Research Article

COVID-19 and the Economic Crisis: Examining Global Impacts with Thematic Analysis

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Abstract: The COVID-19 pandemic has significantly impacted health systems and economies worldwide, creating a global crisis that necessitates international cooperation. The aim of this study is to explore research areas and thematic trends in publications related to COVID-19 and economic crises using co-word analysis. A total of 5094 publications, published between 2020 and 2024, related to the keywords "economic crisis" and "COVID-19" were examined using the Web of Science (WoS) database. The publications were analyzed using R Studio and the Bibliometrix package. The annual growth rate of publications related to COVID-19, and economic crises peaked in 2022. The initial publications in 2020 focused on the epidemiological definition of the pandemic, while from 2021 onwards, studies on economic impacts and crises gained more attention. Co-word analysis revealed an increase in research addressing the relationship between the pandemic and economic crises. The thematic map analysis identified key themes such as "COVID-19" and "financial crisis," which showed a high degree of centrality and formed the research focus, with these terms appearing in most of the publications. Additionally, niche themes such as "connectedness" and "stock market" pointed to specific studies examining financial connections and market dynamics. This clearly demonstrates how the interaction between COVID-19 and economic crises has evolved over time and how research focus areas have shifted. The study concludes that research addressing the relationship between the pandemic and economic crises plays a critical role in filling gaps in literature and in developing strategies for future pandemics. Future research problems could be structured to enhance the ability of countries and international organizations to cope with economic crises and develop strategies to prepare for future pandemics.

Keywords: Bibliometrix, COVID-19, Co-Word Analysis, Economic Crisis
Jel Codes: E32, I18, F62, H12

COVID-19 ve Ekonomik Kriz: Tematik Analizle Küresel Etkilerin İncelenmesi

Öz: COVID-19 pandemisi, dünya genelinde sağlık sistemlerini ve ekonomileri ciddi şekilde etkileyerek, uluslararası iş birliğini zorunlu kılan küresel bir kriz yaratmıştır. Bu çalışmanın amacı, COVID-19 ve ekonomik kriz konularına yönelik yayınlardaki araştırma alanlarını ve tematik eğilimleri eş kelime analizi yöntemiyle keşfetmektir. Web of Science (WoS) veri tabanı üzerinden, 2020 ile 2024 yılları arasındaki "ekonomik kriz" ve "COVID-19" ile ilgili anahtar kelimelerle yayımlanmış 5094 yayın incelenmiştir. Yayınlar, R Studio programı ve Bibliyometrik paketi kullanılarak analiz edilmiştir. COVID-19 ve ekonomik krizle ilişkili yayınların yıllık artış hızı, özellikle 2022 yılında en yüksek seviyeye ulaşmıştır. 2020 yılındaki ilk yayınlar pandemi sürecinin epidemiyolojik tanımına yönelikken, 2021 yılından itibaren ekonomik etkiler ve krizle ilgili çalışmalar daha fazla ilgi görmüştür. Eş kelime analizi sonuçları, pandeminin ekonomik krizle olan ilişkisini ele alan araştırmaların arttığını ortaya koymuştur. Tematik harita analizinde "COVID-19" ve "financial crisis" gibi temel temaların büyük bir merkezilik göstererek araştırma odağını oluşturduğu, bu terimlerin çoğu yayında yer aldığı tespit edilmiştir. Ayrıca, "connectedness" ve "stock market" gibi niş temaların, finansal bağlantılar ve piyasa dinamiklerini inceleyen spesifik araştırmalara işaret ettiği gözlemlenmiştir. Bu, COVID-19 ile ekonomik kriz arasındaki etkileşimin zaman içinde nasıl evrildiğini ve araştırmaların hangi alanlara kaydığını açıkça göstermektedir. Çalışmada pandeminin, özellikle ekonomik krizle olan etkileşimini ele alan araştırmaların, literatürdeki boşlukları doldurmak ve gelecekteki pandemilere dair stratejiler geliştirmek adına kritik bir role

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sahip olduğu sonucuna varılmaktadır. Gelecek araştırmalarda temel araştırma problemleri, ülkelerin ve uluslararası kurumların ekonomik krizlerle başa çıkma yeteneklerini ve gelecekteki pandemilere hazırlık stratejilerini geliştirecek şekilde kurgulanabilir.

Anahtar Kelimeler: Bibliyometrik, COVID-19, Eş-Kelime Analizi, Ekonomik Kriz
Jel Kodları: E32, I18, F62, H12

1. Introduction

The COVID-19 pandemic has made history an event that deeply shook not only health systems but also economic structures around the world. This disease was declared a pandemic by the World Health Organization (WHO) on March 11, 2020, causing social life to come to a standstill in many countries (World Health Organization [WHO], 2020). Countries have implemented various measures to protect the lives of their citizens and ensure that their health systems can handle this large-scale pandemic. The initial measures included isolation, quarantine, and widespread lockdowns to slow the spread of the virus (International Monetary Fund [IMF], 2020, p. vii-1). However, it was not possible for countries to prevent the spread of the pandemic with unilateral domestic policy measures. This situation required coordination of cooperation efforts in the international arena (Turan & Yurdakul, 2021, p. 174-175). The importance of multilateral cooperation between countries was emphasized at the onset of the COVID-19 pandemic. It was highlighted that when treatments and vaccines are developed for the disease, both rich and poor countries should have immediate access to these treatments through a global effort. It was also stated that the international community will need to increase financial assistance to many emerging markets and developing economies (Gopinath, 2020, p. vi). The immediate priority for the health sector was to strengthen its capacity and resources. Measures were aimed at limiting the effects of the COVID-19 pandemic by increasing health expenditures and implementing measures to reduce transmission. However, it was also expected that the measures taken to reduce the transmission of the disease and protect the lives of citizens would have negative impacts on economic activities. It was stated that these effects would have a short-term cost on economic activities. However, it was underlined that the measures taken should also be seen as an important long-term investment in human health and economic well-being. Nevertheless, the negative effects of these measures on economic activities were unavoidable (IMF, 2020, p. vii-1). The negative economic impact of COVID-19 on a global scale had significant devastating consequences on countries. The pandemic left many countries facing economic stagnation in the short term and weakened their growth potential in the long term (World Bank [WB], 2020, p. 5). At the onset of the pandemic, many countries encountered economic challenges such as loss of labor force, declining consumer spending, and reduced investments. Countries were soon compelled to introduce comprehensive economic support packages due to rising unemployment rates and stagnation in various sectors (IMF, 2020, p. vii-1).

The health measures taken against the pandemic, the disruption of supply chains and the drop in demand have negatively affected many sectors. For example, the service sector (tourism, transportation and retail) was hit the hardest. Additionally, even large-scale fiscal and monetary stimulus packages in developed countries have only provided limited support for recovery. The consequences of this economic downturn have led to great instability not only in government policies but also in global labor markets (Gopinath, 2020, p. xiii; WB, 2020, p. 7-8; Kolahchi et al., 2021, p. 825-827; Naseer et al., 2023, p. 6). In this context, the fact that the pandemic caused high and increasing costs worldwide in a short time was met with concern. At the very beginning of the pandemic, it was predicted that the global economy would shrink sharply by 3% by the end of 2020. Concerns were raised that this situation would have much worse consequences than the financial crisis

of 2008-2009. Even under the assumption that the pandemic would be reduced and brought under control in the second half of 2020, it was predicted that it would take a long time for the global economy to recover (IMF, 2020, p. vii-1). However, beyond the forecasts, global GDP contracted by 5.2% in 2020, which was recorded as one of the deepest economic recessions in modern history. According to the World Bank (WB), the pandemic has exacerbated poverty and deepened socioeconomic imbalances, particularly in low- and middle-income countries (WB, 2020, p. 5). In this context, understanding the relationship between COVID-19 and the economy is of great importance at both academic and practical levels. There are extensive studies in the literature addressing this relationship. Studies in the literature have the potential to provide valuable insights to draw lessons for the future.

2. Literature Summary

During the COVID-19 pandemic, economic decision-making processes of individuals, businesses and countries have been shaped by uncertainties and crisis management. Studies from various countries have examined the economic impacts of COVID-19 on a global scale and analyzed the long-term consequences of these impacts (Baker et al., 2020; Xu et al., 2021). These studies reveal how the health crisis is linked to economic stagnation and its implications for international trade, employment, and public policies. Moreover, research on the economic impacts of COVID-19 covers a wide range of dimensions. For example, Baker et al. (2020, p. 7) emphasize that the economic impacts of COVID-19 have led to a multi-sectoral disruption, similar to previous economic crises. The research shows that global economic growth has slowed down significantly due to the pandemic and job losses have been experienced in many sectors. In this respect, the research confirms that at the onset of the pandemic, many countries faced economic challenges such as labor force losses, falling consumer spending and reduced investments. A study by Xu et al. (2021, p. 154-156) examined the effects of COVID-19 on supply chains. The fact that many businesses have stopped or limited their operations during the pandemic has revealed the fragility of global supply chains. This situation caused difficulties in product supply and price increases in many countries. Sharma & Borah (2022, p. 761) emphasized in their study that COVID-19 can create social and economic crises indirectly and evaluated the increase in social problems such as domestic violence in this context. This finding clearly shows how the social dimension of the pandemic is intertwined with economic impacts. Adams-Prassl et al. (2020, p. 490-491) examine the effects of COVID-19 on the labor force, stating that job losses have reached large dimensions in many sectors and this situation threatens long-term economic stability. This finding is clear evidence that the effects of the pandemic have left deep traces not only in the health field but also in socioeconomic areas (Bodrud-Doza et al., 2020, p. 1). There are also studies showing a close relationship between the health and economic dimensions of COVID-19. Thomas et al. (2020, p. 5-6) emphasize the potential of health crises to create economic instability. This study shows that strengthening the health system is a critical priority to prevent economic crises.

Research on the economic impacts of COVID-19, especially in developing countries, is also noteworthy. Ozili (2021, p. 405-406) analyzed the structural economic causes and consequences of the pandemic based on the Nigerian case. The study reveals that COVID-19 has left lasting effects not only on health but also on economic structures. Lukash et al. (2021) examined the effects of COVID-19 on regional economic development and compared economic recovery processes in different regions. This study shows that regional differences play an important role in strategies to cope with the economic crisis. Quaglia & Verdun (2023, p. 640, 647) examine the European Central Bank's (ECB) response to the economic crisis related to COVID-19. The study reveals that the ECB's responses to the crisis were based on lessons learned from previous crises. How the policies of such institutions are shaped in times of economic crisis is an important part of the literature. The measures taken by institutions in times of economic crisis are also important in the

literature. Valla & Miguet (2022) examined the fiscal and monetary measures implemented in the European Union (EU) to mitigate the economic effects of COVID-19. In their study, they emphasize the impact of policies such as wage support and liquidity aids, while drawing attention to public debt and labor market problems in the long run. Tuysuz et al. (2022) analyze the regional effects of the COVID-19 pandemic on the Turkish economy and reveal the main determinants of economic vulnerability and resilience. The study emphasizes that the economic impacts of the pandemic differ across regions and the relationship between regional economic structures and resilience. Maritz et al. (2020, p. 4612) emphasize the importance of entrepreneurship in the COVID-19 process and examine how entrepreneurs played a role in overcoming the crisis. In this context, the study is important in terms of addressing the potential contributions of entrepreneurship in the economic recovery process of the pandemic. Borio (2020, p. 182) pointed out that the economic crisis caused by COVID-19 is "dangerously unique," highlighting the fragility of current economic systems. These similarities are important for understanding how the pandemic differs from previous economic crises. As can be seen, research on the economic effects of COVID-19 has shown that these effects are multifaceted.

Given the context described above and the large presence of these studies in the literature, bibliometric analyses that identify key trends, authors and key themes for the future are considered necessary. A bibliometric analysis of the findings of studies that address the COVID-19 pandemic from an economic perspective and within the framework of crisis management has the potential to facilitate the understanding of the link between the pandemic and the economic crisis. At the same time, it is useful in terms of revealing trends in research on the pandemic and economic crisis.

3. Materials and Methods

The aim of this study is to explore research areas and thematic trends in publications focusing on COVID-19 and the economic crisis through co-word analysis.

For this purpose, the following questions were sought to be answered in the study:

Q1: What are the current and future research themes for COVID-19 and the economic crisis?

Q2: What are the thematic developments on COVID-19 and the economic crisis?

Bibliometric analysis reveals the structure, dynamics and trends of a field by examining scientific literature with quantitative methods (Cobo et al., 2011, p. 1382). This analysis evaluates the development of a discipline with different parameters such as citation relationships, author collaborations, journal performances, and provides guiding insights (Zupic & Čater, 2015, p. 430). In this respect, bibliometric analysis is a comprehensive method used to understand the structure, trends and development of scientific literature.

Co-word analysis is one of the main sub-methods of bibliometric analysis. This method reveals the thematic structure and conceptual connections of a research area by examining the frequency and relationships of keywords used together in a text. In this respect, the method allows identifying the basic themes of research fields and their evolution over time (Cobo et al., 2011, p. 1385; He, 1999, p. 1216). Co-word analysis is an effective tool for thematic mapping of a given discipline and tracking conceptual shifts over time.

The co-word analysis method is highly valuable in analyzing large datasets and identifying important topics within the text. Co-word analysis-based studies are used to discover connections between texts and are applied in various fields such as health improvement (Arslan-Aras, 2024, p.136-137). Co-word analysis and bibliometric analysis methods are shaped by differences in scope and focus. While bibliometric analysis describes the broad structure and general trends of research fields, co-word analysis focuses on the details and thematic connections of this structure. However, co-word analysis alone is considered a sufficient and powerful method, especially for thematic mapping of a particular discipline and for elaborating conceptual connections (He, 1999,

p. 1217). Cobo et al. (2011, p. 1385) stated that co-word analysis can be used as a stand alone method. Co-word analysis method usually consists of the following steps (Cobo et al., 2011, p. 1384-86; Zupic & Čater, 2015, p. 435):

• Keyword Extraction: The first stage is the extraction of keywords from the scientific literature to be analyzed. This is usually done from the titles, abstracts and keyword sections of the articles

• Word Matching and Matrix Creation: To understand the relationship between the extracted keywords, a co-word matrix is created. In this matrix, the frequency of occurrence of keywords together is calculated and the connections between words are identified.

• Network Analysis and Clustering: The co-word matrix is transformed into a network structure and the thematic clusters in this network are identified. At this stage, thematic groups are usually defined using graph-based analysis tools or algorithms

• Visual Mapping and Interpretation: Thematic clusters are visualized, and a thematic map is created. This map allows understanding the structure of the research area and examining the relationships between themes. Finally, the map is interpreted to explain the main themes and connections in the field.

In the study, it was assumed that the history of the first scientific publications dates back to 2020, considering the date when the "COVID-19" outbreak was declared a pandemic. Based on this assumption, the range of 2020-2024 was determined as the time constraint. In the research, a search was conducted in the Web of Science (WoS) database for the period between 01.01.2020 and 05.11.2024 (the date of the scan). The keywords to be used during the search were determined among the concepts that would define the economic crisis and COVID-19 (that could be associated with these words). The search was conducted using the "topic" option with the identified keywords (see Table 1). As a result of the search, 5734 publications were accessed. Of the publications accessed, those that were not published in "English" were filtered and publications other than articles were excluded. No index and scientific field restrictions were made in the study, and 5094 studies were included in the analysis. The Bibliometrix package developed by Aria & Cuccurullo (2017) in the R Studio 3.0.1 statistical program was used in the analysis. For the analysis, data were downloaded in Bibtex format and imported into the analysis program. An ethical committee report was not necessary for this study which used data derived from the literature. Detailed analysis results are presented in the findings section.

Table 1. Query description

Category	Limitation	No. of included publications
Query outcomes before search refine		
Topic (("COVID-19" OR " COVID-19 pandemic" OR " Covid pandemic" OR "SARS-CoV-2" OR "SARS COV 2" OR "SARS-CoV 2" OR "2019-nCoV" OR "Coronavirus" OR "Wuhan virus" OR "Novel coronavirus" OR "Covid crisis" OR " COVID-19 outbreak" OR " COVID-19 epidemic" OR "Coronavirus outbreak" OR "Coronavirus pandemic" OR "Coronavirus disease 2019" OR "SARS Coronavirus 2") AND ("Economic cris*" OR "Economic lockdown" OR "Financial cris*" OR "Economic downturn" OR "Economic recession" OR "Financial recession" OR "Global recession" OR "Economic collapse" OR "Market crash" OR "Financial collapse" OR "Economic disruption" OR "Economic slowdown" OR "Global economic crisis" OR "Macroeconomic crisis" OR "Financial downturn" OR "Economic shock" OR "Financial instability" OR "Economic turmoil" OR "Global financial crisis" OR "Credit crisis" OR "Economic contraction")) Time Span (2020-2024)		5734
Languages		5412
Document Types	Excluding non-article sources	5094

4. Findings

The annual growth rate of COVID-19 and economic crisis-related publications is presented in Figure 1. The analysis was performed on a sample of 5094 publications published between 2020 and 2024. According to, the highest number of publications is 1162 and belongs to the year 2022. In 2020, the number of publications is 537. After reaching the highest number in 2022, the number of publications started to decrease. In 2023, the number of publications decreased to 1144 with the decrease in publication trends and then decreased to 989 in 2024. Since the data for 2024 belongs to December, it is possible to make a general evaluation of the decrease in publication trends.

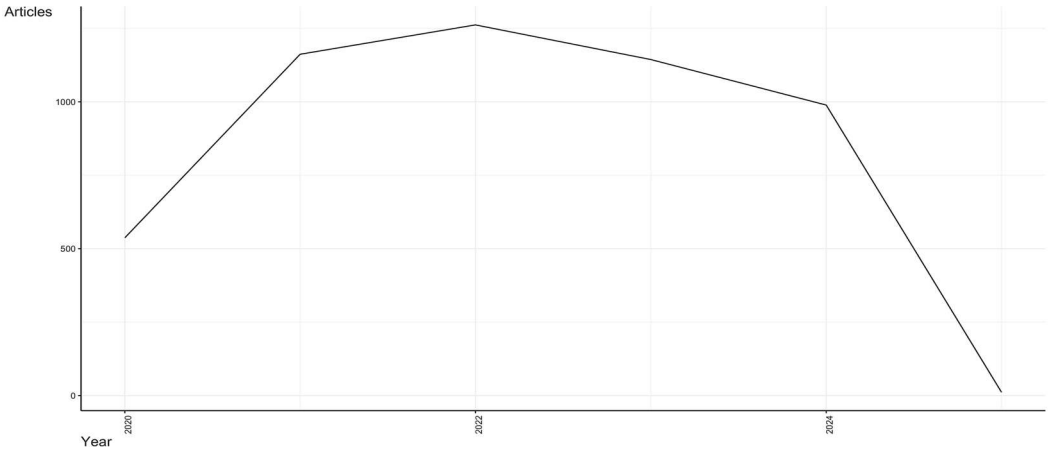

Figure 1. Number of publications by years

Publication topics focus on the COVID-19 pandemic and the economic crisis caused by it, highlighting the multifaceted landscape of relevant research. However, the results show a significant decrease of -54.05% in annual publications (see Table 2. The average age of publications addressing the relationship between COVID-19 and the economic crisis is 1.25 years. This is considered a positive indicator of the rapid academic response of researchers to the effects of COVID-19 causing the economic crisis. Each publication received an average of 15.63 citations, indicating the high impact and relevance of this body of work. Furthermore, the publications are supported by a solid reference network of 221,968 citations. Finally, there are 5547 keywords plus and 13,070 author's keywords. The high numbers generate interest in exploring the relevance and evolution of keywords.

Table 2. Descriptions

MAIN INFORMATION ABOUT DATA	Results
Timespan	2020:2024
Sources (Journals, Books, etc)	2223
Documents	5094
Annual Growth Rate %	-54,05
Document Average Age	1,82
Average citations per doc	15,63
References	221968
DOCUMENT CONTENTS	
Keywords Plus (ID)	5547
Author's Keywords (DE)	13070
AUTHORS	
Authors	16175
Authors of single-authored docs	816
AUTHORS COLLABORATION	
Single-authored docs	867
Co-Authors per Doc	3,7
International co-authorships %	32,97
DOCUMENT TYPES	
Article	4516
Article; book chapter	29
Article; data paper	6
Article; early access	220
Article; proceedings paper	6
Article; retracted publication	2
Review	311
Review; early access	4

Figure 2 shows the 10 most frequently used keywords. According to this figure, the most frequently used keyword is "COVID-19" with 2010 (35%). This is followed by the keywords "pandemic" with 340 occurrences (6%), "COVID-19 pandemic" with 328 occurrences (6%), "crisis" with 245 occurrences (4%) and "economic crisis" with 209 occurrences (4%). It was observed that the keyword mental health was the tenth most frequently repeated words in the studies on COVID-19 and economic crisis.

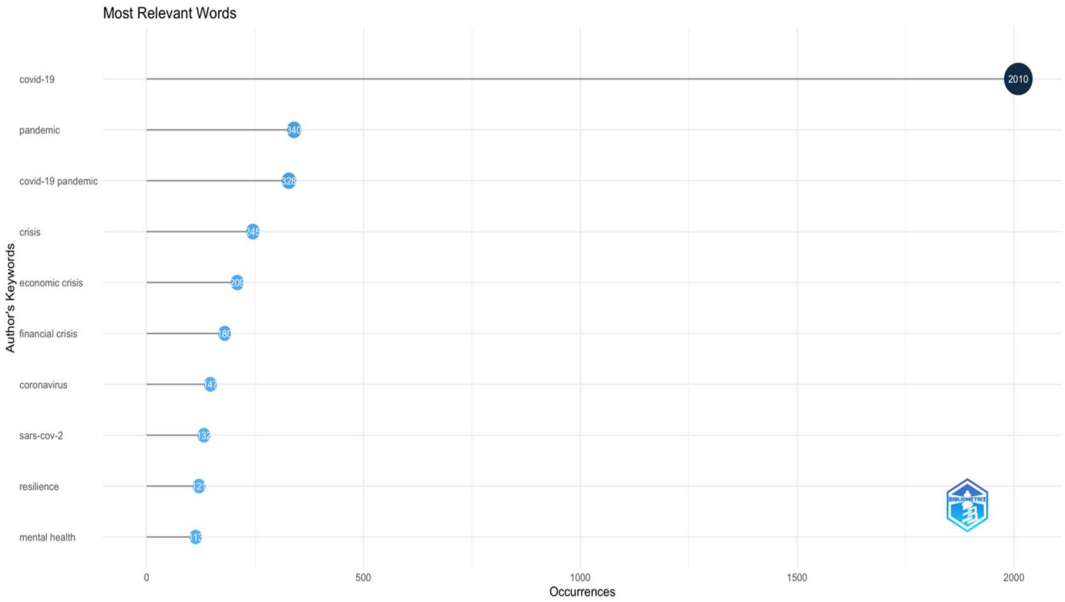

Figure 2. Ten Most Frequently Used Keywords

In the research, the network map of author keywords generated by Bibliometrix was created and presented in Figure 3. Figure 3 shows the network of keyword frequencies

between 2020 and 2024. This network summarizes the themes of most interest to researchers. The keywords are clustered in one cluster, around the keyword COVID-19. Clearly, the COVID-19 node is in a central position. This highlights the significant research focus on COVID-19, as evidenced by the most frequent occurrence of the keywords "COVID-19", "pandemic" and "COVID-19 pandemic".

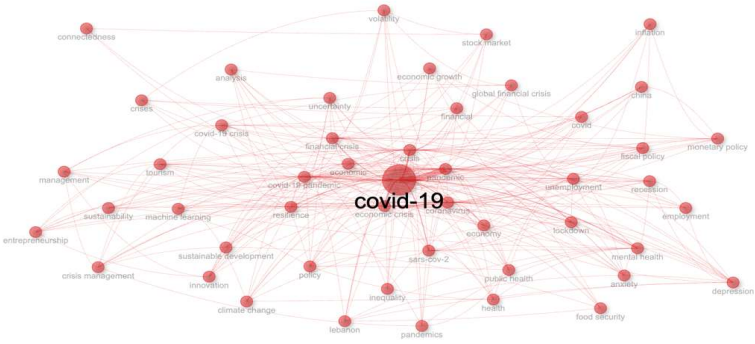

Figure 3. Network Map of Author Keywords

Trend topics analysis was conducted to reveal the conceptual structure in the field and to examine the evolution of research topics. In the trend topics analysis, the minimum word frequency was set as 10 and the first four keywords were selected for each year to show the topic trend in the field. The results of the analysis showing the conceptual trend in the field are presented in Figure 4. Figure 4 shows that the most frequently used keywords are "mortality", "acute respiratory syndrome", "respiratory syndrome coronavirus" and "clinical characteristics". These words can be considered as a result of the fact that in 2020, the first year when COVID-19 was declared as a pandemic, more research was conducted to define the disease epidemiologically (lethality rate, type of virus). In the second year of the pandemic, the keyword "mortality" was accompanied by the words "Sars", "coronavirus", "economic crisis" and "impact". In 2022, "economic crisis", "risk", and "impact" are the most frequently used keywords. In 2023, "volatility", "financial crisis" and "performance" are the most recurring keywords. In 2024, in addition to "financial crisis" and "performance", the keywords "migration," "selection," and "economic policy uncertainty" were among the most recurrent keywords.

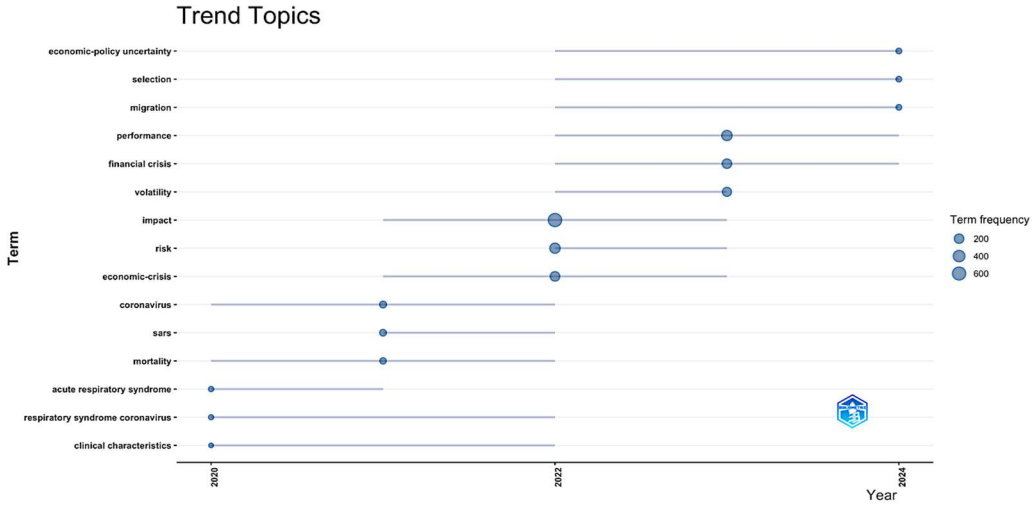

Figure 4. Trending Key Concepts from 2020-2024

Figure 5 shows the overall thematic map of studies on COVID-19 and the economic crisis. This map was created by Bibliometrix based on author keywords. Arslan-Aras (2023, pp. 195-198) explained thematic maps in general. Thematic maps can be associated with four different themes: basic themes, motor themes, niche themes and descending/emerging themes. Motor themes (upper right quadrant) are themes that form the basis of a research area and stand out as advanced topics. Basic themes (lower right quadrant) refer to topics that are important to the research area but have a low level of development. Niche themes (upper left quadrant) are themes that cover specific sub-topics and often represent marginal areas. Declining or emerging themes (lower left quadrant) refer to topics that are developing or have lost interest. According to the thematic map created in this study based on author keywords, the basic themes "COVID-19", "pandemic", "cris", "COVID-19 pandemic", "financial crisis" and global "financial crisis". Niche themes include "stock market", volatility, "crises", "connectedness", "TVP-VAR" and "G15". There is no distinct theme in motor themes and emerging or declining themes. In the context of the COVID-19 pandemic and the economic crisis, the presence of "connectedness", "TVP-VAR" (Time-Varying Parameter Vector Autoregression) and "G15" among the niche themes may be since these concepts are specific tools and concepts used to examine financial and economic linkages during the crisis period.

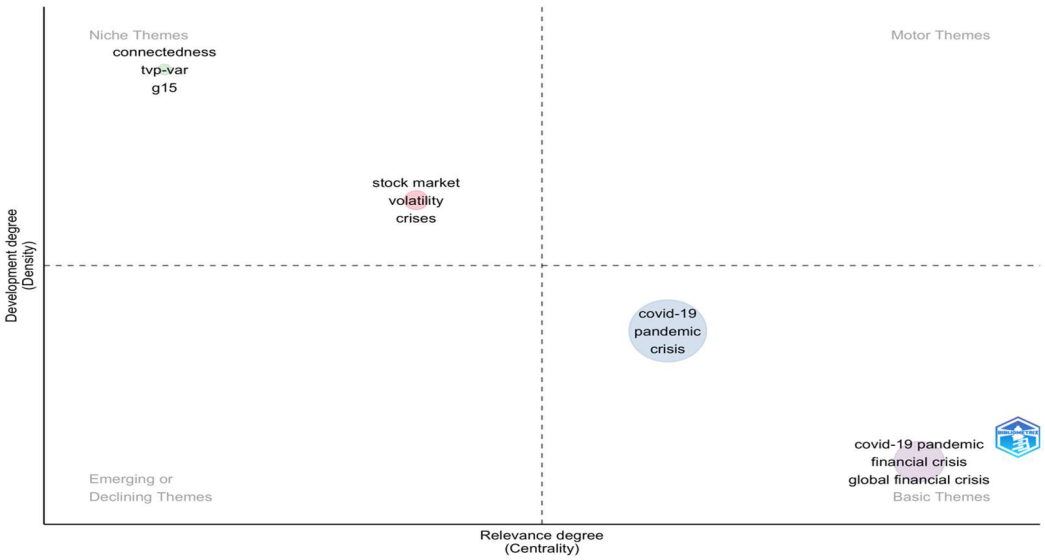

Figure 5. The overall thematic map of studies related to the economic crisis and COVID-19 (Author's Keywords)

Figure 6 shows the overall thematic map of studies on COVID-19 and the economic crisis. This map was created by Bibliometrix based on keywords plus. According to the map, the keywords in the motor themes are "risk", "volatility," and "returns"; in basic themes, they are "impact", "performance," and "economic crisis"; in niche themes, they are "health", "mental health", and "unemployment"; and in emerging or declining themes, they are "coronavirus," "identification," and "infection." The overall thematic map on COVID-19 and the economic crisis reveals the different research orientations of the literature on the pandemic and the economic crisis. It also shows that the economic impacts of the pandemic are a broad research focus. Keywords such as "risk", "volatility", and "returns" in the engine themes indicate that research on the uncertainty and volatility of financial markets during the pandemic is concentrated. The presence of the keywords "impact", "performance" and "economic-crisis" in the basic themes indicates that the destructive effects of the pandemic on the global economic system are being tried to be understood, and that the economic impacts and performance evaluations of the pandemic are at the center of research. Factors such as unemployment, loss of income and economic

stagnation during the pandemic caused crisis management and economic recovery strategies to be prioritized. The niche themes "health", "mental health" and "unemployment" indicate that social and individual health and employment crises during the pandemic have become the focus of research. Finally, the emerging or declining themes of "coronavirus", "identification" and "infection" reveal the importance of epidemiological analyses at the beginning of the pandemic and the subsequent declining relevance of these topics. These findings suggest that economic impacts have been one of the most visible and widely resonant aspects of the pandemic, and it is therefore to be expected that such themes will be intensively examined in research. The effects of the pandemic on the global economy have profoundly affected not only financial markets, but also areas such as health expenditures, employment and public finance.

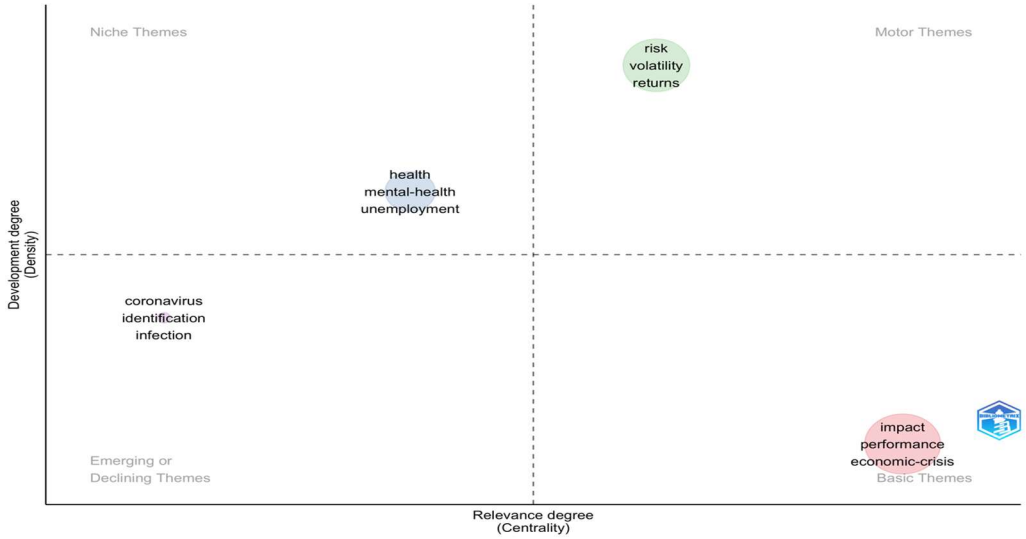

Figure 6. The overall thematic map of studies related to the economic crisis and COVID-19 (Keywords Plus)

Figure 7 illustrates the thematic evolution map, displaying the historical development of studies on COVID-19 and the economic crisis. Each node in the thematic diagram represents a topic, with the size of the node reflecting the number of keywords included in the theme. The links between the nodes indicate the evolutionary direction of the concepts being analyzed. The continued historical connections between these concepts suggest their ongoing importance in the field. Different colors in the connection lines allow for easy differentiation, while the thickness of the lines indicates the number of shared keywords. Essentially, the wider the line, the stronger the connection between topics (Cobo et al., 2011, p. 158). The map in Figure 7 is based on author keywords, using keywords and thematic evolution to depict the history of themes and their evolution. Thematic evolution was analyzed using bibliometrix software over two time periods. These time segments were automatically generated by the program to provide a clearer representation of the thematic evolution. The first period, from 2020 to 2022, covers the early stages of the pandemic. The second period, from 2023 to 2024, spans two years following the end of the pandemic in 2023. The first period is divided into five themes: "crisis," "COVID-19", "financial crisis", "stock market", and "safe haven". These themes then transformed into "COVID-19" and "connectedness" themes in the second period.

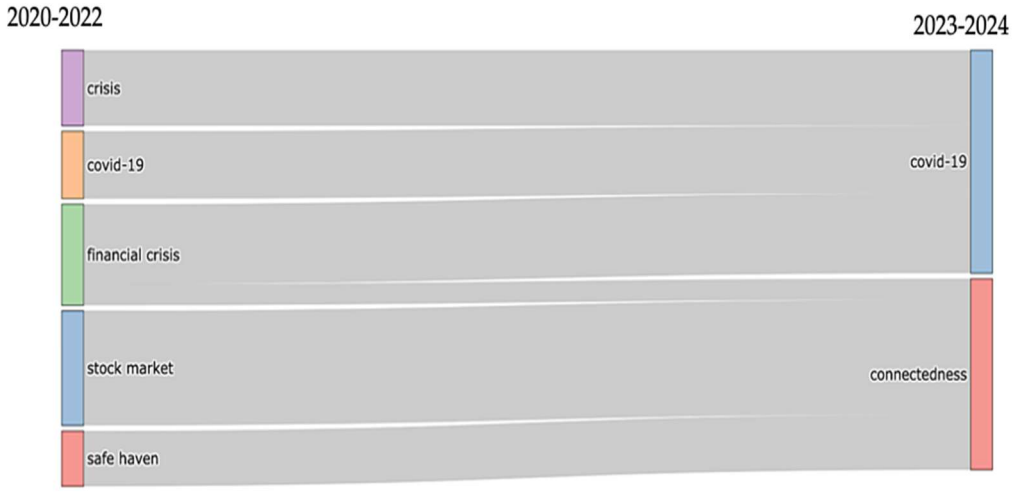

Figure 7. Thematic evolution of studies related to COVID-19 and economic crisis

5. Discussion

Examining the relationship between COVID-19 and the economic crisis through bibliometric analysis methods is very useful in understanding the global effects of the pandemic on the economy. However, revealing the economic impact of the COVID-19 pandemic requires comprehensive analysis. This necessity stems from important information gaps in the literature. Although there is an extensive literature on the relationship between the COVID-19 pandemic and the economy, there are still knowledge gaps. Many studies have focused on specific countries, regions and sectors to reveal the economic effects of COVID-19 or to address its relationship with the economic crisis (Lukash et al. 2021; Ozili 2021, Tuysuz et al., 2022; Valla & Miguet 2022; Ünüvar & Aktaş, 2022; Quaglia & Verdun 2023; Chatterjee, 2024). Similarly, some studies have focused on the effects of the pandemic on the economy at the cross-sectional level and momentarily (Baker et al, 2020; Huang et al. 2020; Gopinath, 2020a). Again, some studies have either discussed the economic effects of the pandemic in general terms or evaluated them at a conceptual level by comparing them with past pandemics (Barro et al., 2020; Maital & Barzani, 2020; Nikola et al, 2020; Kaplan et al., 2022). Research on the impact of the pandemic on the economic crisis on a global scale and in a comprehensive manner or long-term forecasts of this impact are often limited to those conducted by international organizations such as the WB and IMF or supported by national institutions (Fernandes, 2020, Gopinath, 2020a; IMF, 2020; WB, 2020). As can be seen, most of the existing studies have focused on specific countries, regions and immediate impacts. They have been limited in revealing the long-term effects of the pandemic on the economy/economic crisis. These limitations highlight the need for studies that address the economic impact of COVID-19 on a global scale or comprehensively, using systematic analysis, meta-analysis and bibliometric analysis methods that provide more detailed information on trends and results in research. In addition, these limitations reveal the importance of these studies in which secondary data are used to produce results with high evidence value. In the literature, various studies have been conducted on the relationship between COVID-19 and the economy with these analysis methods.

For example, Faramarzi et al. (2024) conducted a study on the global economic impact of COVID-19 through systematic review and meta-analysis. Using both "top-down" and "bottom-up" approaches, the researchers examined direct and indirect costs and analyzed a wide range of issues from hospital bed costs to the impact of COVID-19 on national economies. The results show that the financial burden of COVID-19 on health systems and economies is significant and varies significantly across countries. The research highlights the need to pay more attention to social and family economic outcomes in the post-pandemic period and recommends that policymakers prioritize economic programs. This

comprehensive review makes an important contribution to filling the gaps in the literature on the economic impacts of COVID-19. For example, Obrenovic & Oblakovic (2024) analyze the financial and economic impacts of COVID-19 in their study, analyzing 1257 articles on this topic and mapping the main themes using bibliometric analysis tools such as VOSviewer. The study highlighted critical themes such as economic challenges, policy responses and resilience strategies and identified global collaboration networks and thematic trends using keyword mapping and clustering techniques. In particular, this study provides valuable insights for making sense of the economic and financial impacts of the pandemic and provides actionable recommendations for future research on sustainable financial strategies and for policymakers. With its emphasis on identifying research gaps and trends, it is an important resource for understanding the multidimensional economic impacts of the pandemic.

A similar study was conducted by Zhong & Lin (2022). The researchers analyzed research productivity and collaboration networks at the level of countries, institutions and authors by examining the research on the economic effects of COVID-19 in literature with bibliometric analysis method. By addressing the economic impacts of the pandemic, the researchers revealed that scientific studies in this field have increased and created important literature in different disciplines. In this study, the relationship of COVID-19 with the economic crisis and the solution proposals for it are discussed in detail. The study is considered important in terms of revealing research trends, especially focusing on the global financial crisis and adaptation policies to the current economic situation and identifying important trends and research gaps that can guide future research.

Another bibliometric analysis study was conducted by Liu et al. The researchers comprehensively evaluated the literature in this field by addressing the economic impacts of the COVID-19 pandemic through bibliometric analysis. The study analyzed the economic consequences of the pandemic at the level of various sectors and countries, while also revealing thematic trends in global research collaborations and scientific publications. In this context, the study provides important recommendations that will guide future research on the economic impacts of COVID-19. This study makes a valuable contribution in terms of identifying the strengths and weaknesses of literature in understanding the effects of the pandemic on the economy. At the same time, it also provides a basis for studies examining the socioeconomic consequences of the pandemic.

Another bibliometric analysis study on the relationship between COVID-19 and economy was conducted by Arslan-Aras (2024). The researcher examined 2456 studies published between 2020 and 2023 with bibliometric analysis and co-word analysis method in a comprehensive study on the economic dimension of the COVID-19 pandemic. The study aimed to identify the gaps and future research agenda in this field by analyzing the most frequently used keywords, periodic themes and how these themes have evolved over time on the economic impacts of the pandemic. The study also revealed that the themes of economic uncertainty and crisis are among the declining or rising trends. These results constitute an important source for understanding the methodological diversity and thematic development of research on COVID-19 economic dimensions. The study also emphasized that the theme of economic crisis in the context of COVID-19 is poorly structured, that the relationship between pandemic and economic crisis needs to be further explored, and that it could be a potentially influential topic for the research field. In this context, the theme suggested by Arslan-Aras was analyzed in this study. The study was conducted to understand the impact of the COVID-19 pandemic on the economic crisis. The study presents the results of the common word analysis. In the study, data between 2020 and 2024 were analyzed and the development of key concepts during this period was observed. It is expected that the first of the ten most frequently recurring keywords is "COVID-19". However, it is noteworthy that mental health is among the most frequently recurring words.

The COVID-19 pandemic has led to radical changes in individuals' lifestyles, and factors such as quarantine and isolation practices, unemployment, economic uncertainty

and loss of income have had a serious impact on mental health. In turn, lack of social support, isolation and economic hardship have led to an increase in depression, anxiety, and stress disorders. Therefore, the high frequency of repetition of the term "mental health" in studies can be interpreted as pointing to the individual psychological effects of crises and its reflection in the literature (Pfefferbaum & North, 2020, p. 511).

As a result of the trend topics analysis, the most frequently recurring keywords were identified each year. In 2020, it can be considered as an expected situation that the most frequently recurring words will be mortality", "acute respiratory syndrome", "respiratory syndrome coronavirus" and "clinical characteristics". Cucinotta and Vanelli (2020, p. 157) stated that in 2020, the start year of the COVID-19 pandemic, an intense scientific effort was made to understand the epidemiological characteristics of the disease. In particular, many articles on the transmission mechanisms, lethality rate, basic reproductive number (R0), and genetic characteristics of the virus were published during this period

In the second year of the pandemic, the words "sars", "coronavirus" and "impact" were among the most frequently repeated keywords along with "mortality". It is expected that alternative words will be used depending on the increase in the number of research on the pandemic. However, with the economically devastating impact of the pandemic starting to be felt in 2021, the “economic crisis" took its place among the four most frequently repeated keywords. According to Ozili and Arun, the frequent use of the keyword "economic crisis" in 2021 (p. 7) shows that the economic effects of the COVID-19 pandemic have become more evident globally. Although the focus was on health measures at the beginning of the pandemic, factors such as prolonged quarantine measures, labor force losses, supply and demand imbalances caused economic difficulties to be felt on a wider scale. During this period, many countries faced economic stagnation, rising debt burdens and income inequality.

It is seen that the economic instability that continues in parallel with the continuation of the pandemic is reflected in the most frequently recurring keywords in 2022 and 2023. In 2023, the fact that the word "performance" is among the most frequently used keywords may indicate the efforts of countries to evaluate and improve the recovery processes of their health systems and economies in the post-COVID-19 period. The World Health Organization (WHO, 2023) declared on 5 May 2023 that the COVID-19 pandemic was no longer a global health emergency. Following the end of the pandemic, there has been a period of reassessment of health systems in terms of service capacity and effectiveness, and economies in terms of productivity, labor performance and sustainable growth. In this period, studies analyzing the performance of countries after crisis management came to the fore (Rathnayake et al., 2021; Moolla & Hiilamo, 2023). In 2024, the fact that the keywords "financial crisis," "performance," "migration," "selection," and "economic policy uncertainty" are among the most recurrent ones can be interpreted as indicating that although the pandemic has ended, its global socio-economic effects will continue in the long term.

In the post-pandemic period, economic difficulties, conflicts and climate-related crises have increased migration flows, especially in developing countries. In this period, deteriorating living conditions and economic systems due to the pandemic pushed people to relocate in search of new opportunities (Lerpold et al., 2023 p. 2, 13; Whitaker, 2023). This trend may indirectly explain why migration is one of the most recurrent keywords. Similarly, the association of the concept of "selection" with the post-pandemic economic crisis may indicate that selection and evaluation processes have gained importance in the process of restructuring businesses and economies. It can also be interpreted as the prominence of selection processes in resource allocation and prioritization processes in health systems and economies.

Businesses have made their selection processes data-driven to adapt to new norms such as remote working and digitalization after the pandemic and contributed to sustainability goals (Saini & Tarkar, 2024, p. 9284; Agrawal, 2023, p. 119). In health systems, effective allocation and prioritization of resources have been decisive, especially

in the processes of vaccination and distribution of medical services (Ganum & Thakoor, 2021, p. 6-8). Organizations have adapted to technological innovations and increased their flexibility by reorganizing their personnel selection processes (Saini & Tarkar, 2024, p. 9285). These selection mechanisms both accelerated economic recovery and created a strong foundation for long-term sustainability (Sunge et al., 2024, p. 5-6). The results of these studies may provide insights into the strategic importance of selection mechanisms in post-pandemic recovery.

Finally, "economic policy uncertainty", which is among the most frequently repeated words in the post-pandemic period, may be associated with the negative impact of the pandemic on investors' behavior and financial markets. In their study, Umar et al. (2023, p. 2-4) observed that increased economic uncertainty had a negative impact on some financial markets, especially after the pandemic. This was associated with an increase in investors' risk aversion and a decrease in confidence in alternative investment instruments during periods of uncertainty. These results suggest that the key concept of economic policy uncertainty reflects the challenges of post-pandemic economic recovery.

In the study, thematic maps were created according to the author and plus keywords. In the context of the COVID-19 pandemic and the economic crisis, it is usual to find concepts such as G15 in the concepts emerging in the basic and niche themes. Similarly, it is not surprising to see specific tools used to examine the financial and economic connections of the crisis period, such as TVP-VAR, or concepts such as connectedness.

JEL codes are a system for standardized classification of economic topics. "G15" covers topics such as international financial markets, capital flows between countries, financial integration, exchange rate movements and the effects of global financial crises. This code is particularly used to analyze emerging markets and the global financial system (American Economic Association [AEA], 2022). In this respect, it is expected that G15 is among the most frequently recurring keywords.

The concepts of TVP-VAR and connectedness play a critical role in understanding the dynamic nature of interactions in financial markets in the context of the post-pandemic economic crisis. The TVP-VAR method allows to understand the propagation mechanism of shocks by analyzing how the connectedness between financial assets changes over time. Studies using this approach show that the COVID-19 pandemic has had far-reaching effects on the financial system with increased interconnectedness and volatility across assets (Mishra et al., 2023, p. 103490). During the pandemic, traditional safe-haven assets such as gold and oil were found to have a strong correlation with equities and other financial assets. This situation reveals that the risks of financial contagion have increased, and more careful decisions should be made regarding investment strategies. Moreover, connectedness analysis provides important information for assessing the systemic risks of financial markets and providing guidance to policymakers (Shaik et al., 2024, p. 884). Therefore, it is expected that TVP-VAR and connectedness concepts will be used frequently due to the increasing research needs to understand the uncertainties and interconnectedness dynamics in financial markets after the pandemic. This study can be seen as an important source of information to assess the thematic trends and research areas in studies on the relationship between COVID-19 and the economic crisis. Therefore, it is thought that the study will benefit the literature both in terms of filling the gap in the research field and in terms of the results it reveals.

6. Conclusion

The COVID-19 pandemic has put great pressure on health systems and economies around the world, and many countries have faced serious challenges in combating the pandemic. In this context, there have been many studies addressing the economic impacts of COVID-19 from many perspectives. As a result, research on the economic impact of COVID-19 provides important insights into the depth and scope of this crisis. In addition, these studies are critical for understanding the economic impacts of the pandemic and shedding light on future research. In particular, bibliometric analysis studies conducted

for this purpose have been useful in examining keyword co-occurrences, most cited studies and research collaborations in terms of revealing the economic impact of COVID-19. It is concluded that research on the interaction of the pandemic, especially with the economic crisis, has a critical role in filling the gaps in literature and developing strategies for future pandemics.

In line with other studies, this study highlights the evolving research landscape addressing the economic impact of COVID-19 and its relationship with the economic crisis. In addition, this study identifies key themes and challenges in studies conducted both during and after the pandemic, providing valuable insights into future research directions that have not previously been well documented. In particular, the results from these studies can provide a rich perspective for decision-makers in dealing with potential future health crises. In addition, the inclusion of economic resilience and crisis management theories in the analyses planned in this field can contribute to the literature in terms of seeing the development of post-pandemic recovery strategies. At the same time, researchers may be advised to frame their main research problems in terms of how countries and international organizations can better prepare for future pandemics to cope with economic crises. Moreover, expanding research through national and international collaborations will allow for a broader understanding of the economic and social impacts of the pandemic.

Limitations

In this study, only the co-word analysis method was used, and this can be considered among the limitations of the study. Although the bibliometric analysis method is an effective tool in providing a general map of the research area, it was not preferred in this study due to the existence of recent studies that provide comprehensive bibliometric maps. Instead, co-word analysis was used to elaborate the thematic relationships and conceptual connections that the study focused on. However, the co-word analysis method is limited to analyzing thematic details and conceptual connections and does not provide an overall domain map. Cobo et al. (2011) argue that the integration of co-word analysis with bibliometric analysis reveals interdisciplinary connections more comprehensively. Since this study focuses only on the co-word analysis method, it does not aim to provide a bibliometric map and overview of the field. Therefore, it is recommended that the study be evaluated considering this limitation. In future research, it is recommended that different bibliometric analyses such as performance analyses and cluster analyses be included in the co-word analysis. The combination of methods can better fill the knowledge gaps in scientific literature by addressing the relationship between COVID-19 and the economic crisis more comprehensively.

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