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Inflation Rate and COVID-19: A Bibliometric Analysis Using R

By

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ABSTRACT

This research intends to investigate the connection between the inflation rate and COVID-19 through a literature review and bibliometric analysis. The research set out to rigorously document the author's and source's relevance by cataloging their theoretical framework, total output, and emerging knowledge trends. Information is gathered and analysed using Microsoft Excel and R Studio from Scopus databases. Based on a large body of literature, we compiled a searchable database of the 205 most pertinent documents and papers over the last three years. According to preliminary statistics, there was a rise in the number of studies on the inflation rate and COVID-19 between 2020 and 2022. The most significant journals, authors, documents and papers on the subject are identified using bibliometric analysis using R. By combining the most important aspects of the inflation rate and COVID-19 into a single idea, this study shows how a new research topic can be developed, establishing new study avenues in the vast subject of the inflation rate as well as the recently developed and fiercely fought topic of COVID-19.

Keywords: Inflation rate, COVID-19, bibliometric analysis

INTRODUCTION

Existing knowledge of the inflation

Inflation is the term used to describe the overall rise in prices for goods and services (excluding asset prices) throughout the economy. It is also possible to think of inflation as a general decline in the value of money because when inflation occurs, people can buy fewer products and services for the same amount of money. Measures of inflation are used to alter monetary values to maintain purchasing power through time, enabling more accurate comparisons between various historical periods. Real monetary values are those that have been adjusted for inflation; nominal monetary values are those that have not been.

The average price of a standardised group of products and services also referred to as a market basket, may be tracked over time to determine the inflation rate. A pricing index, such as the CPI or PCE, is typically used to measure inflation. A price index was calculated by dividing the price of a market basket in a given year by the price of the basket in a base year. Chain

weighting takes changing purchasing patterns into account. The percentage change in the price index across several periods is then used to calculate the rate of inflation (Weinstock, 2023).

Different price indices are often used for different objectives and include various items and services in their market baskets. The CPI, which is frequently used to modify family income over time, for instance, covers consumer goods and services that families typically purchase. In contrast, the gross domestic product (GDP) deflator measures inflation for all final goods and services produced in the United States. It is often used to adjust the GDP for inflation over time. Similarly, PCE calculates inflation for all final products and services customers buy in the US. Because of methodological variations, PCE and CPI measurements of inflation differ slightly. The preferred inflation indicator of the Federal Reserve is PCE inflation. Additional inflation indexes include the Producer Price Index, the Employment Cost Index, and the Import/Export Price Index. Moving forward, PCE inflation will be contained in the report.

Inflation is often measured using either headline inflation or core inflation. Core inflation excludes the cost of food and energy, whereas headline inflation covers the whole range of goods and services within a standard market basket. Due to the erratic nature of food and energy prices, which can hide the longer-term patterns in headline inflation that worry policymakers and economists, researchers frequently employ core inflation in place of headline inflation. But a more realistic representation of the price fluctuations that people experience may be found in headline inflation (Weinstock, 2023).

A rise in a particular commodity or service price does not equal an increase in total inflation since inflation monitors the broad changes in prices throughout the economy. To indicate the proportional importance of each commodity or service to the broader economy, different weights are assigned to the items and services in a certain basket. Inflation as a whole will be calculated with greater weight given to categories having higher relative relevance to the economy, such as food, than to categories with lesser relative significance, such as apparel (Federal Reserve Bank of Cleveland).

Limitations and gaps

Following the COVID-19 outbreak, inflation in affluent economies spiked significantly after over two decades of low and steady inflation. (Martin et al., 2022). Although the effects of COVID-19 on pricing may be substantial, there is little evidence of this yet. Thus, this study aims to analyse and evaluate prior studies on inflation and COVID-19. Evaluating the current state and trend of publishing, the most prominent contributors (authors, articles, and sources), and how the topic of the publication has progressed in terms of the inflation rate and COVID-19.

Research question

R studio is used to show the review process utilising the research questions below to use bibliometric, text-mining, and visualisation capabilities.

Table 1: Research Questions (RQ)

No.	Research Question (RQ)	Analysis Procedure
1.	What are the Inflation rate and COVID-19 publications' current state and trends?	• Annual Scientific Production • Three-Field Plot
2.	What are the most impactful contributors to the Inflation rate and COVID-19?	• Most relevant authors • Most relevant sources • Most Cited Countries
3.	What are the most impactful articles, authors and sources on the Inflation rate and COVID-19?	• Most Global Cited Documents • Most Local Cited Documents • Authors' Local Impact • Lotka's Law • Sources Local Impact • Bradford's Law • Co-occurrence Network
4.	How has the subject of the publication coverage on the Inflation rate and COVID-19 evolved?	• Thematic Map • Trend Topics • Word's Frequency over Time • WordCloud • TreeMap

This article follows on to a more in-depth discussion and analysis after simply going through the crucial definitions for inflation rate and COVID-19. The methodology portion of the study includes a description of the procedures utilised in this inquiry, including the data searching process, data collection, extraction, and analysis. The research findings were described in the section that followed. The study's findings are emphasised in the publication's discussion and conclusions, which also address the study's limitations and provide avenues for further investigation.

LITERATURE REVIEW

Inflation rate and COVID-19

The COVID-19 pandemic has interfered with businesses' capacity to manufacture products and services and customers' spending habits since March 2020. These supply and demand interruptions have changed the relative pricing of the impacted items, which has led total prices to fluctuate exceptionally fast at first and eventually decline. Due to the exceptionally low prices in the year before, or "base effects," this trend has also affected 12-month measurements of inflation since March 2021.

Due to closures, business interruptions, shortages, and social alienation, the pandemic resulted in several long-lasting commercial and supply-chain disruptions. Some of these led to higher part pricing and increased company expenses (such as higher cleaning costs), which could be passed on to customers. The producer price index, which tracks the cost of inputs, climbed by 1% in a month (or 12% annually) and 7.3 % in the 12 months before June 2021. A shortage in the manufacture of microchips is one of these long-lasting disruptions that is expected to linger for some time. These days, microchips are used in more than just information technology goods. Microchips are now present in a wide range of consumer items, including home

appliances and automobiles, due to the rise of smart gadgets. As a consequence, there have been supply problems for a variety of items. For instance, scarcity has limited the availability of new cars, contributing to the steep increase in costs for both new and used vehicles.

Individual supply snarls, supply shocks, and bottlenecks are by their very nature likely to be transient, therefore they would only temporarily raise inflation. According to Goldman Sachs, supply-constrained product categories are temporarily but very slightly increasing core inflation by roughly 1%: It is anticipated that by 2022, those categories would reduce core inflation by around 0.5% (David and Laura, 2021). But if these supply variables become pervasive and persistent enough, it may mean that taken as a whole, they are truly being influenced by demand forces.

Consumer spending habits were also disturbed by the pandemic. Closures, social isolation, virus concerns, and other limitations, for instance, contributed to a sharp fall in several categories of in-person-only services in 2020. Famous examples are restaurants, hotels, and air travel. Additionally, in 2020, prices for several of these goods dropped significantly. With the economy's recovery, there is a pent-up desire for expenditure categories that were prohibited in 2020. Prices for these groups are now stabilising or, in circumstances where supply or labour disruptions are also a problem, even exceeding 2020 levels. However, this unmet demand could not by itself result in ongoing inflation in the future. In 2021, a family that avoided holiday travel in 2020 could elect to spend more money on vacation or take more time off, but probably not in subsequent years.

This demonstrates the short-term influence of "base effects" on inflation. Economists often examine inflation over the preceding 12 months instead of monthly statistics since monthly data are "noisy" (i.e., they increase and decrease swiftly without indicating a longer-term trend). According to the CPI, prices dropped in March, April, and May of 2020 and did not wholly recover until August of that year. (PCE reports that prices dropped in both March and April of 2020.) Since the "base" of the computation is an artificially low index number for 2020, 12-month CPI inflation rates for March through August 2021, notably in March and May 2021, will seem high. But base effects cannot account for the full inflation spike in March, April, May, and June of 2021; these months had double-digit percentage increases in only one month.

As a result of the pandemic, consumers were unable to spend money on some services and they were spending more time at home, leading to an increase in demand for other goods and services, such as consumer durables (which saw 28% growth in output in four quarters ending with the first quarter of 2021). A temporary increase in pricing may result from a sudden increase in demand for a product, but in certain circumstances, the supply side may respond by bringing prices back down. Lumber prices, for instance, peaked in the second half of 2020 as demand increased but have since fallen (Dezember, 2021). There is no guarantee that the price of an item will continue to go up in the future, even if the demand shift that led to the price increase is permanent. In such a case, the price rise won't affect overall inflation. This emphasises the role of broad price rises, rather than changes in relative prices, in generating inflation over the long run.

Economic impact payments (often referred to as "stimulus checks") from pandemic relief measures seem to be fueling the growth in demand for consumer durables (Weinstock, 2020). There should be no lasting inflation from stimulus payments since they are only one-time. Every good or service has its own set of unique variables that may be used to justify its pricing.

Some have, for instance, paid particular attention to the sharp increase in the cost of secondhand automobiles that has been widely reported since April of 2021. But from the beginning of this year through June 2021, practically every key component of the CPI has indicated above-average growth.

METHODOLOGY

Searching strategy

A well-organized set of search phrases is a search strategy. In order to get accurate and thorough results, the search strategy will use keyword search techniques (Piccarozzi et al., 2021; Salameh et al., 2020). PRISMA (Preferred Reporting Items for Systematic Reviews) and bibliometric analyses were employed in this research (see Figure 1). This strategy comprehensively studies the information amassed throughout time (Visser et al., 2021). Filtering and enhancing bibliographic data usually involve bibliometric approaches, such as discovering important articles in a database (such as Scopus). The VOSviewer application is currently being used to display the data. Using bibliometric analysis, future research ideas may be identified and predicted (Paul & Criado, 2020). Over 50 million items from over 5,000 articles may be found in Scopus, an Elsevier database (De Mauro et al., 2016). At the same time, our institution also obtained the Scopus database. We selected the Scopus database as our primary data source primarily for this reason.

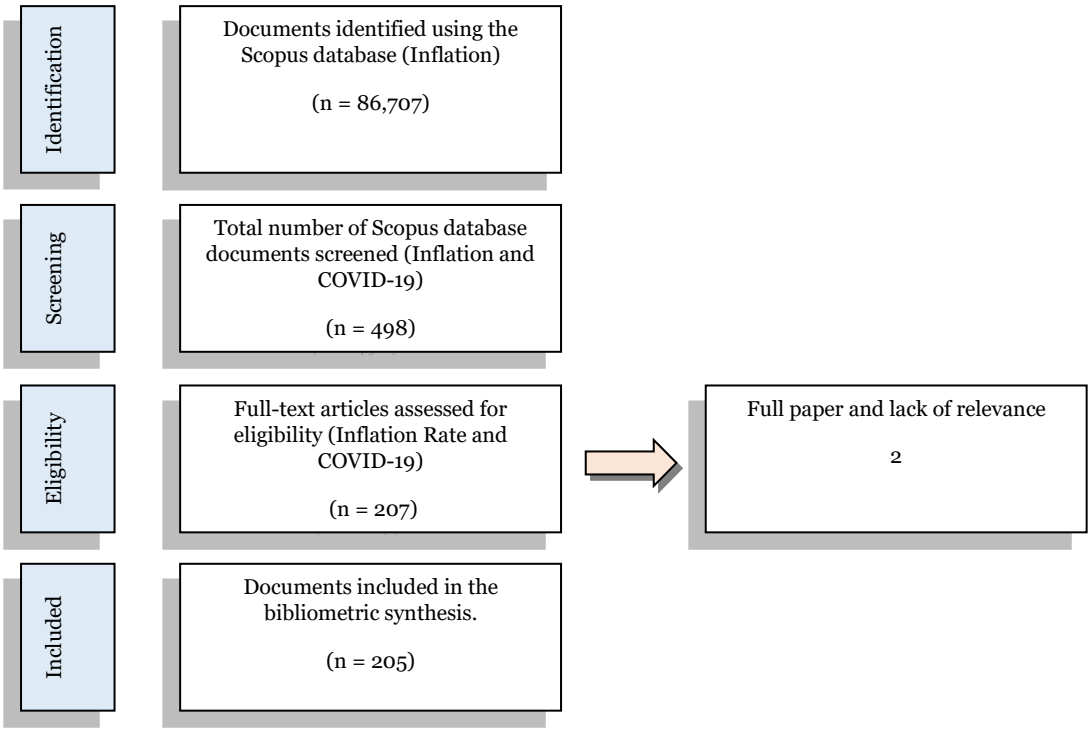

Figure 1: PRISMA diagram

Inclusion and exclusion criteria

Following previously specified criteria, all search results are initially checked for titles and abstracts (refer to **Table 2**). After that, they reviewed and summarised each article that had made it beyond the first screening process. Each research study is assessed based on the number of publications, the most esteemed journals and authors, and the research topics that were often discussed. We decided to create a final database of 205 publications from 2020 to 2023 due to the abundance of research on the inflation rate and COVID-19.

Table 2: Search criteria

Scopus Category	Searching criteria	No. of article
Topic 1	"Inflation"	86,707
Topic 2	"Inflation AND COVID-19"	498
Topic 3	"Inflation AND Rate AND COVID-19"	207
Research year	2020-2023	207
Document Type	All types of publication	205
Language	Chinese, Czech English, English, Portuguese, French, German, Hungarian, Russian, Spanish	205
Author name	All	205

Extraction techniques

Table 2 lists the 207 journal articles exported in a format compatible with the applications. To increase the study's accuracy, the downloaded database underwent a thorough analysis. The term "Inflation" is the first one that is looked for in the extraction process, then "Inflation AND COVID-19," and finally "Inflation AND Rate AND COVID-19." Excel (.csv) and VOSviewer were the tools we employed for this study. For bibliometric academic researchers, VOSviewer software is a free programme that visualises bibliometric maps. The final Scopus database offers the most helpful information on article titles, authors, keywords, and citations, including all references. It is beneficial to analyse bibliometric data since it can identify and foresee potential future study topics (Paul & Criado, 2020).

Choice of synthesis method (Analysis)

Analysis of descriptions was part of the initial investigation procedure. We created several Excel graphs to chart the evolution of works on inflation rate and COVID-19 concepts across time. The bibliometric analysis method was applied in the phase that came next. This method uses citations to identify the articles and scholars who have had the most impact on a certain subject. Several other metrics, including the H-index, total citations, and citations per article, may also represent academic standing. Depending on the results, the co-citation analysis may concentrate on the author, journal, co-citations of particular keywords, etc. We produced "network maps" based on article links by viewing our sample database with VOSviewer and R studio.

RESULTS AND DISCUSSIONS

Document Profiles

The publications discovered covered the years 2020 through 2023. Only after 2020 did publications begin to improve in an organisation and start to steadily and gradually grow in number. Based on the 205 papers in total (**Table 3**), there is a -44.34% yearly growth rate, a 3,41 average number of citations per document, and a total of 7950 references. Additionally, articles (160) are the most common kind of publication for this field of study, followed by reviews (7).

Table 3: Document Profiles

Description	**Results**
MAIN INFORMATION ABOUT THE DATA	
Timespan	2020:2023
Sources (Journals, Books, etc)	165
Documents	205
Annual Growth Rate %	-44.34
Document Average Age	1.59
Average citations per doc	3.41
References	7950
DOCUMENT CONTENTS	
Keywords Plus (ID)	766
Author's Keywords (DE)	713
AUTHORS	
Authors	657
Authors of single-authored docs	41
AUTHORS COLLABORATION	
Single-authored docs	45
Co-Authors per Doc	3.38
International co-authorships %	22.44
DOCUMENT TYPES	
Article	160
Book	1
Book chapter	9
Conference paper	22
Conference review	2
Erratum	1
Letter	2
Note	1
Review	7

RQ1: What are the Inflation rate and COVID-19 publications' current state and trends?

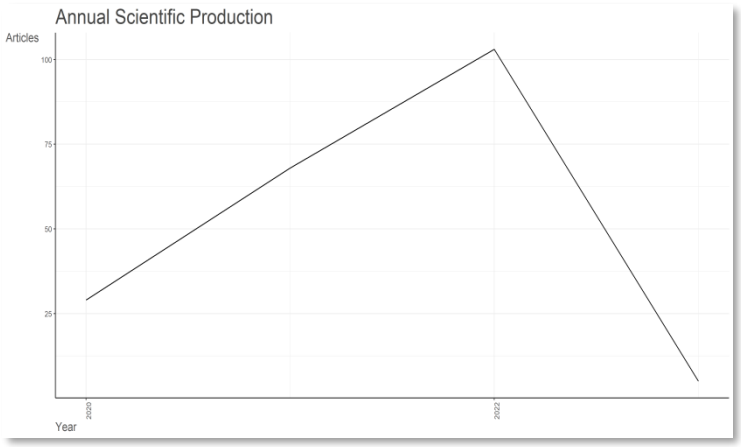

Figure 2: Annual Scientific Production (total articles published from 2020-2023)

In 2023, only 5 out of 205 papers were successfully published, as shown by the data in **Figure 2**. This topic's lack of interest in mainstream media discourse may explain the low number of publications. Dialogue has been hampered because experts in the field and academics cannot understand the importance of the inflation rate from a broader perspective. The number of publications increased between 2020 (29 articles published) and 2022. The COVID-19 pandemic that hit at that time caused the subject of the inflation rate to start receiving greater attention. The year 2022 they had the most production with 103 publications.

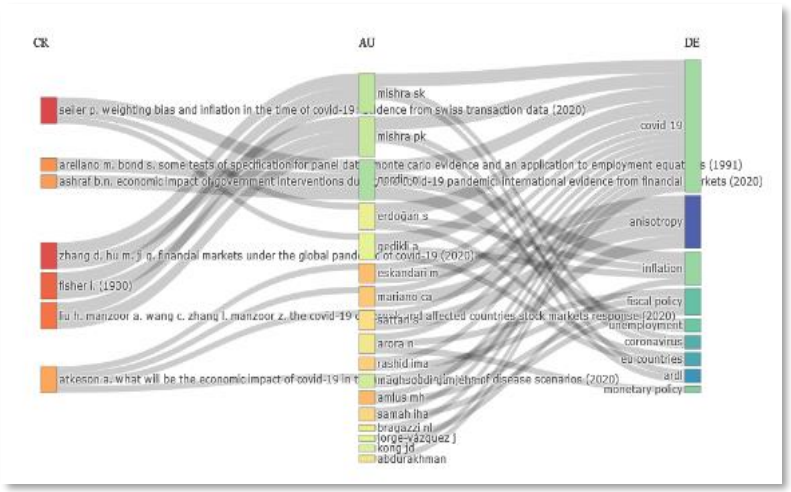

Figure 3: Three-Field Plot

The name of the published journal, a list of the author's names, and the themes/topics covered are the three elements that make up the Three Fields Plot image above (**Figure 3**). The three elements are connected by a grey plot that is relevant to each one. Following the names of the journals is a list of their regular contributors, followed by a list of the topics that each author frequently researches about the inflation rate and COVID-19-related issues. The rectangle's size shows how many publications there are for each component.

It is clear from the image above that the first element of the Three Fields Plot has seven journals that publish papers on the inflation rate and the COVID-19 subject. The top publication that publishes the most articles on the topic of COVID-19 research and inflation rates is "What will be the economic impact of COVID-19 in the US? Rough estimates of disease scenarios (2020)" is shown with an orange rectangle associated with various authors, including Eskandari M, Mariano CA, Sattari S, and Maghsoudi-Ganjeh M.

The author's name is displayed in the second element in the image's centre. The topical keywords often used to the right of the image will be linked to the author. In this study, 17 eminent researchers participated in this plot. The rectangle size represents the number of research articles each author has published. Regarding this study, the authors, Mishra SK and Nordin N, who are shown by green rectangles, mainly discuss the inflation rate and COVID-19.

On the right side of the image, there is a third element that explains the study topic. Authors who produce a lot of work on related subjects are linked to each topic. Nine keyword topics have been listed based on the image's results. The term "COVID-19" is one of the topics frequently indicated with a green rectangle among all the topics displayed. Anisotropy and inflation, which virtually all writers use often, are in second and third place, respectively. This shows how studying the inflation rate and COVID-19 is intimately tied to the word COVID-19 itself.

RQ2: What are the most impactful contributors to the Inflation rate and COVID-19?

Regarding the second research topic, the study focuses on the most pertinent authors, most relevant sources, most cited countries, and most locally cited sources in the field of the inflation rate and COVID-19. The sample database has the most relevant authors and publications, as shown in **Figure 4**. Generally, six authors have major influence: Amlus MH, Eskandari M, Mariano CA, Rashid IMA, Samah IHA, and Sattari S.

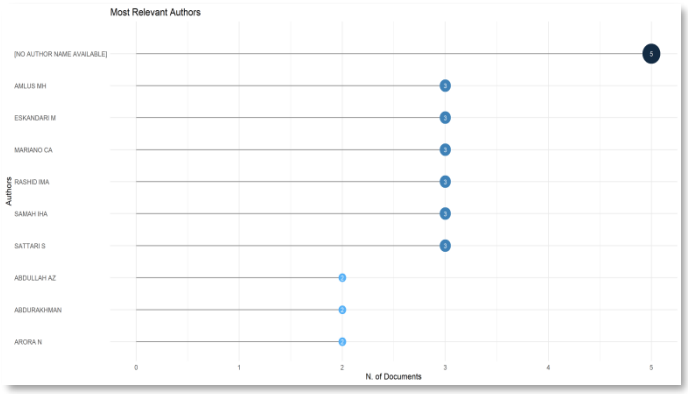

Figure 4: Most Relevant Authors

Figure 5 displays the number of research articles produced by each journal based on how pertinent they are to the inflation rate and COVID-19. The information displays a list of the top journals by name along with an interval for the number of documents published as a blue bar

chart. The amount and importance of the study subject are indicated by the darker the blue colour is, and all journals have been published somewhere between 0 and 4 documents.

The top-ranking journals are Mathematics and Sustainability (Switzerland), with four published documents, as indicated in a dark blue bar chart compared to the bars for the other journals. This is so because the journal has a bearing on the subject matter covered. There are eight journals designated in bright blue for the journals with the fewest publications (2nd lowest place). This indicates that the inflation rate and COVID-19 topic are still lacking in both quantity and relevance. As the most relevant data sources, a total of 10 journals are listed.

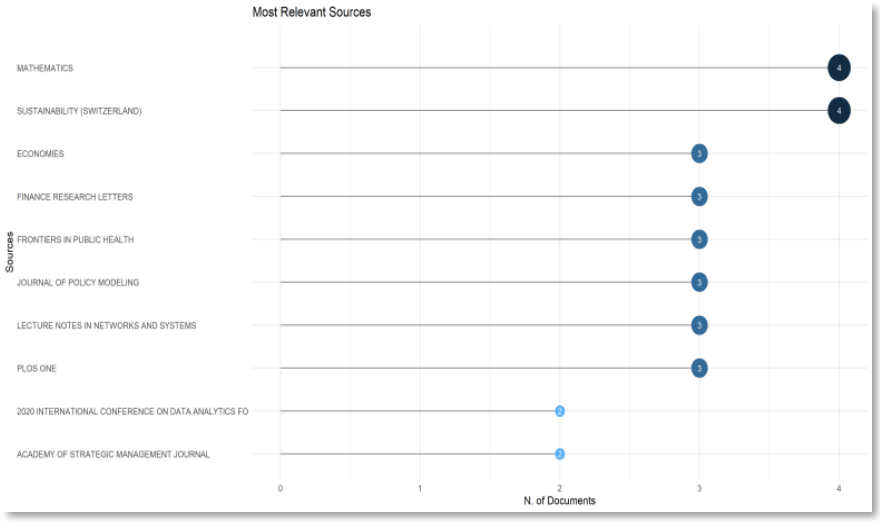

Figure 5: Most Relevant Sources

Following **Figure 6**, we can see that the top ten countries and categories of papers relating to the inflation rate and COVID-19 are highlighted. Whereas the USA (with 109 citations), China (with 68 citations), and Ghana (with 40 citations) are the top three countries that are the most cited in this field. Even though most publications are in the form of articles and review papers, there are many other types of documents that are published as well. Overall, the inflation rate and COVID-19 are topics that are actively discussed in the USA, while conferences are popular places for discussing and exchanging ideas.

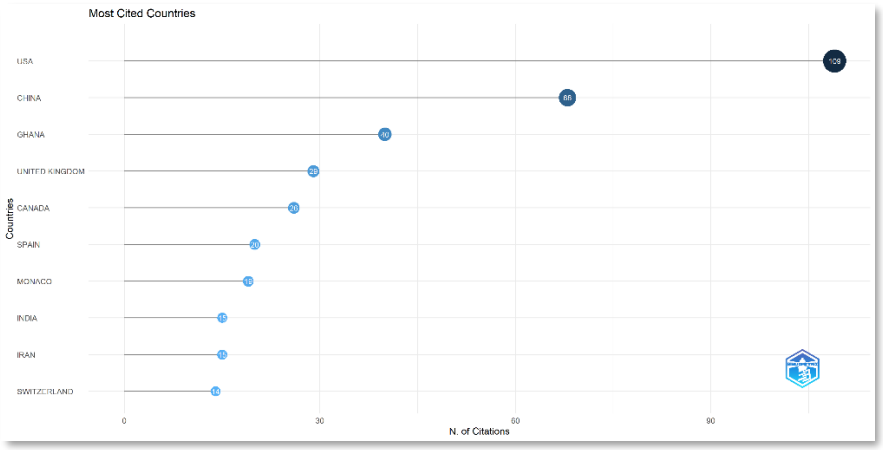

Figure 6: Most Cited Countries

RQ3: What are the most impactful articles, authors, and sources on the Inflation rate and COVID-19?

Highly cited documents

With Web of Science citation records ranked in the top 1% in their field, this coveted ranking honours the brightest researchers in the world. You are a successful and significant academic if your work appears on the list of most referenced articles. Additionally, when more people hear about the researchers' links with larger institutions, the exposure and possible reputation of such associations grow significantly (Martínez et al., 2015). However, a number of external variables that don't seem to be directly connected to the "quality" of the article's content affect the total number of citations an article obtains. (Fahimifar et al., 2022). **Figure 7** lists the 10 papers and documents that have received the most citations worldwide in the fields of COVID-19 and inflation. The most prominent are Pelletier JH (2021), which has 62 total citations, and Binder C (2020), which has 84 total citations. Total citations in other articles ranged from 16 to 36. In contrast, the subjects presented are rather diverse and not especially connected to inflation rates and COVID-19.

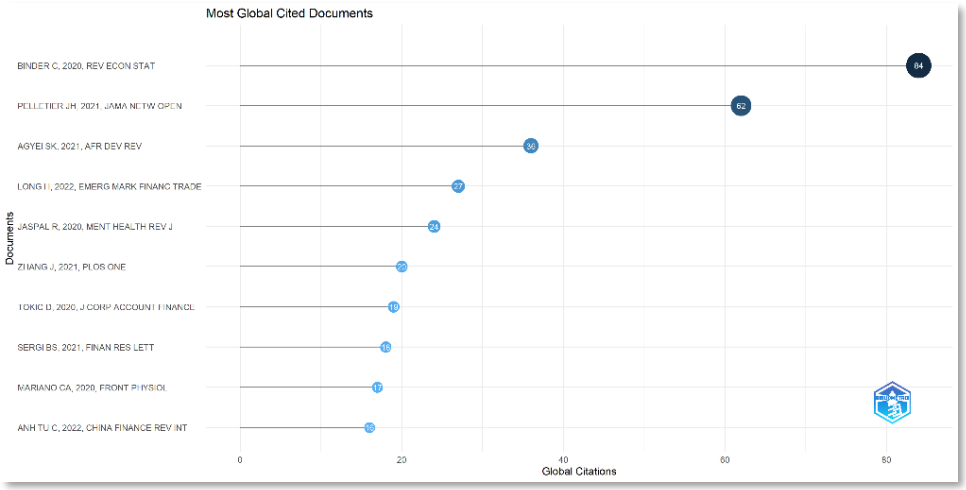

Figure 7: Most Global Cited Documents

Figure 8 displays the 10 articles on the field inflation rate and COVID-19 that have received the greatest local citations. Among the most noteworthy is Seiler P (2020), who has a total of 5 citations. Other works, with a total of 1 to 3 citations, are not very relevant to the topic of inflation rates and COVID-19.

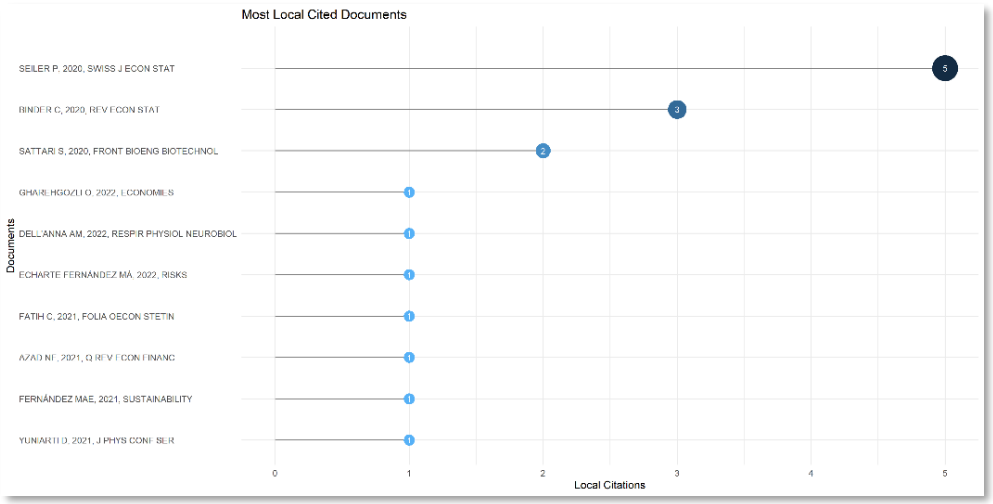

Figure 8: Most Local Cited Documents

Author's Local Impact

Authors who have had their articles published can also be classified according to the h-index of the effect. The range of our h-index values is 0 to 3. On the bar chart, the size of the impact is indicated in dark blue. In contrast, **Figure 9** below demonstrates that Eskandari M., the author with the highest h-Index, is indicated with a dark blue bar chart colour, which denotes the most influence followed by Mariano CA and Sattari S, both having h-Index values of 3. The remaining authors obtained a low h-Index of 2 and a lower level of impact.

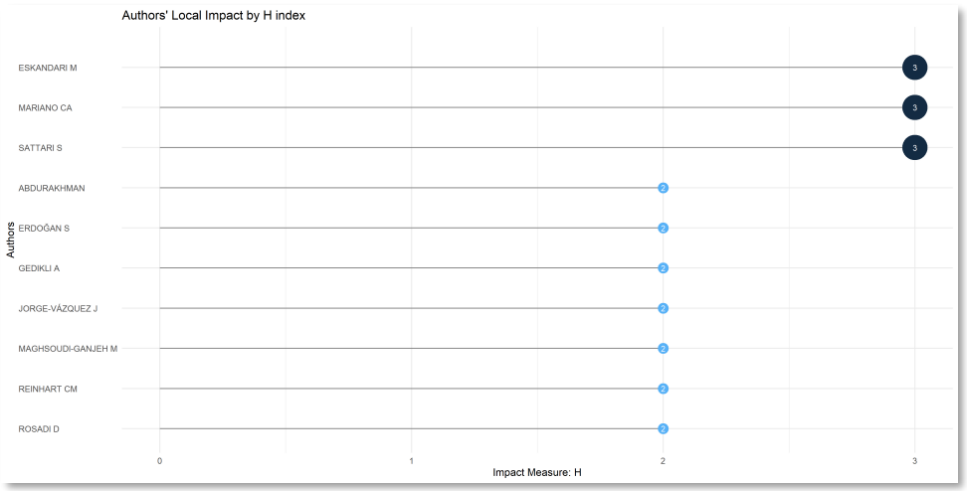

Figure 9: Authors' Local Impact

Lotka's Law

Often referred to as the "inverse square rule of scientific invention," Lotka's Law has gained widespread recognition in recent decades. In its most basic form, it states that there is a constant ratio between the proportion of writers who publish many publications and those who publish just one. (Friedman, 2015). In other words, it provides information on how often authors on a certain subject publish their works (Maz-Machado et al., 2017). Since then, several academics from other fields have examined author productivity and publications using Lotka's Law (Friedman, 2015). The distributions of the observed and fitted Lotka's are shown in **Figure 10**. A total of 1 to 5 papers have been published. **Figure 10** below shows unequivocally that as the number of articles published rises, fewer authors participate.

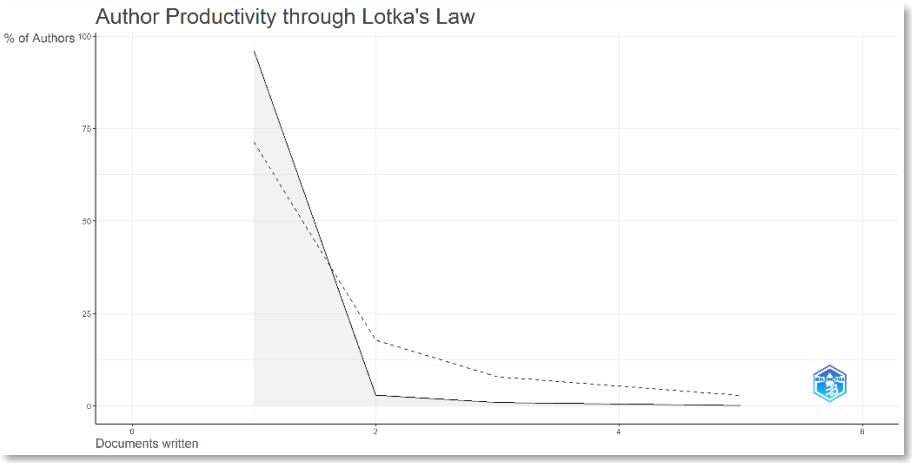

Figure 10: Lotka's Law

Calculations for journals are not just dependent on total production or content relevancy. The influence of each journal that publishes a paper on the topic of the inflation rate and COVID-19 is also examined in this study by calculating the publication's h-index, which is shown in a blue bar chart. **Figure 11**, in addition to displaying the h-index number, also highlights the influence the magazine has on the world through the use of blue. The larger the influence the magazine will have, the darker the blue on the diagram.

Sustainability (Switzerland), which is highlighted in dark blue in **Figure 11**, is in the top spot with an h-index of 3. Six journals with h-index values of 2 are in the second position. Three journals are identified in bright blue on the figure as having an h-index of 1, which denotes a journal with a low impact.

Figure 11: Sources' Local Impact

Bradford's Law

Bradford's rule indicates that the number of journals in the second and third zones will be n and n2 times bigger than that in the first zone, therefore if the numbers for the core and middle zones are known, the total number of journals carrying articles on a topic should be predictable (Fairthorne, 2005; Garfield, 1980). Once the whole number of articles is known, it should be possible to determine how much crucial data is being withheld due to the inadequate search. Since doing a systematic review requires much time and effort, it would be useful if Bradford's law properly predicted the amount (and, if possible, quality) of the literature (Friedman, 2015).

The classification of journals into core, intermediate, and wide groups is depicted in the image below, which is based on Bradford's law. The important journal categories include colour and annotations. This group of periodicals comprises those that produced the most studies on inflation and COVID-19 at a certain point in time. The 29 most pertinent sources for information on the inflation rate and Covid-19 are displayed in **Figure 12**. The most notable publication in this field is Mathematics (4 articles), followed by Sustainability (4 papers) and Economies (3 papers). Since peer review is a part of the publishing process for these journals, it helps to ensure their correctness and value to their respective professions.

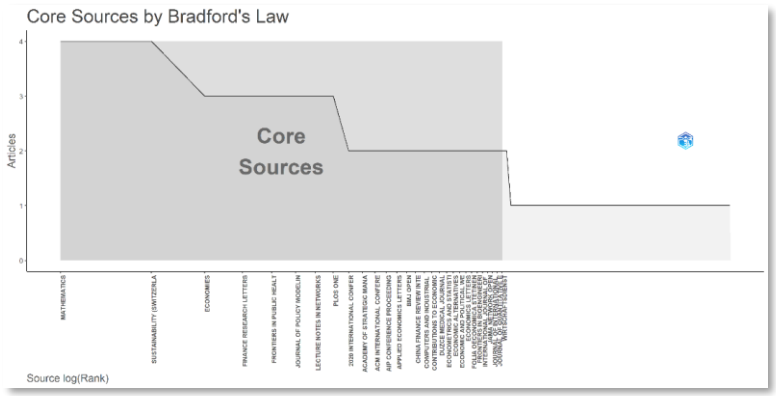

Figure 12: Bradford's Law

Co-occurrence network

A co-occurrence network, also known as a semantic network, is a text analysis technique that shows potential connections between people, organisations, ideas, bacteria, and other biological entities (Segev, 2021). Co-occurrence network building and visualisation are made feasible by text that has been saved electronically and is text-mining compatible. Co-occurrence analysis may be defined as simply counting matched data inside a collection unit (Cohen et al., 2005; van Eck & Waltman, 2021). The high-frequency keywords with a close co-occurrence relationship to the topics of the inflation rate and COVID-19 are shown in **Figure 13**. Three significant clusters have been created as shown in **Figure 13**. Cluster 1 is made up of the terms "COVID-19", "Monetary policy", "Pandemic", "Inflation", "Financial crisis", "Fiscal policy", "Unemployment", "Economic crisis", "Investments", and "Interest rate". The terms "Corona disease 2019", "United States", "Article", "Male", "Adult", "Female", "Middle-aged", "Artificial ventilation", and "Controlled study" make up Cluster 2. Cluster 3 contains the networks "Human", "Humans", "Sar-cov-2", "Pandemic", and "Epidemiology", among others.

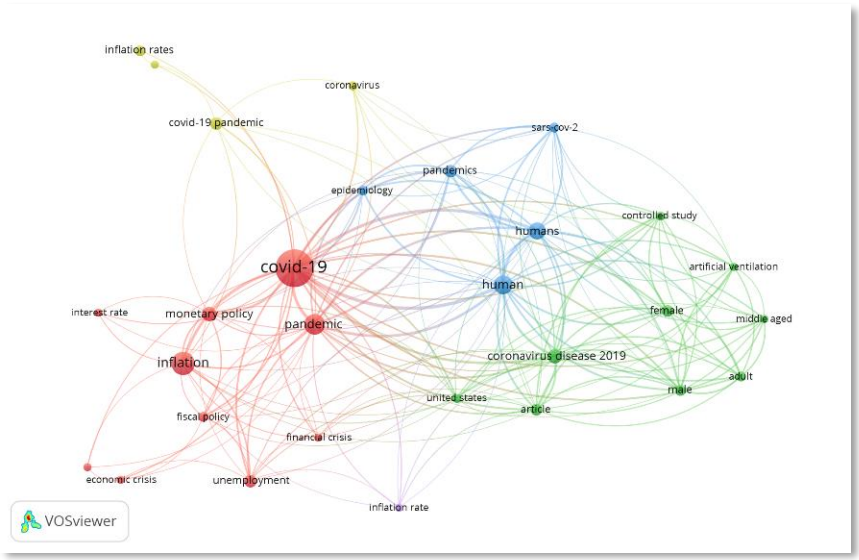

Figure 13: Co-occurrence Network

RQ4: How has the subject of the publication coverage of the Inflation rate and COVID-19 evolved?

The method combines performance analysis with scientific mapping to discover and visualise conceptual subdomains, then quantify and visually represent the theme evolution of the study subject (Cobo et al., 2011). In this study, a number of analyses were conducted, including the thematic map, trend topics, Word's Frequency Over Time, Wordcloud, and Treemap.

Thematic Map

A thematic analysis of evolution. The network of connections between scientific fields, articles, and authors is graphically represented in science mapping, often referred to as bibliometric

mapping (Rashid et al., 2021). It has been applied in many domains to reveal subjects and other previously undiscovered concepts (Chen et al., 2019). The study also separated thematic maps into 4 quadrants in **Figure 14** based on density and centrality. All references to the research subject were reviewed by a semi-automatic system, which also added more keywords. to find differences. It's necessary to design and explore a driving or motor theme that is densely concentrated in the top right quadrant. This quadrant's major topic is "COVID-19". The bottom left quadrant also exhibits motifs that are developing and waning with a modest degree of development, as seen by its low centrality. Topics in this quadrant include "macroeconomics". Furthermore, there are recurring motifs with great centrality in the lower-right quadrant (i.e., basic themes). The sole major topic in this quadrant is "inflation rates".

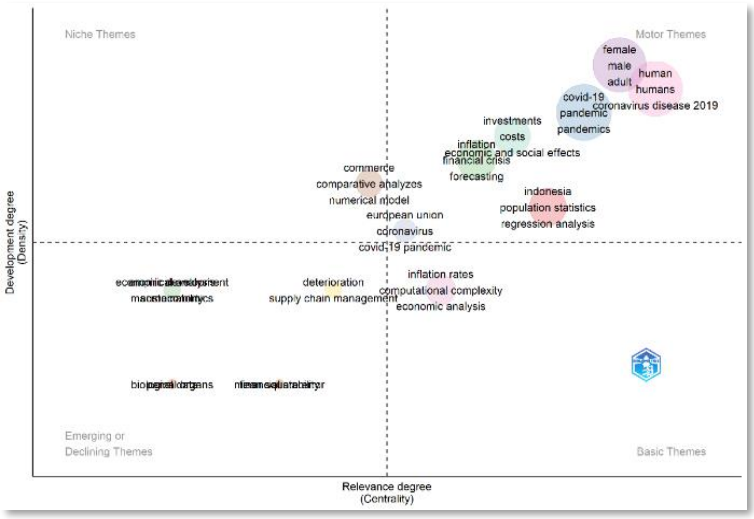

Figure 14: Thematic Map

Trend topics

The trends in the field are also examined in this study, and the following table provides a snapshot of the evolution of the term along with the accompanying year. In order to distinguish between themes that have been used for a long time and those that have only recently (Bolaños, 2022; Yardibi et al., 2021). The term is used more frequently and more lately further to the right as it rises in the list. The topic's development began to considerably accelerate in 2021, as seen in **Figure 15** and **Table 4**. As stated in the data's description below, the subject has been used since 2021, especially in talks on inflation and COVID-19 (F=39), human (F=25), human (F=20), pandemic (F=17), and United States and inflation (F=9 and 7, respectively). Even though time has passed, the frequency of the issue inflation is still minimal. From 2021 to 2022, "COVID-19" is the subject that receives the most discussion compared to other subjects in years q1, q2, and q3. This information also explains why the inflation rate and COVID-19 topics have recently gained popularity.

Table 4: Trend Topics (year)

item	freq	year_q1	year_med	year_q3
pandemic	17	2021	2021	2022
united states	9	2021	2021	2022
inflation	7	2021	2021	2022
COVID-19	39	2021	2022	2022
human	25	2021	2022	2022
humans	20	2021	2022	2022

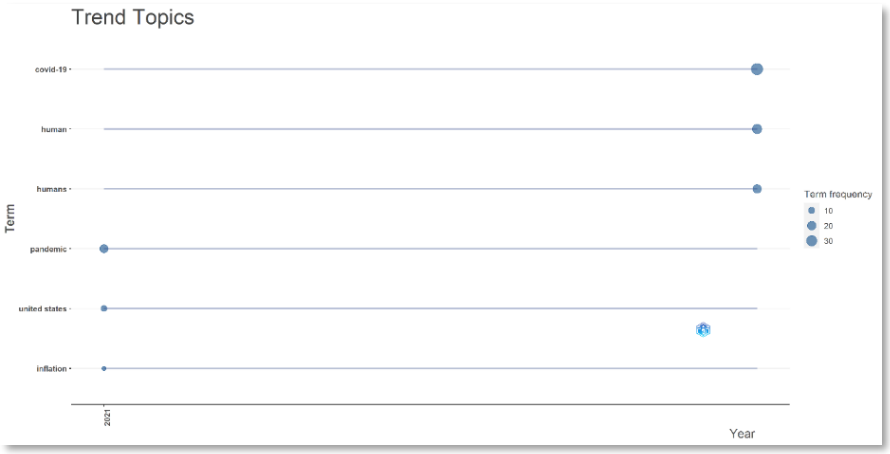

Figure 15: Trend Topics

Word's Frequency Over Time

The data set indicates that the frequency of words across time is a reliable measure of the evolution of language. In addition to the author's keywords, title, and abstract, a tally of the most frequently used keywords is one method of presenting selection. Both approaches count the total annual occurrences as their basis. **Figure 16** shows, based on annual totals, how the most popular terms in the area of inflation rate and COVID-19 study grow from 2020 to 2022. **Figures 16** and **17** demonstrate that there was a discernible uptick in the use of many significant keywords beginning in 2009. Data from "Word's Frequency over Time" for the years 2020 and 2022 reveals an increase in the usage of frequently used keywords like "COVID-19". A number of other analyses, including the "Trend Topics" and "WordCloud" investigations, show similar patterns, thus we may feel confident in this finding. This discovery further clarifies why certain phrases were selected as timely and important.

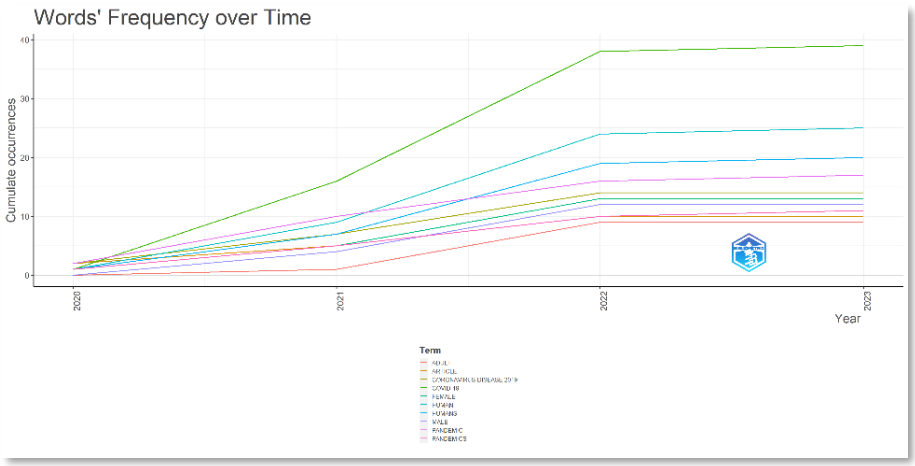

Figure 16: Words' frequency over time

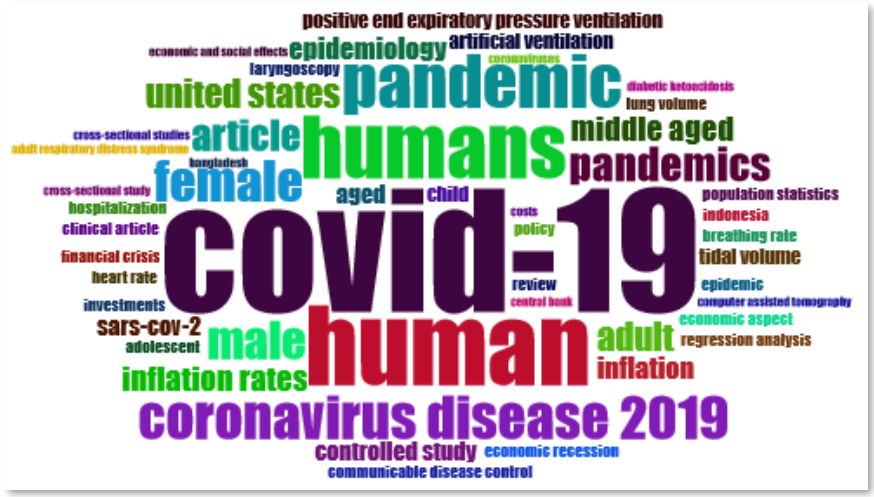

Figure 17: Word cloud

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Tree Map

Tree maps are a graphical representation of hierarchical data in which nodes are represented by stacked rectangles (Lockhart, 2015). They are composed of several stacked, suitably sized rectangles. A wide rectangle in a data tree represents a branch, whereas smaller rectangles show the size of each node inside that branch. **Figure 18** shows the top 50 phrases based on keyword plus, the author's keywords, the title (bigrams), and the abstract (trigrams) in different tree maps. According to the tree map data, "COVID-19" has the highest percentage (11%) followed by "humans" (7%) and "humans", both of which have 6%. Other elements, such as "inflation", "inflation rates", and "economic and social repercussions", only contribute a modest percentage, ranging from 1% to 3%.

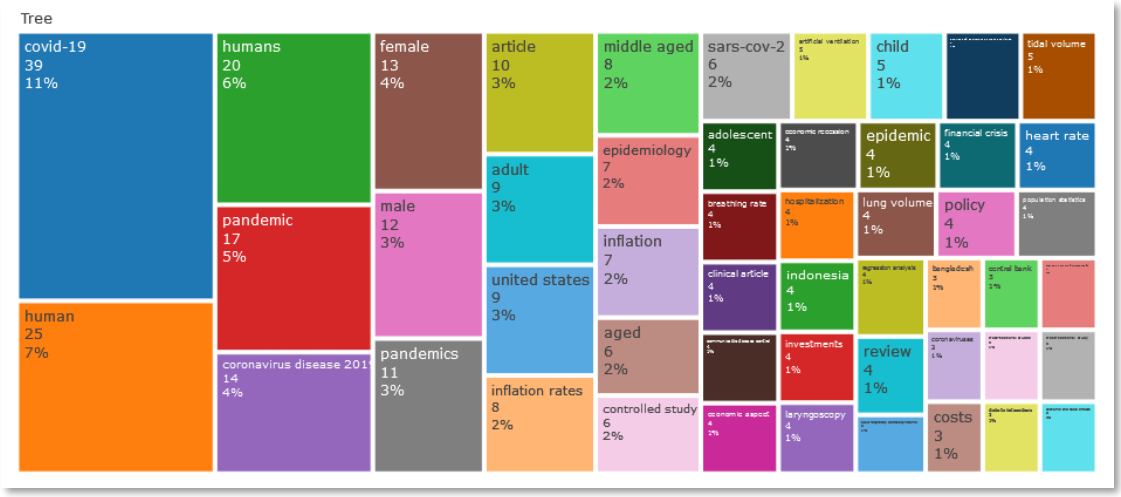

Figure 18: TreeMap

CONCLUSION

The goal of this research is to examine the connection between inflation and COVID-19 studies in the years 2020-2023. The 205 documents consulted for this study show that the amount of research on the topic of inflation has grown yearly. For example, throughout the research period, the authors Amlus MH, Eskandari M, Mariano CA, Rashid IMA, Samah IHA, and Sattari S often researched the topic of inflation and COVID-19. COVID-19 is a keyword that is frequently used in TSR research. As a result, research into the inflation rate approach is advancing and becoming inextricably linked to COVID-19. Given that there is currently a dearth of economic and financial studies that thoroughly tackle the issue of inflation, this research on the topic has to be continually updated.

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