The Future of Economic Growth and Investment in Africa: A Bibliometric Analysis

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Abstract. Economic growth increases a country's real gross domestic product (GDP) over time. Investment is the expenditure on capital goods, such as machines, factories, and technology, that enhance the productive capacity of the economy. This paper aims to provide a comprehensive overview of the research trends and future directions in the field of economic growth and investment in Africa, based on a bibliometric analysis of the relevant literature. Using the Scopus database, we identified and analyzed 1,163 articles published between 2004 and 2023, This study employs a five-step methodology that consists of: (1) identifying keywords; (2) initializing search results; (3) including and excluding certain initial results items; (4) assembling initial data statistics; and (5) doing data analysis. The study findings revealed that the highest number of publications on economic growth and investment in Africa was in 2023 (166 articles), the top contributing affiliation was the University of South Africa, the leading influential country was South Africa and Social Sciences was the main source of contributions. Additionally, Odhiamb Nicholas M. topped the list of the top authors with high publications and 166 papers, while Simplice, Bekun, and Festus Victor held the top spot on the list of the most influential authors in terms of citations. Similarly, this study demonstrated that certain authors collaborate. This study identified four research clusters that could serve as a basis for future research expansion on economic growth and investment in Africa.

Keywords: Africa; Bibliometric analysis; Economic growth; Investment.

Abstrak*. Pertumbuhan ekonomi meningkatkan produk domestik bruto (PDB) riil suatu negara dari waktu ke waktu. Investasi adalah pengeluaran barang modal, seperti mesin, pabrik, dan teknologi, yang meningkatkan kapasitas produktif perekonomian. Makalah ini bertujuan untuk memberikan gambaran komprehensif tentang tren penelitian dan arah masa depan di bidang pertumbuhan ekonomi dan investasi di Afrika, berdasarkan analisis bibliometrik dari literatur yang relevan. Dengan menggunakan database Scopus, kami mengidentifikasi dan menganalisis 1.163 artikel yang diterbitkan antara tahun 2004 dan 2023. Penelitian ini menggunakan metode lima langkah yang terdiri atas: (1) mengidentifikasi kata kunci; (2) menginisialisasi hasil pencarian; (3) termasuk dan tidak termasuk item hasil awal tertentu; (4) menyusun statistik data awal; dan (5) melakukan analisis data. Temuan penelitian mengungkapkan bahwa jumlah publikasi tertinggi mengenai pertumbuhan ekonomi dan investasi di Afrika terjadi pada tahun 2023 (166 artikel), afiliasi dengan kontribusi terbesar adalah Universitas Afrika Selatan, negara berpengaruh terbesar adalah Afrika Selatan dan Ilmu Sosial adalah sumber kontribusi utama. Selain itu, Odhiamb Nicholas M. menduduki puncak daftar penulis teratas dengan publikasi tinggi dan 166 makalah. Sementara itu, Simplice, Bekun, dan Festus Victor menduduki posisi teratas dalam daftar penulis paling berpengaruh dalam hal kutipan. Demikian pula, penelitian ini menunjukkan bahwa penulis tertentu berkolaborasi. Studi ini mengidentifikasi empat kelompok penelitian yang dapat menjadi dasar untuk perluasan penelitian di masa depan mengenai pertumbuhan ekonomi dan investasi di Afrika.*

Kata kunci: Afrika; Investasi; Pertumbuhan ekonomi; Analisis bibliometrik.

BACKGROUND

In recent years, Africa has emerged as a promising region for economic growth and investment, with its vast natural resources and young population, has the potential to become a major player in the global economy Over the past decade, the continent has experienced significant economic growth, driven by sectors such as agriculture, manufacturing, and services, Foreign direct investment (FDI) has also been flowing into Africa, attracted by its growing consumer market and investment-friendly policies, One of the key trends in economic growth and investment in Africa is the increasing focus on diversification (Beg et al., 2024).

Many African countries are moving away from their traditional reliance on commodities and are investing in sectors such as technology, renewable energy, and infrastructure development. This shift towards diversification is crucial for sustainable economic growth and reducing vulnerability to external shocks. Another important trend is the rise of intra-African trade and regional integration. African countries are recognizing the benefits of closer economic cooperation and are working towards creating a single market through initiatives such as the African Continental Free Trade Area (AfCFTA) (Ali et al.,

2023a). This integration is expected to boost intra-African trade, attract more investment, and foster economic growth across the continent. In terms of future research, several areas warrant further exploration. Firstly, understanding the impact of technological advancements on economic growth in Africa is crucial (de Bruyn et al., 2023a).

The continent has seen a rapid increase in mobile phone penetration and internet connectivity, which has the potential to drive innovation, entrepreneurship, and productivity. Secondly, exploring the role of sustainable development in economic growth is essential. Africa is vulnerable to climate change and environmental degradation, and addressing these challenges is crucial for long-term economic prosperity. Research on sustainable agriculture, renewable energy, and green infrastructure can provide valuable insights into promoting inclusive and environmentally friendly economic growth. Lastly, studying the impact of political stability and good governance on economic growth and investment is vital. African countries with stable political environments and effective governance structures tend to attract more investment and experience higher economic growth (Gálvez-Sánchez et al., 2021).Understanding the factors that contribute to political stability and good governance can inform policy decisions and promote sustainable development. In conclusion, Africa's economic growth and investment landscape are evolving rapidly. Diversification, regional integration, technological advancements, sustainable development, and good governance are key factors shaping the future of economic growth in Africa. Further research in these areas can provide valuable insights and contribute to the continent's sustainable development agenda (Singh & Vashishtha, 2023a).

However, despite the few drawbacks of FDI, it still has significant importance on the economy of the countries (Cicea & Marinescu, 2020). FDI is a major element for countries to attract the technology, capital, and know-how needed to transform their economies from traditional activities to higher-end manufacturing and services (Musa et al., 2024). Through the FDI, foreign-owned companies have the chance to leave a positive effect on the domestic economy and productivity levels of local corporations. The improvement that foreign firms leave in the domestic market could be viewed from a macro and a micro perspective (Ibrahim & Nurmandi, 2023). When examining the macro level, FDI could create different and modern economic sectors that have never existed in the country, diversify the country's exports, and boost the economy's technological frontier of the country (Hassan et al., 2023a). On the micro level, FDI could promote technology transfer through knowledge spillovers and connections between foreign and local firms, enhance employee and managerial competencies, and improve investment incentives and productivity in down-stream and upstream areas (Alfaro & Chauvin, 2020). In addition, the strong competition that foreign companies' entry imposes on the domestic market could trigger domestic companies to improve their efficiency, exclude unproductive local companies, and redistribute production factors to more productive corporations and uses (Hassan et al., 2023a). Consequently, it is crucial to perform a thorough analysis of all papers published in this regard and identify the key contributors to the journal, author, organization, and country level, as well as to further define the top documents and keywords, after defining what FDI means and its enormous importance on the countries' economies and topics closely related to it. Clarifying the development of FDI, highlighting related topics and study areas, and outlining a future research agenda are all essential for gaining a deeper understanding of the topic (Babajic et

al., 2021). Utilizing bibliometric and network analysis, the primary goal of this research is to investigate the state of economic growth and investment in Africa from 2004 until 2023 (by the author).

RQ1: Who are the key contributors and impactful sources, authors, and countries in economic growth and investment research in Africa?

RQ2: What implications can a bibliometric analysis of economic growth and investment in Africa offer to policymakers and scholars?

RQ3: What are the dominant research topics, and how do their research interest and research impact develop over time?

MATERIALS AND METHODS

The review aims to present the scope of research on economic growth and investment in Africa during the past 20 years to this end, bibliometric and visualization techniques were combined in the analysis. Additionally, the foundation of bibliometric analysis is tracking research on a certain topic and presenting the results through a variety of characteristic analyses of these studies. High-quality papers were found in the study by utilizing relevant publications from the Scopus database. The "Topic" option was used to search for keywords in the title, summary, or keyword sections during the scan on January 15, 2024 (Babajic et al., 2021), 1.558 articles on Economic Growth and Investment in Africa came up in the initial search.

The search yielded English and open-access publications that were part of the study, with the keywords "Economic Growth" and "Investment" as well as "Africa" serving as triggers for them Scopus has been used to obtain Economic Growth and Investment in Africa, journals in this research since it includes intelligent tools to visualize, analyze, and track study output in all subject areas such as we have manually screened to remove irrelevant publications using the criteria listed in Table 1 to ensure the relative significance of the examined publications to Economic Growth and Investment in the fields of Economics, Econometrics and Finance, Social Sciences, Business, Management, Environmental Science, and Accounting. Thus, 597 publications were left for further examination. Table 1 lists the inclusion and exclusion criteria. Moreover, Figure 1 depicts the analytical research structure (Ali et al., 2023b).
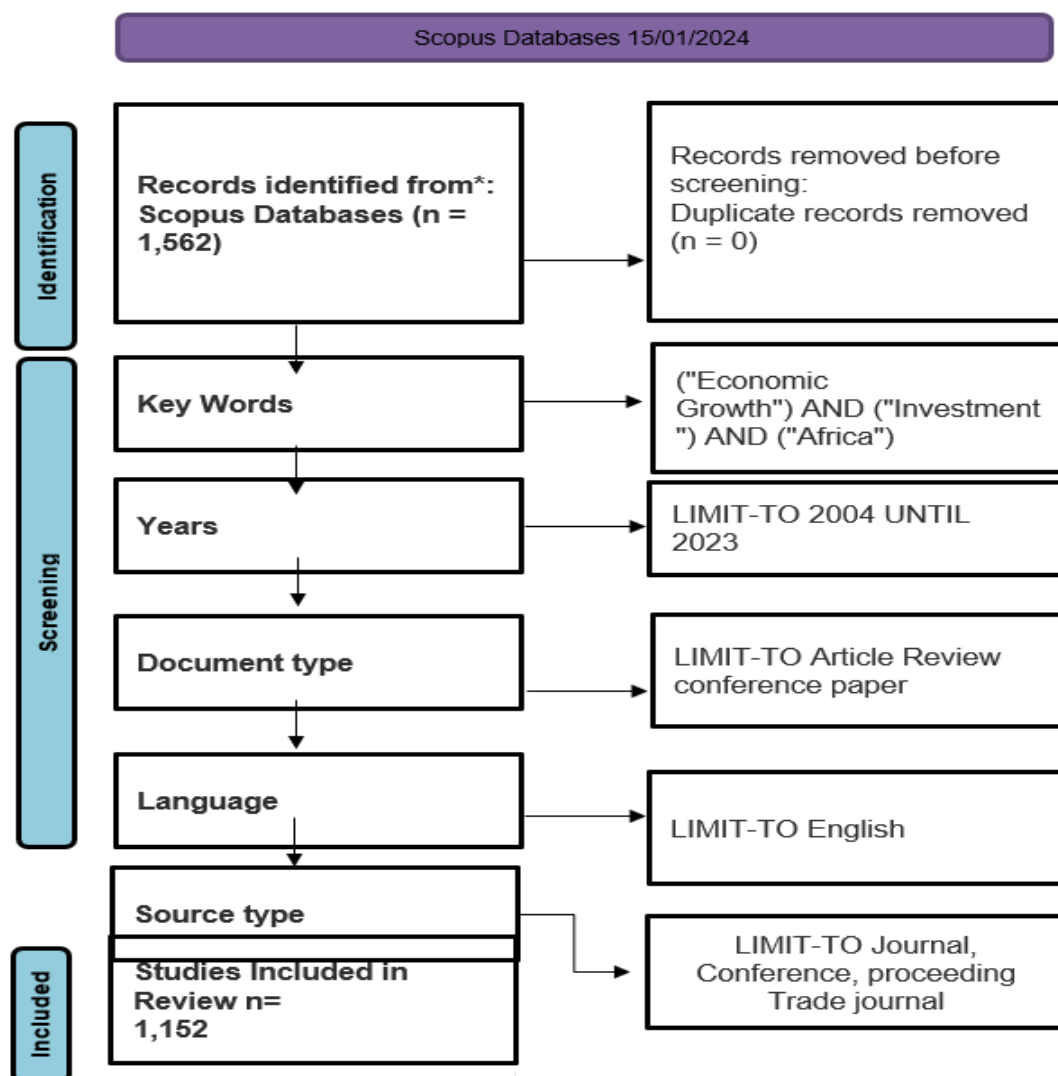
The Bibliometric Analysis


Figure 1. PRISMA Flow Diagram

Inclusion and exclusion of initial result

Table 1. The inclusion and the exclusion criteria for data screening

Inclusion criteria	Article, Conference paper, Review
	All documents Subject Area
Exclusion criteria	Book, Book chapter, Note, Editorial, Short survey, Erratum
	Retracted.

RESULTS AND DISCUSSION

One of the main areas of study in the field of bibliometric studies is bibliometric mapping. There are two components to bibliometric mapping: (1) creating a bibliometric map and (2) displaying maps graphically. Within the bibliometric literature, scholars are primarily focused on creating bibliometric maps, with little emphasis placed on the graphical depiction of maps (Van Eck & Waltman, 2010). Bibliometric analysis was once performed using a variety of software programs, each of which had unique features and limitations. While there are several tools available for bibliometric analysis, Bibexcel, Publish or Perish, and HistCite are the most widely used ones. Because BibExcel is flexible enough to make adjustments and modifications to data imported from many databases, including Web of Science and Scopus, it was selected for this study's bibliometric analysis. Additionally, BibExcel can offer comprehensive data analysis for use with network analysis tools like VOSviewer. We noted in the section above (Exclusion and inclusion) that Scopus outputs were exported as RIS. As a result, BibExcel was utilized to get the RIS form for analysis. The following areas are the focus of data collection analysis.(Dhiman & Arora, 2024).
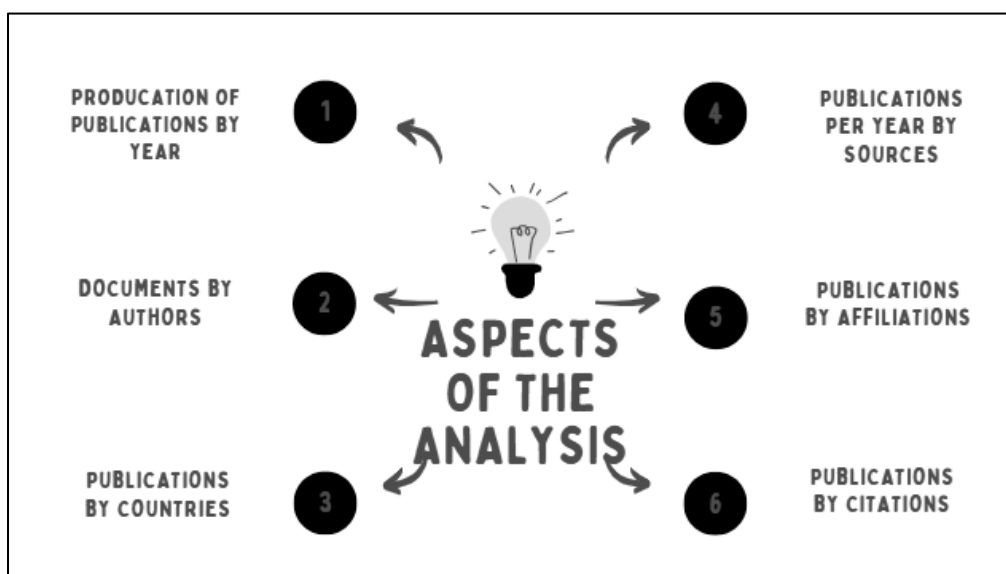
Source: Author created by using Canva Mind Map.

Figure 2. Aspects of Assessment of Extracted Articles

Distribution of Publications by Years

An examination of the articles' publication years during the preceding 20 years was done to address the first finding. The number of papers released annually served as a gauge for the volume of study and level of interest in the subject, to see the pattern over time and pinpoint the highs and lows in the publication activity, a line graph was created. The information and graph demonstrate a distinct upward trend in the number of publications over time, particularly in the most recent years, from 2020 to 2023. This suggests that the

academic and research community is becoming more aware of and interested in the topics covered in these publications. Figure 3 shows the average number of documents published annually or the publication rate of the documents. The total number of documents divided by the number of years yields the publication rate. The data indicates that 54.5 documents are published annually (Madzík et al., 2023). However, this rate is not constant, as it varies from year to year. The highest publication rate was in 2023, with 166 documents, while the lowest publication rate was in 2004, with 11 documents.(Maione et al., 2023).
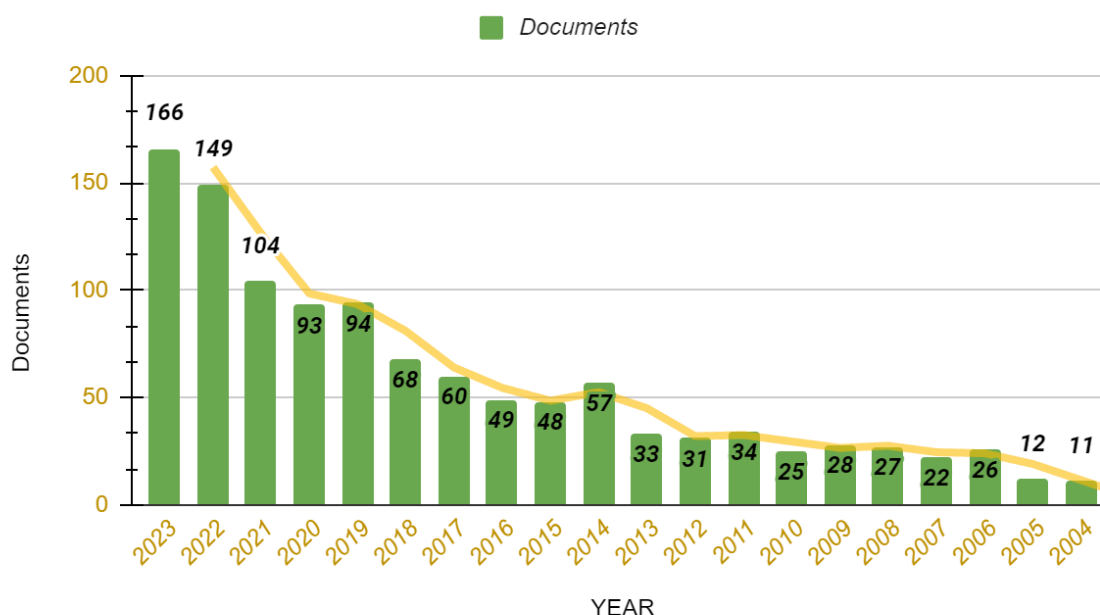
Documents by Year

Figure 3. Distribution of publications by years (2004–2023)

The Top 10 Highly Productive Journals

We used the following criteria to analyze the most cited journals in our content analysis: Total Publication, Total Citation, Cite Score of the journal, The most cited article, Times cited, and Publisher. The results are shown in Table 2. According to Table 2 and Figure 4, the most productive journals for Economic Growth and Investment in Africa were "Environmental Science and Pollution Research," which had 22,779 total publications and 195,106 total citations. "African Development Review," which had 201 total publications and 140 total citations, and "Cogent Economics and Finance," which had 1,057 total publications and 2,978 total citations (Oliveira & Moutinho, 2021). Additionally, Table 2 displays the distribution of the most fruitful journals pertaining to Economic Growth and Investment in Africa, On the other hand, RQ2 also investigated the most prolific authors in the Economic Growth and Investment in Africa research area. In the content analysis made for the prolific authors in the Economic Growth and Investment in Africa research area,

"Author," "Total Publications," "h-index," "Total citations," "current affiliation," and "country" were chosen as the analysis criteria as shown in Table 3.

Table 2. The top 5 highly productive journals on Economic Growth and Investment publications by year for the last two decades in Africa (2004-2023)

Journal	TP	TC	Cite Score (2023)	The Most Cited Article (Reference)	Times Cited	Publisher
Environmental Science and Pollution Research	22,779	195,106	8.6	Alternative energy and natural resources in determining environmental sustainability: a look at the role of government final consumption expenditures in France	118	Springer Nature
1.3 African Development Review	201	140	5.7	Does infrastructural development foster export upgrading in Africa?	5	Wiley-Blackwell
1.4 Cogent Economics and Finance	1,057	2,978	2.8	Food prices response to global and national factors: Evidence beyond asymmetry	11	Taylor & Francis
Journal of African Economies	106	252	2.4	The Economic Impact of the Pandemic in Rwanda: An Analysis of Firm-Level VAT Data	2	Oxford University Press
World Development	1,212	15,020	12.4	Does environmental regulation increase domestic value-added in exports? An empirical study of cleaner production standards in China	19	Elsevier

Note: TP = Total Publications, TC = Total Citation.

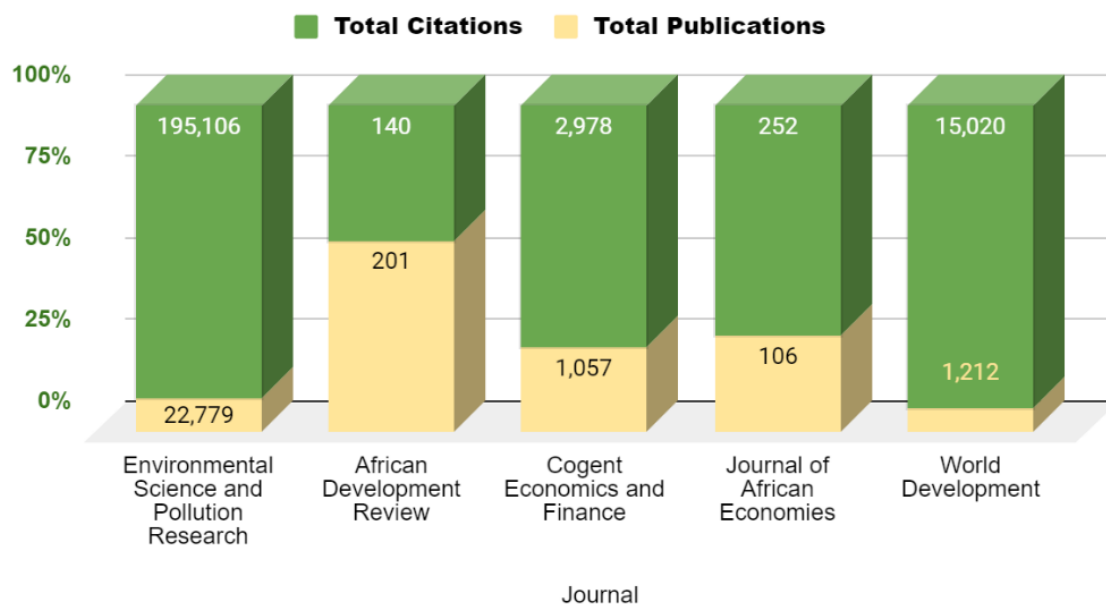## Total Publications and Total Citations

Figure 4. Top Five Scopus journals contributing to the field of Economics Growth and Investment

Top 10 Highly Prolific Authors

In the relevant subject topic of Economic Growth and Investment in Africa, Table 3 lists 15 highly productive authors. Additionally, "Odhiamb Nicholas M." was the most prolific author, having published 304 times overall, had the highest h-index of 36, 5,214 citations overall, and was a South African national. The author, "Adams, Samuel," who is also from Ghana, is listed next. He has 92 publications overall, an h-index of 28, and 3,836 citations overall. It followed by "Bekun, Festus Victor" with a total number of publications of 213, with an h-index of 56, in addition to a total of 10,209 citations, and the author is from Istanbul, Turkey. Furthermore, from an H-index standpoint, the top three remained the same as ranked by the publishing count. Moreover, other prolific authors in Economic Growth and Investment in Africa research area data were presented in Table 3 (de Bruyn et al., 2023b).

Table 3 List of the 10 most prolific authors in Economic Growth and Investment in Africa research area

Author	Year of 1st Publication	TP	h-Index	TC	Current Affiliation	Country
Odhiamb Nicholas M.	2002	304	36	5,214	University of South Africa, Pretoria, South Africa	South Africa
Adams, Samuel	2006	92	28	3,836	Ghana Institute of Management and Public Administration	Ghana
Bekun, Festus Victor	2016	213	56	10,209	İstanbul Gelişim Üniversitesi,	Istanbul, Turkey
Meyer, Daniel Francois	2014	88	14	642	University of Johannesburg, Johannesburg	South Africa
Clinton, Aigbavboa Ohis	2010	682	26	3,545	University of Johannesburg, Johannesburg	South Africa
Anyanwu, John C.	1991	39	19	1,380	Macroeconomic Policy, Abidjan	Cote d'Ivoire
Ibrahim, Muazu	2015	43	18	1,229	African Development Bank Abidjan	Cote d'Ivoire
Phiri, Andrew	2011	67	9	234	University of Religions and Denominations	Iran
Udeagha, Maxwell Chukwudi	2018	26	17	641	University of Pretoria, Pretoria	South Africa
Samour, Ahmed	2019	46	18	1,053	Dhofar University, Salalah	Oman

Note: TP = Total Publications, TC = Total Citation.

Figure 5. Co-citation of Prominent Authors

Most Productive Countries

The Economic Growth and Investment in Africa study area's top 10 producing nations are displayed in Table 4 and Figure 6, which also depict the topic distributions of the most prolific nations, regions, and establishments. From a national perspective, the majority of the specified nations and areas showed a consistent interest in all areas of research on economic growth and investment in Africa. On the other hand, different nations and areas demonstrated a particular interest in particular trends, for example, the International Institute for Environment and Development found that "South Africa" was the most producing nation, with a total of 311 publications. They were followed by "China" with 111 publications overall from the National Academy for Mayors of China, and "The United States" with 161 publications overall from the Harvard Medical School. Additionally, Table 5 displayed data from the Economic Growth and Investment in Africa research area for additional prosperous and productive nations.(Nazaruddin et al., 2023).

**Table 4. List of the 15 Most Productive Countries in
the Economic Growth and Investment in Africa Research Area**

Rank	Country	TP	Most Productive Academic Institutions	Rank	Country	TP	Most Productive Academic Institutions
1	South Africa	311	International Institute for Environment and Development	6	Ghana	73	Newcastle Business School, University of Newcastle
2	United States	161	Harvard Medical School	7	Turkey	52	University of Castilla La Mancha, Ciudad Real, Spain
3	China	111	National Academy for Mayors of China	8	India	42	Harvard Medical School
4	United Kingdom	107	Global Surgery and Social Change, Harvard Medical School	9	Australia	39	Harvard Medical School
5	Nigeria	101	Harvard Medical School	10	Ethiopia	26	National Science Foundation

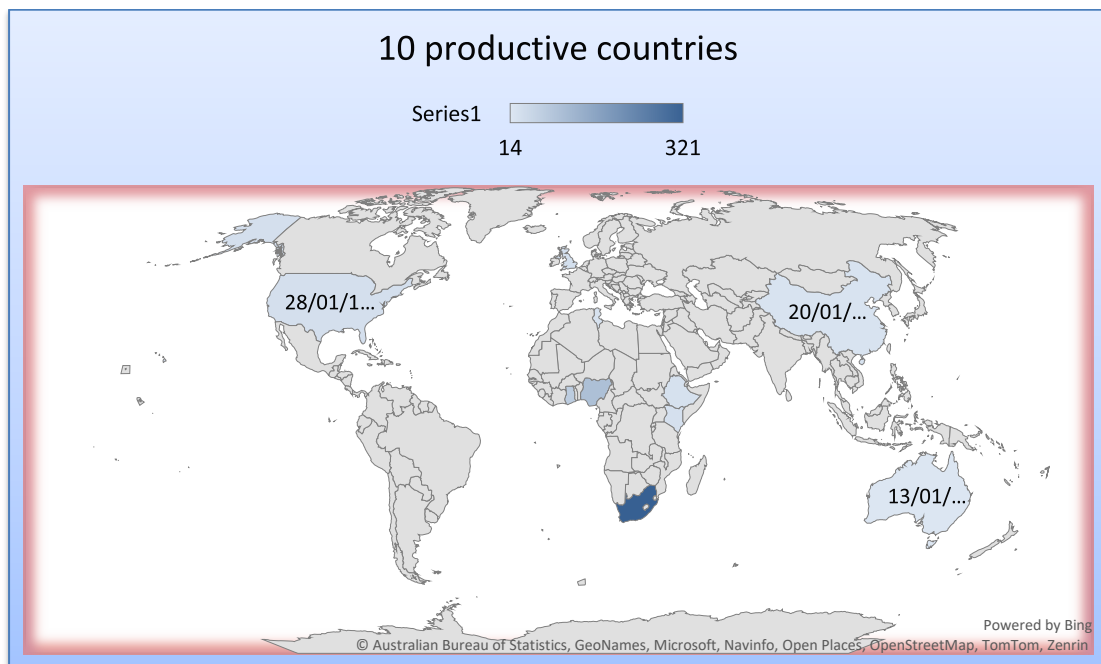Note: TP = Total Publications, TC = Total Citation.

Figure 6. Ten Productive Countries in the Economic Growth and Investment in Africa
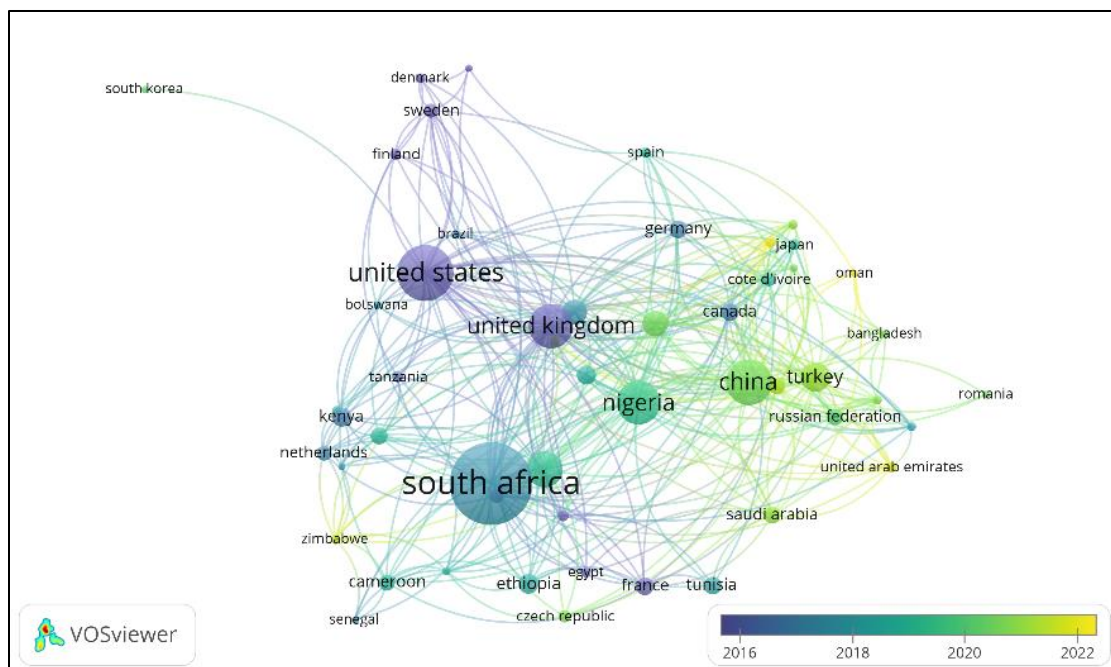

Figure 7. Analysis Results of Productive Countries in Economic Growth and Investment in Africa

A country network of publications or research collaborations is depicted in Figure 7 above, where nodes stand for individual countries and edges for connections. The network can show the diversity, density, and geographic distribution of the publications and research in the field. The information and the graph also show each nation's publishing volume, or the total number of articles or research products generated in that nation. The publication volume can be measured by the size of the nodes, with larger nodes indicating higher publication volume. Countries like the United States, the United Kingdom, China, and South Africa have large nodes, suggesting they have significant publication volume in the subject matter. The publishing chronology of each nation, which is the timeframe or scope of the publications or research results generated by that nation, is also depicted in the data and the graphic. The color of the edges and nodes can be used to display the publication history; a gradient from blue to green represents the years 2016 to 2022. Darker colors indicate more recent or increased publication activity in the relevant fields, such as South Africa and China.(Shanti et al., 2023)

Keywords Occurrence Network

The network of keyword occurrences represents study hotspots and research trends in a specific topic (Tang, Liao, Wan, Herrera-Viedma, & Rosen, 2018). To find the words or phrases that are commonly found in the list of keywords or in the titles of targeted publications, a similar analysis is performed. By examining the keywords used in the papers, the discussion of keywords helps to discover how a specific field of study was constructed. Additionally, keywords highlight the content's intellectual essence.(Abuhassna et al., 2022).
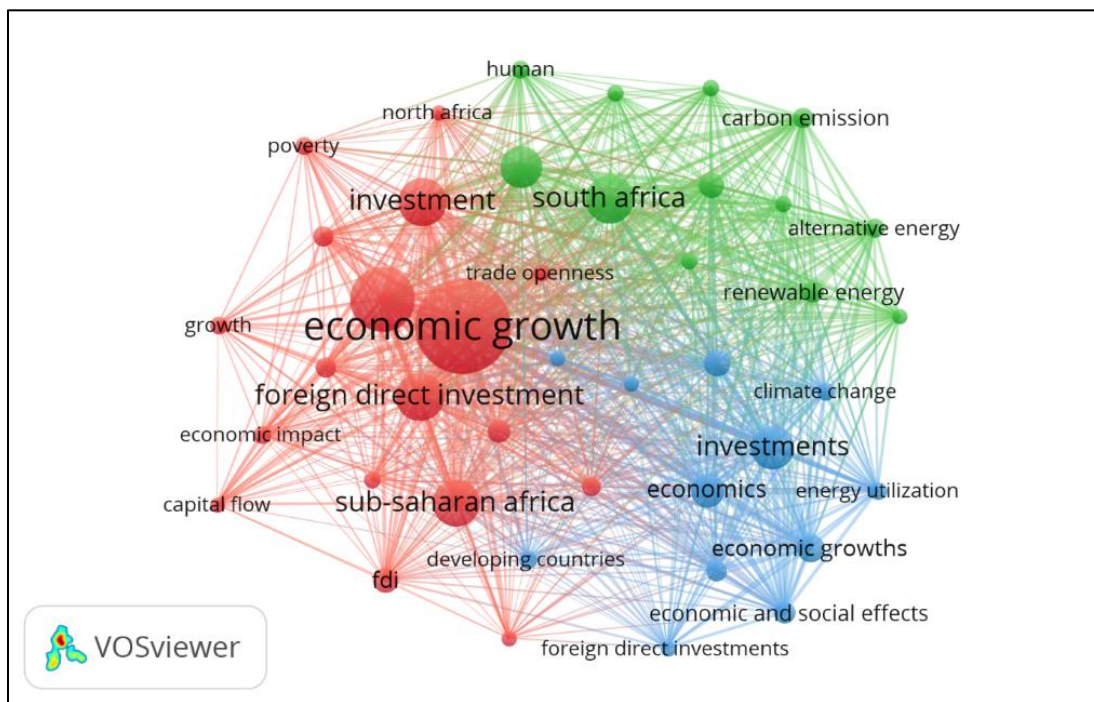

Figure 8. Keywords

The VOSviewer analysis outcomes reveal a total of 4215 keywords in all articles pertaining to Economic Growth and Africa. Applying a minimum keyword occurrence criterion of 5, this standard is satisfied by 416 keywords. To spotlight the most popular keywords, the minimum occurrence criterion is raised to 31, resulting in the selection of 50 keywords from the entire pool. As shown in Figure 8, VOSviewer classifies the top 50 keywords into three clusters, each distinguished by a unique color. Every Cluster restricted to a specific number of keywords termed items.

Table 5. Main Keywords Clusters

No	Cluster	Color	Items	Main keywords
1	Cluster	Red	20	Foreign direct investment, economic impact, poverty, trade openness.
2	Cluster	Green	15	Carbon Emission, South Africa, renewable Energy, Human.
3	Cluster	Blue	15	Climate change, Developing Country, energy Utilization, economic and social effects.

The main subject of the study, economic development and investment, appears as a significant node in both Cluster I and Cluster II. Upon closer inspection of the clusters, you can observe that each cluster's nodes—namely, its keywords—exhibit strong connections with each other within the map's framework. The keyword frequency rates within each cluster indicate the main domains of interest from previous research. For instance, Cluster II (green) accentuates investment patterns (15 items), Cluster III (blue) establishes a link towards Continent Africa (15 items), and Cluster I (red) concentrate on Economic Growth (20 items). Every cluster signifies a noteworthy research trend in the field of Economic Growth and Investment by highlighting various research aspects through their relation with cluster keywords.
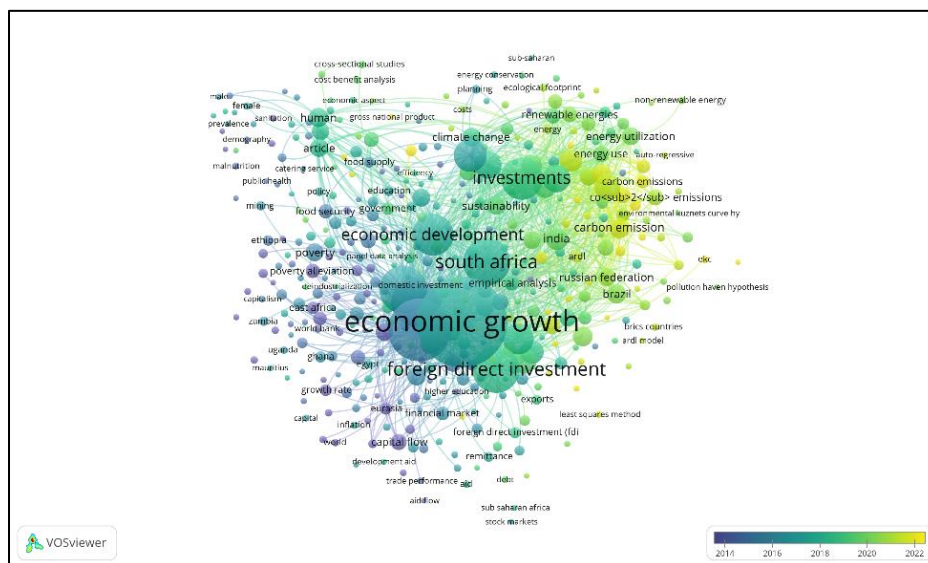

Figure 9. VOSviewer Analysis of the Top Keyword Occurrences

Co-author Analysis

It is difficult for an individual to finish research on a certain topic by themselves. To be completed, many scientific research initiatives require strong teamwork. One of the main areas of bibliometrics study is co-authorship research. An indicator of the state of research in a certain field of study is the degree of research cooperation (Liao et al., 2018). This section mostly presents the co-authorship analysis of the authors and organizations. We employ the VOSviewer software to perform the co-authorship analysis. Co-authorship analysis is shown in Figures 10 (Singh & Vashishtha, 2023b).
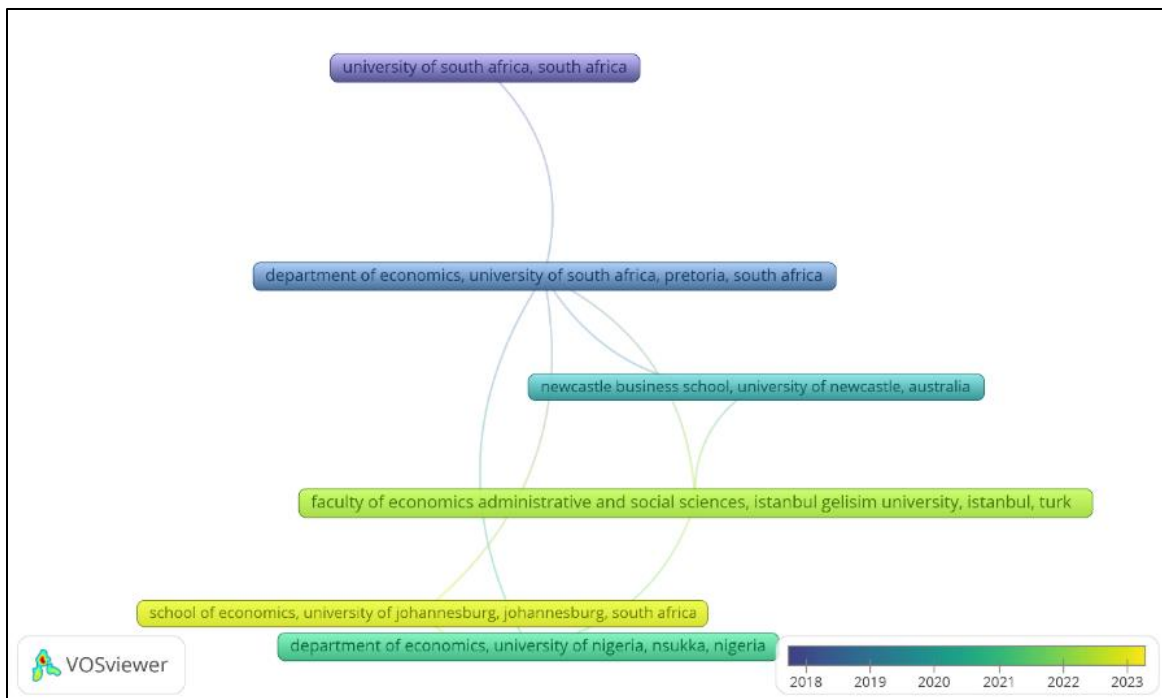

Figure 10. Map of Network Visualization of Co-authorship

CONCLUSIONS AND RECOMMENDATIONS

The African continent is now transforming the way of economic development from the conventional way to inclusive growth and sustainable development This research aimed to review and investigate trends of research production in the area of Economic Growth and Investment in Africa over 20 years by employing bibliometric and network analysis. Between 2004 and 2023, journals listed in the Scopus database published about 1,562 articles about Economic Growth and Investment in Africa. Despite the abundance of literature reviews on Economic Growth and Investment in Africa, it appears difficult to objectively and analytically identify the most influential authors, publications, clusters of emergent studies, and author collaborations without using bibliometric and network analysis. This contributes to the field of study by charting the relationships between the more influential and higher-

ranking articles and offers an assessment of the effective documents and other evaluation components. The findings of this study reveal the trends of publications in the field of Economic Growth and Investment in Africa.

The results show the development of the research in the area of Economic Growth and Investment in Africa, the contributions of organizations, and the contributions of countries in publications. Between 2004 and 2023, a lot of influential publications were released. As per the study, the year 2023 saw the highest production of research on Economic Growth and Investment in Africa. The most influential source in this field was Economic Growth, and the authors with the highest number of publications were Odhiambo, N.M. and Bekun, F.V. and Adams, Samuel. The University of South Africa was the most contributing affiliation in this field, and the geographical distribution of publications indicated that South Africa was the most influential country in this field.

For future studies, this research has identified part of the recent works in economic growth and investment, which can be used to identify potentially influential articles, Identification of influential scholars in economic growth and Investment is essential to set the stage for further research. Table 5 shows the cluster analysis; it describes the major research issues in the field of economic growth and Investment in Africa, based on the strong connection of keywords in the cluster, On the other hand, terms with low frequencies suggest possible subjects (topics) for further research, according to keyword analysis it among the research's contributions. This study's effective usage of VOSviewer for network analysis is another contribution. Few research works on investment and economic growth use VOSviewer as a network analysis tool.

This work creates a guide for conducting network and bibliometric research with VOSviewer software. There is undoubtedly a constraint to the arrangement and presentation of the study's findings. Certain facets of evaluation, such the publication stage and the language of the papers (we only included English), were left out of this study (we only included the final). Although there are many alternative tools available for network analysis, VOSviewer was chosen for this study's use. Since only the Scopus database was used for data abstraction in this study, it is advised that future research make use of additional databases, such as Publish or Perish, Web of Science, IEEE Xplore, and Springer to develop the research. On top of that, we recommend that future researchers use other Network analysis tools such as Gephi, Pajeck, and HistCite (only accept data from Web of Sciences).

Conflict of interest

In relation to the publishing of this study, the authors state that they have no potential conflicts of interest. Furthermore, the writers have firsthand experience with all ethical concerns, including as redundancy, plagiarism, informed consent, misconduct, data fabrication or falsification, double publishing or submission, and redundancy.

Ethical considerations

Not applicable.

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