)/20 = 2016) Furthermore, it will fall in

the green portion, which shows that keywords are early. The node will be yellow only if the element's majority will be the latest, as shown in Figure 12.

2.1.3. Density visualization

In density visualization, the whole figure is filled with blue color, but some parts of it are colored with yellow based on the elements' density close to the objective term. The higher the element's density will be, the more prominent will be the yellow color. The lower the density, the bluer will be the yellow color. So, the density relies on the elements' number in the surroundings and the significance of those elements. Finally, Density visualization has been used to mark the vital area and area of interest (V. Eck and Waltman 2020; Luo et al., 2022).

2.2. Data source

The data in this analysis were regained from the Scopus database. In 2004, SciVerse launched the Scopus to encourage bibliotheca searches worldwide with a smooth approach to "the world's significant abstracts and citations database of experts review literature" (Marinova et al., 2013), covering all types of high impact factors international journals, article publications, book series, and many of the conference papers. "Many leaders and subject matter specialists have Scopus as a neutral abstract and citation database developed by such individuals. Scopus puts effective finding and analysis instruments in the control or hands of researchers, librarians, research managers, and funders to upgrade ideas, people, and institutions".¹

Figure 8 about the Scopus Scopus (Launched 2004) 84+ million 26.0+ thousand active serial titles records 1.8+ billion 17.6+ million 7+ thousand 243.4+ thousand cited references dating back to 1970 authors profiles books 17.5+ million 94.8+ thousand open access items affiliation profiles

Source: https://www.elsevier.com/solutions/scopus

3. Keywords used

For extracting the literature data from the Scopus database, we searched some keywords in the Scopus' title, keywords, and abstract portion. Numerous publication turnouts to identify economic resilience related publications. For searching the publications, the keywords are operated, primarily affiliated with

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¹ Scopus.com

"economic resilience" And also operated with mixtures of both economics and resilience as: "resilient economy," "economic resiliency," "economics," AND "resilience," and "resilienc* economi*" OR "economi* resilienc*", the different results for some searches has been shown in Table 1.

Table 1 different search titles on Scopus database.

Searched titles	results
TITLE-ABS-KEY("economic resilience")	695
TITLE-ABS-KEY("ECONOMIC RESILIENCY")	97
TITLE-ABS-KEY("ECONOMIC RESILIENCE") AND (LIMIT-	335
TO (SUBJAREA, "SOCI"))	
TITLE-ABS-KEY("economic resiliency")	36
TITLE-ABS-KEY("ECONOMIC RESILIENCE")	3

4. Findings

Several interesting results were found when querying the Scopus database on code: *TOPIC: (TITLE-ABS-KEY ("economic resilience") AND (LIMIT-TO (SUBJAREA, "SOCI")))*. The search provided 355 documents shown in Figure 9.

Figure 9 search result in Scopus database



Figure 11 contains the network visualization of all keywords and structures associated with the 355 identified papers. It has been designed according to the following criteria: the minimum number of occurrences of keywords in the titles, abstracts, or keywords of the 355 identified publications: minimum three occurrences. Out of the 1909 identified words and structures, 191 meet the previously mentioned threshold, as shown in

Figure 10.

Figure 10 map creation through VOSviewer.



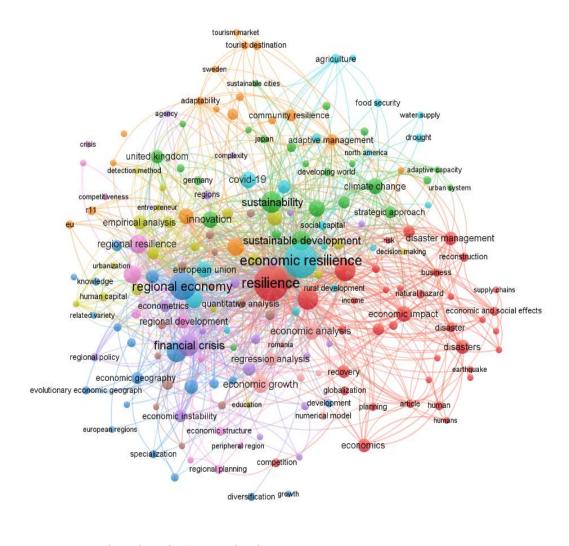
Source: VOSviewer

The 191 items are divided into 10 clusters of different colors; the first cluster (red) is the most extensive consists of 33 items regarding resilience: Economic impacts and most natural disasters. The second cluster (green) consists of 31 items, and primarily, this cluster describes the regional economy; The third cluster (blue) consists of 23 items shows macroeconomic resilience terms; the fourth cluster (yellow) consists of 21 items mainly covering economic resilience, productivity, pandemic terms; the fifth cluster (purple) consist of 17 items mainly on tourism; the sixth cluster (aqua) consists of 16 items mostly shows the terms related to sustainability; the seventh cluster (orange) also consists of 16 items which shows the

terms related to adaptability and sustainability cities; the eighth cluster (brown) consists of 14 items; the ninth cluster (pink) consists of 13 items, and finally the tenth cluster (peach) consists of 7 items.

Figure 11. The cluster of all keywords associated with the 355 publications that responded to the Scopus

Figure 11. The cluster of all keywords associated with the 355 publications that responded to the Scopus database.

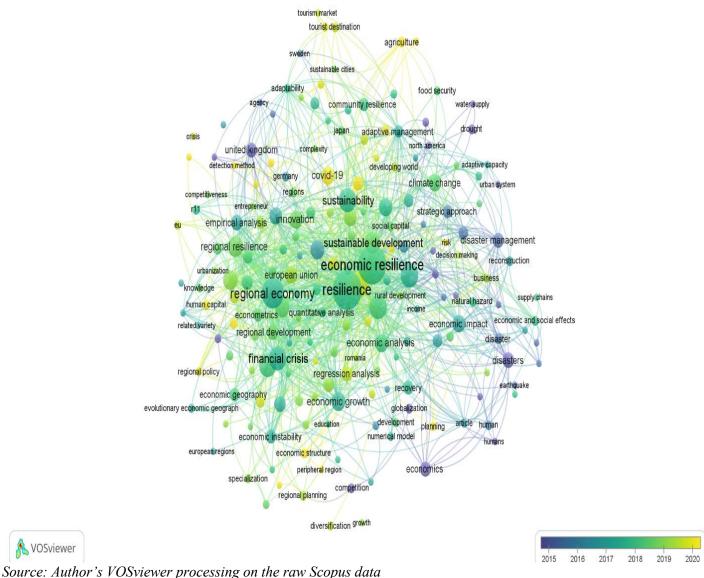


♣ VOSviewer

Source: Authors' VOSviewer processing, based on the Scopus database

The same methodology has been applied in the case of Figure 12, but it contains the evolution of the links between the keywords previously identified in Figure 11.

Figure 12. The evolution of the links between the all keywords (2015- 2022)



source: Author's vOsviewer processing on the raw scopus adta

Figure 13. The density map of all keywords and structures associated with the 355 publications concerning economic resilience contains the density of all keywords associated with the 355 identified papers, and it has been designed according to the above criteria. "All keywords, guide to keywords specified by the electronic databases, and the author's keywords" (Luo et al., 2022). It indicates all keywords' density distribution. It even reports the research focus (in yellow) associated with economic resilience, including regional resilience, economic development, and financial crisis

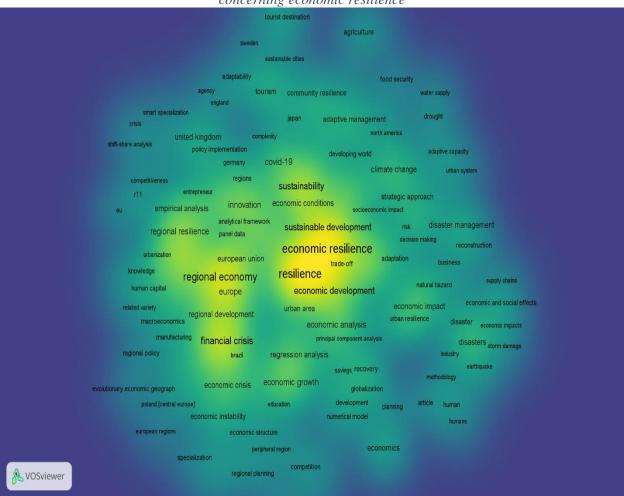


Figure 13. The density map of all keywords and structures associated with the 355 publications concerning economic resilience

Source: Author's VOSviewer processing, based on the raw Scopus data

The interest is apparent; the analyzed concept is usually used with such words as vulnerability, financial crisis, regional economy, sustainability, economic development, economic conditions, and disasters.

5. Conclusion

This article analyzed the research on economic resilience through a bibliometric analysis. We found a number of articles related to economic resilience in social science. The study revealed that economic resilience in social science is a promising area of research since it is pretty scarcely researched theoretically and empirically.

This study intends to deliver a comprehensive assessment of the prior and recent research trends and articles in the field of economic resilience. Due to diverse views, convergence, and application of economic resilience among worldwide researchers, this study notifies clear statistics about economic resilience. It provides a route for curious researchers to better understand the nature and essence of the field by improvising the report's content.

Compared with other countries, the European countries and Asia countries published more articles in the economic resilience field. However, the entire published articles in the European countries was only barely more than the Asia countries.

The enormous publications were published by authors from the US, UK, and China; 182 articles have been published by these countries, which are 51.2% of 355 articles published only in the subject of social science. These countries indicated high levels of research association.

The top three authors in this regard are Adam Rose, Adrian Healy, and Gillian Bristow. However, the highly cited published articles are by Gillian Bristow 10.5.

The top three institutions are Cardiff University (12 publications), the University of Southern California (9 publications), and The Ohio State University (8 publications).

The most documented type was articles 295, at 83.09% of the 355 articles.; Others are books (9.9%), chapters (9.9%), review articles (2.8%), books (1.7%), conference papers (1.1%), and others are covered by the editorial and note.

Figure 11 illustrates the bibliometric network of correspondence of all keywords used by Authors, with the data and details of 10 clusters indicating distinct colors by each cluster. The red one is the broadcast, and it assembles the keywords relating to economic resilience and its economic impact on disasters. In addition, the peach color cluster is the most undersized cluster of 7 items and consists of the terms in the subject of economic resilience, such as economic analysis, regression analysis, investment, numerical model, Romani's, savings, and economic growth.

Finally, the publications showed that the most frequent keywords illustrate development and policy, which are the focal and main research points for economic resilience. This method also permitted us to find those terms that are fresh to the domain knowledge, such as COVID-19 pandemic, macroeconomic resilience, oil shocks, and banking resilience.

6. Limitation of the data selection

The publications included in this article are only English documents. Which has been cited by only English literature, and no non-English publications were assessed in this source of data (Scopus). That is why the publication estimated in this article does not cover all economic resilience research publications. There is no doubt that the current publications and research results outweigh what we concluded and achieved in this study. However, if some other academic papers were also contributed in this area, specifically in other languages such as Chinese, French, German, Persian, and Spanish, it would be more attractive if the capacity of search tools expanded.

7. Future research directions and Recommendations

With the help of investigating the development and growth of the research topic, we track down that the major subjects and the research boundary of economic resilience are continuously modified from 1985 to 2022. In this regard, from the bibliometric reports, we identified some fundamental research problems for further economic resilience research.

Some recommendations for future research are:

- i. The latest keywords used by the researchers are COVID 19, Macroeconomic resilience, exchange rate shock, and banking resilience. So, further research can be done by researchers on these keywords.
- **ii.** Further research should be done on the web of science (WOS) database.

iii. Policies should be made on up-to-date research, and on the border of knowledge should be done on these keywords such as Banking resilience, oil shock, exchange rate shock.

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ETHICAL CONSIDERATION

Authenticity of the texts, honesty and fidelity has been observed.

CONFLICT OF INTEREST

Author/s confirmed no conflict of interest.