Assessing the Global Research Landscape on Fiscal Sustainability (1976–2023): A Scopus-Based Bibliometric Analysis

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Abstract - In the aftermath of COVID-19, coupled with high inflation, many countries are facing severe fiscal challenges. Developing countries, in particular, are confronting challenges associated with increasing their revenue to restore fiscal sustainability while dealing with the rising cost of living. Given the vital role of fiscal sustainability, research communities around the world have, over the past few decades, sought to explore debt vulnerabilities and fiscal conditions in order to sustain spending and build the necessary room to handle future shocks in different economic settings. This study conducts a bibliometric analysis of 1,231 scientific papers published on various facets of fiscal sustainability that are available in the Scopus database over the period from 1976 to 2023. The analysis of the intellectual structure of the selected research articles is carried out using VOS viewer and the Bibliometrix R package. The study is expected to provide a platform for academicians, researchers, governments, and policymakers to develop insights and explore solutions to tackle the menace of fiscal unsustainability.
Keywords: Bibliometric Review, Fiscal Sustainability, Debt Sustainability, Network Visualization, Scopus, VOS Viewer

I. INTRODUCTION

Fiscal sustainability forms a cornerstone of economic policy discussions, as it encapsulates the interaction between fiscal choices, economic well-being, and the welfare of present and future generations. The rising national debt in many developed nations over the past few decades has sparked concerns about potential negative effects on inflation, productivity, unemployment, international competitiveness, and economic growth (Brady & Magazzino, 2018). Fiscal imbalance in an economy can have far-reaching implications for its own financial health as well as for the overall economy. Today, as governments grapple with complex policy decisions, understanding and prioritizing fiscal sustainability remain paramount to fostering economic resilience and securing a prosperous future. Fiscal sustainability has become a prominent issue, and the assessment of fiscal sustainability has become a progressively demanded component of macroeconomic analysis (Abdullah *et al.,* 2012). It is a more pressing concern in developing countries due to the predicaments posed by globalization, technological advancements, and demographic shifts. Over the last few decades, issues related to fiscal sustainability have garnered particular attention from scholars and policymakers, who are vigilantly, and perhaps incessantly, investigating the fiscal health of countries in order to gain a clearer picture of government solvency.

In the quest for a comprehensive understanding of fiscal sustainability, it is pertinent to consider the global dimensions of the problem, because fiscal decisions in one country have far-reaching implications for international financial markets, trade relations, and the stability of the global economy. Therefore, it is essential to reflect on the interconnectedness of fiscal sustainability across borders and to understand the role of international cooperation in ensuring a sound economic future by exploring the pool of literature in the Scopus database through bibliometric analysis.

In recent years, bibliometric analysis has become a widely adopted research approach because it enables the examination of extensive scientific datasets and contributes to the generation of impactful insights (Donthu, Kumar, & Pattnaik, 2020b; Donthu, Kumar, Pattnaik, & Lim, 2021; Khan *et al.,* 2021). Scholars apply this technique for multiple purposes, such as identifying evolving research trends, assessing the performance of journals and publications, analyzing collaboration networks, and exploring the intellectual foundations of a specific research area within the existing literature (Donthu, Kumar, Pandey, & Lim, 2021a; Donthu *et al.,* 2020e).

Over the last few decades, researchers have made several attempts to gain an in-depth understanding of the intricacies of fiscal and debt sustainability, especially after the turmoil caused by the global financial crisis of 2008, which underscored the significance of maintaining prudent fiscal policies to mitigate economic shocks and ensure macroeconomic stability. The growing body of research on fiscal sustainability worldwide focuses on understanding macroeconomic scenarios and their effects on national economic health, thus highlighting the need of the hour. To the best of existing scholarly knowledge, a comprehensive bibliometric investigation into the evolving dimensions of fiscal health has yet to be conducted. The primary objective of this study is to conduct an in-depth exploration of the

literature concerning different aspects of fiscal sustainability, with the aim of outlining the complexities surrounding fiscal conditions across the globe. Accordingly, the study seeks to address the following research questions.

1. What is the trend in publications on issues related to fiscal sustainability?
2. Which authors, countries, and organizations have contributed significantly to the literature on fiscal sustainability, and what have been the collaboration patterns among them?
3. What are the top publishing sources on the various dimensions of fiscal sustainability?
4. Which co-authors and countries are bibliographically coupled?
5. What are the emerging and rapidly developing themes within the field of fiscal sustainability?
6. What implications does the present research have, what gaps exist in the literature, and what is the scope for future research?

This extensive study seeks to broaden knowledge of fiscal sustainability, a key element for sound fiscal management, economic stability, and enduring financial well-being.

A. Theoretical Milestones

Fiscal sustainability is regarded as the ability of a country to balance its expenditure and taxation against its liabilities or committed spending (Hamilton & Flavin, 1986; Connell & Zeldes, 1988; Trehan & Walsh, 1991; and Bohn, 1995). The need to examine fiscal sustainability gained prominence in the 1980s in India, when a sharp fiscal weakening was observed across the country (Jadhav, 2010). A similar pattern was observed by Rao (2000) during 1990–91, when state finances were weak due to a low level of central transfers and poor expenditure management by sub-national governments. Anand *et al.* (2002) is of the view that it is paramount to study fiscal health, as weak state finances deteriorate the overall position of public finance and directly affect fiscal sustainability. In recent years, fiscal sustainability has become a crucial subject in the field of economic studies. Navigating complicated economic dynamics while maintaining fiscal stability, preserving long-term financial health, and fulfilling duties to citizens is a challenge faced by governments worldwide (Kaur *et al.,* 2022).

Several attempts have been made in the past to examine the fiscal conditions of various countries, and these studies have observed that weak fiscal health has a significant impact on the overall economic health of economies. For instance, Moraga and Vidal (2004) explored the concept of fiscal sustainability within the framework of an overlapping generations model, allowing for the presence of fiscal imbalances. Their work provided insights into how such imbalances can evolve over time in a dynamic economy. Afonso and Jalles (2012) investigated the sustainability of public finances across OECD nations. Their findings revealed a concerning trend, showing that in many of these countries, fiscal policies were becoming less sustainable over time. Similarly, Muzenda (2014) analyzed the alignment of government fiscal policies with the intertemporal budget constraint during the period 1990–2013. The study concluded that fiscal sustainability was largely maintained, as governments tended to adjust primary deficits or surpluses in response to fluctuations in debt levels.

Amankwah *et al.* (2018), in their study, investigated Ghana's long-run debt sustainability and ascertained the solvency condition for the country. The results revealed that fiscal policymakers responded to high accumulated debt levels by adjusting the primary balance. Ghana's debt level was concluded to be sustainable, as it satisfied the solvency condition of the intertemporal government budget constraint (IGBC). Koo (2008) assessed debt sustainability in Korea by taking the Asian financial crisis into consideration. The results of the empirical analysis indicated that government debt exceeded its sustainable level, and the crisis significantly affected and pushed the debt level further; hence, fiscal consolidation was suggested. Bajpai (2002), Anderson (2010), and Sood *et al*. (2022) highlighted the importance of reducing revenue deficits, strengthening fiscal consolidation, and lowering public debt as essential components of a sound fiscal strategy.

Jadhav (2010) proposed six indicators for assessing fiscal sustainability. These include the comparative growth rates of GDP and public debt, the stability of the fiscal position, the sufficiency of the primary surplus, the burden of debt servicing, the overall asset–liability structure, and the relationship between borrowing costs and returns on public assets. Nautet and Van (2011) underlined the importance of adopting a clear fiscal consolidation strategy. Their work pointed to three major areas requiring focused attention. First, reducing public debt must remain a core priority. Second, there is a need to strengthen labor markets by improving employment levels and enhancing productivity. Third, the study stressed the necessity of reforming key social sectors, specifically pension systems, healthcare services, and elderly care, to ensure long-term fiscal balance. They noted that, in order to restore sustainable public finances in most advanced countries, large-scale reform programs would be necessary.

Furthermore, as stated by Barnhill and Kopits (2003), the evaluation of fiscal sustainability has historically concentrated on fiscal imbalances as well as the government's long-term financial standing, particularly with regard to public debt. To assess fiscal risk, the authors also considered non-traditional measures, including revenue structure and contingent liabilities. Nevertheless, these approaches fall short of meticulously quantifying adverse events, especially in developing nations.

B. Significance of the Study

A bibliometric analysis of fiscal sustainability and its role in the economy can offer significant insights into this critical field. Through such an analysis, the present research identifies key patterns, dominant trends, and emerging lines of inquiry within the field. It also draws attention to the critical themes that scholars are currently engaging with. Together, these findings help to illustrate how the discourse on fiscal sustainability is evolving and present the changing facets of fiscal situations worldwide. By synthesizing research findings, the study contributes to the authors' understanding of how fiscal sustainability functions as a component of macroeconomic analysis and forms a cornerstone of economic discussion. Research in the domain of fiscal sustainability is important, as it serves as the foundation of a government's financial stability. It is a vital component of debt management, the fulfillment of long-term obligations, and the continuation of essential public services (Bostan *et al.,* 2021).

This field of study is extremely important, as it evaluates a government's ability to manage debt, deliver essential services, and prevent financial turmoil, given that fiscal policy plays a crucial role in economic expansion. This examination has a substantial impact on important decisions related to taxation, expenditure, and economic stability, and it provides ample information for the public, investors, and legislators (Marín *et al.,* 2023).

II. METHODOLOGY

A. Research Process

This study presents a bibliometric analysis of selected research articles on fiscal sustainability published and accessible in the Scopus database over the period from 1976 to 2023, using VOS viewer. Scopus is considered the largest abstract and citation database, comprising peer-reviewed literature, scientific journals, books, and conference proceedings. The search strategy employed the following keywords: "fiscal sustainability," "fiscal imbalance," "debt sustainability," and "public debt sustainability," which were considered from the titles, keywords, and abstracts of various studies appearing in the Scopus database. The initial search yielded 1,870 articles, among which 602 were not relevant to the present study. After eliminating the non-relevant articles, the researcher was left with 1,268 articles, out of which 33 articles were removed for not meeting the inclusion criteria. This left 1,235 articles, from which 4 articles were subsequently eliminated, resulting in a final sample of 1,231 articles for the study. Figure 1 presents a summary of the literature search.
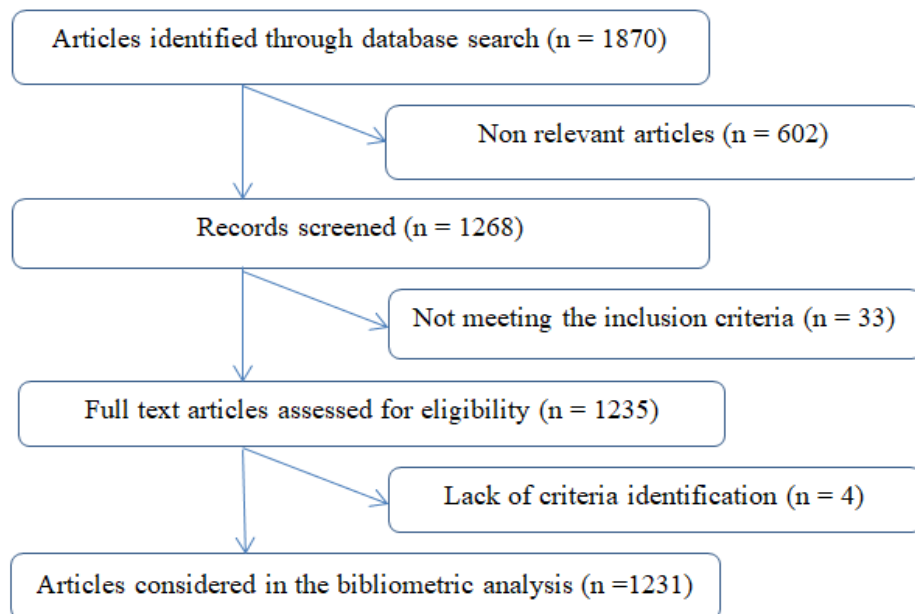

Fig.1 Fiscal Sustainability Search Flowchart   Source: Authors' work

III. RESULTS AND DISCUSSION

A. Trends of Research Publication

Figure 2, representing trends in research publications on fiscal sustainability since 1976, shows that the number of publications has gradually increased over time, indicating that the topic is gaining momentum and popularity among researchers. In the aftermath of the global financial crisis of 2008, researchers were keen to examine the economic positions of various countries. This is reflected in the graph below, as the number of publications increased and exceeded 30 in the year 2009. Research on fiscal sustainability has continued to grow steadily in recent years, as indicated by 112 publications in 2022. This signifies an anticipated growth and upward trend in the subject in the coming years due to its far-reaching implications for the economy. It is considered one of the prominent research

topics for scholars, as publishing on fiscal sustainability serves both academic and practical purposes, thereby

contributing to societal well-being and the stability of global economies.
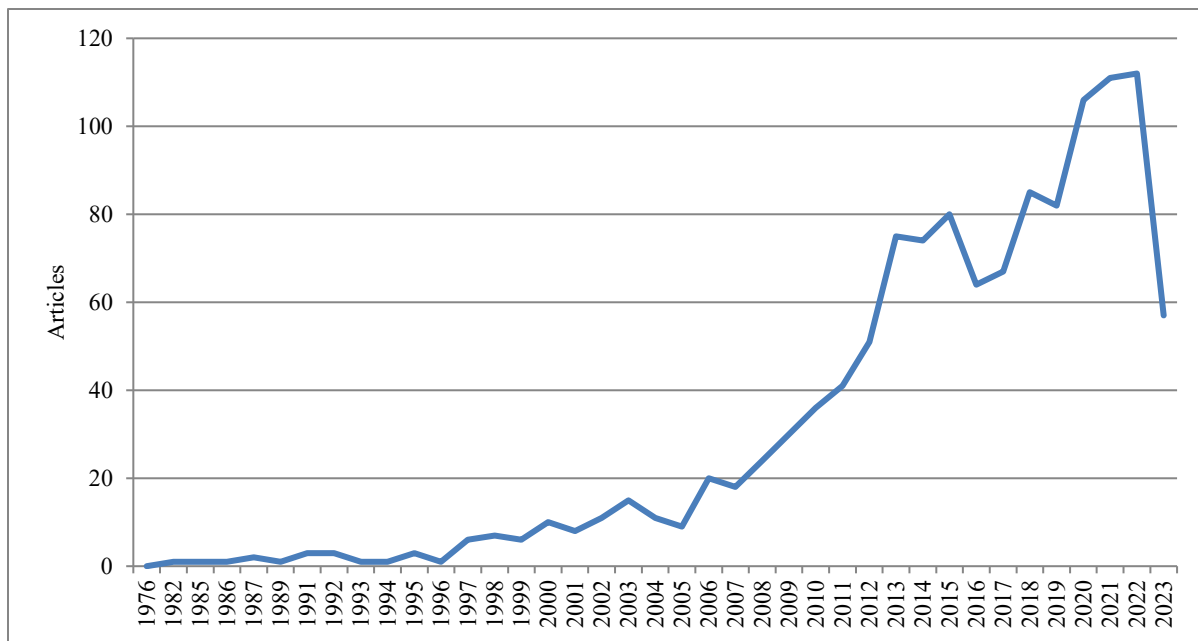

Fig.2 Dynamics of Research Publications on Fiscal Sustainability (1976 - 2023)   Source: Authors' work

B. Most Influential Affiliations

Table I presents the institutional backdrops supporting research on fiscal sustainability. Eminent institutions, leading universities, and research bodies contributing to this literature are predominantly located in advanced economies. It is observed that the majority of contributions originate from the International Monetary Fund. The European Central Bank and Universidade de Lisboa occupy the second and third ranks among institutions, having published 18 and 17 articles, respectively. In addition, universities and research institutions in the United States and Germany play a particularly strong role in shaping the discourse on this subject, reflecting their significant influence in the field.

TABLE I MOST CONTRIBUTING AFFILIATIONS

Affiliations	Countries	Articles	Rank
International Monetary Fund	USA	70	1
European Central Bank	Germany	18	2
Universidade de Lisboa	Portugal	17	3
The World Bank	USA	17	3
National Bureau of Economic Research	USA	14	4
The Australian National University	Australia	12	5
University of Oxford	UK	12	5
Sapienza Universita di Roma	Italy	12	5
London School of Economics and Political Science	England	11	6
Inter-American Development Bank	USA	11	6

Source: Authors' work

C. Most Prominent Authors

Table II demonstrates the most prolific authors publishing on the issue of fiscal sustainability. The 1,231 publications on fiscal sustainability have been contributed by 1,153 authors, among whom the most eminent authors are Auerbach, A. J., and Andersen, T. M., with five publications

each and 41 and 39 citations, respectively. They are followed by Afonso, A., and Jalles, J. T., with four publications and 82 citations. Their research article titled *"To Consolidate or Not to Consolidate? A* Multi-Step Analysis to Assess Needed Fiscal Sustainability" is particularly impactful in terms of citations, averaging 20.5 citations per year.

Authors	Number of Publications	Total Citations	Citations per Publication
Andersen T.M.	5	39	7.8
Auerbach A.J.	5	41	8.2
Afonso A.; Jalles J.T.	4	82	20.5
Akram V.; Rath B. N	3	28	9.3
Burret H.T et.al	3	20	6.6
Campos E.L.Cysne R.P	3	6	2
Cevik S.	3	2	0.6
Chotia V.	3	1	0.3
Coombs G; Dollery B	3	16	5.3
Ferrarini B.	3	16	5.3

Source: Authors' work

D. Most Publishing Countries

Figure 3 showcases the countries that are more actively involved in publications, thereby contributing to the pool of research on fiscal sustainability. As per the table, the United States of America plays a leading role among all countries in fiscal sustainability research, with 271 publications in comprehensive and high-quality journals, followed by the United Kingdom with 108 publications and Germany with 95 publications. India is positioned among the top 10 countries, with 41 research articles and a total of 123 citations. At an overall level, research in the domain of fiscal sustainability and related areas has emerged from all geographical regions.
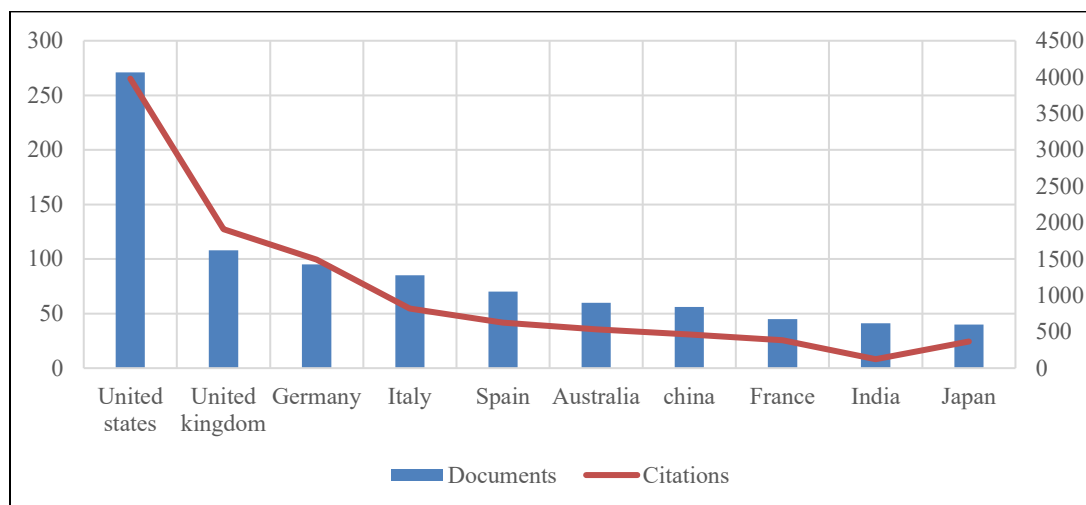

Fig.3 Most Publishing Countries   Source: Authors' work

E. Bibliographic Coupling of Countries

Bibliometric coupling (BC) is a technique used to identify similarities between research works. It occurs when two studies cite the same source in their reference lists, indicating a shared intellectual connection. It is grounded in understanding the nature of networking among countries publishing on topics related to fiscal sustainability. This technique can also be extended to journals, authors, and organizations. Figure 4 shows the countries contributing more extensively to the literature on fiscal sustainability. In the figure, each circle depicts a country, with its size representing the level of contribution. The dots represent the level of association. With a total of seven clusters, the bibliometric coupling illustrates the relationships a country shares with others; the larger the node size, the higher its level of association.
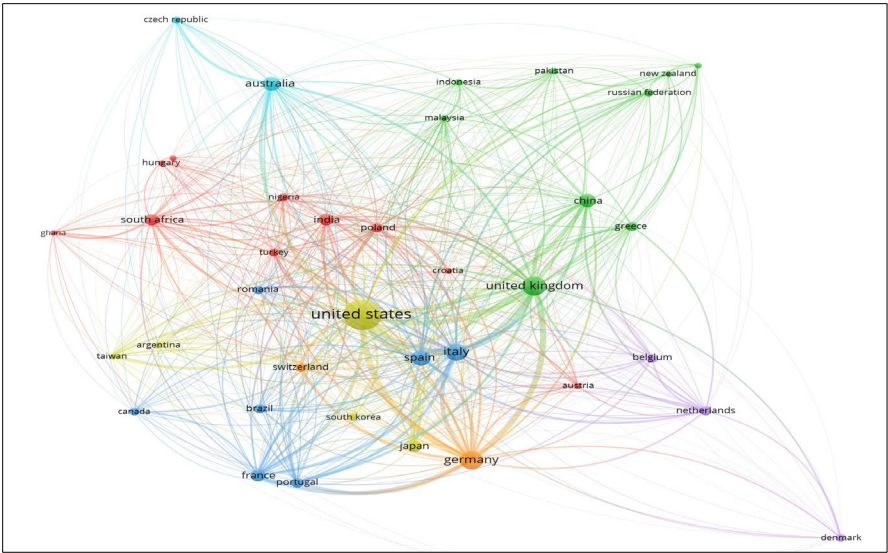
Fig.4 Bibliographic Coupling of Countries
Source: Authors' work using VOS viewer tool and Scopus database

F. Analysis of Keywords in VOS Viewer

In the selected sample of 1,231 papers, the minimum occurrence threshold for keywords was set at five, out of a total of 2,563 keywords, and 110 keywords met this threshold. Of these, three keywords were eliminated as they did not fit the required criteria. The five most frequently occurring author keywords among the remaining 107 keywords are presented in Table III.

Note: [1] Total number of occurrences; [2] Total link strength. Table III shows that *"fiscal sustainability"* is the most frequently encountered term, followed by *"public debt"* and *"fiscal policy"*. Fiscal sustainability also has the highest total link strength, indicating that it is linked with other terms on many occasions.

TABLE III GENERAL CITATION STRUCTURE

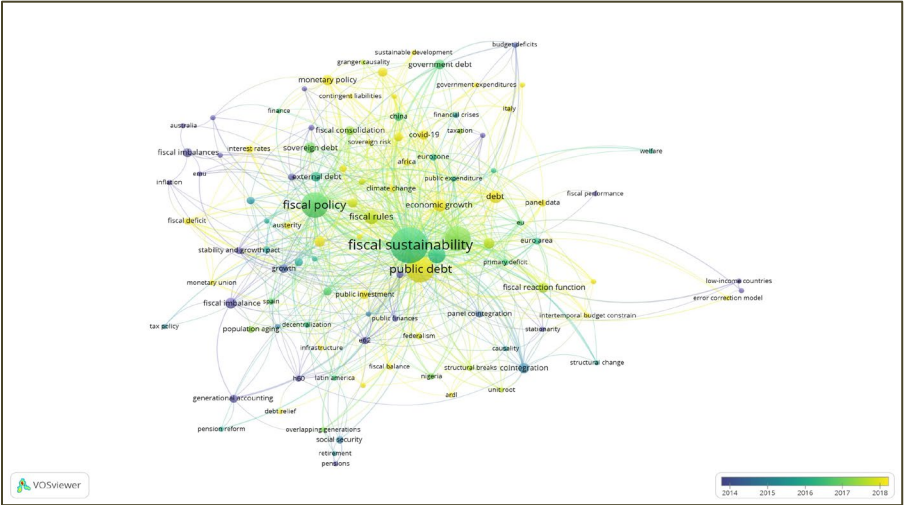| Keyword	Frequency[1]	LS[2]
Fiscal sustainability	242	297
Public debt	132	253
Fiscal policy	123	210
Debt sustainability	113	140
Sustainability	54	81

Fig.5 Analysis of Keywords in VOS Viewer
Source: Authors work using VOS viewer tool and Scopus database

Figure 5 shows the keyword analysis in VOS viewer. The colored nodes indicate the average number of publications per year in relation to each node (Van Eck & Waltman, 2010). The larger the node in the network, the higher the number of occurrences of a keyword, and the smaller the distance between two nodes, the stronger their relationship, that is, the more frequently they appear together. The words that appeared at the beginning of the period of analysis

(1976–2015) are indicated by blue nodes. The keywords in green nodes (specific to the period 2015–2017) are positioned around the center of the network, while the terms in yellow nodes are encountered in more recent literature. The majority of keywords specific to a particular time period imply a concentration of that topic within that timeframe. This suggests emerging trends, significant developments, and increased interest in the topic during that specific period.

G. Keywords Cloud

A word cloud is a visual tool used to summarize text-based data. It highlights how often specific keywords appear in research articles by displaying frequently used words more prominently. Figure 6 presents the most cited keywords in literature reviews concerning areas related to fiscal sustainability in the form of a word cloud. The cloud is generated using Biblioshiny. The visual emphasis given to each term, both in size and placement, reflects its relative importance within the dataset (Liao *et al.,* 2019). Words that appear more frequently in the literature are displayed in larger fonts and positioned more prominently in the cloud, while less common terms appear smaller. Researchers use word cloud generators to highlight popular words and phrases based on their frequency and relevance. From the generated word cloud, it is observed that fiscal policy, public debt, and debt sustainability are prominently used in research, indicating their current relevance and providing a visual understanding that facilitates more in-depth analysis.

Fig.6 Prominent Keywords Cloud
Source: Authors work using Bibliometrix R tool and Scopus database

H. Co-Occurrence of Authors Keywords

To delve deeper into the study of fiscal sustainability, an analysis of the repeated use of keywords is conducted to identify research trends and key themes within the field. This approach determines the cognitive structure of the problem under study and enables the construction of a visualization map using content analysis. For this purpose, a network visualization based on scientific publications indexed in the Scopus scientometric database is generated using the VOS viewer toolkit. A map of the relationships formed between fiscal sustainability and other related categories identifies seven clusters, marked in red, green, blue, purple, yellow, orange, and turquoise. A larger circle in the figure represents a higher number of occurrences of a particular concept, indicating that the keyword appears more frequently in the scientific literature. Therefore, the size reflects how often the term is used alongside "fiscal sustainability" in articles indexed in the Scopus scientometric database. Analyzing keyword co-occurrence is helpful in understanding the relatedness of terms within research articles, which assists researchers in grasping ongoing trends and patterns in the literature. The above network shows seven clusters, 1,446 connections/occurrences (keyword co-occurrences), and a total connection strength of 1,908 (the number of publications in which two terms are used together). A brief description of these is presented in Table IV.
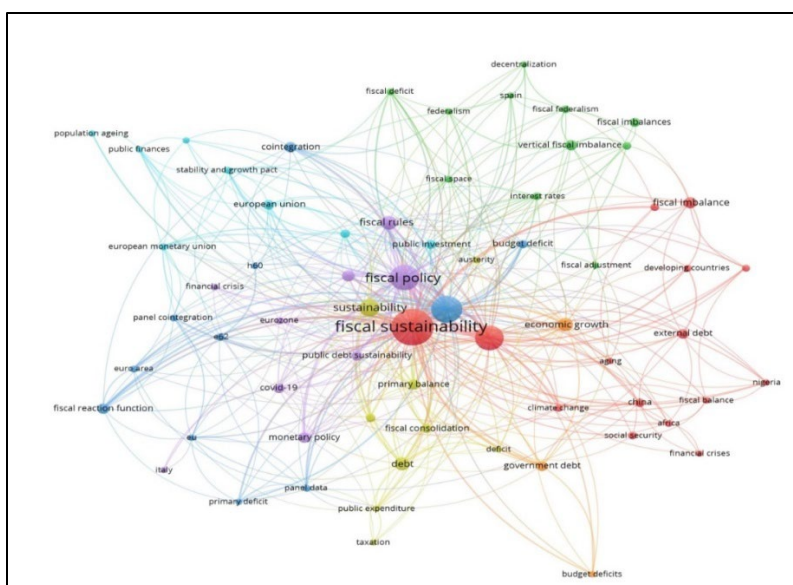
Fig.7 Keywords Co-occurrence Network
Source: Authors work using VOS viewer tool and Scopus database

TABLE IV SUMMARY OF KEYWORDS CO-OCCURRENCES ON FISCAL SUSTAINABILITY

Cluster	Characteristics and example of main keywords
Cluster 1 (red): 15 units of objects	Fiscal Sustainability as an integral component of the sustainable economic development Examples of keywords: fiscal imbalance, social security, fiscal balance, financial crises, developing countries
Cluster 2 (Green): 11 units of object	Fiscal sustainability as a medium to keep proper check of the development of the country Example of keywords: fiscal deficit, vertical fiscal imbalance, interest rates, fiscal space, decentralization, federalism
Cluster 3 (Blue): 11 units of object	Fiscal sustainability as a part of financial system Example of keywords: public debt, budget deficit, primary deficit, fiscal reaction function
Cluster 4 (Yellow): 9 units of object	Fiscal sustainability as a measure of consolidation Example of keywords: primary balance, public expenditure, taxation, public finance, fiscal consolidation, debt, deficit
Cluster 5 (Purple): 9 units of object	Fiscal sustainability as a tool to administer the health of the country Example of keywords: fiscal policy, fiscal rules, monetary policy, public debt sustainability, financial crisis, sovereign debt, covid-19
Cluster 6 (Turquoise): 8 units of object	Fiscal sustainability as a means of stability and growth Example of keywords: public investment, public finance, stability and growth pact, structural breaks, growth
Cluster 7 (Orange): 3 units of object	Fiscal sustainability as part of economic system Example of keywords: budget deficits, economic growth, government debt

Source: Authors' work

I. Bibliographic Coupling of Authors

Bibliographic coupling is a science mapping method that works on a simple idea: if two documents cite the same sources, they are likely to address related topics (Kessler, 1963; Weinberg, 1974). This approach groups publications into thematic clusters by examining the references they share. It is particularly effective when applied to research produced within a defined period, as noted by Zupic and Čater (2015). An article on long-term fiscal sustainability in advanced economies written by Alan J. Auerbach (2016) shows dominance in bibliographic coupling. The study *"Sovereign Debt Composition and Time-Varying Public Finance Sustainability"* by António Afonso and João Tovar Jalles (2017) appears next in the bibliographic coupling analysis. These two works are frequently cited together, indicating a strong connection in their reference patterns. Figure 8 illustrates the bibliographic coupling of authors.
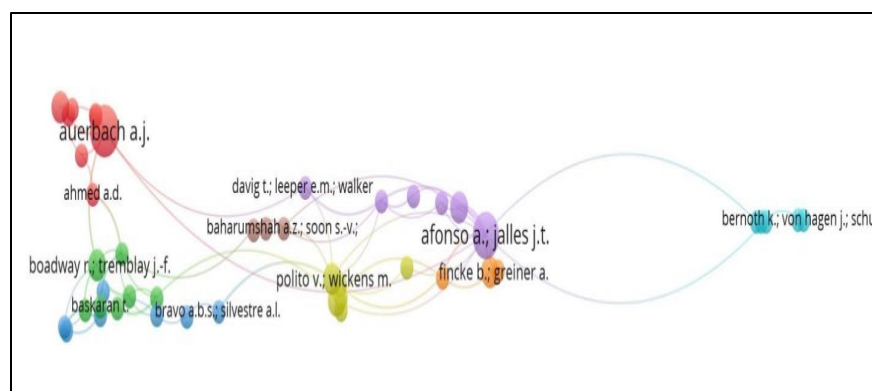
Fig.8 Bibliographic Coupling of Authors
Source: Authors' work using VOSviewer tool and Scopus database

J. Co-Citation Analysis of Cited Authors

Co-citation analysis is another science mapping technique. It assumes that publications cited together are likely to share a common thematic focus (Hjørland, 2013). This analysis is used to uncover the intellectual structure of a research field (Rossetto *et al.,* 2018). In a co-citation network, a link is formed between two works when both appear in the reference list of the same publication. A brief description of the co-citation analysis of cited authors is presented in Table V. An author co-citation network is created when two researchers are cited together in another work, helping to trace how knowledge spreads within the field. Figure 9, generated through VOS viewer, shows the network based on 1,231 journal articles with a threshold limit of 50. Thicker lines indicate stronger links between authors, while larger nodes represent those who hold more central and influential positions in the research landscape. The network indicates that authors such as Bohn, Afonso, Alesina, Blanchard, and Pesaran are highly cited by many other scholars. Five distinct clusters identified in the figure are represented by different colors. The red cluster is the largest, comprising authors such as Alesina, A., Blanchard, O., Rogoff, K., Reinhart, C., Krugman, P., Gupta, S., Panizza, U., and Trebesch, C. In the figure, some nodes are very close to one another, whereas others are more distant, indicating differences in link strength.

TABLE V CO-CITATION ANALYSIS OF CITED AUTHORS

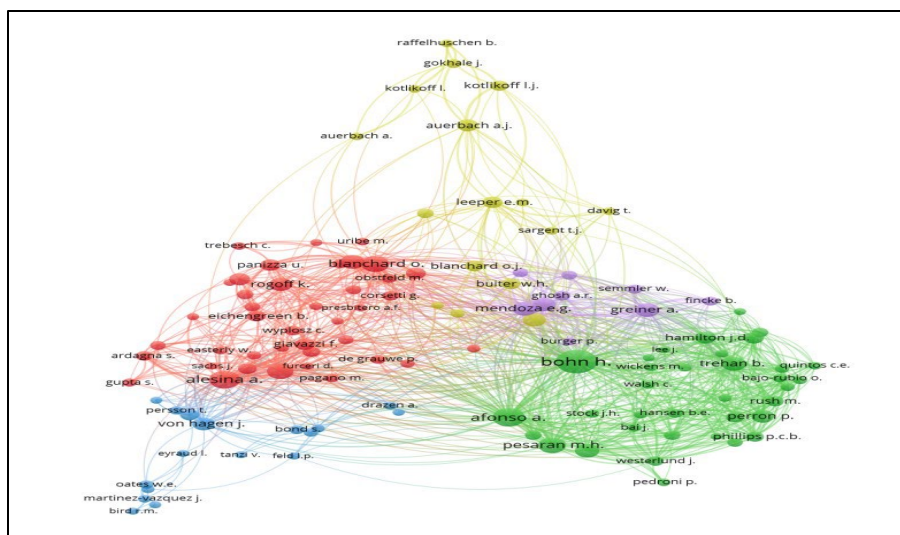| Author	Citations	Total Link Strength
Bohn H.	554	2695
Afonso A.	337	1859
Alesinba	315	1283
Blanchard O.	258	797
Pesaran M.H.	247	1246
Perotti R.	244	1212
Greiner A.	205	1140
Reinhart C.M.	194	621
Mendoza E.G.	192	1026
Trehan B.	191	1157

Fig.9 Co-Citation Analysis Network
Source: Authors work using VOSviewer tool and Scopus database

K. Evolution of Topics

Trending topic analysis is a powerful mapping method that shows the shifting focus of the literature over the years. Figure 10 depicts the topics identified from the authors' keywords, using a minimum frequency threshold of five occurrences per article across intervals of three years. Upon examining the authors' keywords from 1976 to 2023, several prevalent themes emerge, including public debt sustainability, panel data, government expenditures, vertical fiscal imbalances, COVID-19, interest rates, economic growth, budget deficits, debt dynamics, and fiscal performance. The trending topic analysis underscores the evolving and emerging research landscape over the years, aiding in the understanding of how the literature has progressed over time.

This analysis reveals the growing importance of fiscal health issues, especially after the global financial crisis, directing notable trends and in-depth investigations into the pivotal elements shaping fiscal sustainability. The emphasis on topics such as public debt sustainability, fiscal imbalance, fiscal rules, public finance, public debt, fiscal policy, primary balance, fiscal consolidation, and other key components showcases increased awareness of the multiple facets and challenges impacting economic growth and policymaking across countries. The use of methods such as cointegration, alongside fiscal rules and primary balances, portrays a developing analytical landscape within the study of fiscal sustainability.
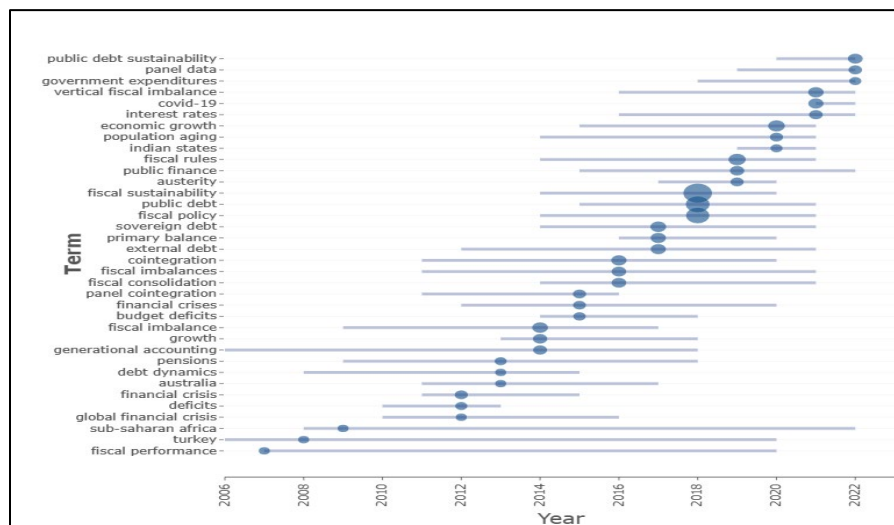

Fig.10 Trend Topics Over the Years Based on the Authors' Keywords
Source: Authors' work using Bibliometrix tool and Scopus database

L. Topics with High Development and Relevance

Based on the concepts of density (level of development) and centrality (degree of relevance), the analysis yields a thematic map categorized into four distinct quadrants. The visual mapping makes it possible to identify four distinct categories of themes, as described by Cahlik (2000), depending on the quadrant in which they are plotted. Themes positioned in the upper-right quadrant are referred to as *motor themes*, representing well-developed and central topics within the research field. This quadrant comprises fiscal policy, debt sustainability, and fiscal rules, which are grouped into one cluster characterized by high centrality and high density.

Themes positioned in the lower-right quadrant are referred to as *basic and transversal themes*. This section encompasses two main clusters. Cluster 1 includes fiscal sustainability, public debt, and sustainability, while Cluster 2 covers vertical fiscal imbalance. These themes exhibit high centrality but low density, indicating that they are conceptually significant to the field but represent broad, cross-cutting topics spanning multiple areas of research.

The lower-left quadrant represents *emerging or declining themes*. This group contains fiscal imbalance, external debt, and China. These topics show low centrality and low density, suggesting that they are underdeveloped, less integrated into mainstream research, and currently occupy a marginal position within the domain.

The upper-left quadrant corresponds to *highly developed yet isolated themes*. These topics demonstrate strong internal cohesion (high density) but limited external connections (low centrality), meaning that although they are well established within their niches, their overall relevance to the broader field remains limited. This quadrant consists of two clusters: Cluster 1 includes fiscal decentralization and fiscal federalism, and Cluster 2 includes fiscal imbalance.

Each quadrant presents opportunities to deepen understanding of prevailing topics and their causal relationships, which, in turn, helps researchers identify the research landscape and evolving trends within the field.
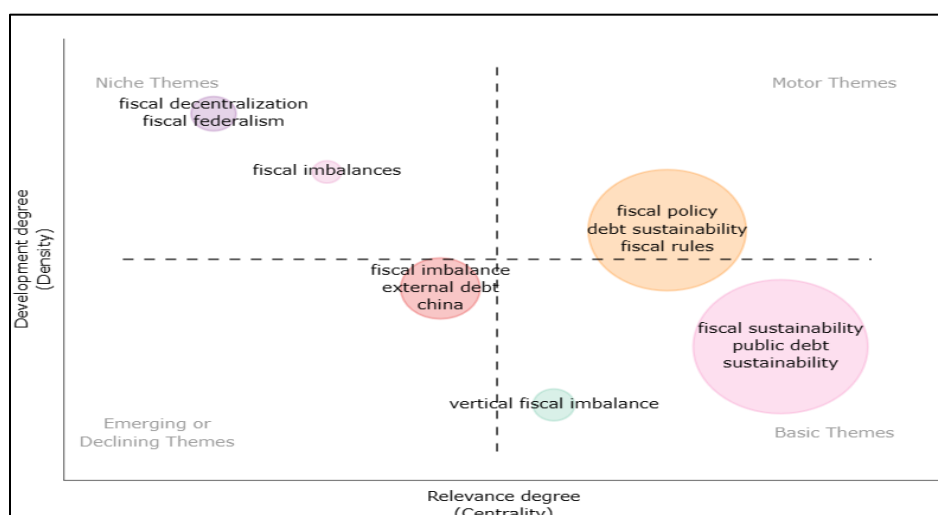
Fig.11 Visualization of Thematic Mapping
Source: Authors' work using Bibliometrix tool and Scopus database

M. Three-Field Plot

A three-field plot analysis was conducted to examine the pattern of flow among keywords (left), contributing authors (center), and publication sources (right). In Figure 12, the size of the boxes corresponds to the associated quantity (keywords, authors, or sources). The visualization represents a three-field plot of scholarly work on fiscal sustainability, highlighting the interconnections among keywords, contributing authors, and publishing journals.
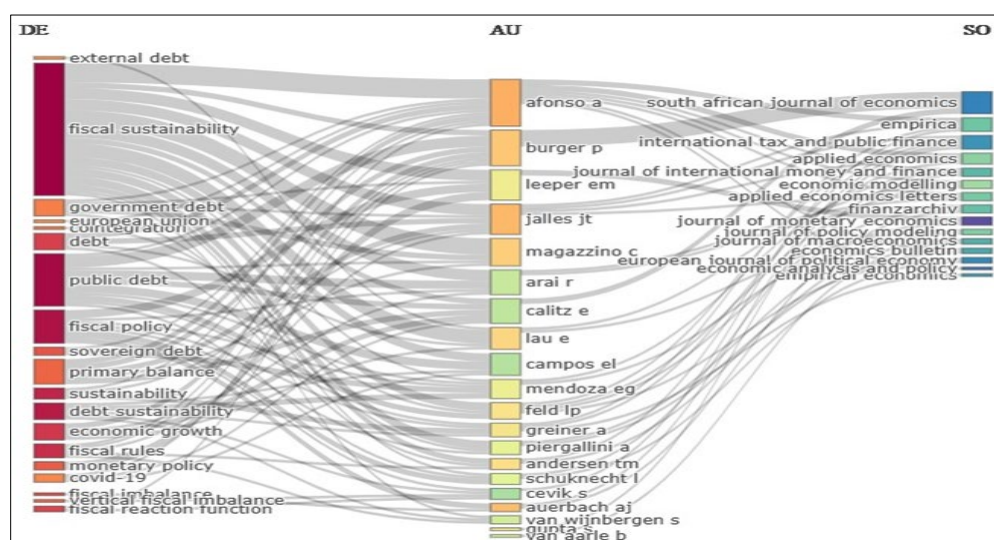

Fig.12 Sankey Diagram for Fiscal Sustainability Research Flow (Keyword-Author-Source)
Source: Authors work using Bibliometrix tool and Scopus database

The network analysis demonstrates that keywords such as "fiscal sustainability," "public debt," "fiscal policy," "debt sustainability," "primary balance," and "economic growth" display the widest linkages, implying frequent use by researchers in this field. Additionally, certain authors, such as Afonso, employ an extensive range of keywords, reflecting the breadth and diversity of their research interests. This suggests that their work encompasses multiple dimensions of fiscal sustainability, as demonstrated by their publications in reputed and wide-ranging journals, including the South African Journal of Economics, Empirica, and International Tax and Public Finance.

IV. FINDINGS OF THE STUDY

This study highlights that fiscal sustainability is more than a measure of solvency or debt control. It should be understood as a continually evolving process that emerges through the interplay between fiscal policy, institutional capacity, and economic resilience. The evolving literature suggests that sustainability depends not only on sound fiscal numbers but also on a government's ability to respond to shocks and maintain policy credibility over time. The patterns observed in global research reveal strong methodological contributions from developed countries, which also top the list in terms of publication output, while

developing nations offer valuable real-world perspectives that largely remain underexplored. Bridging this gap can create a richer and more in-depth understanding of fiscal sustainability.

Looking forward, the concept of fiscal sustainability should not be confined to balancing budgets or managing the debt positions of national and subnational governments; rather, it should take into account new challenges affecting a country's financial health, such as climate risks, including the costs of natural disasters, and digital transitions, that is, how technology reshapes taxation and government spending. To address these issues, future studies should develop integrated models that examine not only revenue and expenditure but also institutional and adaptive capacity, that is, how effectively governments manage their finances and respond to change.

V. CONCLUSION

Fiscal sustainability is a complex area that has attracted increasing attention from researchers in recent years and has become an increasingly demanded component of macroeconomic analysis. It is pertinent to develop a clear understanding of fiscal sustainability, as this can help shape not only present policy actions but also lay the groundwork for future generations. With this vision in mind, the demand for studies on fiscal sustainability has risen in recent years, as governments and researchers alike recognize the need for action. The problem statement or challenge faced by governments, policymakers, and researchers is complex, and the solution is not straightforward; therefore, it is important to analyze and probe the intricacies affecting a country's financial health and attempt to establish linkages among them through research. It is hoped that such efforts will subsequently translate into actionable measures to sustain and grow the economy.

Using a database such as Scopus, this study examines 1,231 articles published between 1976 and 2023 to identify important patterns and potential areas for further research. For the purpose of analysis, the study employed VOS viewer and the Bibliometrix R package to model bibliographic information related to fiscal sustainability. The results show that in recent years there has been growing traction in research publications on fiscal sustainability, as researchers are increasingly interested in examining the financial positions of countries in different economic settings and suggesting measures that may benefit policymakers and improve fiscal conditions. Higher levels of publication output were observed from developed economies such as the United States, the United Kingdom, and Germany. Likewise, the institutions contributing most to fiscal sustainability research are primarily based in the United States and Germany. The findings indicate that there remains significant scope for further research aimed at developing and refining measures of fiscal sustainability, as a country's fiscal health paves the way for economic growth. Several authors, such as Andersen, Auerbach, and Afonso, are actively contributing to the expanding body of scientific literature.

By observing publication patterns, the study suggests the need for greater global collaboration to incorporate diverse insights from authors across different countries, reflecting varied practices and methodological approaches adopted to sustain and enhance economic growth. Keyword analysis using VOS viewer revealed emerging trends and significant developments in keywords across different time periods. An examination of trending topics based on authors' keywords highlights several important assessment methodologies that provide insights into fiscal sustainability across nations. One such methodology is panel data analysis, which enables a comprehensive evaluation of fiscal health and economic trends over time. The visualization of thematic mapping yielded four distinct quadrants, enabling researchers to identify key topics such as fiscal policy, debt sustainability, and fiscal rules, which are characterized by high centrality and density. Analysis of the three-field plot further provides insights into the flow of scholarly research and its publication in diversified journals such as the South African Journal of Economics, Empirica, and International Tax and Public Finance.

This analysis reveals a significant gap in the field of fiscal sustainability, particularly the lack of comprehensive literature reviews that critically assess and evaluate underlying methodologies. The findings emphasize the need to examine fiscal sustainability across diverse economic settings and underscore the importance of such research for governments, policymakers, and researchers.

VI. LIMITATIONS AND SCOPE FOR FUTURE STUDY

This study is also subject to certain limitations. To begin with, the analysis relied exclusively on the Scopus database as the main source of information on fiscal sustainability. Although Scopus provides extensive coverage of peer-reviewed research, it is possible that some relevant publications were not included in this dataset. Future research could expand the scope by integrating additional databases to achieve more comprehensive mapping and to compare outcomes across various bibliometric platforms. Moreover, the search strategy focused specifically on the keyword's fiscal sustainability, fiscal imbalance, debt sustainability, and public debt sustainability within titles, abstracts, and keywords, which may have led to the omission of studies using alternative terminology. Finally, the research gaps identified in this study could be addressed through the application of innovative analytical approaches and by examining emerging factors such as demographic transitions and policy adjustments in response to evolving economic contexts. Recognizing these limitations provides valuable direction for future investigations aimed at strengthening and broadening the understanding of fiscal sustainability.

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