Kurdish Studies
Jan 2024
Volume: 12, No: 1, pp.4589-4610
ISSN: 2051-4883 (Print) | ISSN 2051-4891 (Online)
www.KurdishStudies.net

Received: October 2023 Accepted: December 2023
DOI: https://doi.org/10.58262/ks.v12i1.330

Bibliometric Analysis of Financial Development and Economic Growth: Past Trend, Current Development, and Future Prospects

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Abstract

Purpose – The research objective is to perform a bibliometric analysis on 662 Scopus database documents published between 1986 and 2022. Design/methodology/approach – In the current study, citation metrics and analysis were performed using Harzing's Publish or Perish, Tableau Public, Biblioshiny - Rstudio, and Microsoft Excel and VOSviewer for frequency analysis and data visualization. Findings - The results have been presented in graphs, tables, and knowledge maps on the historical patterns, growth, and prospects utilizing co-occurrence, co-authorship, and co-citation analysis using the methodologies above. This study has identified famous writers, publications, countries, academic institutions, and potential career options. The results show that the majority of publications are from China (114, 17.22%), followed by Turkey (65, 9.81%) and Malaysia (9.36%). The University of South Africa (18, 2.71%) in South Africa is the academic institution with the highest productivity. This study offered fresh directions for future research on financial innovation and economic expansion, including green finance, FinTech and financial digitization, sustainability, and green investment. Originality/value – This study is the first to examine papers on financial development and economic growth in the Scopus science database, to the best of the author's knowledge.

Keywords: *Bibliometric analysis, financial development, economic growth, VOSviewer, and Harzing's Publish and Perish.*

1. Introduction

Financial development, particularly in the banking industry and stock market, has been recognized as a key driver of economic growth (Shahbaz et al., 2018; Levine, 2005). The relationship amidst the development of finance and growth of the economy has been extensively studied, but there are still unresolved questions and divergent views among economists. While some critics argue that finance is overemphasized in economic growth, others emphasize the undeniable positive impact of financial markets and banking systems on economic development, especially in developing countries (IMF, 2015).

The importance of financial development in stimulating economic growth has been acknowledged for more than a century, with the recognition of the role of bank loans and the creation of stock markets (Levine, 2005). Recent literature has further explored the relationship between financial sector growth and economic expansion (Levine, 2005; Khan and Luintel, 1999; Shahbaz et al., 2013; Demirgüç-Kunt and Levine, 2018; Nyasha and Odhiamo, 2014; Ibrahim

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and Alagidede 2017, Ibrahim and Alagidede 2018, Pradhan et al., 2015; Arvin et al., 2018). However, despite the acknowledged economic and social relevance of the finance-growth nexus, there has been no systematic literature evaluation or bibliometric analysis of this topic.

This study aims to bridge this research gap by conducting a comprehensive performance analysis combining scientific mapping and both qualitative and quantitative methodologies, to identify future research areas related to the connection between financial development and economic growth. By examining historical trends, recent advancements, and future directions, this study will analyze the extensive literature spanning 37 years on the finance-growth nexus.

The research questions that this study seeks to address are as follows: (1) What changes have occurred in the annual and global patterns of publication over time? (2) Which papers and publications are considered most influential? (3) Who are the most prolific authors? (4) Which organizations and countries have made significant contributions? (5) What are the patterns of author keyword co-occurrence and co-citation? (6) What networks are starting to emerge depending on the author's keyword publication years? To answer these questions, a bibliometric analysis combined with innovative visualization techniques will be employed.

The use of bibliometric analysis is particularly valuable in understanding the spike in publications and the influence of the research topic. This study intends to provide a thorough knowledge of the conceptual framework of the development of finance and growth of the economy nexus by analysing the performance of scientific actors such as keywords, documents, authors, and journals and applying co-occurrence and co-citation analyses. We'll visualise the relationships and find similar themes using knowledge maps and network diagrams. By conducting a detailed investigation of bibliometric knowledge maps and co-occurrence and co-citation analyses, this study will contribute to the identification of new areas of interest for future research. Additionally, bibliometric analysis offers an objective and analytical approach to address subjectivity bias that is often present in surveys and literature reviews. Therefore, analyzing the link amidst the development of finance and growth of the economy using bibliometrics is a sensible and pertinent approach.

With regard to the time frame and quantity of papers examined, this study is the most extensive and comprehensive. Significant occurrences including the global financial crisis, volatility in the price of oil, the economic effects of the COVID-19 pandemic, and technological developments in the banking sector, particularly the advent of FinTech and financial digitalization, are all taken into account. The findings of this study will serve as a foundation for research scholars, academics, practitioners, and policymakers to identify research themes and guide future investigations in the development of finance and growth of the economy nexus.

There are five sections in the article. The introduction is presented in Section one, and the literature and theoretical support for the relationship between finance and growth are covered in Section 2, which follows. The study technique and analytic software are described in section three. The findings regarding new hotspots for future research initiatives are presented in section four. The paper is concluded in section five, which also discusses the results.

2. Literature Review

Long-term economic growth is closely correlated with the effectiveness of the financial system, as supported by numerous empirical studies (Levine, 2005). These studies encompass various levels of analysis, including company-level, organization-level, nation-specific, time-lapse, panel,

and cross-country comparisons. Recent econometric studies demonstrate that both markets and financial intermediaries contribute to economic growth, and this relationship is not solely driven by reverse causality. Microeconomic theory also supports the notion that a well-functioning financial system facilitates economic growth by promoting the development of external finance. However, the relationship amidst development of the finance and growth of the economy remains complex and subject to unresolved issues and disagreements.

While several studies provide evidence for a positive link amidst growth of the economy and the development of finance (Adu et al., 2013; Hassan et al., 2011; Kargbo & Adamu, 2009; Akinlo et al., 2009; Adjasi & Biekpe, 2006; Levine & Zervos, 1996; King & Levine, 1993; McKinnon, 1973; Goldsmith, 1969; Schumpeter, 1911), there is still ongoing research to understand the precise nature of the interaction between the financial and real sectors. Over the past decade, researchers have explored various factors contributing to economic growth, including investments, human capital, innovation, R&D activities, macroeconomic policies, demographics, geography, politics, institutions, foreign direct investments, and trade openness. Sociocultural influences, such as trust, have also gained attention as potential drivers of economic growth.

It is significant to remember that empirical assessments of financial functions often face challenges due to the difficulty of directly measuring the impact of financial systems on growth-related aspects such as resource mobilization, corporate governance, risk management, and financial exchanges. Existing research has examined laws, regulations, and macroeconomic policies that influence financial development (Beck et al., 2003; Boyd et al., 2001; Huybens & Smith, 1999; LLSV, 1997, 1998; Roubini & Sala-i-Martin, 1992, 1995; Bencivenga & Smith, 1992), shedding light on the specific factors that affect the functioning of financial development.

The role of development of the finance in growth of the economy is widely discussed within the context of finance-led growth theory. However, there is a gap in the literature regarding both the literature review and the bibliometric analysis that comprehensively examine the relationship amidst the development of finance and growth of the economy. This study aims to fill this gap by employing bibliometric analysis as the main approach.

In summary, the empirical evidence indicates a strong positive correlation between long-term growth of the economy and the effectiveness of the financial system. While various factors contribute to economic growth, the relationship amidst the development of finance and growth of economy remains complex and subject to ongoing research. Addressing the challenges in measuring financial functions and understanding the specific factors that influence financial development is crucial for comprehending this relationship. Additionally, there is a need for a comprehensive literature review and bibliometric analysis to further our understanding of the connection between development of finance and growth of economy.

2.1 Bibliometric Analysis

The studies on the interaction between development of finance and economic expansion that are listed in the Scopus database are thoroughly examined in this bibliometric study. It is believed that a trustworthy method for assessing scientific publications is bibliometric analysis (Adnan et al., 2022, Zhang et al., 2019, Liu et al., 2014). Bibliometrics is a useful and trustworthy method for organizing information and generating analytical output (Liu et al., 2020). Although it is only recently being used in finance (Adnan et al., 2022). By charting the development of prior trends and recent advancements, the authors expect to significantly contribute and provide an excellent resource for potential future research by examining the research on the relationship amidst the development of finance and growth of economy utilizing network mapping and quantitative methods (Adnan et al., 2022; Ali et al., 2022; and Maia et al., 2019).

3. Methods

In this bibliometric study, we analyzed papers related to "economic growth" and "financial development" in the Scopus scientific database. The study examined papers from all categories published between 1986 and 2022. The Scopus database is a widely respected source of information in the scientific community.

Using the search terms "economic growth" and "financial development" in the article titles, we identified relevant papers on the relationship between finance and economic growth in various languages. We excluded erratum and duplicate documents to ensure accurate counting.

Figure 1 depicts our search approach. A bibliometric study was conducted on all of the documents. This study made use of the following:

- The frequency percentage of each publication was calculated using Microsoft Excel 2019 and the corresponding graphical representations were made;
- the bibliometric networks will be created and visualized using VOSviewer (version 1.6.19); and
- The citation metrics were calculated using the Harzing's Publish and Perish tool.
- Tableau Public 2022.4. Ink tool was used to visualize the worldwide scientific production indexed by Scopus on financial development and economic growth.
- Biblioshiny – Rstudio, the tool used to visualize the annual scientific production, and the average citation per year.

3.1 Search Strategy

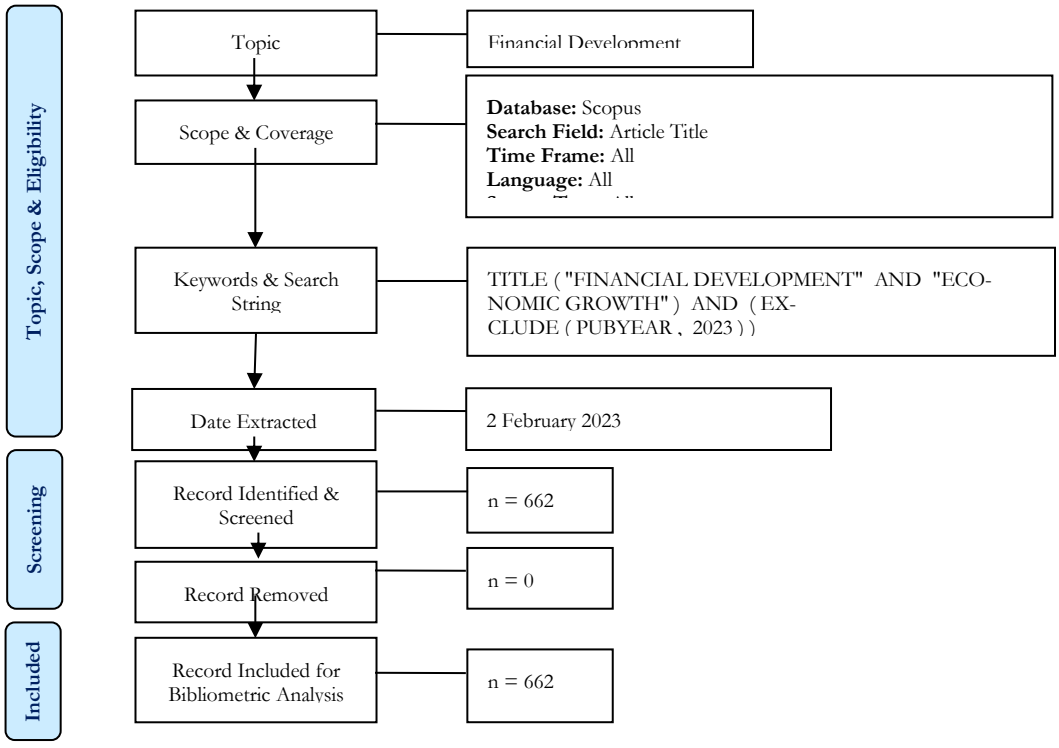

Figure 1: Flow Diagram of the Search Strategy.
Source: Zakaria et al. (2020), Moher et al. (2009)

3.2 Organization of Data

This section focuses on organizing downloaded data files in "CSV" format and importing them into various analysis tools. Microsoft Excel 2019, Tableau Public, VOSviewer 1.6.19, and Harzing's Publish or Perish were used in the analysis. The "export refine" file was downloaded to determine annual publications. The papers were analyzed in Microsoft Excel, checking for duplicates, review articles, missing author names, and other issues. The identified article "EIDs" were used to refine the search, and the final list was downloaded for further analysis and knowledge mapping using VOSviewer. The downloaded ".csv" file was then imported into Excel for data analysis and charting, and another ".csv" file was generated for bibliometric mapping in VOSviewer.

4. Results

This section presents the results of the bibliometric analysis conducted in this study to address the research objectives. The study aimed to examine the current trends and outcomes of academic publications in the field of financial development and economic growth, identify the most influential nations, organizations, and authors, and highlight important studies in this area. Various characteristics of the extracted academic work were analyzed, including the annual growth of publications, source types, document and language sources, subject areas, keyword analysis, publication distribution by countries, authorship analysis, title and abstract analysis, and citation analysis. The results provide insights into the current patterns and impact of the subject matter. The data for this research was gathered from the Scopus database. The discussion on yearly growth to 2022 demonstrates the trends and effects of various publication types on financial development and economic growth.

4.1 Documents Profiles

When evaluating gathered data, the document's kind and source are taken into account. The legitimacy of the document determines its type, such as "article," "conference paper," or "book chapter." The source type indicates where the document came from, like a book series, journal, or conference paper. It's important to note that the document type may differ from the source type. For example, a conference paper is a document type published during a conference, but it can be categorized based on its source type, such as an entire journal article, conference paper, or book chapter. Table (1) summarizes nine categories of informational resources related to finance and economic growth. Articles constitute 87.16% of all publications, followed by conference papers at 4.38%. Other types of texts make up less than 8.46% of the total. In this study, the documents used were classified into nine primary sources, with articles (87.16%) being the highest, followed by conference papers (4.38%). Book chapters and reviews each contribute significantly, accounting for 3.47% and 3.32%, respectively (see Table 1).

The language has been examined to see which language has most research published in it after identifying the document and source type.

Table 1: Document Type.

Document Type	Total Publications (TP)	Percentage (%)
Article	577	87.16%
Conference Paper	29	4.38%
Review	23	3.47%
Book Chapter	22	3.32%
Note	4	0.60%
Book	2	0.30%
Erratum	2	0.30%
Retracted	2	0.30%
Letter	1	0.15%
Total	662	100.00

Table 2: Source Type.

Source Type	Total Publications (TP)	Percentage (%)
Journal	608	91.84%
Conference Proceeding	26	3.93%
Book	21	3.17%
Book Series	7	1.06%
Total	662	100.00

Languages of Documents

According to Table 3, the journals' major language of communication is English, which account for 95.95% of all publications. Moreover, several documents included multiple languages, such as French, Spanish, Russian, Bulgarian, and Chinese, however these languages made only a small portion of all published documents overall.

The final characteristic in recognizing the current trends in a field, knowing the current linguistic trends indicates which industries have seen the most financial development and economic growth.

Subject Area

This study categorizes the published documents from Table (4) into different subject groups. The distribution reveals literature on finance and economic growth across various fields, including "Economics," "Econometrics and Finance," "Business Management and Accounting," "Social Sciences," and "Energy." Social sciences account for approximately half of the papers (62.84%), ranking second (27.49%) after economics, econometrics, and finance. The study also examines the most productive and influential countries, organizations, and authors in these fields, addressing the second question by organizing articles according to country.

Table 3: Languages.

Language	Total Publications (TP)*	Percentage (%)
English	640	95.95%
French	11	1.65%
Spanish	7	1.05%
Russian	3	0.45%
Bulgarian	2	0.30%
Chinese	1	0.15%
Total	662	100.00

Table 4: Subject Area

Subject Area	Total Publications (TP)	Percentage (%)
Agricultural and Biological Sciences	8	1.21%
Arts and Humanities	9	1.36%
Biochemistry, Genetics and Molecular Biology	3	0.45%
Business, Management and Accounting	159	24.02%
Chemical Engineering	7	1.06%
Chemistry	2	0.30%
Computer Science	30	4.53%
Decision Sciences	10	1.51%
Earth and Planetary Sciences	8	1.21%
Economics, Econometrics and Finance	416	62.84%
Energy	68	10.27%
Engineering	42	6.34%
Environmental Science	74	11.18%
Materials Science	3	0.45%
Mathematics	27	4.08%
Medicine	5	0.76%
Multidisciplinary	5	0.76%
Pharmacology, Toxicology and Pharmaceutics	4	0.60%
Physics and Astronomy	2	0.30%
Psychology	6	0.91%
Social Sciences	182	27.49%

4.2 Publication Trends

Table (5) provides a summary of yearly publications on the development of finance and economic growth nexus from 1986 to 2022. The first study on this topic was conducted by Jung, W.S. in 1986, as indicated by the Scopus database. The table shows that the majority of publications (86, 12.99%) were in 2022. It also presents the number of research publications on the lin amidst the development of finance and growth of the economy gathered by year. The most cited documents were from 1997, with a total of 3296 citations on average, while the publications from 1990 received the fewest citations.

Table 5: Year of Publication.

Year	TP	%	Cumm. %	NCP	TC	C/P	C/CP
1986	1	0.15%	0.15%	1	274	274.00	274.00
1990	1	0.15%	0.30%	1	2	2.00	2.00
1991	1	0.15%	0.45%	1	9	9.00	4.50
1993	1	0.15%	0.60%	1	43	43.00	43.00
1994	1	0.15%	0.76%	1	55	55.00	55.00
1995	2	0.30%	1.06%	2	601	300.50	300.50
1996	3	0.45%	1.51%	3	953	317.67	317.67
1997	2	0.30%	1.81%	2	3296	1648.00	1648.00
1998	1	0.15%	1.96%	1	37	37.00	37.00
1999	4	0.60%	2.57%	3	190	47.50	63.33
2000	2	0.30%	2.87%	2	160	80.00	80.00
2001	4	0.60%	3.47%	4	648	162.00	162.00
2002	5	0.76%	4.23%	5	353	70.60	70.60
2003	8	1.21%	5.44%	8	1341	167.63	167.63
2004	5	0.76%	6.19%	5	727	145.40	145.40
2005	7	1.06%	7.25%	7	423	60.43	60.43
2006	7	1.06%	8.31%	7	605	86.43	86.43
2007	6	0.91%	9.21%	6	68	11.33	11.33
2008	16	2.42%	11.63%	15	705	44.06	47.00
2009	22	3.32%	14.95%	21	705	32.05	33.57
2010	19	2.87%	17.82%	14	166	8.74	11.86
2011	25	3.78%	21.60%	18	944	37.76	52.44
2012	30	4.53%	26.13%	26	1334	44.47	51.31
2013	26	3.93%	30.06%	19	2410	92.69	126.84
2014	34	5.14%	35.20%	26	819	24.09	31.50
2015	35	5.29%	40.48%	32	2539	72.54	79.34
2016	34	5.14%	45.62%	28	713	20.97	25.46
2017	44	6.65%	52.27%	42	1865	42.39	44.40
2018	43	6.50%	58.76%	37	1744	40.56	47.14
2019	53	8.01%	66.77%	47	2058	38.83	43.79
2020	59	8.91%	75.68%	51	1102	18.68	21.61
2021	75	11.33%	87.01%	65	1235	16.47	19.00
2022	86	12.99%	100.00%	49	645	7.50	13.16

Notes: TP=Total Number of Publications; NCP=Number of Cited Publications; TC=Total Citations; C/P=Average Citations Per Publication; C/CP=Average Citations Per Cited Publication; H=H-Index; And G=G-Index.

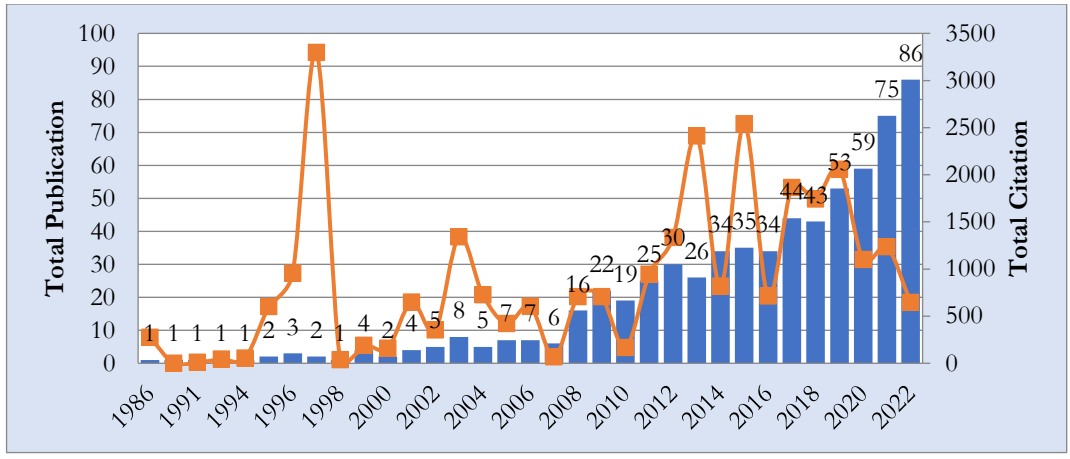

Figure 2: Total Publications and Citations by Year.

There are several reasons for the increased quantity of financial development research in recent years, as depicted in Figures 2 and 3. Firstly, globalization has emphasized the importance of financial development for economic growth and stability, as countries integrate into the global economy and recognize the need for effective financial systems (Levine, 2020). Secondly, financial crises, such as the 2008 global financial crisis, have underscored the significance of financial stability and regulation, sparking research on the role of the development of finance in promoting growth and stability (Barth, Caprio, and Levine, 2013). Thirdly, technological innovation, particularly in fintech, has created new opportunities and challenges for financial development, with the potential to enhance access, efficiency, and reduce costs (Ward and Dashi, 2020). Fourthly, there is an increasing interest in the role of financial development in addressing income and wealth inequality by providing access to underserved populations (Ali and Kamran, 2021). Lastly, advances in econometric models have contributed to research innovation, enabling the exploration of emerging subjects like the relationship amidst the development of finance and the economy, environment, and energy (resulting in increased publications). The highly cited document during the period of study covered is in the year 1997, due to the highest number of citations which reached 2872 citations by 2022. the paper is written by Levine, R. (1997), titled "Financial Development and Economic Growth: Views and Agenda

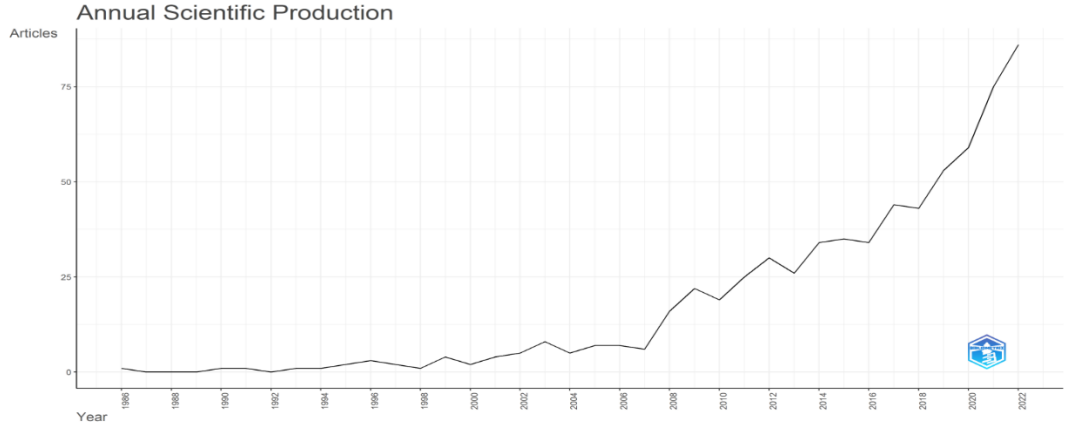

Figure 3: Annual Scientific Production by Year.

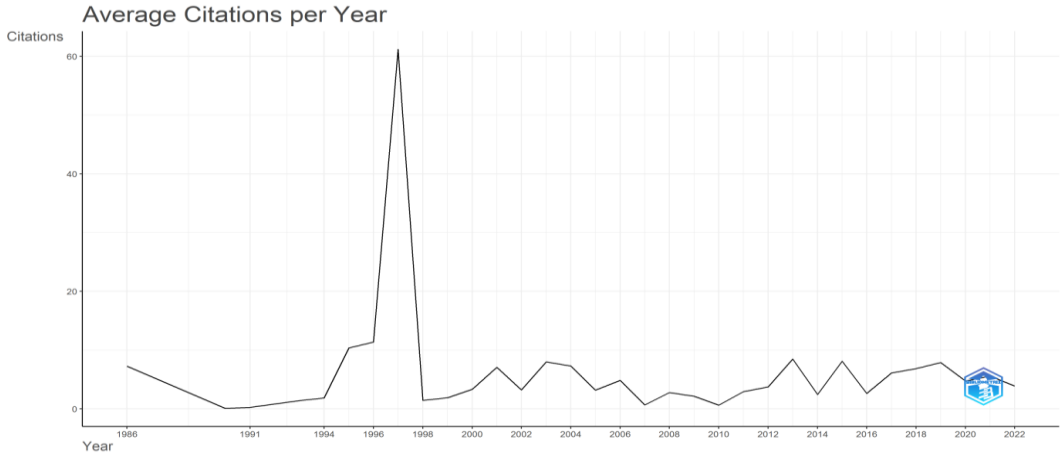

Figure 4: Average Citations per Year.

4.3 Publications by Authors

The examination of the current status of collaborations is the main topic of this section, it highlights the top authors on the relationship between the expansion of the economy and the development of finance. The new study also identifies the most prolific authors who have written about the connection between the expansion of finance and the expansion of the economy. As shown in Table (6), this provides a list of the best-known writers having at least six studies in the field of the relationship between the development of finance and the growth of economy. The most significant authors on the relationship between the development of finance and the growth of economy are Shahbaz, M., and Odhiambo, N.M., who have written 19 and 9 publications on the topic, respectively. On the other hand, Shahbaz, M., was rated top with 2680 citations in terms of the overall number of citations by writers, followed by Ozturk, I. (424).

Table 6: Most Productive Authors.

Author's Name	Affiliation	Country	TP	NCP	TC	C/P	C/CP	*h*	*g*
Shahbaz, M.	Beijing Institute of Technology	China	19	19	2680	141.05	141.05	16	19
Odhiambo, N.M.	University of South Africa	South Africa	9	8	93	10.33	11.63	4	9
Arvin, M.B.	Trent University	Canada	8	1	15	1.88	15.00	5	6
Giri, A.K.	Birla Institute of Technology and Science	India	7	7	189	27.00	27.00	6	7
Murshed, M.	North South University	Bangladesh	7	7	232	33.14	33.14	5	7
Nyasha, S.	University of South Africa	South Africa	7	6	41	5.86	6.83	3	6
Ozturk, I.	University of Sharjah	United Arab Emirates	7	1	424	60.57	424.00	1	1
Pradhan, R.P.	Vinod Gupta School of Management	India	7	7	366	52.29	52.29	6	7
Ibrahim, M.	University for Development Studies	Ghana	6	5	286	47.67	57.20	5	6
Sehrawat, M.	Member of American Economic Association (AEA)	United States	6	6	185	30.83	30.83	6	6

Notes: TP=Total Number of Publications; NCP=Number of Cited Publications; TC=Total Citations; C/P=Average Citations Per Publication; C/CP=Average Citations Per Cited Publication; H=H-Index; And G=G-Index.

4.4 Publications by Institutions

This section concentrates on looking at the current status of partnerships and identifying the most active studies of the relationship between the development of finance and the growth of economy. The institute also participates in studies on the relationship between finance and growth that are based on at least 8 publications. The majority of studies on the relationship between the development of finance and the economy have been published by the University of South Africa., based on table 8. COMSATS Institute of Information Technology – Lahore was elevated to the second-highest institution, the Indian Institute of Technology in Kharagpur is next.

Table 7: Most Productive Institutions with a Minimum of Eight Publications.

Affiliation	Country	TP	NCP	TC	C/P	C/CP	*h*	*g*
University of South Africa	South Africa	18	16	211	11.72	13.19	7	14
COMSATS Institute of Information Technology Lahore	Pakistan	15	14	2110	140.67	150.71	12	15
Indian Institute of Technology Kharagpur	India	11	11	581	52.82	52.82	9	11
Beijing Institute of Technology	China	10	10	788	78.80	78.80	10	10
University of Southern Queensland	Australia	9	9	979	108.78	108.78	7	9
University of Sfax	Tunisia	9	8	561	62.33	70.13	6	9
North South University	Bangladesh	8	8	243	30.38	30.38	5	8
Universiti Malaya	Malaysia	8	8	1093	136.63	136.63	7	8
Trent University	Canada	8	8	381	47.63	47.63	7	8
COMSATS University Islamabad	Pakistan	8	8	324	40.50	40.50	7	8

Notes: TP=Total Number of Publications; NCP=Number of Cited Publications; TC=Total Citations; C/P=Average Citations Per Publication; C/CP=Average Citations Per Cited Publication; H=H-Index; And G=G-Index.

4.5 Publications by Countries

This section examines the current state of cooperation and identifies the nation that will have the greatest impact on global development of finance and the growth of economy. Documents compiled from the Scopus database on the development of finance and the growth of economy has been published by academics from 97 various countries. The most active countries that made contributions to studies on the finance-growth nexus are shown in table 9. China was ranked 1st with 114 total articles; Turkey was ranked 2nd with 65 total publications; Malaysia was ranked 3rd with 62 total publications; and Pakistan was ranked 4th with (59) publications.

Table 8: Top 10 Countries Contributed to the Publications.

Country	TP	NCP	TC	C/P	C/CP	*H*	*G*
China	114	83	2998	26.30	36.12	31	54
Turkey	65	47	3335	51.31	70.96	21	57
Malaysia	62	56	3357	54.15	59.95	21	57
Pakistan	59	54	3108	52.68	57.56	23	55
India	49	45	2912	59.43	64.71	22	49
United States	47	43	3743	79.64	87.05	24	47
United Kingdom	42	39	3220	76.67	82.56	22	42
South Africa	40	35	1214	30.35	34.69	15	34
Australia	36	34	2508	69.67	73.76	22	36
Nigeria	30	29	624	20.80	21.52	10	24

Notes: TP=total number of publications; NCP=number of cited publications; TC=total citations; C/P=average citations per publication; C/CP=average citations per cited publication; h=h-index; and g=g-index.

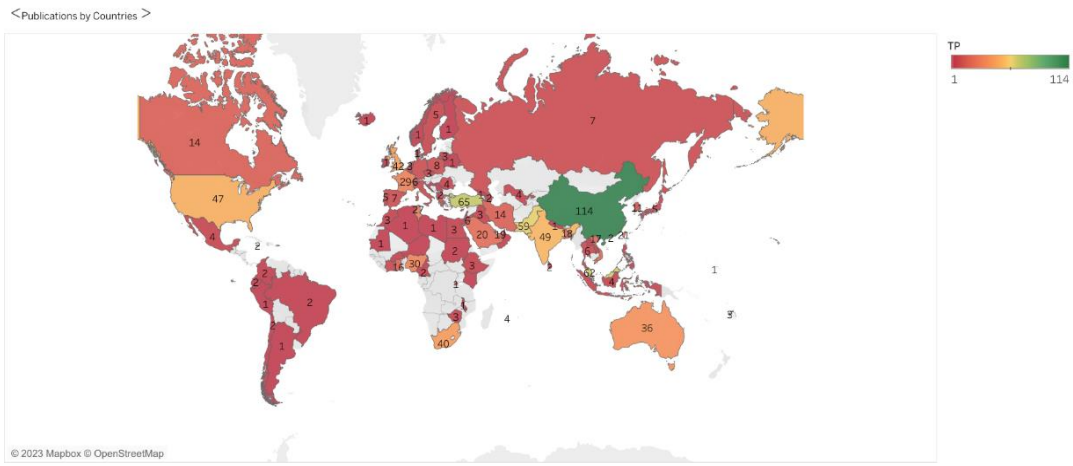

Figure 5: Worldwide Scientific Production Indexed by Scopus on Financial Development and Eco-nomic Growth.

4.6 Publications by Source Titles

Table (10) presents the top 14 journals in the literature on the relationship between financial development. Elsevier Ltd. owns four journals, followed by Springer (2), Taylor and Francis Ltd. (2), Multidisciplinary Digital Publishing Institute (MDPI) (1), and John Wiley & Sons Ltd. (1). Among these journals, Environmental Science and Pollution Research (Springer) is the most active with 30 articles and 1016 citations. It focuses on environmental science and allied fields. Applied Economics (Taylor and Francis Ltd.) is the second journal with 13 publications and 458 citations, followed by Cogent Economic and Finance (Taylor and Francis Ltd.) with 11 articles and 1301 citations. Economic Modelling (Elsevier Ltd.) ranks fourth in terms of the quantity of publications, with 11 articles and 1301 citations. Environmental Science and Pollution Research (Springer) has the highest number of citations, while Renewable and Sustainable Energy Reviews (Elsevier Ltd.) ranks 12th with eight articles and 2337 citations. Renewable and Sustainable Energy Reviews and Energy Economics are classified as high-impact factor journals.

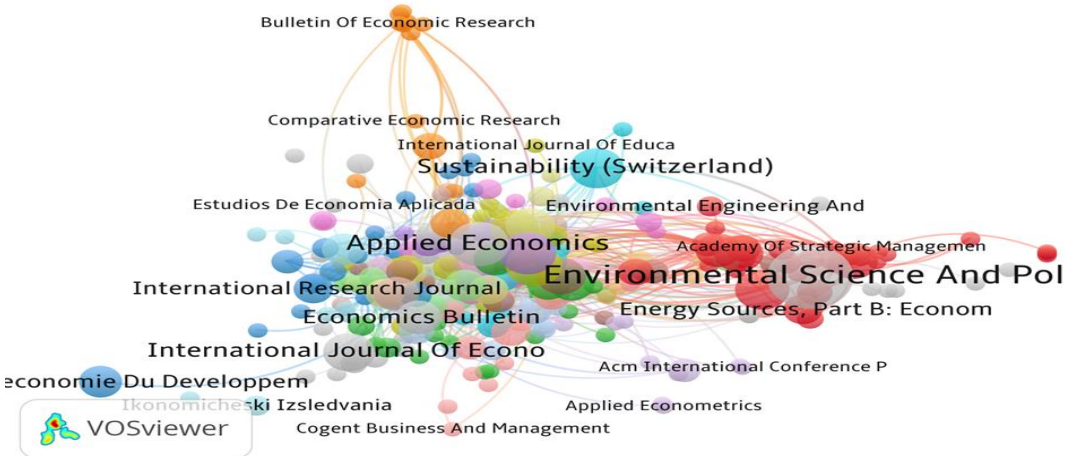

Figure 6: Network Visualization Map of the Citation by Source Titles.

The CiteScore measure, which is based on data on citations from the Scopus database, is viewed as an alternative to the impact factor for evaluating journal impact (Ali et al., 2022b). By examining these journals' impact factors, Table (10) illustrates that Renewable and Sustainable Energy Reviews have the highest impact factor (IF) (16.79); Journal of Energy Economics (7.04), Environmental Science and Pollution Research (5.19), Economic Modeling (3.92), and Sustainability Switzerland (3.9) are the publications that come after.

Similarly, Table (10) illustrates that Renewable and Sustainable Energy Reviews with CiteScore (28.5), SJR (3.67) is leading; followed by Energy Economics Journal with CiteScore (11.3), SJR (2.54); Environmental Science and Pollution Research CiteScore (6.6), SJR (0.83); Sustainability Switzerland CiteScore (5), SJR (0.66); Energies CiteScroe (5), SJR (0.65); and Economic Modelling CiteScore (4.8), SJR (1.065).

The publications where the articles appeared as well as the findings of a citation analysis of the connection between the development of finance and the expansion of the economy are shown in Figure (6). Using VOSviewer, this was done to group the journals according to the mentioned sources. The journals are the items whose names are displayed in boxes. The journal's box label grows in size in proportion to the journal's weight (Van Eck & Waltman, 2020). The journals are organized into ten-color clusters, and it can be seen that the literature on the relationship between the development of finance and the growth of economy is commonly published in journals in the domains of environmental sciences and pollution (white color), as well as economics, finance, and econometrics (gray color).

Table 9: Most Active Source Titles.

Source Title	Tp	Tc	Publisher	Cite Score	Sjr 2020	Snip 2020
Environmental Science and Pollution Research	30	1016	Springer	6.6	0.831	1.154
Applied Economics	13	458	Taylor and Francis Ltd.	2.8	0.563	1.086
Cogent Economics and Finance	11	292	Taylor and Francis Ltd.	2.3	0.411	1.061
Economic Modelling	11	1301	Elsevier	4.8	1.065	1.733
International Journal of Energy Economics and Policy	10	203	EconJournals	4.1	0.38	0.89
Sustainability Switzerland	10	186	Springer Nature Switzerland AG	5	0.664	1.31
International Journal of Economics and Financial Issues	9	34	EconJournals	-1	(2019) 0.203	0.799
Applied Economics Letters	8	258	Routledge	1.8	0.4	0.663
Energies	8	58	Multidisciplinary Digital Publishing Institute (MDPI)	5	0.653	1.104
International Journal of Finance and Economics	8	192	John Wiley and Sons Ltd	2.1	0.424	0.976
Journal Of Policy Modeling	8	675	Elsevier	3.9	0.803	1.625
Renewable And Sustainable Energy Reviews	8	2337	Elsevier Ltd.	28.5	3.678	4.535
Economics Bulletin	7	54	Economics Bulletin	0.8	0.239	0.395
Energy Economics	7	1606	Elsevier	11.3	2.549	2.347

Notes: TP=Total Number of Publications; TC=Total Citations; Citescore = Average Citations Received Per Document Published in the Source Title; SJR = Scimago Journal Rank Measures Weighted Citations Received by the Source Title; SNIP = Source Normalised Impact Per Paper Measures Actual Citations Received Relative to Citations Expected for the Source Title's Subject Field.

4.7 Citation Metrics

The metrics for citations for the documents obtained from 1986 to 2022 are summarized in Table (11). Table (11) shows the annual number of citations. The table of citation metrics reveals that over 37 years (1986-2022), 28855 662 published articles received citations, for 779.86 citations on average every year. The most important publication in the field of the development of finance and the growth of economy nexus studies replies to the second RQ, which is addressed in this section of the study. We examined a total of 662 articles using the sum of their citation counts in order to respond to RQ1. Citation analysis is the most popular method of evaluating the impact of research articles, however there are other approaches (Ding and Cronin, 2011). Also, the most frequently referenced papers (based on the total number of citations for each document) are shown in Table 12 from the Scopus database. Levine R. (1997), who received 2872 citations overall and 110.46 citations on average per year, was cited the most in the paper "Financial Development and Economic Growth: Perspectives and Agenda".

Publications by source title that display the trend of themes in accordance with the topics of talks have also been prepared in order to further investigate the predominant themes.

Table 10: Citations Metrics.

Metrics	Data
Papers	662
Number of Citations	28855
Years	37
Citations per Year	779.86
Citations per Paper	43.59
Citations per Author	15016.08
Papers per Author	342.66
Authors per Paper	2.5
h-index	84
g-index	156

4.8 Highly Cited Documents

The journal papers with the most citations include (Levine, 1997), (Shahbaz et al., 2013), Demetriades, & Hussein (1996) De Gregorio & Guidotti (1995), and Hermes & Lensink (2003).

From the given list of publications on the development of finance and the growth of economy, we can see that the most cited article is "Financial Development and Economic Growth: Views and Agenda" by Levine, R. (1997) with 2872 citations. This article was published in 1997 and has an average citation per year of 110.46.

The second most cited article is "Economic growth, energy consumption, financial development, international trade and CO2 emissions in Indonesia" by Shahbaz, M., Hye, Q. M. A., Tiwari, A. K., & Leitão, N. C. (2013) with 797 citations and an average citation per year of 79.7. We can also observe that most of the articles were published in the 2000s and 2010s, with only a few published before 2000. This suggests that research interest in the relationship between the development of finance and the growth of economy has increased over time.
Another trend that we can observe is that many of the articles focus on the relationship between CO2 emissions, financial development, and energy consumption indicating a growing interest in the intersection of finance, energy, and the environment.

Overall, the list of publications provides a snapshot of the research trends and interests in the field of the development of finance and the growth of economy, showing an increasing interest in the topic over time and a focus on environmental issues.

Table 11: Top 20 Highly Cited Articles.

No.	Authors	Title	Cites	Cites per Year
1	Levine, R. (1997)	Financial Development and Economic Growth: Views and Agenda	2872	110.46
2	Shahbaz, M., Hye, Q. M. A., Tiwari, A. K., & Leitão, N. C. (2013)	Economic growth, energy consumption, financial development, international trade and CO2 emissions in Indonesia	797	79.7
3	Demetriades, P. O., & Hussein, K. A. (1996)	Does financial development cause economic growth? Time-series evidence from 16 countries	671	24.85
4	De Gregorio, J., & Guidotti, P. E. (1995)	Financial development and economic growth	585	20.89
5	Hermes, N., & Lensink, R. (2003)	Foreign direct investment, financial development and economic growth	503	25.15
6	Calderón, C., & Liu, L. (2003)	The direction of causality between financial development and economic growth	494	24.7
7	Shahbaz, M., Tiwari, A. K., & Nasir, M. (2013)	The effects of financial development, economic growth, coal consumption and trade openness on CO2 emissions in South Africa	481	48.1
8	Shahbaz, M., Khan, S., & Tahir, M. I. (2013)	The dynamic links between energy consumption, economic growth, financial development and trade in China: Fresh evidence from multivariate framework analysis	462	46.2
9	Christopoulos, D. K., & Tsionas, E. G. (2004)	Financial development and economic growth: Evidence from panel unit root and cointegration tests	457	24.05
10	Charfeddine, L., & Kahia, M. (2019)	Impact of renewable energy consumption and financial development on CO2 emissions and economic growth in the MENA region: A panel vector autoregressive (PVAR) analysis	437	109.25
11	Arestis, P., Demetriades, P. O., & Luintel, K. B. (2001)	Financial development and economic growth: The role of stock markets	437	19.86
12	Salahuddin, M., Alam, K., Ozturk, I., & Sohag, K. (2018)	The effects of electricity consumption, economic growth, financial development and foreign direct investment on CO2 emissions in Kuwait	424	84.8
13	Arestis, P., & Demetriades, P. (1997)	Financial development and economic growth: Assessing the evidence	424	16.31
14	Omri, A., Daly, S., Rault, C., & Chaibi, A. (2015)	Financial development, environmental quality, trade and economic growth: What causes what in MENA countries	422	52.75
15	Al-Mulali, U., Ozturk, I., & Lean, H. H. (2015)	The influence of economic growth, urbanization, trade openness, financial development, and renewable energy on pollution in Europe	393	49.13
16	Hassan, M. K., Sanchez, B., & Yu, J. S. (2011)	Financial development and economic growth: New evidence from panel data	367	30.58
17	Shahbaz, M., Zakaria, M., Shahzad, S. J. H., & Mahalik, M. K. (2018)	Energy consumption, financial development and economic growth in India: New evidence from a nonlinear and asymmetric analysis	353	58.83
18	Bekhet, H. A., Matar, A., & Yasmin, T. (2017)	CO2 emissions, energy consumption, economic growth, and financial development in GCC countries: Dynamic simultaneous equation models	341	56.83
19	Al-Mulali, U., & Sab, C. N. B. C. (2012)	The impact of energy consumption and CO2 emission on the economic growth and financial development in the Sub Saharan African countries	331	30.09
20	Salahuddin, M., Gow, J., & Ozturk, I. (2015)	Is the long-run relationship between economic growth, electricity consumption, carbon dioxide emissions and financial development in Gulf Cooperation Council Countries robust?	282	35.25

4.9 Top Keywords

From the table, we can see that "Economic Growth" and "Financial Development" are the top two author keywords in the field of research on the development of finance and the growth of economy. "Economic Growth" has 510 documents published, measuring for 77.04% of all publications, while "Financial Development" has 452 documents published, measuring for 68.28% of all documents published. This indicates that the research focus in this field is largely on the relationship between the growth of economy and the development of finance.

Additionally, we can observe that the number of documents published on "Economic Growth" has grown larger over time, indicating a growing interest in this topic. However, the number

of publications on "Financial Development" has been relatively stable, indicating that this topic has been of consistent interest in the research community.

Other notable author keywords include "Finance", "Economic Development", and "Economic and Social Effects", which all have relatively high percentages of publications. This suggests that these topics are also of interest to researchers in this field.

Overall, the analysis of the number of author keywords of publication on the development of finance and the growth of economy research indicates a strong focus on the relationship between the growth of economy and the development of finance, with other related topics also receiving attention from researchers.

Table 12: Top 20 Author's Keywords.

Author Keywords	Total Publications (TP)	Percentage (%)
Economic Growth	510	77.04%
Financial Development	452	68.28%
Finance	102	15.41%
Economic Development	96	14.50%
Economic Growths	87	13.14%
Economic And Social Effects	79	11.93%
Financial System	75	11.33%
Economics	57	8.61%
Carbon Dioxide	52	7.85%
Financial Market	52	7.85%
Panel Data	48	7.25%
Granger Causality Test	41	6.19%
Economic Analysis	40	6.04%
Energy Consumption	40	6.04%
Trade Openness	39	5.89%
Empirical Analysis	37	5.59%
Granger Causality	37	5.59%
Energy Utilization	33	4.98%
Energy Use	31	4.68%
Cointegration	30	4.53%

4.10 Co-Occurrence Analysis

4.10.1 Co-Occurrence Analysis of Author's Keywords

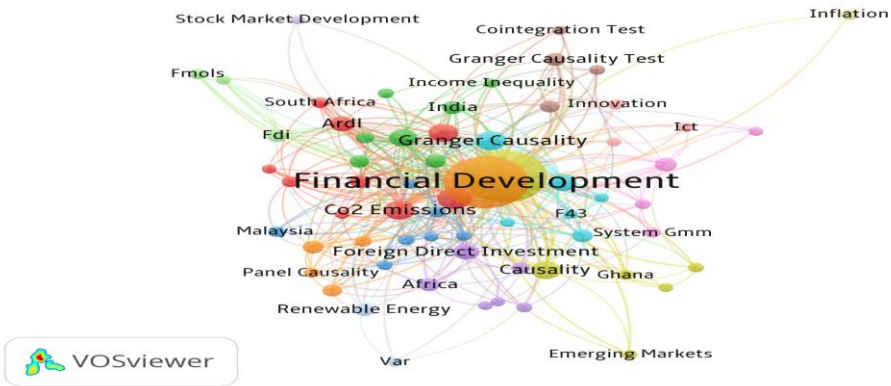

Figure 7: Network Visualization of the Author's Keywords.

The fundamental tenet of the results of the author's keyword analysis is adequate to have an impact on the substance of the piece (Adnan et al. 2022). When two keywords appear in the

article simultaneously, this is known as co-occurring keywords, and it shows that the two topics are related. To solve the last study question, we use the VOSviewer software's keyword and co-occurrence analysis. To map the keywords provided to each page, authors utilized VOSviewer, a program to generate and visualize bibliometric networks (Figure 13). The graphic shows a keyword map visualization created by VOSviewer that highlights the strength of connections between terms through color, circle size, font, and the thickness of connecting lines. The same color is frequently used to group together related keywords. Based on the analysis, (18) clusters in the research on the relationship between the development of finance and the growth of economy have been created using the author's keywords. For instance, the diagram implies that economic growth (colored yellow) and financial development (colored orange) are strongly related and commonly seen together.

To better comprehend the recurrent themes, citation analysis has been done after keyword analysis.

4.10.2 Co-occurrence Analysis of Terms Based on Title and Abstract

In this study, titles and abstracts from gathered documents were checked using VOSviwer based on the volume and timing of occurrences. To be specific, this research builds a co-occurrence network using the binary counting method. In collaboration with the creators of VOSviewer, a binary counting technique is adopted, in which the frequency of the nominal phrase in the publication title has no appreciable bearing (Van Eck and Waltman, 2014). Noun phrases that appear in a publication title just once are handled the same way as noun phrases that appear, for instance, 10 times, according to Adnan et al., (2022).

The title and abstract fields will determine, Figures (10, 11, and 12) display a representation of a term co-occurrence network where at least 10 terms are present. Being the hub of the entire network, Figure (12) uses the keyword "mining" from publications on the relationship between the development of finance and the growth of economy. The node's size reveals the item's weighty appearance, while the connecting line's density reveals how strongly the things are connected. Similar-colored words frequently appear together when shown together. The following illustration, for instance, argues that the terms "financial development," "finance," "banking sector," "credit," "liquid liabilities," "savings," and other terms highlighted in red are interconnected and frequently occur at the same time. VOSviewer generated four distinct colors, each of which represented for one of the publication's four clusters.

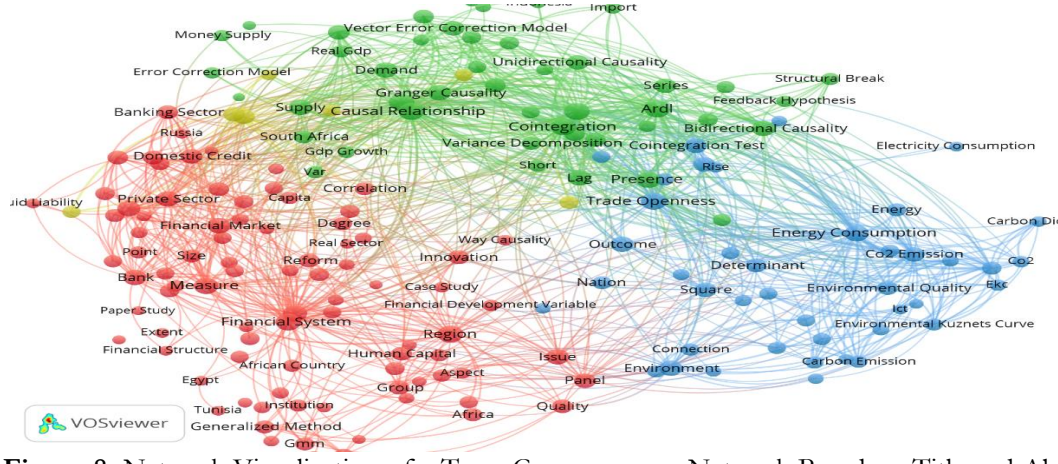

Figure 8: Network Visualization of a Term Co-occurrence Network Based on Title and Abstract Fields.

4.11.1 Citation Analysis

4.11.2 Citation Analysis by Authors

Citation analysis refers to the number of citation frequencies on a certain document, whilst the overall number of citations reflects a document's prominence in that particular field of study (Aria and Cuccurullo, 2017). Furthermore, Citation analysis by authors typically involves collecting data on the number of times an author's works have been cited by other authors in subsequent publications. This data can then be used to calculate a range of measures, such as the total citation count, the h-index, and the g-index. These measures can be used to compare the impact and influence of different authors, as well as to identify important works or authors within a particular field of study (Mester, 2022).

Based on Figures (13, and 14), within the dataset, there are 29 clusters that display the papers that have been cited by other papers. This network depicts in exact detail the structure of the frequent citations made by other authors or academic publications in the field of the development of finance and the growth of economy study. This co-citation network in this area shows that the significant publications are indicated in Table (6). Refers to the Figures (13, and 14) Shahbaz, M. from Beijing Institute of Technology in China has a highest citations (2680) and 19 publications, furthermore, the author has h-index of 16, and h-index of 19. Followed by Odhiambo, M. from University of South Africa, South Africa with (93) citations and 9 publications, in addition the author have h-index of 4, and g-index of 9. The third author (Arvin, M. B) from University of Trent in Canada, based on the citation has achieved 15 citations with 8 publications, also the author h-index of 5, and g-index of 6.

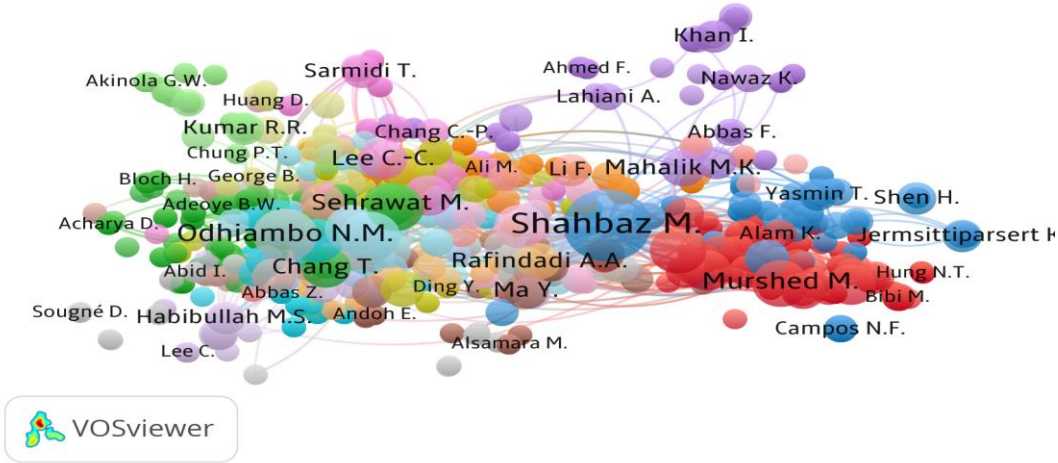

Figure 9: Network Visualization Map of the Citation by Authors.

4.12.1 Co-Citation Analysis

4.12.2 Co-Citation Analysis by Authors

Bibliometric network analysis, specifically co-citation analysis, is essential to have a thorough grasp of the literature on the relationship between the development of finance and the growth of economy. The reader can gain a better idea of the evolution and popularity of the articles

via this study (Bhattacharjee et al., 2023; Zhu et al., 2021). The co-citation network for the development of finance and the growth of economy literature is shown in Figure (15). Clusters of research are known to occur when numerous authors co-cite the same pairs of papers. These clusters frequently have recurring themes among the co-cited works. combined with single link clustering, specialized study fields, and science in its whole.

According to Figure (15), the publications in the dataset that are co-cited by other papers are divided into four major clusters. A node with a similar hue usually has some recurring themes. The authors' frequent citations in the literature on the development of finance and the growth of economy are literally mapped out in this network. We can see from this co-citation network in this field that the significant papers are indicated in Table (12).

Figure 10: Network visualization map of co-citation analysis by authors

5. Discussion and Conclusion

Finding current patterns in the areas of the development of finance and the growth of economy was the study's initial research question. Consequently, a bibliometric study was conducted to meet the main goal, which was to investigate the trend of research on the development of finance and the growth of economy. The productivity of research and publications in a specific field of study can be evaluated using bibliometric analysis (Fanea-Ivanovici and Siemionek-Ruska, 2023; Mansour et al., 2021). Gu (2004) found that information gleaned from bibliometric data can be used to compare the outputs and inputs of scientific researches, assess the study field's effectiveness, and assist academic institutions engaged in research in regulating some funding-related policies. The results of the bibliometric research can also help researchers perform significant research by providing more explanations of the variables that support the study field's research contribution (Akhavan et al., 2016).

Consequently, the focus of this study is on papers relating to the development of finance and the growth of economy that were gathered from the Scopus database. The search query used in this investigation was predetermined, and it was used to locate 662 documents from the declared database. Woo S. Jung (1986) published a paper titled "Financial Development and Economic Growth: International Evidence" that marked the beginning of the development of finance and the growth of economy field of study (as per documents gathered from the Scopus database). The quantity of publications gradually rose till 2009 after that point. The quantity of

writings on financial advancement and economic expansion has grown since that time and continues to this day.

As for the second and third research topics, which sought to determine the effect of effective periodicals and articles, and most productive authors in the field of the development of finance and the growth of economy, citation metrics have been used. The journal of environmental science and pollution research is the most productive with (30), (1016), and (6.6) for publications, total citations, and cite scores respectively. Furthermore, the most productive article written by Levine, R. (1997), titled "Financial Development and Economic Growth: Views and Agenda". The article has a total of citations (2872) in the Scopus database and citations per year (110.46). Additionally, Shahbaz, M., is the most proflic author with 19 publications and 2680 citations.

In terms of document types, article papers account for more than 87.16% of all publications. In addition, 95.95 percent of publications are written in English. The top three nations with the most contributions to publications on the development of finance and the growth of economy are China, Turkey, and Malaysia. Research in the social sciences is mostly focused on the development of finance and the growth of economy. Also, the University of South Africa (18, 2.71%) in South Africa is the highest productivity among all the academic institutions. In general, the Scopus database records 779.86 citations per year, 15016.08 citations per author, and 342.66 papers per author for financial development and economic growth documents.

Finally, let's discuss about the last research question, which is about the subjects that scholars have discussed the most frequently: financial development and economic growth. The results of the keyword, title, and summary analyses conducted by VOSviewer highlight the major components of this field. The terms "economic growth," "financial development," "finance," and "economic development," for instance, when glancing at Table (13), were among the top 20 terms that were most frequently used in the collected documents.

It's also important to note that no search query is ideal; therefore misleading positive and negative results should be expected (Mansour et al., 2022). The Scopus database serves as the sole primary source of documents for the current investigation.

Despite being one of the largest databases that records all scientific studies, Scopus does not always contain all published sources (Ahmi and Mohamad, 2019). More databases, such as Google Scholar, Web of Science, and others, may be used for research in the future. Combining all of these databases can result in interesting and valuable results. Notwithstanding these drawbacks, the current study contributes to our understanding of the relationship between the development of finance and the growth of economy by presenting recent research trends in this area. This study also adds to the body of knowledge on the relationship between the development of finance and the growth of economy by using the bibliometrics method.

Even though bibliometric analysis has certain unique characteristics, the research also has some restrictions that should be put in place to help readers comprehend this paper and support further investigation. Results are primarily focused on certain phrases, particularly financial development as a catchphrase in document titles. Furthermore, some researchers might concentrate on keywords or search terms in the abstract. As a result, their study may not directly serve their objectives. Data screening (cleaning and filtering) is therefore necessary prior to data analysis. Future studies might focus on it.

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