Mapping the COVID-19 Economy: An Exploratory Bibliometric Analysis

Mihai Gabriel CRISTIAN
Lucian Blaga University of Sibiu, Romania
mihai.cristian@ulbsibiu.ro

Maria LAZĂR
Lucian Blaga University of Sibiu, Romania
maria.staiculazar@ulbsibiu.ro

Daria Maria SITEA
Lucian Blaga University of Sibiu, Romania
daria.sitea@ulbsibiu.ro

Carolina ȚÎMBALARI
Lucian Blaga University of Sibiu, Romania
carolina.timbalari@ulbsibiu.ro

Abstract
In recent decades, the COVID-19 pandemic is the biggest social and economic crisis that has influenced all aspects of human life. The main purpose of this research paper is to yield a bibliometric analysis in terms of research papers regarding the influence of the SARS-CoV-2 virus on the international economy. Accordingly, the findings will reveal the papers written in the domains of economics, business and business finance, management, hospitality, leisure, sport and tourism. Thus, current areas of research were examined and future study may be proposed. The analysis shows key information concerning the authors, journals, countries and keywords. It may be acknowledged that the COVID-19 pandemic was of utmost importance for the worldwide researchers. Our judgments and recommendations are supposed to act as a framework to possible research opportunities and conspicuous implications for the economic area.

Keywords: COVID-19; bibliometric analysis; global economy; COVID-19 economy;

JEL Classification: F49; F40; E71;

DOI: http://doi.org/10.24818/ejis.2022.10

1. Introduction

COVID-19 pandemic's rapid growth has wreaked havoc on the people's lifestyle, employment, communities, and companies all across the world. All stakeholders, particularly global businesses, had to urgently work together to decrease the impact on public health and reduce the risk of further disruption to lives and economies around the world.

The worldwide economy is suffering from the COVID-19 pandemic. In this regard, a multitude of research papers have been published. Researchers from all over the world have assessed the economic environment, throughout the country or region they belong to.

Received: 12 March 2022; Revised: 7 April 2022; Accepted: 15 May 2022

Diverse opinions, distinct analyzes and different research methodologies have been observed in research papers published within Web of Science, during the last period.

Based on these fundamental ideas, we decided to conduct a bibliometric analysis to evaluate the number of papers referring to the theme of the COVID-19 pandemic, in the fields of Economics, Business, Business Finance, Management, Hospitality, Leisure, Sport and Tourism. It was taken into account the year of publication, in order to be able to evaluate the frequency of research interest. For a more consistent evaluation, we also analyzed the language in which the research papers were written, as well as the publication journals. With the help of VOSViewer version 1.6.18, we performed the bibliometric analysis, observing the correlations between the keywords, the countries in which the research papers were published and the citations between journals.

Thus, this study evaluated the articles on the theme of the COVID-19 economy, acknowledging questions like the following:

- What are the main topics that researchers wrote about in terms of the economic impact of COVID-19 pandemic?
- What are the most frequent keywords in the reviewed documents on COVID-19 economy's effects?
- What kind of trends exist among publications and notorious researchers regarding the COVID-19 economy?

These research questions were intended to be answered by setting a series of clear objectives - one main objective and three secondary objectives.

Main objective: Analysis of the status of research papers regarding the publications with the theme of the COVID-19 pandemic and its impact on the worldwide economy.

Auxiliary objective 1: Identification of the areas of interest regarding the general framework of the economy, in terms of bibliographic approach.

Auxiliary objective 2: Evaluation of the links between keywords and articles published in different worldwide journals.

Auxiliary objective 3: Analysis of the published research papers with the topic of the COVID-19 pandemic and its impact on the economy, taking into account the co-authorship, journals and the year of publication.

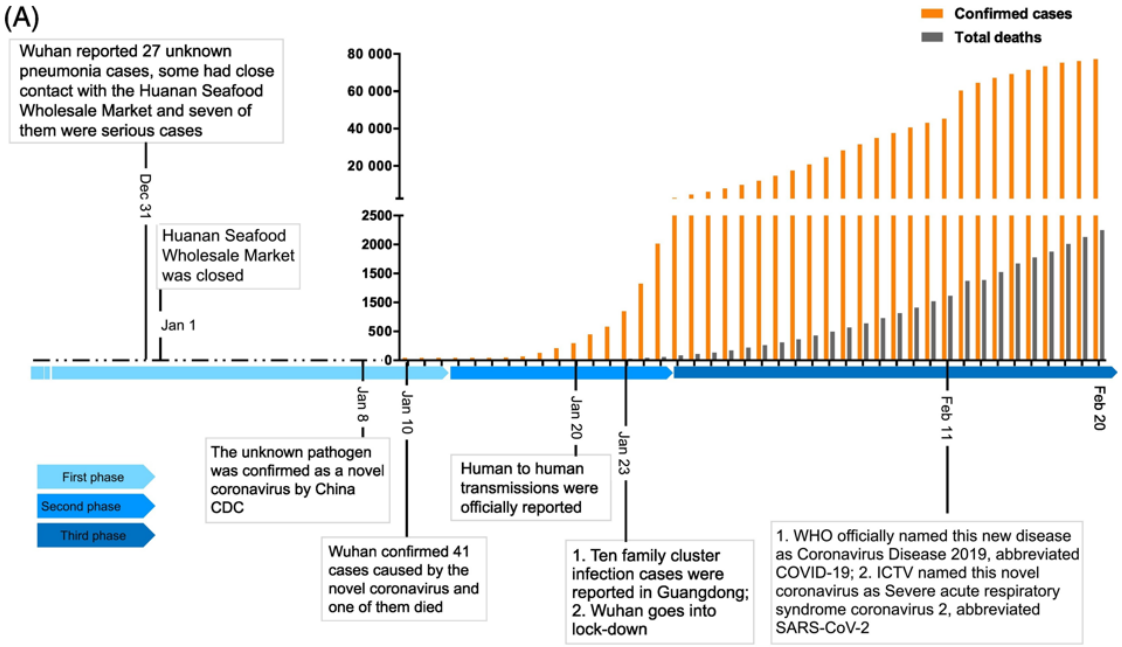
Based on this, the current review highlights the COVID-19 economy through a methodological literature review and bibliometric analysis. It can be characterized as a study that reviews over 937 Covid economy articles and plans to contribute as a reference for researchers. The paper structure includes the following sections: methodology, data analysis, results, discussion, conclusion, and future research directions.

2. Brief Literature Review

SARS-CoV-2 virus, initially observed in Wuhan, China in 2019, affected 483.876.064 people around the world, with 6.152.634 being killed by this virus, until March 2022 (Worldometer, 2022). The World Health Organization (WHO, 2020) initially announced worldwide health emergency in January 2020, while on 11th of March, it acknowledged that the viral outbreak is officially a pandemic. From that moment, the global situation evolved into an international social, economic and health crisis. Through this, all areas of

activity, all industries and economies of the world have been affected in various ways. Moreover, the variations of the virus have rapidly expanded, increasing the challenges of the researchers. Scientists from various fields have made joint efforts to identify the starting point, as well as possible treatments (Byomakesh, Patnaik, Mishra, 2020).

Figure 1. Timeline - Spreading of the SARS-CoV-2 virus



Source: Sun et. al. (2020)

The economic impact does not come predominantly from the pandemic itself, but from the measures taken around the world to control it, which ranged from relatively slight restrictions on mobility and public gatherings to complete serious blockages observed in most of economic activities. This may be translated into a dilemma for the worldwide demand and supply (International Science Council, 2022). The International Monetary Fund forecasted that the global gross domestic product, will decrease to about 4.9% in 2020 (IMF, 2020). The IMF considered that developed economies may confront extended economic threats into 2022 due to the supply shortages. Thus, there may be prospected problems in developing economies motivated by the discrepancy in terms of access to medicines. The coronavirus pandemic has developed a major economic crisis, with a very significant financial shock. COVID-19's economic impact will be determined by the length and severity of the epidemic, as well as when and how much business activity resumes, all of which will be primarily determined by government actions. Economies have also been critically concerned (Donthu and Gustafsson, 2020).

COVID-19 has also pushed international economies to promptly operate in different and more flexible approaches. Businesses changed their objectives and concerns as a result of new demands brought in by the pandemic resilience, attempting to establish an endowment for the forthcoming period (Ivanov, 2020). In this case, business experts and researchers perceive the impact of the COVID-19 pandemic on prospective economic expansion.

3. Methodology

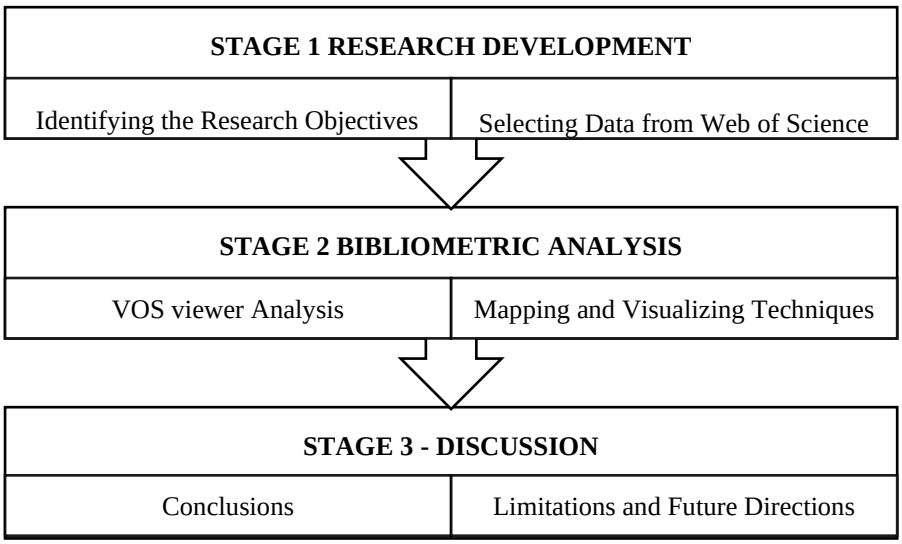
With the development of the pandemic crisis, many academic papers have been published. It is particularly important to identify the number and content of research studies and acquire significant information. Commonly, a bibliometric analysis is a concrete approach to audit the evolution of different research areas. It includes themes and authors, based on different conceptual structures (Donthu, Kumar, & Pattnaik, 2020).

A bibliographic approach is used with the purpose of analyzing the publications. However, the main objective is to check, gather and evaluate the relevant research papers in the area of significance. Being a rigorous assessment, a bibliometric analysis provides an overview of the published papers. (Kitchenham, 2004; Prinsen et al., 2018).

There is no consistent analysis of a bibliometric analysis on COVID economy. Therefore, we focused a bibliometric analysis on the covid economy literature, to establish a field of interest for future research. Through this study, we proposed to clarify the following questions: What are the most frequent keywords in reviewed documents on COVID economy? How many scientific papers on COVID economy have been published in journals? What are the most cited journals on COVID economy? Who are the top 10 authors who published on the subject of COVID economy? The data used for the research were extracted from the Web of Science database and the processing of collected information was done using the VOSviewer software tool. The results, achieved with special tools, answer the research questions proposed.

Firstly, the Web of Science database was chosen as the analysis platform for this research paper. The founder of the first citation index, Eugene Garfield, is the most representative figure of the scientometrics and bibliometrics, helping in the creation of Science Citation Index (SCI) (Clarivate, 2021). The choice of the database can be justified by a considerable number of articles identified based on the selected topic, but also by the notoriety and trustworthiness of the platform. Web of Science comprises multidisciplinary research papers, being of utmost importance in bibliometric analysis, focused on the broad spectrum of economics.

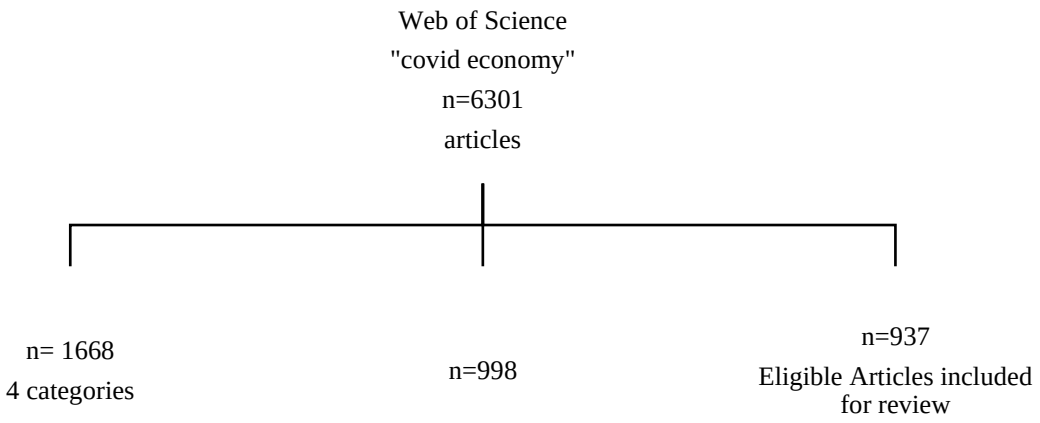
Figure 2. Flow Chart



Source: Authors' conceptualisation

Our research methodology, as illustrated in ***Figure 2***, includes three stages, as follows: Research development, Bibliometric analysis and Discussion. Within Stage 1, we intended to identify research objectives and select data from Web of Science, whereas Stage 2 involved VOSviewer analysis, as well as mapping and visualizing techniques. The last stage highlighted the conclusions, limitations and future directions of research.

Figure 3. Search strategy and extract of data



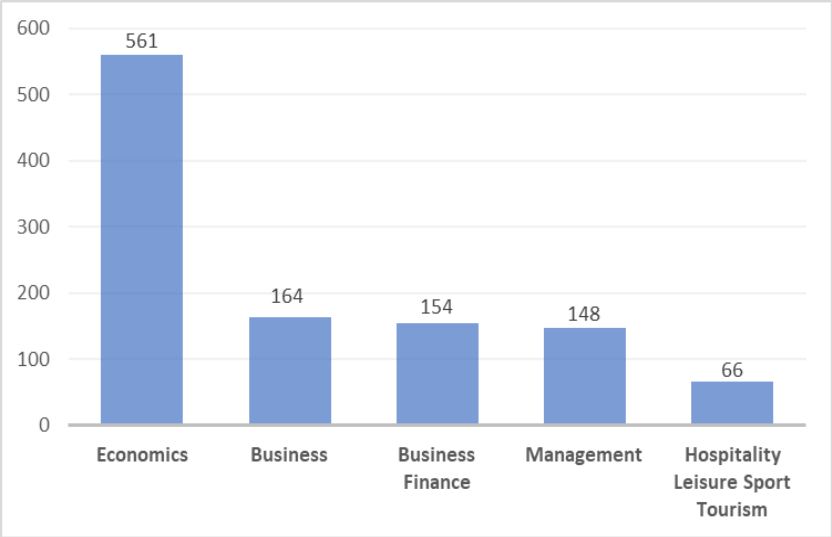
Source: Authors' conceptualisation

In order to perform this bibliometric analysis, the term COVID economy was searched on the Web of Science, offering a wide field of research, covering all topics of interest, presented in ***Figure 3***. The time frame considered is 2020 - 2022 (until 1st of April). In the first phase, 6.301 articles were identified without selecting any filter, from several topics: economics, development studies, business, business financial, hospitality leisure sport tourism, sociology, geography, health policy services, green sustainable science technology, green sustainable science technology, mathematics interdisciplinary applications, health care sciences services, agriculture multidisciplinary, law, demography, forestry, ethics, ecology, transportation, public administration and environmental sciences. These topics were the most suggestive, but in this research paper, particularly five areas were selected to be analyzed - economics, business, business finance, management and hospitality leisure sport tourism. Thus, the number of articles was reduced to 1.656. Subsequently, from this analysis, all articles that are not open access were excluded, remaining 998. Finally, after excluding the non-English articles, 937 articles were considered eligible for review.

4. Data Analysis

In ***Figure 4***, the distribution of research papers on the five analyzed fields can be observed. In the fields of Economics, there is the largest number of publications - 561, roughly 51% of the total of 1.093.

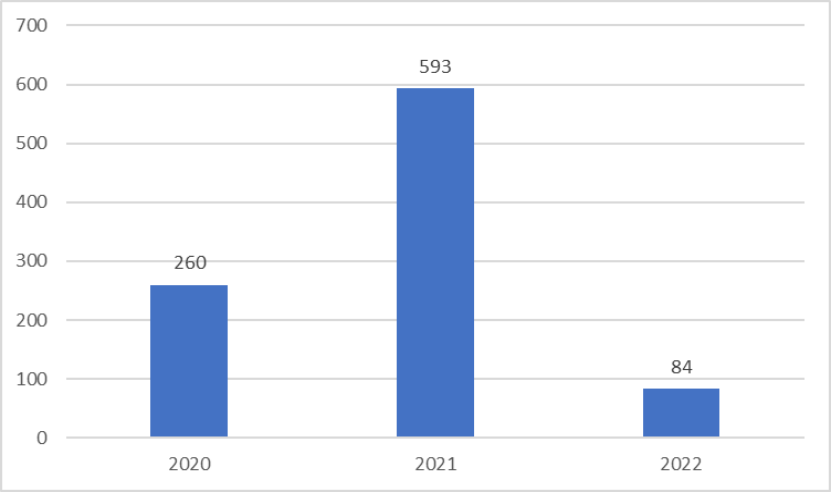
Figure 4. Research areas analyzed on Web of Science



Source: Authors' research

As it is a wider field of interest, it may be considered that it is easily accessible. This field is followed by Business (164 publications - 15%) and Business Finance (154 publications - 14%). The field of Management is at a relatively short distance from the other, with 148 publications, 13,5%. Hospitality-Leisure-Sport-Tourism was the field of least interest to the authors, perhaps due to the fact that countries were locked down, not being able to travel and organize sport activities. Tourism is a major actor in the economies, however travel restrictions have decimated the worldwide tourism sector. Thus, there is a close link between the degree of vaccination and the possibility of traveling abroad. For this reason, the publication of articles analyzing international tourism has been affected.

Figure 5. Distribution by year of published research papers through Web of Science



Source: Authors' research

Performing this bibliometric analysis, 998 published research papers marked as Open Access were identified, but out of this total, non-English ones were excluded, remaining 937. The distribution by year is relevant to be analyzed (***Figure 5***), noting that 2022 is not a full year taken into account, but only its first three months. It is indisputable that in 2021 most of the published articles converge, displaying out the possible reasons:

- The articles written in 2020 were published only in 2021, due to the review process;
- Economic and financial data were released in late 2020, as the COVID-19 pandemic did not affect some countries from the beginning;
- For a good quality research paper, it takes time to gather data and analyze it;
- It was not until March 2020 that the World Health Organization asserted a state of pandemic. (WHO, 2020)

Table 1. Language distribution of published research papers through Web of Science

Languages	No. of papers	Percentage of 100%
English	937	93.88%
Russian	25	2.51%
Spanish	22	2.20%
Portuguese	8	0.80%
Others	6	0.60%
TOTAL	**998**	**100%**

Source: Authors' own research

As mentioned before, performing the present bibliometric analysis, we identified 998 articles marked as Open Access. Regarding the language the papers were written, as expected, the ones written in English language had the highest percentage of all – 93.88%, revealing 937 papers, as shown in ***Table 1***. The other main languages the papers were written in were Russian, Spanish and Portuguese. We also established a language category which included other languages not so frequently used. As anticipated, the `Others` category had the lowest percentage – 0.60%, meaning 6 published papers. Russian papers had the highest percentage – 2.51% among the non-English ones, indicating 25 published papers. The second highest percentage of the non-English papers is 2.20%, expressing 22 Spanish papers. The second lowest percentage of all is 0.80%, implying 8 Portuguese papers. As indicated, 61 non-English papers were excluded and 937 remained to analyze.

Table 2. Distribution according to the type of research paper

Document type	No. of papers	Percentage of 100%
Articles	877	93.59%
Editorial Materials	24	2.56%
Proceedings Papers	22	2.34%
Review Articles	14	1.49%
TOTAL	**937**	**100%**

Source: Authors' own research

The remaining 937 papers were systematized in 4 main categories of documents, consisting of Articles, Editorial Materials, Proceedings Papers, Review Articles, as indicated in ***Table 2***. Completing this bibliometric analysis, we considered 877 articles, expressing the highest percentage of all papers – 93.61%. The lowest percentage was 1.49%, implying only 14 review articles. The second highest number of papers revealed 24 editorial materials, signifying 2.56% whereas the second lowest number of papers disclosed 22 proceedings papers, indicating 2.34%.

Table 3. Source of publications

Nr.	Web of Science Source Title	Documents	Citations
1	**Journal of Risk and Financial Management**	29	192
2	**Economic Research-Ekonomska Istrazivanja**	28	111
3	**World Development**	18	338
4	Baltic Journal of Economic Studies	13	9
5	Entrepreneurship and Sustainability Issues	13	37
6	**Environmental & Resource Economics**	13	276
7	Economies	12	29
8	**Finance Research Letters**	12	126
9	Risks	12	19
10	**Journal of Sustainable Tourism**	11	1074
11	**Transport Policy**	9	103
12	**Emerging Markets Finance And Trade**	8	450
13	International Economics and Economic Policy	8	21
14	Economic Annals-Xxi	7	7
15	Economic Modelling	7	42
16	Gender Work and Organization	7	66
17	Small Business Economics	7	39
18	**Current Issues in Tourism**	6	134
19	Economic and Labour Relations Review	6	8
20	Fiscal Studies	6	52
21	Indian Journal of Labour Economics	6	7
22	Innovative Technologies in Science and Education (Itse-2020)	6	0
23	**International Journal of Contemporary Hospitality Management**	6	160
24	**Journal of Business Research**	6	512
25	Journal of Eastern European and Central Asian Research	6	6
26	**Journal of Industrial And Business Economics**	6	102
27	Journal of International Financial Markets Institutions & Money	6	38
28	Journal of Policy Modeling	6	32
29	Journal of Public Budgeting Accounting & Financial Management	6	21
30	**Oxford Review of Economic Policy**	6	136
31	Research in International Business And Finance	6	83
32	Technological Forecasting and Social Change	6	49
33	Administrative Sciences	5	8
34	Applied Economic Perspectives and Policy	5	40
35	Applied Economics	5	43
36	**Canadian Journal of Agricultural Economics-Revue Canadienne**	5	173
37	Contemporary Economics	5	25
38	Economia Politica	5	7
39	Economic Analysis and Policy	5	64
40	Ekonomia I Prawo-Economics and Law	5	3
41	Evolutionary and Institutional Economics Review	5	1
42	International Journal of Finance & Economics	5	36
43	Journal of Asian Finance Economics and Business	5	34
44	Journal of Mathematical Economics	5	28
45	Journal of The Knowledge Economy	5	3
46	Journal of Theoretical And Applied Electronic Commerce Research	5	4
47	Journal of Travel Research	5	38
48	Oeconomia Copernicana	5	33
49	Operations Management Research	5	63
50	Southern Economic Journal	5	39
51	Studies in Business and Economics	5	3
52	**Tourism Geographies**	5	166

Source: Authors' own sketching

Within a relatively short period of time, a large number of journals published articles examining COVID-19 economy. The journals vary extensively in the number of articles published, citations and publishing source. In ***Table 3*** the sources of publications and the top journal with the most published documents on our research topic may be observed.

According to this, the Open Access journals with the highest number of papers on the theme of COVID-19 economy is Journal of Risk and Financial Management, which is an international, peer-reviewed published monthly, online journal by MDPI with 28 articles, followed by Economic Research Journal, a journal that publishes theoretical, applied, and empirical papers on economics (nano, micro, mezzo and macro) (Publisher: Juraj Dobrila University of Pula, Croatia). World Development Journal (Published by Elsevier, Netherlands) had 18 published articles, being the third journal in our rank.

Other journals with a relevant number of documents are: Baltic Journal of Economic Studies (publisher: Izdevnieciba Baltija Publishing, Latvia), Entrepreneurship and Sustainability Issues (main publisher: Entrepreneurship and Sustainability Center and 11 international partners, publishing house is located in Lithuania), Environmental & Resource Economics (published by Springer, Germany) each of them having 13 published articles. It is followed by the Economies Journal (published monthly online by MDPI), Finance Research Letters (published by Elsevier, Netherlands) and Risks (published by MDPI), each of them having 12 published articles, while the Journal of Sustainable Tourism (British multinational publisher - Routledge) has 11 articles on the theme of COVID-19 economy.

From our Reference list (***Table 3***) the most cited sources belong to the following journals: Journal of Sustainable Tourism (n=1074), Journal of Business Research (n=512), Emerging Markets Finance and Trade (n=450), World Development (n=338), Environmental & Resource Economics (n=276), Journal of Risk and Financial Management (n=192), Canadian Journal of Agricultural Economics-Revue Canadienne (n=173), Tourism Geographies (n=166), International Journal of Contemporary Hospitality Management (n=160), Oxford Review of Economic Policy (n=136), Current Issues in Tourism (n=134), Finance Research Letters (n=126), Economic Research-Ekonomska Istrazivanja (n=111), Transport Policy (n=103), Journal of Industrial and Business Economics (n=102).

Table 4. The list of top researchers

Author	No. of documents
Lee, S.	5
Liu, Y.	5
Chen, Z.	4
Gossling, S.	4
Williams, CC.	4
Zhang, Y.	4
Zhou, H.	4
Welfens, PJJ.	3
Xu, X.	3
Yang, C.	3

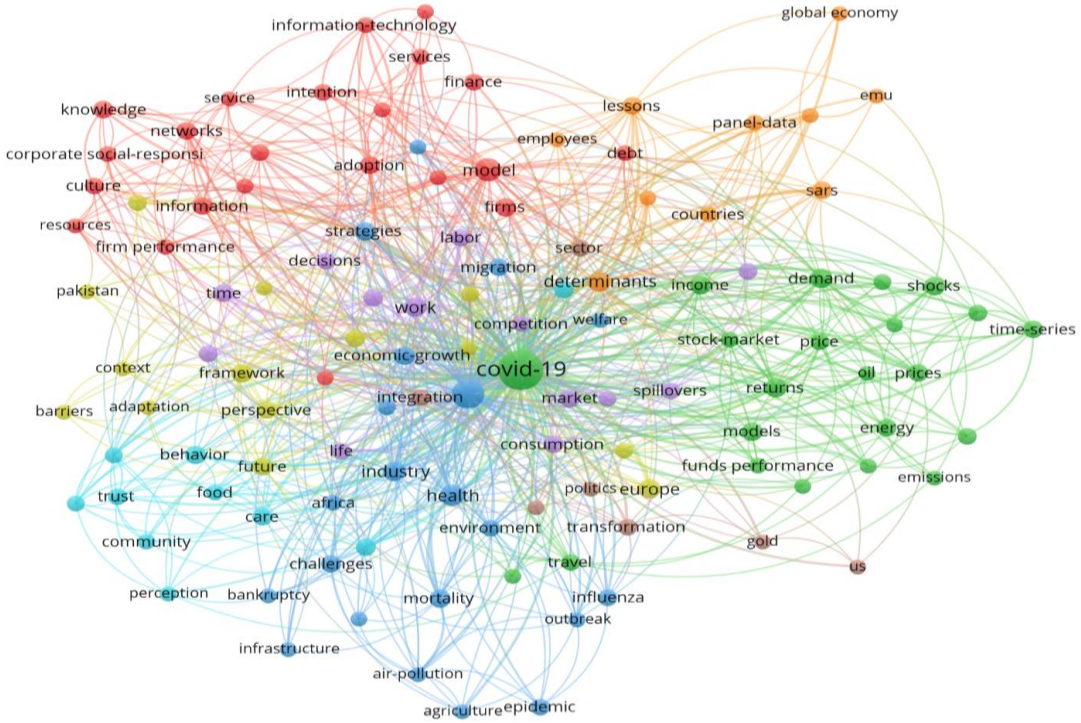
Source: Authors' own sketching

The list of top prominent researchers on COVID-19 economy is opened by Lee S. and Liu Y. with 5 studies in the field of interest. Having 4 publications each in the research area, there may be noted the following authors: Chen, Z., Gossling, S., Williams, CC., Zhang, Y., Zhou, H. Finally, Welfens, PJJ. Xu, X. Yang, C. published 3 research papers each. Regarding the most relevant authors' affiliations, the top positions are occupied by Henley Business School, University of Reading, UK, Seoul National University, The Pennsylvania State University, Lund University, Sweden.

5. Results and Discussions

Using the VOSviewer software tool, we developed bibliometric maps in order to create a better outlook of the speciality literature based on the metadata exported from WoS.

Figure 6. Keyword clusters



Source: Authors' research

The type of analysis through VOSviewer is co-occurring, taking into account all the keywords, with full counting. For the threshold, it was chosen five as a minimum number of occurrences of a keyword. In fact, 119 keywords meet the threshold requirements from the total of 3.716.

Figure 6 graphically represents the link between keywords and the frequency of occurrence. COVID-19 is the most relevant and most popular keyword, justifying the reason why it is placed in the middle of all the other keywords. Thus, the term COVID-19 has 567 occurrences and 687 total link strength. The second most frequent word is impact, with a total of 103 appearances. Thus, it can be understood that the authors made correlations between the COVID-19 pandemic and the impact on different fields and industries. The difference between these two keywords and the next ones is enormous. Accordingly, there are only 36 occurrences for the word model, 21 for determinants and 23 for health. Regarding the link strength, the keyword model stands out having a total of 79 link strength, while the term determinants has 54 and health 52.

However, there may be observed the existence of seven clusters, highlighted differently through the colour, as follows:

Cluster 1 (red) consists of 22 keywords, including: adoption, banking, capabilities, consequences, corporate social responsibility, culture, debt, decision making, finance, firm performance, firms, information, information-technology, intention, knowledge, model, networks, organizations, resources, service, services, systems. This cluster reflects the

direct connection between different economic elements. It refers to finance, financial performance, but also to banks. The technological and informational impact cannot be neglected. It may be concluded that numerous research papers that analyze and highlight the influence of the COVID-19 pandemic on the economy have been performed. Indeed, lockdown has had devastating effects on finances, but the different areas have adapted to the new reality and managed to overcome the obstacles.

Cluster 2 (green) includes 22 keywords as well, namely the following: causality, cointegration, COVID-19, demand, emissions, energy, funds' performance, impulse-response analysis, income, investor sentiment, models, monetary-policy, oil, oil prices, perceptions, price, prices, returns, shocks, stock-market, time-series, travel. Undoubtedly, the word COVID-19 is the most common one, having an occurrence of 567. The least common words are causality, emissions, investor sentiment, monetary-policy, oil prices, perceptions, occurring only five times.

Cluster 3 (blue) includes 21 keywords - Africa, agriculture, air-pollution, bankruptcy, challenges, economics-growth, environment, epidemic, health, impact, industry, infectious-diseases, influenza, infrastructure, insurance, migration, mortality, outbreak, political-economy, strategies, welfare.

Cluster 4 (yellow) reveals 14 items - adaptation, barriers, cities, competitive advantage, context, dynamic capabilities, Europe, framework, future, government, Pakistan, perspective, power, strategy, whereas **Cluster 5 (purple)** consists of 13 keywords, including: competition, consumers, consumption, decisions, efficiency, labor, life, market, markets, quality, spillovers, time, work.

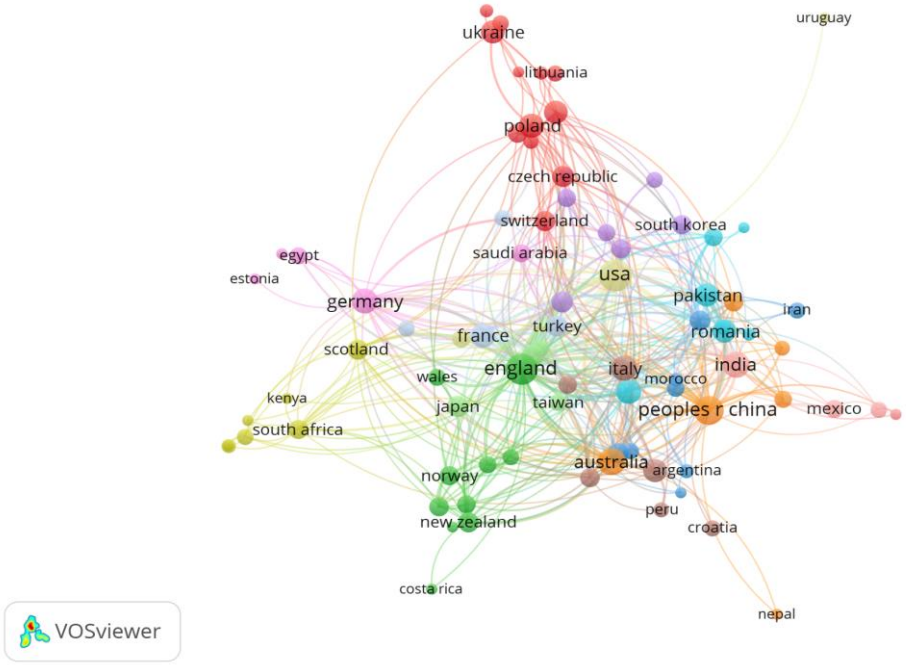
Cluster 6 (light blue) represents 10 keywords - attitudes, behavior, care, community, dynamics, food, perception, satisfaction, sustainable tourism, trust, while **Cluster 7 (orange)** reveals 10 relevant keywords - countries, determinants, economics-crisis, employees, emu, fundamentals, global economy, lessons, panel-data, sars. The last one, **Cluster 8 (brown)** consists of the fewest keywords, as follows: gold, investors, integration, politics, sector, transformation, us.

In ***Figure 7***, we have also performed the bibliometric analysis, revealing the interest in `COVID economy` in every country and the connection between the co-authors' countries. The collaborative article writing is of high interest because co-authors offer valuable insights into their country's economy impacted by the COVID-19 crisis.

We chose using the co-authorship type of analysis – country distribution and full counting method. Out of 95 countries having at least one published document, 95 met the thresholds, but 11 were excluded for nonexistence link strength reasons. The remaining 84 countries having at least one document published and one link strength were expressed using 13 different colored clusters. The colored clusters show the link strength of the co-authorship country distribution.

The **red cluster** includes 12 countries with the link strength of co-authorship country distribution scaling from 1 (Belarus, Georgia) to 31 (Poland). The red cluster revealed the following countries, as shown in ***Table 5***: Azerbaijan, Belarus, Czech Republic, Georgia, Latvia, Lithuania, Montenegro, Poland, Russia, Slovakia, Switzerland and Ukraine. Authors from Poland showed the greatest interest in COVID economy subject, having a total number of 44 documents, 142 citations and 31 total link strength.

Figure 7. Authors' countries represented by clusters



Source: Authors' research

The **green cluster** consists of the following co-authorship country distribution: Bangladesh, Costa Rica, England, Finland, Ireland, Moldova, New Zealand, Norway, Sweden, Wales. As expected, England has the authors with the highest interest in the researched topic, having 151 published documents, 2554 citations and 202 total link strength. Moreover, based on co-authorship country distribution analysis, England is the second country, internationally, after the USA, reporting the highest number of documents and citations on the researched topic.

The **blue cluster** links 8 countries, as follows: Argentina, Bolivia, Brazil, Iran, Kuwait, Morocco, Portugal and Vietnam, whereas the yellow cluster implies 7 countries: Côte d'Ivoire, Ethiopia, Gabon, Ghana, Kenya, Scotland, South Africa.

The **purple cluster** reveals 7 co-authorship country distribution: Austria, Hungary, Indonesia, Malaysia, Philippines, Slovenia, South Korea. The same number of countries are included in the turquoise cluster: Brunei, Canada, Jordan, Pakistan, Romania, Serbia, United Arab Emirates.

The **orange cluster** expresses 6 co-authorship country distribution: Australia, Cyprus, Nepal, China, Singapore, Thailand, authors from China showing the highest interest in this cluster and third in the world with 110 articles, 1175 citations and 118 link strength. This high interest is not a surprising fact, knowing that China was the country where the pandemic broke out. Authors from Australia had a high interest in this topic, as well.

The **brown cluster** involves 6 co-authorship country distribution: Belgium, Croatia, Denmark, Italy, Peru, Spain, the Italian and Spanish authors showing high interest in the COVID economy topic, as expected. As reported, in Italy and Spain the coronavirus spread fast and people were seriously affected.

The **magenta cluster** includes 5 countries: Colombia, Egypt, Estonia, Germany, Saudi Arabia and the same number of countries can be noticed within the pink cluster: Chile, India, Kazakhstan, Mexico, Uzbekistan.

The **light green** and the **light blue clusters** include 4 countries each, as follows: Japan, Lebanon, Netherlands, Taiwan and France, Israel, Tunisia, Turkey.

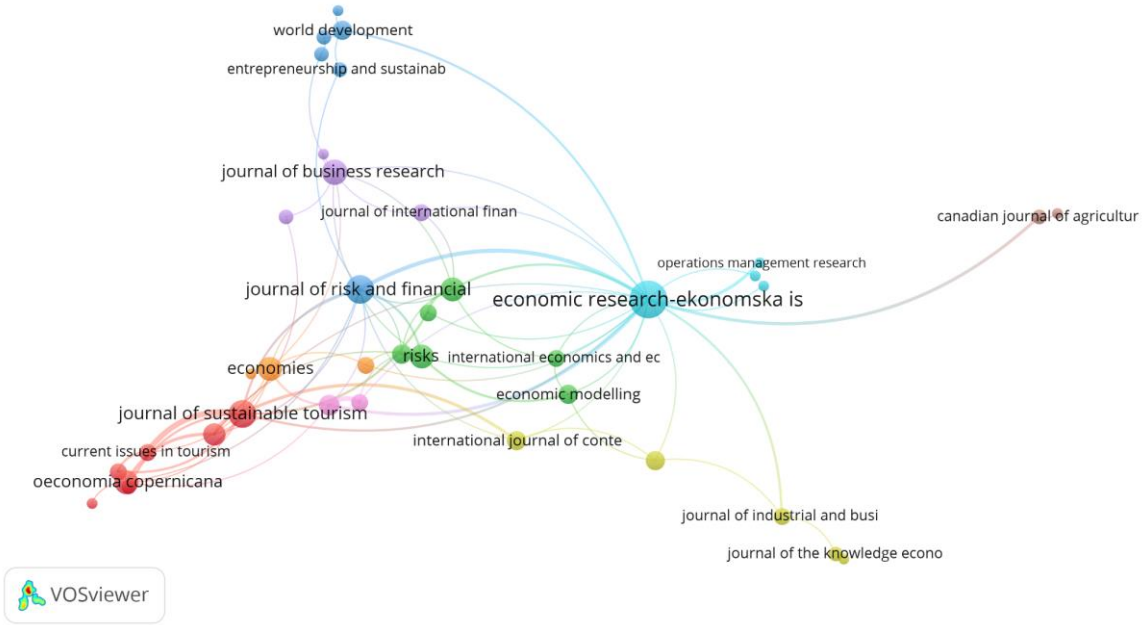
The **light brown cluster** implies only 3 co-authorship country distribution: Greece, Uruguay, USA, authors from the last one having the highest interest in the world in this topic with 180 articles, 3206 citations and 162 link strength.

Table 5. Theoretical approach of the authors' and co-authors' countries

Cluster no.	Cluster colour	Co-authorship country distribution
Cluster no. 1	Red cluster	Azerbaijan, Belarus, Czech Republic, Georgia, Latvia, Lithuania, Montenegro, Poland, Russia, Slovakia, Switzerland, Ukraine.
Cluster no. 2	Green cluster	Bangladesh, Costa Rica, England, Finland, Ireland, Moldova, New Zealand, Norway, Sweden, Wales.
Cluster no. 3	Blue cluster	Argentina, Bolivia, Brazil, Iran, Kuwait, Morocco, Portugal, Vietnam.
Cluster no. 4	Yellow cluster	Cote d'Ivoire, Ethiopia, Gabon, Ghana, Kenya, Scotland, South Africa.
Cluster no. 5	Purple cluster	Austria, Hungary, Indonesia, Malaysia, Philippines, Slovenia, South Korea.
Cluster no. 6	Turquoise cluster	Brunei, Canada, Jordan, Pakistan, Romania, Serbia, United Arab Emirates.
Cluster no. 7	Orange cluster	Australia, Cyprus, Nepal, China, Singapore, Thailand.
Cluster no. 8	Brown cluster	Belgium, Croatia, Denmark, Italy, Peru, Spain.
Cluster no. 9	Magenta cluster	Colombia, Egypt, Estonia, Germany, Saudi Arabia.
Cluster no. 10	Pink cluster	Chile, India, Kazakhstan, Mexico, Uzbekistan.
Cluster no. 11	Light green cluster	Japan, Lebanon, Netherlands, Taiwan.
Cluster no. 12	Light blue cluster	France, Israel, Tunisia, Turkey.
Cluster no. 13	Light brown cluster	Greece, Uruguay, USA.

Source: Authors' research

Figure 8. The bibliographic connection network of journals related to COVID-19 economy



Source: Authors' research

In the COVID economy literature, the bibliographic journal connection shows how many articles from two journals were related by references. ***Figure 8*** reveals a map of bibliographic journal connection that includes the COVID economy topics in documents. We can identify 9 clusters in the ***Table 6***.

Table 6. Journals Cluster

Cluster	Journals
Cluster 1 - red– 7 journals	Current Issues in Tourism
	Environmental & Resource Economics
	Journal of Asian Finance Economics and Business
	Journal of Sustainable Tourism
	Journal of Travel Research
	Oeconomia Copernicana
	Tourism Geographies
Cluster 2 - green – 6 journals	Economic Modelling
	Finance Research Letters
	International Economics and Economic Policy
	Research in International Business and Finance
	Risks
	Technological Forecasting and Social Change
Cluster 3 - blue - 6 journals	Administrative Sciences
	Ekonomia I Prawo-Economics and Law
	Entrepreneurship and Sustainability Issues
	Journal of Risk and Financial Management
	Small Business Economics
	World Development
Cluster 4 - yellow – 5 journals	International Journal of Contemporary Hospitality Management
	International Journal of Finance & Economics
	Journal of Industrial and Business Economics
	Journal of the Knowledge Economy
	Oxford Review of Economic Policy
Cluster 5 - purple – 4 journals	Baltic Journal of Economic Studies
	Innovative Technologies in Science and Education (Itse-2020)
	Journal of Business Research
	Journal of International Financial Markets Institutions & Money
Cluster 6 -light blue – 4 journals	Economic Research-Ekonomska Istrazivanja
	Journal of Public Budgeting Accounting & Financial Management
	Operations Management Research
	Southern Economic Journal
Cluster 7 - orange – 3 journals	Economies
	Evolutionary and Institutional Economics Review
	Fiscal Studies
Cluster 8 - brown – 2 journals	Applied Economic Perspectives and Policy
	Canadian Journal of Agricultural Economics-Revue Canadienne
Cluster 9 - pink– 2 journals	Economic Analysis and Policy
	Emerging Markets Finance and Trade

Source: Authors' own sketching

Out of 52 journals, only 32 of them include linked bibliographic references. As we can see in the table above, 9 clusters were identified. Therefore, the top three clusters interconnected are the red, green and blue ones.

Cluster 1 (red) includes 7 journals: Current Issues in Tourism, Environmental & Resource Economics, Journal of Asian Finance Economics and Business, Journal of Sustainable Tourism, Journal of Travel Research, Oeconomia Copernicana, Tourism Geographies).

Cluster 2 (green) reveals 6 journals: Economic Modeling, Finance Research Letters, International Economics and Economic Policy, Research in International Business and Finance, Risks, Technological Forecasting and Social Change.

Cluster 3 (blue) which consists of 6 journals: Administrative Sciences, Ekonomia i Prawo-Economics and Law, Entrepreneurship and Sustainability Issues, Journal of Risk and Financial Management, Small Business Economics, World Development.

Cluster 4 (yellow) represents 5 journals: International Journal of Contemporary Hospitality Management, International Journal of Finance & Economics, Journal of Industrial and Business Economics, Journal of the Knowledge Economy and Oxford Review of Economic Policy.

Cluster 5 (purple) and **cluster 6 (light blue)** include 4 journals each, as follows: Baltic Journal of Economic Studies, Innovative Technologies in Science and Education (Itse-2020), Journal of Business Research, Journal of International Financial Markets Institutions & Money, Economic Research-Ekonomska Istrazivanja, Journal of Public Budgeting Accounting & Financial Management, Operations Management Research, Southern Economic Journal.

Cluster 7 (orange) contains 3 journals: Economies, Evolutionary and Institutional Economics and Review Fiscal Studies.

Cluster 8 (brown) and **cluster 9 (pink)** consist of 2 journals each, as follows: Applied Economic Perspectives and Policy, Canadian Journal of Agricultural Economics-Revue Canadienne, Economic Analysis and Policy, Emerging Markets Finance and Trade.

6. Conclusions and Future research

The COVID-19 crisis will have effects on various aspects of society and global economy. The current economy is characterized by personalization, as it has taken a completely different form from the pre-pandemic economy. In this regard, research publications on the theme of COVID-19 economy are increasing.

WoS was used to retrieve COVID-19 publications, and the data was objectively and thoroughly examined. Despite this, some limits are unavoidable. To begin with, regardless of the fact that a considerable number of new research articles are added to the WoS every day, only a small percentage of them can offer a complete outlook of the research field.

The impact of COVID-19 on the economy is continuously attracting researchers, who are bringing new perspectives on the analysed field. While the diversity of research areas is increasing, a few broad research subtopics are emerging more significantly. These core topics include the impact of COVID-19 on the economy, business and business finance, management, hospitality, leisure, sport and tourism. Thus, the bibliometric results of this study provide important evidence that COVID-19 pandemic impacts the economy. This particular bibliometric analysis revealed that, 937 papers were published in Web of Science from 52 different journals. The analyzed papers were written in English and expressed 93,88% out of the total number of papers. Articles were the most used types of papers, meaning 93,59% of the total ones. The findings identify the most significant authors related to COVID-19. Finally, keyword and co-word analysis provided a clear view of the principal research associated with the impact of COVID-19 to the economy.

Concerning the keyword links and frequency of occurrence, without any doubts, COVID-19 is the most recurrent word identified by our VOSviewer analysis, with 567 occurrences and 687 total link strength. Indeed, there may be observed other frequent keywords, such as: impact, model, determinants and health.

Referring to co-authorship country distribution analysis, USA, England and China had the highest interest in the researched topic. USA is the top country in our rank, having 180 articles, 3206 citations and 162 link strength, while England had 151 publications, 2554 citations and 202 total link strength. China, the country where the COVID-19 pandemic started, is the third country in the world, counting 110 articles, 1175 citations and 118 link strength.

This research paper is an early attempt of using bibliometric analysis in order to get insightful understandings into the COVID-19 economy research. The outcomes of this study complete the literature review on COVID-19 pandemic areas of interest.

As a result, future articles will need to cover all available databases extensively to acquire more complete data. More specifically, a multi-year analysis is needed in order to be able to make valuable judgments. Also, a bibliometric analysis by continents would be preferable to have a more detailed overview of the study.

References:

Aguinis, H.; Burgi-Tian, J. (2021). Talent management challenges during COVID-19 and beyond: Performance management to the rescue. *Business Research Quarterly* 24(3): 233–240.

Byomakesh, D.; Pooja, P.; Abhisek, M. (2020). COVID-19 pandemic! It's impact on people, economy, and environment, *Journal of Public Affairs* 20(4): e2372.

Chappell, B. (2020). "COVID-19: COVID-19 Is Now Officially a Pandemic, WHO Says," National Public Radio, March 11, 2020.

International Science Council (2022). Pandemia și economia globală, https://council.science/ro/current/blog/the-pandemic-and-the-global-economy/ , Accessed: March 2022.

Clarivate (2021). Web of Science - Confident research begins here, https://clarivate.com/webofsciencegroup/solutions/web-of-science/ , Accessed: April 2022.

Deloitte (2020). Economia românească la răscruce - Între contracția economică provocată de pandemie și oportunitățile oferite de sprijinul financiar al Uniunii Europene, https://www2.deloitte.com/ro/en/pages/business-continuity/articles/economia-romaneasca-la-rascruce-intre-contractia-economica-provocata-de-pandemie-si-oportunitatile-oferite-de-sprijinul-financiar-al-uniunii-europene.html , Accessed: March 2022.

Donthu, N.; Gustafsson, A. (2020). Effects of COVID-19 on business and research. *Journal of Business Research*, 117: 284-289.

Donthu, N.; Kumar, S.; Pattnaik, D. (2020). Forty-five years of Journal of Business Research: A bibliometric analysis, *Journal of Business Research*, 109: 1-14.

European Council (2021). COVID-19: Consiliul aprobă concluzii privind impactul pandemiei asupra securității interne și asupra amenințării teroriste, https://www.consilium.europa.eu/ro/press/press-releases/2021/06/07/covid-19-council-approves-conclusions-on-the-impact-of-the-pandemic-on-internal-security-and-terrorist-threat/ , Accessed: March 2022.

International Monetary Fund (2020). Annual Report 2020, https://www.imf.org/external/pubs/ft/ar/2020/eng/, Accessed: 1 March 2022.

International Science Council, https://council.science/, Accessed: 1 March 2022

Ivanov, D. (2020). Predicting the impacts of epidemic outbreaks on global supply chains: A

simulation-based analysis on the coronavirus outbreak (COVID-19/SARS-CoV-2) case. *Transportation Research Part E: Logistics and Transportation Review*, 136, 101922.

Kitchenham, B. (2004). Procedures for Performing Systematic Reviews, Keele University Technical Report.

Ogrean C.; Herciu, M. (2021). Digital Transformation as Strategic Shift - A Bibliometric Analysis, Studies in Business and Economics 16(3): 136-151.

Orăștean, R.; Mărginean, S.C.; Sava, R. (2019). Bitcoin in the Scientific Literature - A Bibliometric Study, *Studies in Business and Economics* no. 14(3): 160-174.

Mihu, C.; Bogoslov, I.A.; Lungu, A.E. (2021). The Impact of Digital Transformation on Business Management, Revista Economica 73(4): 41-64.

Mousa, M. (2021). COVID-19 and responsible management education (RME) among others: why should public business schools feel threatened? *International Journal of Education Management* 35 (3): 579-593.

Prinsen, C.A.C.; Mokkink, L.B.; Bouter, L.M. et al. (2018). COSMIN guideline for systematic reviews of patient-reported outcome measures. *Quality of Life Research* 27: 1147–1157.

Sun, J.; He, W.T.; Want, L.; Zhou, J.; Veit, M.; Su, S. (2020). COVID-19: Epidemiology, Evolution, and Cross-Disciplinary Perspectives, https://www.cell.com/trends/molecular-medicine/fulltext/S1471-4914(20)30065-4, Accessed on 20 February 2020.

World Health Organization (2020). WHO Directior-General's Opening Remarks at the Media Briefing on COVID-19 - 11 March 2020, https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020 , Accessed: April 2022.

Worldometers, https://www.worldometers.info/coronavirus/, Accessed: 1 March 2022.

World Economic Outlook Update, International Monetary Fund, October, 2021, p. 6.