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Kazakhstan's Scientific Output in Economic Disciplines: Collaboration Networks and Citation Analysis

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ABSTRACT

Kazakhstan's integration into the global scientific landscape is closely tied to the growth and transformation of its publication activity in economics-related disciplines. This study aims to evaluate the evolution of Kazakhstan's publication activity in economics-related disciplines from 2010 to 2023, with a particular focus on growth in output, the emergence of dominant research themes, changes in international collaboration patterns, and the extent of global citation visibility. Using bibliometric methods applied to a dataset of 3,914 Scopus-indexed publications, the analysis focuses on three subject areas: business, management and accounting; decision sciences; and economics, econometrics and finance. The results reveal a sharp increase in publications, from 18 papers in 2010 to over 500 in 2023, with a peak of 538 in 2022. The findings show sustained growth in research output, particularly after higher education and science reforms. Keyword analysis reveals a shift from locally focused topics, such as development and policy, toward internationally relevant themes, including technology and energy. Citation analysis confirms increasing visibility, with 19,967 citations across 2,860 publications, led by China (2,444), Russia (1,430), and the United States (1,186). These findings indicate that Kazakhstan's academic community is gradually transitioning from knowledge consumption to production, pointing to its potential for regional leadership. Future research should assess the quality of international collaborations, expand the disciplinary scope beyond Scopus, and incorporate qualitative approaches to capture the depth of research partnerships more effectively.

KEYWORDS: Economic Research, Economic Discipline, Econometrics, Scientometrics, Research Partnerships, Research Collaboration, Business, Publication Output

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1. INTRODUCTION

Global knowledge production continues to exhibit significant disparities between the Global North and the Global South. Research from high-income, industrialised countries in Europe, North America, and parts of East Asia dominates in terms of visibility, volume, and citation impact. In contrast, many countries in Asia, Africa, and Latin America face barriers such as limited funding, linguistic constraints, and restricted access to international publishing platforms (Connell, 2007; Tijssen, 2007; UNCTAD, 2022; Al-Khoury et al., 2022). To overcome these disparities, it is essential to strengthen mechanisms that support research capacity, foster international collaboration, and ensure greater representation of diverse perspectives in global debates (Boshoff, 2010; UNESCO, 2021).

Despite persistent structural inequalities in global knowledge production, Kazakhstan provides a suitable case for examining how an emerging research system seeks to strengthen its international presence. Since the early 2010s, the country has introduced a series of reforms to modernise its research landscape, including participation in the Bologna Process, expansion of performance-based funding, and incentives to publish in internationally indexed journals (Narbaev & Amirbekova, 2021; Kuzhabekova et al., 2022). These initiatives have contributed to a steady rise in publication output (Amirbekova et al., 2022; Lovakov & Yudkevich, 2021). Yet, important questions remain about whether this growth reflects more profound systemic change, including policy changes, digitalization and other potential areas for growth (Nurtayeva et al., 2024; Matveeva et al., 2023; Movkebayeva et al., 2020; Lodhi et al., 2023). Existing studies highlight uneven international collaboration, limited engagement with global debates, and the modest visibility of locally relevant research in high-impact outlets (Yessirkepov et al., 2015; Amirbekova & Li, 2024; Lovakov et al., 2022). Whether these reforms have enabled Kazakhstan to transition from a knowledge consumer to a knowledge producer remains an open question, making it a critical case for assessing the dynamics of academic development in the Global South.

This study aims to evaluate the evolution of Kazakhstan's publication activity in economics-related disciplines from 2010 to 2023, with a particular focus on growth in output, the emergence of dominant research themes, changes in international collaboration patterns, and the extent of global citation visibility. This focus on economics-related fields is deliberate, as they are strategically important for Kazakhstan's economic modernisation and international competitiveness, yet remain underexplored in scientometric research. The period from 2010 to 2023 coincides with major national reforms in higher education and research policy, providing a meaningful timeframe for analysis. Scopus was selected as the primary database because of its wide coverage of peer-reviewed journals in economics and business disciplines, as well as its structured metadata that enables robust bibliometric analysis. Our analysis employs bibliometric methods to examine trends in publication activity, keyword usage, international collaboration, and citation patterns across three subject areas: Business, Management, and Accounting; Decision Sciences; and Economics, Econometrics, and Finance. These fields were selected because they represent core areas of economic scholarship where Kazakhstan's integration into international academic debates remains limited, yet strategically important. Drawing on established scientometric frameworks, this paper assesses Kazakhstan's progress and ongoing challenges in its transition from a knowledge consumer to a knowledge producer (Serenko, 2021; Tsilika, 2023). The following research questions guide the study:

RQ1: How has Kazakhstan's publication output in economics-related fields evolved between 2010 and 2023?

RQ2: What are the dominant research themes that characterise these fields?

RQ3: How has Kazakhstan's international collaboration shifted between Global North and Global South partners?

RQ4: What patterns of citation impact reflect the visibility of Kazakhstan's research in global academic networks?

The contribution of this study is two-fold. Firstly, applying scientometric analysis to a dataset of 3,914 Scopus-indexed publications provides an in-depth assessment of Kazakhstan's evolving research landscape in economics-related fields, highlighting trends in output, collaboration, and visibility. Secondly, it offers policy-relevant insights on strengthening research capacity, improving international collaborations, and creating incentives for high-quality publications - issues that are highly relevant not only for Kazakhstan but also for other emerging economies where research is closely tied to economic development.

The paper proceeds as follows. Section 2 reviews relevant literature on knowledge production in the Global South and Kazakhstan's research policies. Section 3 outlines the dataset and bibliometric methods. Section 4 presents the empirical results, while Section 5 discusses their significance for Kazakhstan's research system, global debates and limitations. Section 6 concludes with implications and future research directions.

2. LITERATURE REVIEW

Despite the steady growth in the number of publications in developing countries, structural barriers persist that prevent their full participation in global academic processes. These limitations include insufficient funding for science, the dominance of English as a language, and limited access to prestigious publishing platforms. These factors create a situation where the scientific contributions of countries in the Global South are not visible in leading databases. The science of Kazakh economics faces similar challenges: despite the growth in quantitative indicators of publication activity, issues with research quality, depth of international collaboration, and global citation remain unresolved.

This literature review is organised into two parts. First, it outlines global research inequalities between the Global North and Global South. Second, it situates Kazakhstan within this context and connects it to broader discussions on research reforms, bibliometric approaches, and comparative perspectives in emerging economies.

Research output and influence remain heavily concentrated in the Global North, especially in Western Europe, North America, and East Asia, supported by sustained investments in infrastructure and long-term policy frameworks (Connell, 2007; UNESCO, 2021; Wagner & Jonkers, 2017; Rousseau & Ding, 2016). Bibliometric surveys confirm that high-income countries consistently dominate global publication and citation indicators, while Global South systems contribute marginally to international journals indexed in Scopus and Web of Science (King, 2004; Tijssen & Kraemer-Mbula, 2017; Leydesdorff et al., 2019; Chankseliani et al., 2021). This imbalance underscores the persistent structural gap in global knowledge production, highlighting the need for strategies that can strengthen the research capacity and visibility of emerging economies.

The literature on inequalities reveals two recurring themes. First, structural barriers such as limited research funding, English-language dominance, and uneven access to international publishing continue to constrain participation (Al-Khoury et al., 2022). Second, debates on epistemic justice highlight how Northern hegemony extends beyond volume and citations, shaping what counts as legitimate knowledge and whose perspectives frame global debates (Connell, 2007; Santos, 2014; Canagarajah, 2002). These factors underscore the profound nature of global scientific inequality and highlight the need for innovative approaches to address it.

Methodologically, most studies of the North-South divide rely on macro-level bibliometric indicators (publication counts, citations, impact factors), but critics note their limitations in capturing research quality, thematic relevance, and local impact (Moed, 2005; Leydesdorff & Wagner, 2008). There is growing interest in using network analysis and

thematic mapping to assess better collaboration dynamics and emerging research agendas (Glänzel, 2012; Aria & Cuccurullo, 2017; Zupic & Čater, 2015). However, empirical applications remain uneven, with more developed analyses in STEM and fewer systematic studies in economics-related disciplines.

Kazakhstan provides a valuable case for examining how transitional economies pursue academic integration. Since 2010, the government has introduced reforms, including participation in the Bologna Process, performance-based funding, and incentives for international publishing (Narbaev & Amirbekova, 2021). These measures contributed to a rise in research output, especially in STEM, though social sciences and economics-related disciplines remain underdeveloped (Amirbekova et al., 2022; Yessirkepov et al., 2015; Hladechenko & Moed, 2021). This contrast highlights both the progress achieved through policy reforms and the persistent gaps that require further attention in order to strengthen Kazakhstan's position in the global research landscape.

Studies of Kazakhstan's publication patterns reveal several challenges. First, thematic orientation: in Business, Management, and Accounting, around 70% of publications focus on local or regional issues, often using descriptive methods, whereas international studies employ theoretical models and mixed methods (Amirbekova & Li, 2023; Amirbekova et al., 2025). Second, language and access barriers: Russian remains dominant, with limited English proficiency restricting participation in global journals (Yessirkepov et al., 2015). Third, quality concerns: researchers face pressure to publish internationally, sometimes resulting in publication in predatory or low-impact journals (Savina & Sterligov, 2020; Kuzhabekova, 2021; Yelibay et al., 2022). These factors suggest the need for systematic measures to enhance the quality of research and its integration into the international academic community.

From a methodological perspective, while policy reports and descriptive studies exist, few works have applied scientometric techniques to systematically map Kazakhstan's collaboration networks, citation impact, or thematic clusters in economics-related fields (Narbaev & Amirbekova, 2021). Bibliometric methods, such as Bradford's Law, co-authorship analysis, and keyword mapping, have been widely used elsewhere (Small, 1973; Moed, 2005; Serenko, 2021; Tsilika, 2023; Garfield, 1972), but remain underutilised in Central Asian contexts.

Overall, the literature highlights several gaps that frame the research questions of this study. First, while global inequalities in knowledge production are well-documented, little is known about how publication output in emerging economies, such as Kazakhstan, has evolved over time (RQ1). Second, existing work provides only fragmented insights into the dominant themes in economics-related disciplines, with limited analysis of whether these themes align with or diverge from global research agendas (RQ2). Third, although international collaboration has increased, there is insufficient evidence on how Kazakhstan's partnerships balance between Global North and Global South actors (RQ3). Finally, the visibility of Kazakhstani research, as measured through citation impact, remains largely unexplored (RQ4). By addressing these gaps, this study advances understanding of Kazakhstan's transition from a knowledge consumer to a knowledge producer within the global academic system.

3. METHODOLOGY

Bibliometric methods are applied to assess Kazakhstan's knowledge production in economics-related disciplines. Our analysis is organised around four core dimensions: the evolution of publication output, the identification of research themes, the dynamics of international collaboration, and the visibility of research through citation impact. By structuring the study in this way, we provide a systematic and replicable approach for evaluating Kazakhstan's integration into global academic networks. This study uses a research framework, as shown in Figure 1.

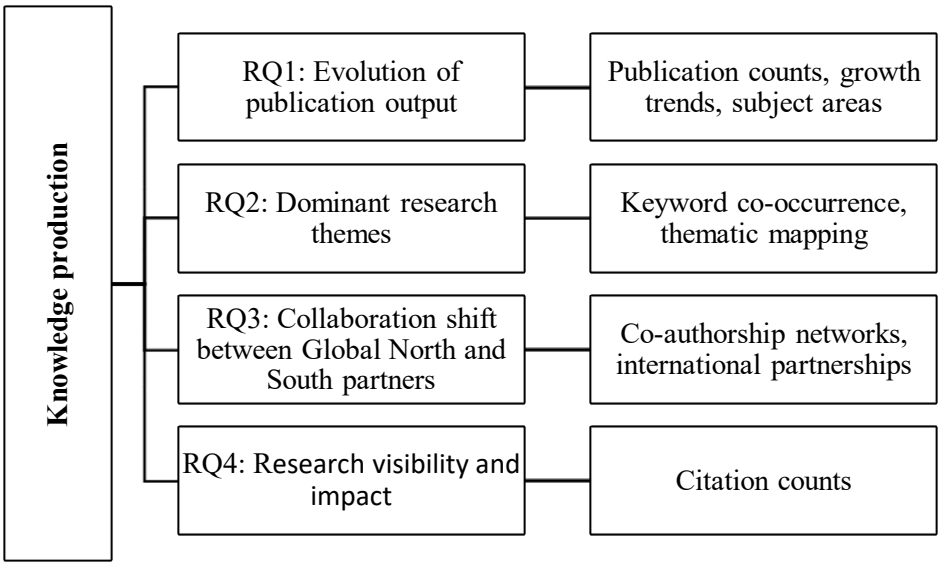

FIGURE 1. Research framework

In Figure 1, the first dimension captures the evolution of publication output, measured through publication counts, growth trends, and subject area distribution. The second dimension identifies research themes, analysed using keyword co-occurrence and thematic mapping. The third dimension focuses on patterns of international collaboration, assessed through co-authorship networks and the distribution of partnerships between institutions in the Global North and the Global South. The fourth dimension evaluates research visibility and impact, using citation counts and related indicators. Together, these measures provide a systematic approach to assessing Kazakhstan's contribution to economics-related scholarship in the global research landscape.

The analysis is based on bibliometric data retrieved from the Scopus database via API queries. Scopus was selected as the primary data source due to its comprehensive indexing of peer-reviewed literature and structured metadata, particularly in the fields of economics, business, and social sciences. The paper extracted all documents affiliated with Kazakhstan between 2010 and 2023 in the subject areas of Business, Management and Accounting (BMA); Decision Sciences (DS); and Economics, Econometrics and Finance (EEF). The dataset includes metadata such as publication year, title, authors and their affiliations, and the countries of co-authors. Additionally, data on citations of these publications were collected through separate API queries. Python was employed for data parsing, cleaning, analysis, and visualization using libraries such as requests, pandas, numpy, and collections. Counter and plotly.express, while Excel was primarily used for exploratory data analysis (EDA). Bibliometric techniques, including keyword occurrence analysis, co-authorship network mapping, and citation analysis, were employed to identify patterns in research production and scholarly influence. This methodological approach was chosen due to its suitability for uncovering large-scale trends in academic output and collaboration.

Data Collection

The dataset comprises all Scopus-indexed publications with at least one author from Kazakhstan, published between 2010 and 2023, in three subject areas: Business, Management, and Accounting (BUSI), Decision Sciences (DECI), and Economics, Econometrics, and Finance (ECON). Data

were retrieved via the Scopus API under the institutional subscription of Kazakh-British Technical University. In total, over 3,900 records were collected with metadata including article identifiers, titles, authors, affiliations, publication details, and citation counts.

All data was retrieved through the Scopus Search API (/content/search/scopus) provided by Elsevier. The queries were structured using Scopus' advanced search syntax with using the following query: AFFILCOUNTRY (Kazakhstan) AND (SUBJAREA (BUSI OR DECI OR ECON)) AND (PUBYEAR > 2009 AND PUBYEAR < 2024) AND DOCTYPE (ar). Metadata fields extracted included article identifiers (eid, doi), titles, authors and affiliations, publication details, and citation counts. The API call was made in JSON format using requests. get (...) in Python, and each page was stored locally for later processing.

Data Processing

Data processing and cleaning were conducted in Python 3.10 using a set of established libraries: requests for API interaction, pandas and numpy for data handling, and collections. Counter for keyword frequency analysis, plotly.express for visualisation, and openpyxl for export to Excel. Microsoft Excel was additionally employed for exploratory analysis and manual verification. The dataset was first deduplicated based on digital object identifiers (DOIs) and, where unavailable, Scopus identifiers (EIDs). Author affiliations were parsed to extract and standardise country names, ensuring consistency for subsequent analysis of international collaboration. Keywords were normalised by converting to lowercase and removing punctuation. These procedures ensured a clean and reliable dataset that could be systematically analysed across four dimensions: publication output, thematic development, collaboration networks, and citation impact. All steps were documented and tested to ensure reproducibility and robustness of the analysis.

Analytical Procedures

Analytical procedures were based on descriptive and exploratory bibliometric methods, structured into three main components: citation analysis, country-level collaboration, and author-level co-authorship networks. Citation analysis involved calculating the total number of citations (19,967 across 2,860 publications in three subject areas, their distribution across years and subject areas, and the countries most frequently citing Kazakhstan-affiliated articles. Figures were generated in Python and verified in Microsoft Excel to ensure accuracy. Country-level collaboration was examined through metadata on author affiliations. Country names were extracted and normalised (for example, "USA" converted to "United States"), and then aggregated by country and by year using Python functions such as groupby() and pivot_table(). This enabled the calculation of frequencies of international versus domestic collaboration, providing insight into Kazakhstan's partnerships with both Global North and Global South institutions. Author-level co-authorship networks were then constructed to capture collaboration structures, focusing on the identification of central actors, the density of relationships, and emerging research clusters. Together, these methods provided a systematic basis for evaluating Kazakhstan's publication output, collaboration patterns, and integration into international academic networks.

4. FINDINGS AND DISCUSSION

The study of publication activity is a crucial tool for understanding how the national scientific system responds to institutional reforms and global challenges. In Kazakhstan, quantitative indicators of publications in international databases allow us to assess not only the level of productivity of researchers but also the degree of their integration into the global scientific space. Growth dynamics of publications reflect the effectiveness of government initiatives aimed at stimulating academic productivity and improving the quality of research. Analysis of publication

output statistics over recent years allows us to identify not only general trends but also key turning points related to changes in scientific policy and academic culture.

Kazakhstan's research output in Business, Management and Accounting, Decision Sciences, and Economics has grown significantly over the past decade. In 2010, only 18 publications were recorded, while in 2023 this number exceeded 500. This steady increase highlights the expanding academic presence of Kazakhstan's scholars in internationally indexed journals and reflects the impact of sustained policy reforms in higher education and science. Figure 2 presents the annual distribution of publications from 2010 to 2023, showing how Kazakhstan's research activity has expanded over time.

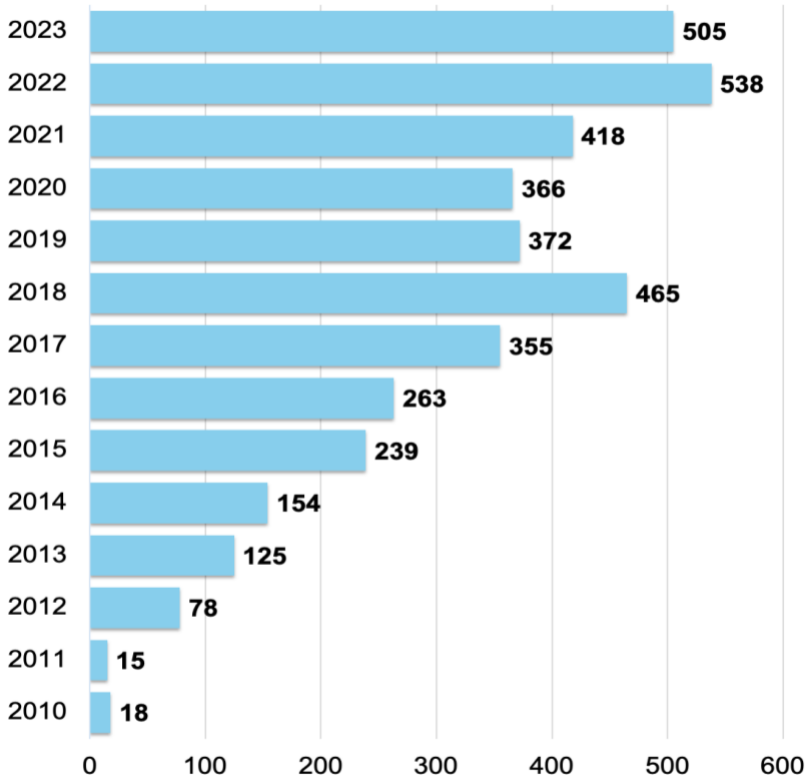

FIGURE 2. Distribution of publications from Kazakhstan by year for 2010-2023

Note: compiled by the authors based on calculations

Figure 2 illustrates that publication growth was particularly sharp after 2014, when policy reforms targeting PhD students and faculty were fully implemented, reshaping academic culture and aligning it more closely with international standards. From 2018 onwards, annual output consistently surpassed 350 publications, peaking at 538 in 2022. This pattern signals a mature phase of research production, supported by government initiatives and institutional policies that incentivised faculty engagement in publishing. The introduction of the Law on Science and the State Program of Education Development (2011–2020) established a performance-based system that prioritised international visibility of research through requirements for PhD completion, academic promotion, and competitive grant funding (Narbaev & Amirbekova, 2021). By 2018, the effects of these reforms had fully materialised, contributing to the peak in output as universities responded to key performance indicators. On a broader perspective, this

trajectory reflects Kazakhstan's goals of integration into the international research network. This has affected the focus on publishing in international journals, increased the visibility of research, and positively demonstrated the application of international research practices.

Next, the keyword analysis identifies the thematic evolution of the research landscape. Moreover, the research context primarily focused on economic development. The keyword highlights this focus on economic transformation, national context and policy-driven changes.

Kazakhstan's research is highly localised as the term "Kazakhstan" has 1336 mentions (see Figure 3).

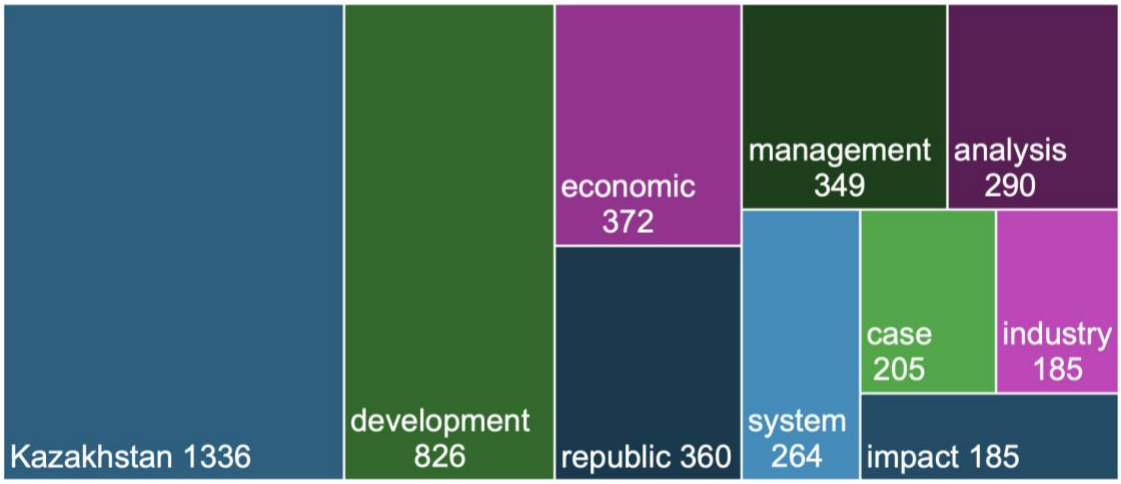

FIGURE 3. Research keywords for 2010–2023

Note*:* compiled by the authors based on calculations

This is closely linked to the country's economic regime and the challenges it has faced since gaining independence. Keywords like "management", "analysis" and "system" suggest an analytical approach and applicability of research in terms of the decision-making process, use of analytical approaches and more comprehensive targeted analysis for informed decision-making. Keywords such as "case", "industry", and "impact" indicate a practical orientation of research in this field and the application of research in specific industries. Over time, new keywords such as "technology", "international", and "energy" began to appear frequently. This demonstrates changes in the focus that are relevant to shifts in Kazakhstan's economy. This shift is related to the integration of the global economy, particularly in terms of international economic cooperation, energy development, and security. The evolution of keywords demonstrates local trends in science and the economy, ultimately serving the needs of economic development. Visualizations of keyword evolution are included in Appendix A for additional reference.

Furthermore, Kazakhstan's scientific landscape is becoming increasingly collaborative, as evidenced by the distribution of international co-authorships. This pattern reflects both the persistence of historical ties with post-Soviet states and the growing integration of Kazakhstan into global academic networks, particularly through collaborations with the United States and the United Kingdom. The five leading partner countries are Russia (337 co-authored publications), the United States (116), Ukraine (104), the United Kingdom (83), and Turkey (51), as illustrated in Figure 4.

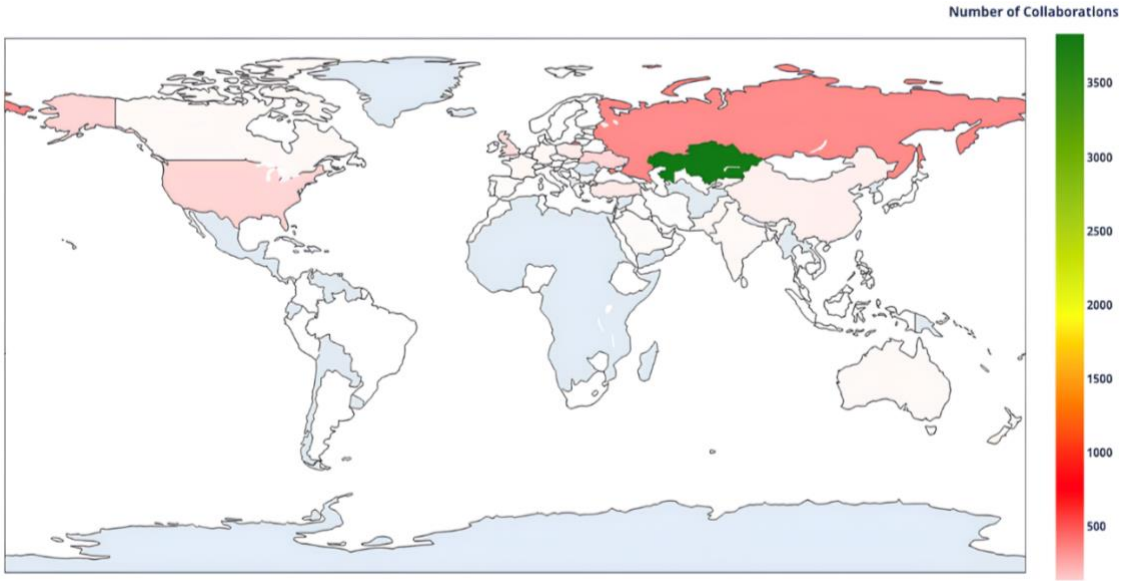

FIGURE 4. Top countries collaborating with Kazakhstan in economic research

Note: compiled by the authors based on calculations

The co-authorship pattern reflects both historical links and emerging new ones. Kazakhstan itself accounts for 3,834 publications, while the top five partner countries are Russia (337), the U.S. (116), Ukraine (104), the United Kingdom (83) and Turkey (51). The past links created during the Soviet time with Russia and Ukraine are sustained and demonstrate a strong, continued partnership. The common past created deeper institutional links. The majority of scientists continue to contribute to this academic network, facilitating joint research and collaboration. The partnership with global leaders of Northern countries, such as the U.S. and the UK, demonstrates significant integration into the global research network. These collaborations are related to the global projects, international visibility and publication in higher-ranked international journals. The partnership with Turkey demonstrates a well-developed academic link with the academic community of Turkey. Strong links illustrate the establishment of joint research and similar academic interests in research. Other collaborations include Poland (45), China (44), New Zealand (39), and Kyrgyzstan (32).

Lastly, the results show that while domestic self-citation remains dominant, Kazakhstan's academic output is increasingly recognised by leading research countries across both the Global South and Global North. The most frequently cited countries are shown in Figure 5.

Kazakhstan itself accounts for 3,339 citations, followed by China (2,444), Russia (1,430), the United States (1,186), and Ukraine (1,007). Other contributors include India (799), the United Kingdom (663), Indonesia (602), Malaysia (420), and Italy (395). Kazakhstan has strong links within the country, as well as with China, Russia, the U.S., and Ukraine. The dominance of local citations reflects the pattern of research networks where the academic community is building on existing local knowledge to develop research further. It also relates to stronger internal networks that can generate knowledge and create a robust research base. Citation activity from China and the U.S. demonstrates a positive trend of global

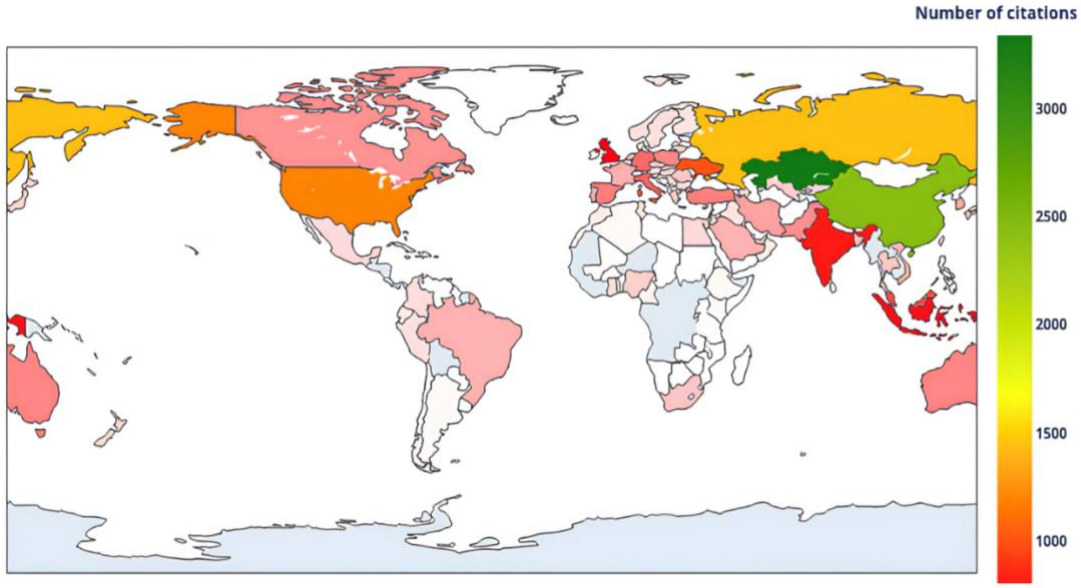

FIGURE 5. Top countries collaborating with Kazakhstan in economic research (citations)

Note: compiled by the authors based on calculations

development and international relevance of Kazakhstan's research. Both countries are leading research nations with strong international profiles, and their engagement reflects wider academic interest in topics related to Central Asia. Russia and Ukraine remain long-standing partners, with sustained research links indicating continuous collaboration and shared interest in similar themes. Overall, the citation impact highlights the internationalisation of Kazakhstan's research and the positive outcomes of strategic decisions aimed at integrating science into global networks.

5. DISCUSSION

The analysis reveals a consistent and substantial increase in Kazakhstan research publications across the economics-related fields in the last decade. The growth from 18 publications in 2010 to more than 500 in 2023 demonstrates a positive trajectory for the economic field's development, which also includes international practices. The growth over the last ten years is possible through consistent policy changes that have evolved into major reforms affecting various stakeholders. The introduction of laws and programs had positively affected the number of publications and engagement of the academic community in research activities. These changes have been embedded and reflected in yearly outputs. This clearly demonstrates the impact of policy reforms, as well as institutional incentives to enhance academic publications and expand research capacity. The keyword analysis reveals a thematic development and evolution. The local and descriptive terms reflecting the focus on national development and growth later evolved into more comprehensive ones, focusing on national transformation, policy changes, and internationalisation, targeting the country's needs. Moreover, these reflect interdisciplinary research and globally relevant topics. This evolution is vital, as it suggests a dynamic environment where research is shifting towards more analytical, evidence-based approaches to addressing local challenges. Additionally, the resonance with internationally relevant topics demonstrates Kazakhstan's integration into the wider academic community, encompassing issues such as international development,

energy policy, and digital. This has a positive notion of linking local research needs with global research topics, thereby expanding Kazakhstan's research contribution.

Similarly, Kazakhstan's global partnership has been growing and developing in recent years. Ukraine and Russia, as major partners in research, reveal the continued historical links between the countries, while new international partners demonstrate Kazakhstan's integration into the Global North's research networks. This is very important, as it reflects the quality of the studied topics and the partnership network, which ultimately contributes to international visibility and reputation. This demonstrates strong links with regional partners as well as global partners. The significant implication of this lies in the strong outputs, both in terms of quality and scholarly outreach.

The citation pattern demonstrates Kazakhstan's growth in international visibility of research, which is the result of the quality of published academic papers. The citation count related to local research reflects strong links within research groups in the country. At the same time, growth globally demonstrates the relevance of research to researchers from both the Global North and the Global South. The nature of research in Kazakhstan shows the interest of various researchers and demonstrates the consistency of research with the international agenda. This suggests that Kazakhstan's research is being recognised by the global academic community, and highlights opportunities for its further development.

Overall, collaboration with Global North countries is significant as it demonstrates the quality and visibility of research. This might enhance international funding opportunities, promote great integration into scholarly networks, and diversify the research agenda. The diversification of partnerships may contribute positively to growth in regional and global markets. The networks aiming to enhance the quality of partnerships will ensure the long-term, sustained development of a research landscape that is relevant and effective. This study offers important insights into the development and evolution of Kazakhstan's research output in the economics-related field. However, several limitations must be acknowledged. The study is based purely on Scopus and covers papers indexed in international journals. This is why it may underrepresent local studies that are published in languages other than English and in local journals. This might lead to an overlook of the regional contribution of this research. Because the study is relying on bibliometric indicators, it doesn't capture the quality and depth of research. Further research could employ a qualitative approach, incorporating interviews and case studies to gain a deeper understanding. Collaboration analysis through co-authorship reveals major partners, although it doesn't reveal the depth of partnership and its nature. Future work could provide a more comprehensive understanding of collaborations through international partnerships and capacity building.

6. CONCLUSIONS

This study examines the trajectory of Kazakhstan's research outputs in economics-related fields from 2010 to 2023, highlighting growth and thematic diversification. The increase in the number of publications reveals deep trends of growing scholarly engagement, systemic policy changes, and national reforms that have boosted and were designed to stimulate the expansion of research. Institutional reforms related to the training of PhD, academic career development, and grant funding have contributed significantly to this growth. Kazakhstan, since gaining independence, has allocated its resources to higher education and focused its efforts on creating strong incentives for research to be published in international journals, participating in global research, and achieving international visibility.

The role of economics-related research is a significant factor for a country's success, as it reflects crucial areas for economic growth. Kazakhstan has noted the shift in keywords and the type of research conducted. Moreover, the changes reflect the current state of research with increased capacity in topics related to

energy, industry, internationalization. The shift suggests the relevance of research in this area and growing interest. The collaboration patterns reveal strong links with countries in the Global South and Global North, as well as involvement in research through regional and global research communities. The quality of publications is characterized by the interest from countries that are leaders locally and globally. From the policy perspective and understanding of research in economics-related fields, this research suggests several implications. The government's active support of research and the creation of an environment resulted in positive outcomes. Provided incentives had affected the quality of reforms and research outputs over the past decades. The following direction for research in this field should prioritise the quality of publications over quantity and set new, high-level goals to increase publications in highly reputable journals. Another area that could be developed further is international collaborations. Kazakhstan is recognised for its international programs, including strategic initiatives such as joining the Bologna process; therefore, the development of quality partnerships is essential and requires consistent support mechanisms. The comprehensive development of the research system in Kazakhstan would positively influence the applicability of research and enhance its impact on the country's economy as well as overall growth and contribution to global knowledge development.

In the future, the development of Kazakh science should be based on the formation of a strategy aimed at improving the quality of research and its international recognition. One of the key areas will be the study of international cooperation, the expansion of access to leading academic networks, and the utilisation of joint projects to integrate into the global agenda. Focusing on these tasks will not only strengthen the country's position in the worldwide research space, but also ensure the sustainable impact of national science on the processes of socio-economic modernization.

AUTHOR CONTRIBUTION

Writing–original draft: Yelena Li, Diana Amirbekova.
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Formal analysis and investigation: Yelena Li, Diana Amirbekova.
Development of research methodology: Yelena Li, Mariyam Taskinbayeva.
Resources: Yelena Li, Diana Amirbekova.
Software and supervisions: Yelena Li, Diana Amirbekova.
Data collection, analysis and interpretation: Yelena Li, Diana Amirbekova.
Visualization: Yelena Li, Mariyam Taskinbayeva.
Writing review and editing research: Diana Amirbekova, Mariyam Taskinbayeva.

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Supplementary visualizations