

# FEATURES AND TRENDS OF THE KNOWLEDGE ECONOMY: A BIBLIOMETRIC ANALYSIS USING THE SCOPUS DATABASE (1998-2024)\*

BİLGİ EKONOMİSİNİN ÖZELLİKLERİ VE EĞİLİMLERİ: SCOPUS VERİ TABANI KULLANILARAK YAPILAN BİBLİYOMETRİK ANALİZ (1998-2024)

Araştırma Makalesi  
Research Paper

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## Abstract:

This research presents a bibliometric analysis of scholarly literature on the knowledge economy, covering the period from 1998 to October 1, 2024, based on 439 documents retrieved from the Scopus database. It tracks the evolution of publication output, identifies the most influential works, and evaluates contributions by authors, institutions, and nations, as well as journal impact. Furthermore, it explores thematic trajectories and co-authorship networks within the field. Findings reveal that the knowledge economy has matured into a global, interdisciplinary arena, with key foci on innovation, higher education, sustainability, and human capital. The COVID-19 crisis has further underscored the critical role of digital transformation in this domain. Looking ahead, research is encouraged to deepen inquiry into knowledge management, the dynamics of human capital, the persistence of social inequalities, and the pursuit of sustainable development.

**Keywords:** Knowledge Economy, Bibliometric Analysis, Science Mapping, Thematic Analysis, Bibliometrix R-Package

## Öz:

Bu çalışma, 1998-2024 yılları arasındaki bilgi ekonomisi araştırmalarını bibliyometrik bir perspektiften incelemektedir. Bilgi ekonomisi, entelektüel sermaye ve inovasyonun ekonomik büyüme ve rekabet gücü üzerindeki etkisini araştıran ekonomik bir paradımadır. Çalışmada Scopus veri tabanından toplanan 439 makale analiz edilmiştir. Zaman içinde yayın artışındaki eğilimleri, en çok atıf alan makaleleri, yazar, kurum ve ülke düzeyindeki katkıları ve dergilerin etkisini değerlendirmiştir. Ayrıca, bilgi ekonomisi içindeki tematik eğilimler ve iş birliği ağları da incelenmiştir. Sonuçlar, uluslararası bir araştırma alanı olarak bilgi ekonomisinin, özellikle inovasyon, yükseköğretim, sürdürülebilir kalkınma ve insan sermayesi gibi temalara vurgu yaparak, disiplinler arası iş birlikleri tarafından şekillendirildiğini göstermektedir. Çalışma, COVID-19 salgınının dijitalleşme ve bilgi ekonomisinin önemini nasıl artırdığını vurgulamaktadır. Ayrıca, gelecekteki araştırmaların bilgi yönetimi, insan sermayesi, sosyal eşitsizlikler ve sürdürülebilir kalkınma gibi konulara daha fazla odaklanması gerektiğini önermektedir.

**Anahtar Kelimeler:** Bilgi Ekonomisi, Bibliyometrik Analiz, Bilim Haritalama, Tematik Analiz, Bibliometrix R-Paketi

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## INTRODUCTION

Since the early 21st century, knowledge and technology have become critical elements of economic growth and competitiveness in the global economy. Unlike traditional production models, knowledge-based activities and intellectual capital have come to the forefront within a new economic paradigm known as the knowledge economy (Powell and Snellman 2004). This paradigm, shaped by innovation, technological advancement, and globalization processes, has played a central role in many countries' long-term development strategies (Peters, 2009). The knowledge economy defines a structure where intellectual resources and innovative thinking drive success, and knowledge creation supports economic growth.

The knowledge economy places knowledge and its effective utilization at the core of enhancing competitive advantage. In this context, collaborative research has emerged as a vital mechanism for promoting innovation, which requires interdisciplinary approaches to address complex challenges (Dimitrova and Wellman 2015). This cooperative framework not only elevates research quality and influence but also fosters the creation of novel insights and technologies essential for sustaining economic expansion (Mensah and Enu-Kwesi 2018).

In recent years, the progression of knowledge economy studies has attracted considerable scholarly interest, underscoring knowledge's pivotal role in driving economic expansion and innovation. Bibliometric techniques are essential for charting the development of this field, as they enable researchers to uncover prevailing trends, thematic clusters, and patterns of collaboration across the literature (Manisha and Singh 2024; Vaquero García et al. 2024). By analysing publication data, citation networks, and authorship patterns, researchers can uncover the influence of key actors in the field (Shahid et al. 2024). The knowledge economy has become an important research area, examining the relationship between scientific production and economic development. Scholars have utilized a variety of methodologies to assess how scientific output influences knowledge economy metrics. In this vein, numerous investigations have applied bibliometric methods alongside theoretical models to examine multiple facets of the knowledge economy.

Researchers have investigated the nexus between scientific output and knowledge economy indicators through diverse bibliometric and conceptual approaches. Nguyen & Pham, (2011) examined 165,020 peer-reviewed articles published between 1991 and 2010 across ASEAN countries, categorizing nations by publication volume and demonstrating a strong association between research productivity and a composite "knowledgeability" index—Singapore alone accounted for 45 percent of the region's output. Nouri et al., (2013) conducted a bibliometric survey of the LISTA database to identify the top fifteen journals that effectively shape and guide scholarly discourse in the knowledge-economy domain. Extending the temporal scope to 1986–2021, Giraldo et al., (2022) highlighted the rising prominence of knowledge management, knowledge-based systems, and digital transformation processes in driving economic development. Aparicio et al., (2023) analysed 1,228 articles from 1991 to 2020, uncovering seven thematic clusters—from foundational

theories of the knowledge-based economy to its post-capitalist reconceptualization—thus mapping the field’s conceptual and intellectual structure. Finally, Pu et al., (2023) reviewed 169 publications dated 2010–2020 to explore how knowledge-economy mechanisms can help overcome environmental, social, and governance (ESG) constraints, offering strategic directions for integrating sustainability into knowledge-driven economic models.

These bibliometric analyses demonstrate that research in the knowledge economy is rapidly evolving and intersects with numerous disciplines. However, the comprehensive mapping of the evolution, themes, and collaborative networks in knowledge economy research remains largely incomplete. To address this shortfall, the present work undertakes a bibliometric investigation of the worldwide development, principal thematic strands, and collaboration networks within knowledge economy research. Ultimately, understanding the global evolution of knowledge economy research and analysing thematic trends and collaborative networks in this field will help develop policies and strategies that shape the future of economic growth and competitiveness. Employing bibliometric techniques, this research evaluates the present landscape and anticipates emerging trajectories in knowledge economy scholarship, thereby offering valuable insights to enrich the academic discourse in this field.

The results of this bibliometric investigation align with and extend existing theoretical models such as the Triple Helix Model, which emphasizes the interaction between academia, industry, and government in fostering innovation. Similarly, the emergence of regional collaboration themes supports the Regional Innovation Systems (RIS) perspective, highlighting the role of localized knowledge networks in economic development. By empirically mapping these dynamics, this study provides updated evidence on how these frameworks manifest in contemporary knowledge economy research.

## 1. METHOD

### 1.1. Data Collection and Review Protocol

This study applies bibliometric analysis to investigate trends, thematic structures, and collaboration patterns in knowledge economy research. Bibliometric methods enable the quantitative mapping of scholarly output and the identification of intellectual contributions, co-authorship networks, and thematic shifts across time (Moral-Muñoz et al., 2020; Ayaz et al., 2021; Ayaz et al., 2023; Aytekin et al., 2025).

Although multiple bibliographic databases are available for literature reviews, Scopus was selected for this study based on its extensive coverage of peer-reviewed journals, structured metadata, and compatibility with bibliometric software such as Bibliometrix (Mongeon & Paul-Hus, 2016; Aria & Cuccurullo, 2017). Compared to Web of Science, Google Scholar, or Dimensions, Scopus offers a more comprehensive source for interdisciplinary research, especially in the social sciences and management fields (Harzing & Alakangas, 2016). Google Scholar, despite its breadth, suffers from a lack of standardization and limited export capabilities (Martín-Martín et al., 2018), while Web of Science has more restricted coverage of international journals (Mongeon & Paul-Hus,

2016). Therefore, Scopus was deemed the most appropriate database to ensure methodological consistency, export flexibility, and global journal representation.

To ensure methodological transparency and reproducibility, the data collection process was aligned with a modified version of the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) and SPAR-4-SLR (Scientific Procedures and Rationales for Systematic Literature Reviews) protocols (Page et al., 2021; Paul et al., 2021). This approach included the following phases:

In the Identification (Assembling) phase, a comprehensive query string was constructed to search for relevant studies in the Scopus database. The query targeted article titles, abstracts, and keywords containing the terms "knowledge economy," "knowledge-based economy," and their variations. To ensure methodological consistency, filters were applied to include only documents categorized as research articles or reviews, while excluding non-English publications, non-journal sources (e.g., conference proceedings, book chapters), and documents at the "Article in Press" (AIP) stage. This initial search, conducted on October 1, 2024, yielded a total of 717 records.

During the Screening and Eligibility (Arranging) phase, a set of inclusion and exclusion criteria was systematically applied. The inclusion criteria required that documents be indexed in Scopus, published in academic journals, written in English, categorized as articles or reviews, and finalized in terms of publication stage. Conversely, publications that were not peer-reviewed journal articles, not in English, still in press, or irrelevant to the scope of the knowledge economy were excluded. Following the application of these criteria, the dataset was refined to include 439 high-quality publications suitable for bibliometric analysis.

In the final Inclusion and Analysis (Assessing) stage, this curated dataset served as the foundation for the bibliometric and thematic evaluations. The temporal coverage of the dataset spans from 1998 to 2024; however, it is important to note that records from 2024 include only those published up to October 1, which may result in a slight underrepresentation of the full year's output. A PRISMA-based summary of the selection process is provided in Table 1..

**Table 1:** Alignment between the PRISMA and SPAR-4-SLR Protocols

Phase(s) (SPAR-4-SLR / PRISMA)	Consideration	Application in This Study
<b>Assembling / Identification</b>	Search focus / Review domain	Knowledge Economy
	Research question(s)	<ol style="list-style-type: none"> <li>1. What are the temporal trends in publications and citations on the knowledge economy?</li> <li>2. Who are the leading authors, countries, journals, and institutions in the field?</li> <li>3. What are the dominant thematic areas and emerging trends in the knowledge economy literature?</li> <li>4. How are collaboration networks structured among scholars and institutions?</li> </ol>
	Search database	Scopus
	Advanced search strategy	TITLE, ABS, and KEY fields searched using combinations of “knowledge econom*” and “knowledge-based econom*”
	Search period	1998–2024 (up to October 1, 2024)
	Focused field	Knowledge Economy (interdisciplinary)
	Search results	717 publications
<b>Arranging / Screening and Eligibility</b>	Publication stage	Final only
	Source type	Academic journals only
	Document type	Research articles and reviews
	Language	English
	Filtered results	439 articles
<b>Assessing / Inclusion</b>	Analysis method	Bibliometric and thematic analysis
	Software	R – Bibliometrix package
	Agenda proposal method	Identification of key research streams, thematic clusters, and gaps in the literature

## 1.2. Data Cleaning and Validation

Prior to analysis, the dataset underwent a rigorous cleaning and validation process. Duplicate records were automatically detected and removed using Scopus’s export tools and further verified manually. Metadata fields (e.g., author names, affiliations, publication titles, keywords) were standardized to correct for inconsistencies in formatting and indexing. Records with incomplete metadata or that were out of scope were excluded after manual inspection.

These procedures ensured the consistency and reliability of the final corpus, reducing the risk of bias and supporting the integrity of subsequent analyses.

## 1.3. Analytical Tool and Techniques

The analysis was conducted using the Bibliometrix R-package (Aria & Cuccurullo, 2017), an open-source suite for comprehensive bibliometric analysis. This software was chosen for its ability to process large bibliographic datasets and its rich suite of functions, including:

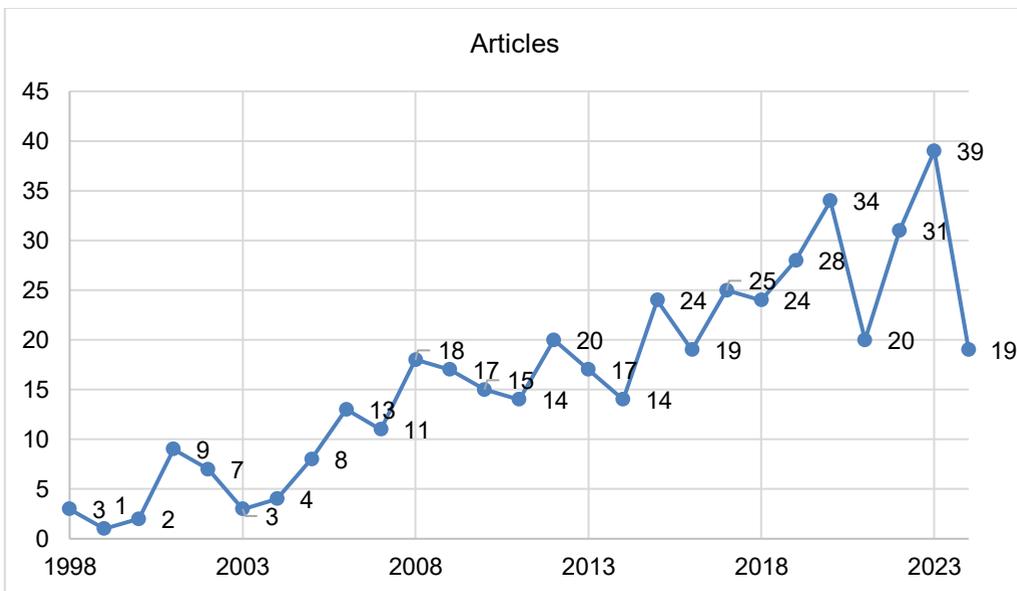
- **Data ingestion and formatting** of Scopus-exported records
- **Descriptive bibliometrics** (e.g., publication and citation counts, author productivity, journal impact)
- **Network analysis** (e.g., co-authorship, keyword co-occurrence, co-citation)
- **Trend and temporal analysis** for examining thematic evolution
- **Visualization** of collaboration structures and thematic maps

These techniques enabled the detailed mapping of intellectual structures, influential publications, and temporal shifts in the knowledge economy literature.

## 2. RESULTS AND DISCUSSION

### 2.1. Analysis of Annual Publications

The number of publications on knowledge economy studies over the years is presented in Figure 1. A review of Figure 1 reveals the changing interest of the research community in this field over time.



**Figure 1:** Annual Growth of Publications (1998–2024)

As depicted in Figure 1, the annual volume of knowledge economy publications remained notably low from 1998 through 2004. In 1998, only three articles were published, and the number dropped to just one article in 2000. This period reflects the early stages of knowledge economy research, indicating that the field was not yet widely recognized by scientific communities. However, a notable increase occurred in 2003 with nine publications, signalling the gradual momentum that knowledge economy studies started to gain.

Although an increase in the number of publications was observed between 2008 and 2017, it was not consistent, with declines occurring in certain years. During this period, the growing interest in knowledge economy studies can be seen, though this interest did not consistently expand, showing a fluctuating trend. For instance, while 20 articles were published in 2013, the numbers fell to 17 and 14 in 2014 and 2015, respectively. This fluctuation indicates that the knowledge economy was an emerging field but had not yet fully established itself in academic circles.

The year 2018 marks a significant leap, with the number of publications rising to 24, indicating increased awareness and more research activity in the knowledge economy field. The growth continued until 2020, further demonstrating that the knowledge economy was becoming a rapidly expanding area of research.

The global disruption caused by COVID-19 notably accelerated scholarly interest in the knowledge economy, with a marked uptick in publications during 2020 and 2021. The year 2020 reached a high point, registering 34 articles, reflecting researchers' heightened focus on the critical role of digital infrastructure and knowledge-intensive services under pandemic conditions. However, the publication count reached another peak in 2023, with 39 articles, before sharply dropping to 19 in 2024. This decrease may indicate a rebalancing of research activities after the pandemic, with a shift toward more in-depth and high-quality studies. Another possible explanation for this decline is that the 2024 data only cover the period up to the end of September. As the year has not been fully completed, the publication count for 2024 is difficult to evaluate, and it is likely that this figure will increase by the end of the year.

In conclusion, bibliometric trends in the knowledge economy show a progression from early exploration to significant growth and expansion, followed by a more stable period of research activity. While the field is still developing, there is a need for more interdisciplinary collaborations and innovative research approaches. It is expected that future studies in the knowledge economy will continue with more refined applications and gain greater depth.

## 2.2. Analysis of Top Cited Articles

Table 2 lists the most influential publications in knowledge economy research, offering a clear perspective on the field's development and the thematic and methodological focal points around which the scholarly community has coalesced. These studies address various topics such as different applications of the knowledge economy, knowledge transfer, strategic management, socio-economic impacts, and innovation ecosystems.

Cooke & Leydesdorff, (2006) investigated how regional innovation systems—through localized knowledge flows and technology transfer—catalyze economic development. In a strategic management framework, Kim & Mauborgne, (1998) demonstrated that firms relying on knowledge-based strategies can secure sustainable competitive advantages by optimizing their internal knowledge management processes. Tchamyou, (2017) highlighted the pivotal role of knowledge-driven policies in accelerating economic growth within developing nations, while Godin (2006) traced the historical transformation of the

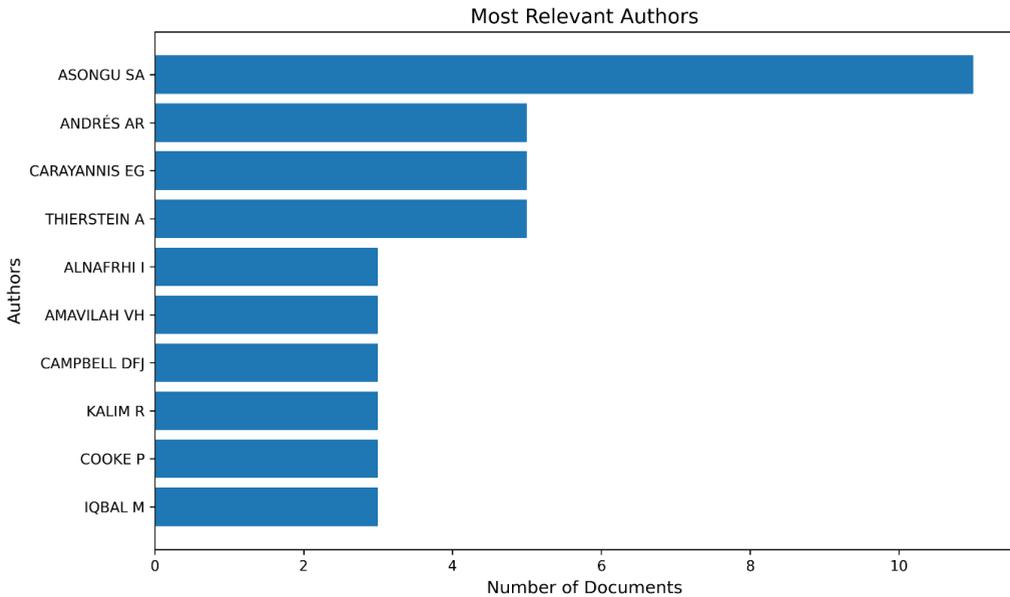
knowledge economy and detailed the evolving mechanisms of technology transfer. Vallas & Kleinman, (2008) explored the broader socio-economic repercussions of a knowledge-intensive economy, revealing its profound effects on labor markets and social structures. Nurunnabi, (2017) linked the knowledge economy to corporate governance and sustainable development, emphasizing how institutional strategies must integrate knowledge assets to advance long-term sustainability. Neumann & Tan, (2011) focused on higher education's function in knowledge creation and dissemination, illustrating universities' central role in shaping education policy and research management. Amavilah et al., (2017) examined the long-term implications of knowledge economy dynamics for technological foresight and social transformation, and Scott & Walsham, (2005) analyzed how organizations structurally adapt to knowledge-centric paradigms. Finally, Asheim, (2012) underscored the importance of knowledge-based innovation policies in regional development, demonstrating how targeted policy interventions can strengthen local innovation ecosystems.

**Table 2:** Top 10 Cited Articles Relevant to Knowledge Economy

Paper	Doi	TC	TC per Year
Cooke P, 2006, J Technol Transf	<a href="https://doi.org/10.1007/s10961-005-5009-3">10.1007/s10961-005-5009-3</a>	443	23,32
Kim Wc, 1998, Strategic Manage J	<a href="https://doi.org/10.1002/(SICI)1097-0266(199804)19:4&lt;323::AID-SMJ976&gt;3.0.CO;2-F">https://doi.org/10.1002/(SICI)1097-0266(199804)19:4&lt;323::AID-SMJ976&gt;3.0.CO;2-F</a>	370	13,70
Tchamyou Vs, 2017, J Knowl Econ	<a href="https://doi.org/10.1007/s13132-016-0417-1">10.1007/s13132-016-0417-1</a>	250	31,25
Godin B, 2006, J Technol Transf	<a href="https://doi.org/10.1007/s10961-005-5010-x">10.1007/s10961-005-5010-x</a>	215	11,32
Vallas Sp, 2008, Socio-Econ Rev	<a href="https://doi.org/10.1093/ser/mwl035">10.1093/ser/mwl035</a>	142	8,35
Nurunnabi M, 2017, J Knowl Econ	<a href="https://doi.org/10.1007/s13132-017-0479-8">10.1007/s13132-017-0479-8</a>	130	16,25
Neumann R, 2011, Stud High Educ	<a href="https://doi.org/10.1080/03075079.2011.594596">10.1080/03075079.2011.594596</a>	130	9,29
Amavilah V, 2017, Technol Forecast Soc Change	<a href="https://doi.org/10.1016/j.techfore.2017.04.013">10.1016/j.techfore.2017.04.013</a>	111	13,88
Scott Sv, 2005, Organ Sci	<a href="https://doi.org/10.1287/orsc.1050.0127">10.1287/orsc.1050.0127</a>	101	5,05
Asheim B, 2012, Reg Stud	<a href="https://doi.org/10.1080/00343404.2011.607805">10.1080/00343404.2011.607805</a>	100	7,69

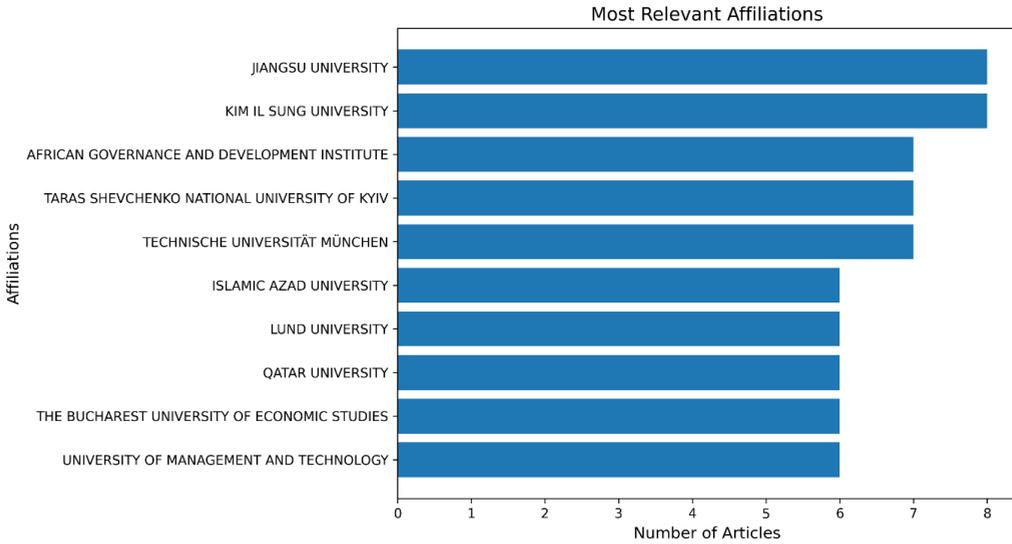
### 2.3. Analysis of Authors, Affiliations, and Countries

The body of knowledge economy research can be characterized by examining author productivity, institutional participation, and national output. A synthesis of these contributions is provided in Figure 2, which visualizes the most prolific authors and thus highlights the individuals who have driven scholarly discourse in this domain.



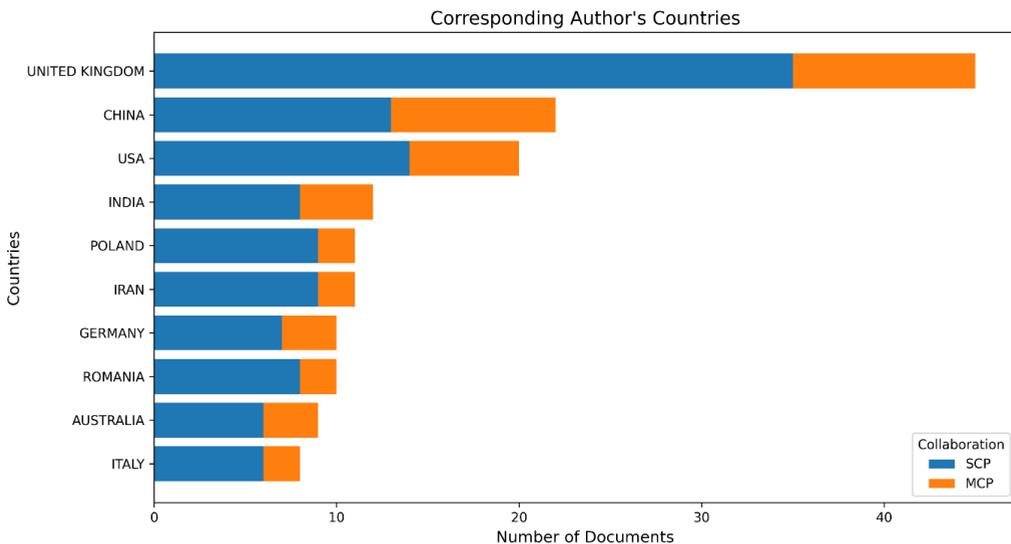
**Figure 2:** Most Productive Authors

The productivity of authors in the field of the knowledge economy demonstrates that a specific group of academics has shaped the scientific discourse in this area. In the ranking of authors presented in Figure 2, Asongu SA stands out as the most prolific, having contributed a total of 11 articles, playing a central role in knowledge economy research. This indicates that Asongu holds a pioneering research agenda in the field and has been instrumental in driving developments. He is followed by Andrés AR, Carayannis EG, and Thierstein A, each contributing 5 articles, marking them as significant contributors to the field. These authors provide sustainable research focuses and methodological contributions in the knowledge economy domain. Additionally, scholars such as Alnafrahi I, Amavilah VH, and Cooke P, each with 3 articles, have made important contributions to the literature and have supported the field's development. These authors have facilitated the expansion of the field through both individual efforts and collaborative work. The most productive institutions are presented in Figure 3.



**Figure 3:** Top 10 Productive Affiliations in The Field of Knowledge Economy

When Figure 3 is examined, it is evident that Jiangsu University and Kim Il Sung University stand out among the most prolific institutions in the field of the knowledge economy. Both universities have contributed significantly to knowledge economy research with 8 articles each. Their leading positions suggest that they have dedicated research groups or departments focused on the knowledge economy, contributing greatly to the development of this field. Other institutions, such as the African Governance and Development Institute, Taras Shevchenko National University of Kyiv, and the Technical University of Munich, have also made notable contributions, each with 7 articles. These institutions highlight that the knowledge economy is being researched on a global scale, with academic institutions from different countries actively involved in the field. Lund University, Qatar University, and Bucharest University of Economic Studies, each with 6 articles, also hold significant positions in knowledge economy research. These institutions enrich the field through interdisciplinary collaborations and contributions from experts across various fields. This diversity among institutions demonstrates the multifaceted nature of the knowledge economy and the global scale of research efforts. The most productive countries are presented in Figure 4.



**Figure 4.** Top 10 Productive Countries in The Field of Knowledge Economy

Figure 4 reveals that the United Kingdom, China, and the United States are the foremost contributors to knowledge economy scholarship. The United Kingdom occupies the top position in terms of publication volume, underscoring the pivotal role of its universities and nationally coordinated research efforts in advancing this field. China and the United States rank second and third, respectively, reflecting their substantial and growing engagement in knowledge economy research. China's substantial number of single-country publications (SCP) indicates a strong research capacity at the national level, while its multi-country publications (MCP) demonstrate openness to international collaborations. Countries like India and Poland are also actively contributing to knowledge economy research. Research from these countries highlights the importance of the knowledge economy for emerging economies and shows that scientific studies in this field are conducted in various countries.

Collectively, these visualizations demonstrate that knowledge economy research constitutes a truly global enterprise, informed by a rich tapestry of contributions from individual scholars, institutions, and nations. The prominence of both high-output authors and internationally networked organizations underscores the field's complexity and the synergistic benefits of cross-border collaboration. Moreover, the extensive thematic and geographic breadth evident in the data reflects the inherently interdisciplinary character of knowledge economy studies and the far-reaching influence of its scholarly community.

## 2.4. Analysis of Top Journals

The bibliometric assessment of leading outlets in knowledge-economy scholarship reveals a striking concentration of research within a relatively small subset of journals. As shown in Table 3, the top five journals together account for approximately 35 % of all published items in the field. These include both specialized and interdisciplinary outlets.

**Table 3:** Top 15 Productive Journals in The Field of Knowledge Economy

Journal	h index	TC	NP	PY_start
Journal of The Knowledge Economy	16	1305	48	2011
Sustainability (Switzerland)	8	270	14	2017
Prometheus: Critical Studies in Innovation	5	113	5	2000
Technological Forecasting and Social Change	4	175	4	2015
Environmental Science and Pollution Research	3	25	3	2023
Global Networks	3	133	3	2010
International Journal of Knowledge-Based Development	3	36	5	2012
Journal of Innovation and Entrepreneurship	3	74	3	2015
Journal of Knowledge Management	3	48	3	1998
Journal of Science and Technology Policy Management	3	27	3	2015
Journal of Technology Transfer	3	687	3	2006
Management and Marketing	3	30	3	2017
Regional Studies	3	176	3	2008
Studies in Higher Education	3	181	3	2010
Technology in Society	3	59	3	2020

As shown in Table 3, the Journal of the Knowledge Economy, launched in 2011, ranks among the most influential outlets in this domain. To date, it has amassed 1,305 citations and holds an h-index of 16, underscoring its authority in both theoretical discourse and applied research on the knowledge economy. The journal consistently publishes a wide spectrum of studies that explore how knowledge assets drive economic growth, foster innovation, and support sustainable development initiatives. Sustainability (Switzerland), published since 2017, addresses the relationship between environmental sustainability and the knowledge economy. With 270 citations and an h-index of 8, it presents research exploring how the knowledge economy affects sustainable development. This journal offers a perspective that integrates environmental factors with the knowledge economy by investigating the development of knowledge-based sustainability strategies. Prometheus: Critical Studies in Innovation, a journal with an h-index of 5, has been offering a critical review of innovation since 2000. It explores how the knowledge economy is shaped by innovative applications and critical thinking, assessing innovation processes from both academic and practical standpoints. Technological Forecasting and Social Change is a significant journal focusing on the knowledge economy, technological forecasts, and social change. With 175 citations and an h-index of 4, it hosts studies that investigate the impact of knowledge on technological advancements and social change, serving as a critical platform for researchers seeking to understand the interaction between the knowledge economy and technological developments. Environmental Science and Pollution Research, published in 2023, focuses on the environmental impacts of the knowledge economy. Global Networks, established in 2010, has accrued 133 citations to date and investigates how

knowledge-based economies shape and are shaped by transnational networks, illuminating the mechanisms through which knowledge flows drive innovation and economic development. The *International Journal of Knowledge-Based Development*, launched in 2012, has garnered 36 citations and maintains an h-index of 3; it specializes in examining how knowledge economy principles inform development policies and strategic planning. Since its inception in 2015, the *Journal of Innovation and Entrepreneurship* has accumulated 74 citations by focusing on the intersection of knowledge economy dynamics with entrepreneurial ecosystems and innovation processes. The *Journal of Knowledge Management*, in continuous publication since 1998, remains a cornerstone outlet for research into organizational knowledge practices, consistently publishing work on how knowledge management underpins economic growth and strategic decision-making. The *Journal of Science and Technology Policy Management*, active from 2015 onward, contributes to policy discourse by analyzing how knowledge economy considerations inform science and technology governance. Since 2006, the *Journal of Technology Transfer* has been a leading forum for scholarship on the mechanisms and outcomes of technology transfer, demonstrating how knowledge diffusion catalyzes economic expansion through innovation. *Management and Marketing*, first issued in 2017, explores the implications of knowledge economy developments for strategic management and marketing, probing how knowledge assets influence firm competitiveness. *Regional Studies* offers in-depth analyses of knowledge economy activity at subnational scales, highlighting the role of regional innovation systems in translating knowledge resources into economic value. *Studies in Higher Education* provides a dedicated venue for research on universities' central role in knowledge creation and dissemination, examining the impact of knowledge economy imperatives on higher-education policy and practice. Finally, *Technology in Society* publishes critical examinations of how technological change—and the knowledge economy more broadly—reshapes social institutions and cultural norms, thereby offering insights into the societal dimensions of knowledge-driven economic transformation.

These journals cover various dimensions of the knowledge economy and appeal to a wide academic community. Research on the environmental, social, political, and economic impacts of the knowledge economy is published through these journals, making significant contributions to academic literature.

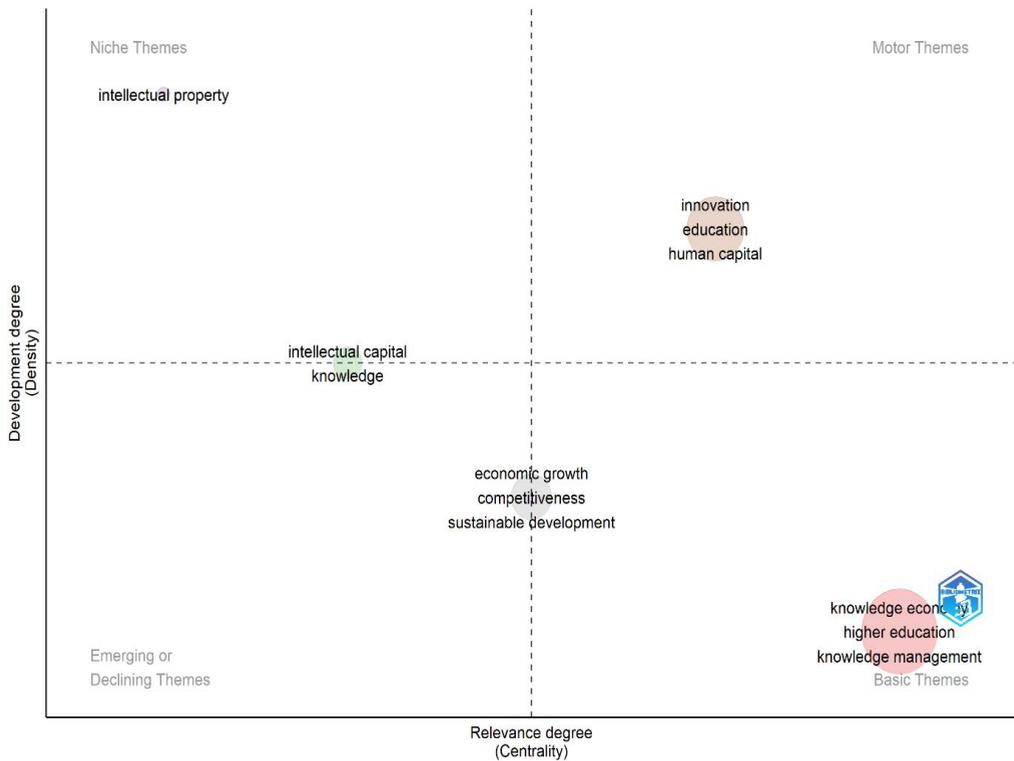
## 2.5. Analysis of Hot Topics, Evolution, and Trends

The word cloud presented in Figure 5 helps to highlight the most frequently used terms or themes in a specific research field.



**Figure 5.** Word Cloud Based on Keywords Related to Knowledge Economy

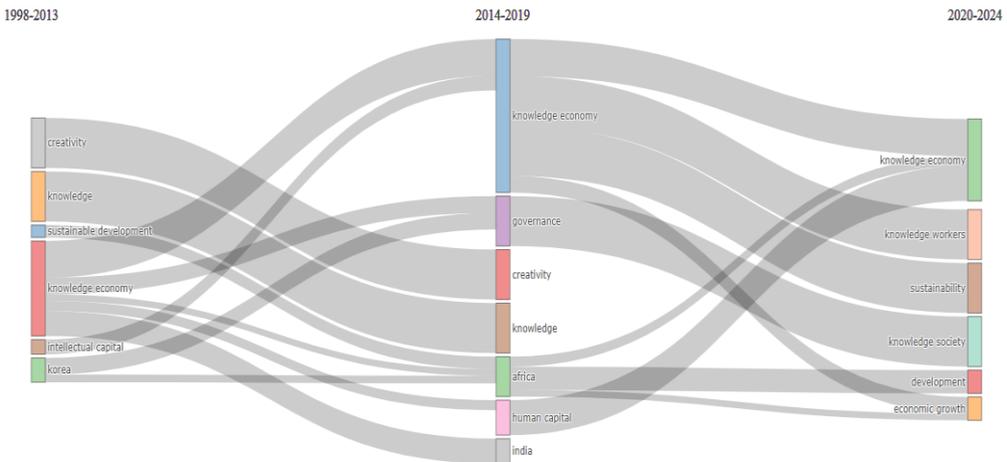
The inspection of Figure 5 reveals that “innovation” and “higher education” emerge as dominant keywords, underscoring their central importance in driving the knowledge economy. Educational institutions are instrumental in cultivating human capital, which in turn fuels economic expansion through novel technological and organizational processes (Kofarbai and Abdullahi 2021). Equally prominent are terms such as “economic growth” and “sustainable development,” indicating that knowledge assets and inventive capabilities not only stimulate immediate gains but also support long-term, sustainability-oriented growth trajectories (Bielenkova et al. 2022). The frequent occurrence of “intellectual capital” and “human capital” further confirms that this paradigm rests fundamentally on non-tangible resources rather than on physical inputs—a distinction that is vital for maintaining global competitiveness (Peters, 2020). References to “globalization” and “competitiveness” highlight the imperative for continuous innovation and technological advancement in order to secure an edge in international markets; within this context, effective knowledge management and the strategic deployment of intellectual capital become crucial determinants of success world (Levytskyi, Radynskiy, and Dyachun 2021). Collectively, these findings illustrate how innovation, education, and the stewardship of human and intellectual resources—core pillars of the knowledge economy—interact to promote both economic development and sustainable progress. Figure 6 presents a thematic map partitioned into four quadrants, each reflecting varying degrees of topic centrality and developmental maturity within the field.



**Figure 6:** Thematic Map of Keywords in Research on Knowledge Economy

The upper-right quadrant typically contains "motor themes" that are both well-developed and central to the research area. In this map, "innovation", "education", and "human capital" are in this quadrant. These are the driving forces of the knowledge economy and are fundamental to the development of knowledge-based societies. These themes are well-researched and interconnected, suggesting they are critical in shaping both the academic discourse and policy frameworks. For instance, innovation and human capital have been highlighted as essential for economic development in recent studies (Efe 2023). In the upper-left quadrant, we find "intellectual property". This theme, while highly developed, is less central in the broader knowledge economy discourse. It remains more isolated from the central debates, often linked to legal frameworks and specialized areas such as intellectual rights and patent law. The literature highlights that intellectual property plays a critical role in protecting innovation, yet it remains somewhat peripheral in broader discussions of human capital or sustainable development (Peters, 2020). The lower-left quadrant typically reflects emerging or declining themes. Here, we see terms like "economic growth", "competitiveness", and "sustainable development". While these themes are critical to the knowledge economy, they are either in a phase of emerging prominence or becoming less central as new paradigms (such as innovation and human capital) take the lead. Recent research emphasizes the importance of economic growth in sustainable models of development, suggesting that these themes may evolve further depending on how

knowledge economies develop globally (Choriyevich and Qizi 2022). The lower-right quadrant houses "knowledge economy", "higher education", and "knowledge management". These are essential foundational themes that, while not as fully developed as motor themes, provide the core structure for ongoing research. They are likely to grow in importance as more resources are devoted to understanding how knowledge can be effectively managed and utilized within educational institutions and across industries (Kintu, Aydin, and Zhu 2020). The thematic map furnishes a nuanced understanding of how different research strands within the knowledge economy vary in maturity and influence. Core areas such as innovation, human capital, and education emerge as driving forces—so-called “motor themes”—propelling the field forward, whereas fundamental constructs like the knowledge economy itself and higher education remain underexplored and present fertile ground for deeper inquiry. Concurrently, nascent topics such as sustainable development and economic competitiveness are gaining traction and are poised to become more central as scholarship in this arena progresses. Complementing this, the thematic evolution map (Figure 7) traces the chronological progression of key themes from 1998 to 2024. By illustrating the rise, transformation, and decline of specific topics over time, it offers a dynamic portrayal of shifting scholarly priorities and the birth of novel research directions within the knowledge economy domain.



**Figure 7:** Thematic Evolution of Keywords in Research on Knowledge Economy

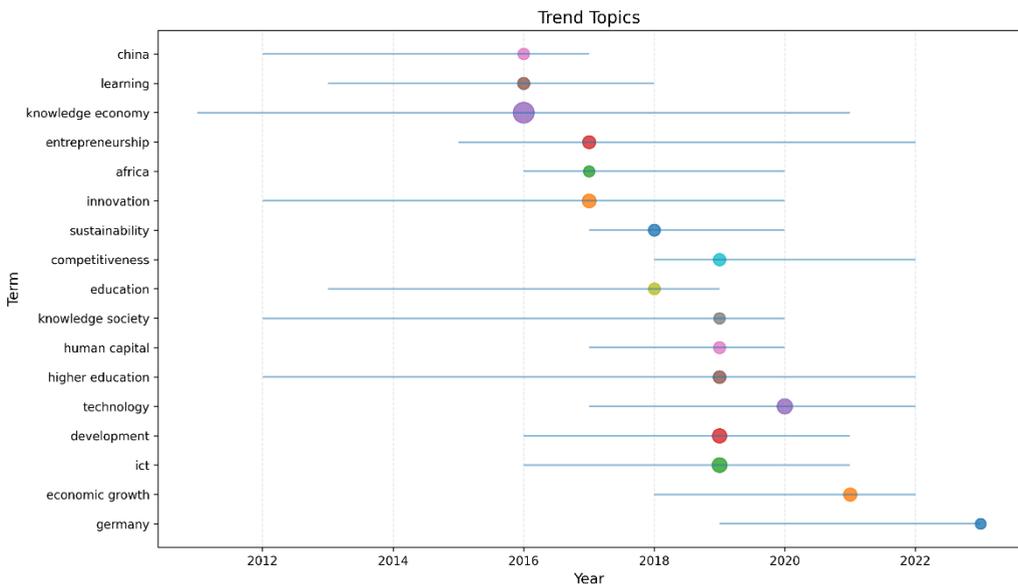
When examining Figure 7, we can observe how research on the knowledge economy has developed and transformed over time, with different periods highlighting various research themes. These periods reflect the phases where certain themes gained prominence, while others began to attract less attention.

During the 1998–2013 period, the research focus was on core concepts such as creativity, knowledge, and sustainable development. These themes emphasized the importance of creativity and knowledge sharing as fundamental components of the knowledge economy. Moreover, the emergence of terms like intellectual capital and

knowledge economy signalled the central role of human capital and knowledge in driving economic growth (Duca 2023). In the 2014–2019 period, knowledge economy continued to remain a prominent theme, while new topics such as governance and creativity emerged. These themes underscored the significance of knowledge not only in economic processes but also in governance and creative endeavours. Creativity and innovation, particularly in knowledge-based economies, were recognized as critical drivers of economic growth (Mohamed et al. 2021). In the 2020–2024 period, the theme of knowledge economy remained at the forefront, while new themes such as knowledge workers, human capital, and sustainable policies gained prominence. These themes highlight the need for knowledge economies to align with sustainable policies and emphasize the importance of developing human capital to achieve competitive advantages. Additionally, themes such as economic globalization highlight the global dimension of the knowledge economy and the impact of digitalization in this process (Sycheva, Budagov, and Novikov 2020). In conclusion, throughout these three periods, we observe the evolving and dynamic nature of the knowledge economy. While foundational themes such as creativity and knowledge have remained central, more specific topics like human capital, knowledge workers, and sustainable policies have emerged in recent years, reflecting the changing priorities and focus areas within this field. The visualization of trend topics based on keyword frequency (Fig. 8) offers a temporal overview of research interests and thematic transitions in the field of the knowledge economy. The terms, drawn from publications spanning 2011 to 2024, highlight both persistent themes and emerging topics within the academic discourse. This temporal analysis not only underscores the areas of sustained scholarly focus but also brings attention to new, evolving themes that are shaping the future directions of research in the knowledge economy.

When considering Figure 8, the trends reflected in the visualization further reinforce the evolving nature of research on the knowledge economy, which integrates aspects of human capital, innovation, and technological advancement to drive economic growth. "Germany" appears as a frequent term, reflecting the country's significance as a leading economy driven by innovation and knowledge. Research in this area tends to focus on how Germany has managed to harness technology and innovation for economic growth, especially post-2014. This suggests that scholars are interested in studying Germany's model of a knowledge-based economy (Hájek and Stejskal 2018). "Economic Growth" shows a high frequency with consistent appearance, emphasizing that the knowledge economy is intrinsically tied to broader discussions on how knowledge-intensive sectors fuel economic expansion. Studies highlight how technology, human capital, and education influence economic outcomes globally (Bond-Smith 2019). "ICT" (Information and Communication Technology) has a notable presence from 2015 onward, suggesting the role of ICT as a foundation of the knowledge economy. Research in this area explores how ICT acts as an enabler of innovation, improving productivity and creating new economic opportunities (Švarc and Dabić 2017). "Development" and "Technology" as terms demonstrate the tight link between technological progress and economic development within the knowledge

economy framework. Innovation-driven development models are key areas of inquiry, with countries focusing on scaling technology-driven initiatives to boost economic outcomes (Shkarupa et al. 2022). "Higher Education" appears significantly from 2015, reinforcing the critical role of education in fostering a knowledge-based society. The literature suggests that education is essential for developing human capital, which is the backbone of a thriving knowledge economy (Zhakhanova 2020). "Human Capital" and "Knowledge Society" are central to the discourse, underlining the importance of skills and expertise in economic success. Research emphasizes how investment in human capital and the formation of a knowledge society lead to sustainable economic growth (Välilmaa and Hoffman 2008). "Entrepreneurship" and "Innovation" are frequent topics, with peaks around 2017, reflecting the growing focus on innovative business models and entrepreneurial ventures as drivers of the knowledge economy. Studies have shown that entrepreneurship plays a pivotal role in transforming knowledge into economic value (Malerba and McKelvey 2020). "Sustainability" is a more recent topic that gained prominence around 2018, indicating a shift towards exploring the intersection of sustainability and the knowledge economy. Scholars are increasingly interested in how knowledge-driven growth can be aligned with environmental and social sustainability (Smuts and Van der Merwe 2022). "Competitiveness" consistently features, reflecting research on how countries and organizations leverage the knowledge economy to maintain a competitive edge in global markets. The term highlights the role of innovation policies and intellectual capital in boosting national and corporate competitiveness (Rodríguez, Dahlman, and Salmi 2014). "Africa" and "China" are also noteworthy. The appearance of these terms suggests a focus on emerging economies and how they are integrating knowledge-based economic models to leapfrog traditional industrial development stages (Qobo and le Pere 2018).



**Figure 8:** Trend Topics by Keywords of Research on Knowledge Economy

The trends identified highlight the maturity and evolution of the knowledge economy discourse. Core themes like human capital, innovation, and ICT remain dominant, but there is also an emerging interest in sustainability and how it integrates with economic competitiveness. This reflects a dynamic research landscape increasingly concerned with addressing global economic challenges through knowledge and innovation.

## **CONCLUSION, LIMITATIONS and FUTURE DIRECTIONS**

This investigation of knowledge economy scholarship spanning 1998–2024 uncovers a marked acceleration in publication activity, illustrating the field’s transition from its nascent exploratory stage into a period of concentrated research—and a surge further propelled by the COVID-19 pandemic’s emphasis on digital transformation and educational innovation. Additionally, the field has been enriched by an international and interdisciplinary research community, with sustained thematic focuses on knowledge, innovation, higher education, and sustainable development. This underscores the necessity for robust collaboration among stakeholders.

Although bibliometric analysis provides valuable quantitative insights, it has notable limitations. Its reliance on metrics such as publication and citation counts may not fully capture the complexity or quality of the research (Donthu et al. 2021), potentially leading to an overestimation of the field’s growth (José de Oliveira et al. 2019). To mitigate these issues, our study integrated both quantitative and qualitative analyses, offering a more comprehensive evaluation of the knowledge economy.

This study exclusively relied on the Scopus database and included only articles published in English. While Scopus is a widely recognized and robust source, this approach may have inadvertently excluded relevant research from regional databases or non-English language publications. As a result, the findings may reflect a global but linguistically filtered view of knowledge economy research. Future studies could expand the scope by incorporating multilingual sources and additional databases such as Web of Science or Dimensions.

Future research should further explore the impact of the knowledge economy on innovation, competitiveness, and sustainable development, with a particular focus on human and intellectual capital, digitalization, and knowledge management. Moreover, emerging themes such as sustainable development, social inequality, and ethical considerations warrant deeper investigation to ensure that the knowledge economy delivers inclusive benefits across both economic and social dimensions.

While this study employed the Bibliometrix R package as the sole analytical tool due to its compatibility with Scopus data and its established credibility in bibliometric research, the reliance on a single software platform represents a methodological limitation. Emerging AI-assisted tools—such as pyBibX—offer advanced functionalities for network exploration, semantic clustering, and automation of data preprocessing. Future studies may benefit from adopting a multi-tool analytical framework that integrates Bibliometrix with such AI-

supported platforms. This would not only enhance analytical depth but also facilitate more dynamic and large-scale bibliometric evaluations across diverse databases and disciplines.

### ***Statement of Research and Publication Ethics***

The publication process of the article has been conducted in accordance with the principles outlined under the heading “Compliance with Ethical Rules” in the Social Sciences Journal of the Institute of Social Sciences at Karadeniz Technical University. The research section of the study does not contain any issues requiring ethical committee approval.

### ***Author Contributions Statement***

The article, handled as a single-authored work, was entirely produced by the author.

### ***Conflict of Interest Statement***

There are no potential conflicts of interest declared by the author in the article.

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