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Kazakhstani Scientific Collaboration with Post-Soviet Countries: Dynamics and Impact

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Abstract

This study explores the dynamics of international collaboration in scientific publishing by Kazakhstani authors, with a particular focus on co-authorships with scholars from post-Soviet countries. Drawing on bibliometric data from Scopus and SciVal, we analyze the evolution of Kazakhstan's scientific output in international collaborations over the 2011-2023 period. The results reveal notable trends in the geographical and institutional distribution of joint publications, shedding light on the relative impact of such collaborations on Kazakhstan's academic visibility.

A key finding of this study is the persistence and strengthening of scientific ties between Kazakhstan and other post-Soviet countries, despite the collapse of the Soviet Union over three decades ago. This trend appears to have been further reinforced by the introduction of indicator-based research evaluation systems and the adoption of policies aimed at the internationalization of science and higher education in post-Soviet countries, including Kazakhstan. As a result, Kazakhstani researchers increasingly engage in joint publications with colleagues from former Soviet republics. Notably, the volume of publications in collaboration with Russian authors remains the highest, although growing collaboration with researchers from Central Asia, particularly Uzbekistan, has also been observed.

In terms of publication quality, the study reveals that articles co-authored by Kazakhstani researchers with scholars from post-Soviet countries tend to be cited more frequently than those published with authors from other regions. Between 2014 and 2023, the average citation count of joint publications with post-Soviet colleagues was 19.87, compared to 13.52 for those co-authored with non-post-Soviet researchers. Moreover, publications with post-Soviet collaborators were more likely to appear in journals with lower impact-factor quartiles (Q3 and Q4), whereas those with non-post-Soviet co-authors were more frequently published in higher-impact journals (Q1 and Q2).

Introduction

Since joining the Bologna Declaration in 2010, Kazakhstan has pursued integration into the international scientific and educational community. In 2011, foundational regulatory documents were adopted, formalizing the transition from the Soviet model to Western standards for conducting research and implementing an indicator-based research evaluation system (Marina & Sterligov, 2021). Bibliometric analysis, which evaluates publication activity in international journals indexed in Scopus and Web of Science (WoS), became the primary method of assessment. Through this approach, the government initiated a policy aimed at internationalizing research in Kazakhstan (Moldashev et al., 2020).

One of the key indicators of integration into the global scientific community is the production of joint publications in international collaborations. Significant changes have been observed in this regard among Kazakhstani authors. For instance, the share of internationally co-authored publications in Scopus increased from 46.6% in 2011 to 53.2% in 2023.

As noted by Matveeva et al. (2023), in 1993, 19% of internationally co-authored publications by Kazakhstani researchers involved collaboration with post-Soviet scholars. According to Scopus data, in 1990–1991, Kazakhstani authors published 71 articles, 11 of which (15.5%) were written in international collaboration.

The shift in research priorities, particularly the adoption of internationalization policies in Kazakhstan and other post-Soviet countries, has led to the revival of previous scientific connections for co-authoring and publishing in international journals.

The purpose of this paper is to analyze the level of scientific collaboration between Kazakhstani researchers and their post-Soviet counterparts, 33 years after the dissolution of the Soviet Union, based on publications indexed in Scopus.

Methods

The data sources for analyzing the bibliometric indicators of publication activity by Kazakhstani authors in journals indexed in Scopus included the official website of www.scopus.com, as well as the analytical platform SciVal by Elsevier (www.scival.com). The primary data from these sources were collected on April 9, 2024, with additional data collected on July 28, 2024, and January 20, 2025. The choice of Scopus as the data source is due to its inclusion of a broader range of journals across all scientific disciplines (Mongeon & Paul-Hus, 2016), providing a more objective representation of international collaboration among authors from Kazakhstan.

To determine the total number of publications by Kazakhstani authors in Scopus, the advanced search query "AFFILCOUNTRY(Kazakhstan)" was used. The analysis considered all types of publications. To identify the number and share of publications by Kazakhstani authors in international collaboration in Scopus, the following approach was applied: using SciVal's "Explore" section, the publication date range was set to 2014–2023, and the "Country/Region" filter was applied to select "Kazakhstan." Subsequently, the "Collaborations" filter was used to isolate "International Collaborations," and post-Soviet countries (Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine, and Uzbekistan) were selected under the "Country/Region" filter.

Data on institutional-level international collaboration were obtained via the SciVal search feature, where the names of Kazakhstani organizations in English were entered.

To calculate average citation rates, the number of publications with post-Soviet countries, the proportion of such publications, and analyze publication activity and citation counts by Kazakhstani institutions, the standard functionality of Excel was employed.

Research development in Kazakhstan: an overview

Kazakhstan has prioritized the internationalization of its scientific endeavors, aiming for deeper integration into the global academic community. This strategic shift aligns with broader efforts to modernize its research and education systems, reflecting

global standards and fostering collaboration with leading international institutions. The adoption of the *"Law on Science"* (MES, 2011a) in 2011 and the introduction of new regulatory acts in the field of science (MES, 2011b; MES, 2011c) solidified the transition from the Soviet model of scientific training to a Western framework. These changes were further driven by Kazakhstan's accession to the Bologna Declaration as part of the so-called "package of post-socialist reforms" (Kerimkulova & Kuzhabekova, 2017).

These legal reforms and the government's drive to establish a scientific system aligned with Western standards had a profound impact on the development of research activities in Kazakhstan. According to data from SciVal and the Scopus database (Elsevier), Kazakhstani authors published 50,973 articles in Scopus-indexed journals between 2011 and 2023. Given that the total number of publications by authors affiliated with Kazakhstan in the Scopus database across all years is 59,734, this means that 85.3% of all publications occurred during this period.

The most significant year-over-year growth in publication output followed the adoption of new regulatory acts in the field of science in 2011 (see Figure 1). While publication growth between 2011 and 2019 was characterized by fluctuations—marked by sharp increases and declines due to the turbulence of the transitional period—since 2020, the trend has become more stable.

The spikes in publication output during earlier years were partly driven by the effects of publication-focused policies, commonly referred to in the literature as the "publish or perish" phenomenon (Kurambayev & Freedman, 2021). This policy also had negative consequences, such as a rise in publications in predatory journals (Kudaibergenova et al., 2022; Marina & Sterligov, 2021). The growth in such publications was fueled by some researchers' attempts to meet formal requirements for publishing in international databases, often as a prerequisite for earning academic degrees, titles, grants, or points in institutional internal performance rankings (Yessirkepov et al., 2015). For some researchers, these requirements became a "game," prompting them to develop strategies to improve their chances of being published in appropriate journals (Moldashev et al., 2019) and achieve their professional goals.

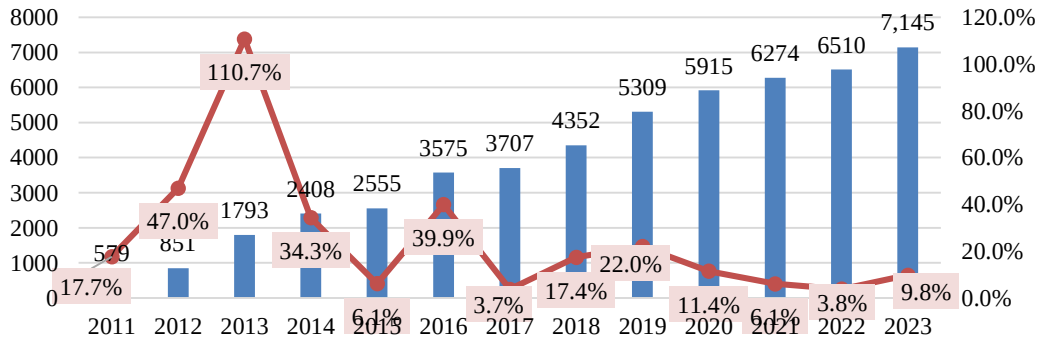


Figure 1. The number and annual growth rate (%, right axis) of publications by Kazakhstani authors in Scopus-indexed journals, 2011–2023.

For example, the relaxation of publication requirements for scholars in the social sciences and humanities in 2015 led some researchers to adopt a "gaming" strategy (Smagulov et al., 2018; Moldashev et al., 2020).

Thus, the "publish or perish" policy encourages researchers to publish in international journals but can also foster unethical practices (Kurambayev & Freedman, 2021). Such practices include publishing in predatory journals, relying on paper mills that provide publication services for international databases, or purchasing authorship slots in pre-written articles markets. For instance, through a single paper mill, Kazakhstani authors published 542 articles between 2019 and 2022 (Abalkina, 2023).

By 2020, the regulatory framework for scientific publications in international journals was harmonized, reflecting a unified scientific policy (Turginbayeva & Makanova, 2024). Detailed criteria were introduced for journals (percentile rankings in CiteScore, citation indices in WoS, and thematic alignment), authors (first or corresponding author), and articles (relevance to the journal's focus). These measures aimed to combat publications in questionable journals and discourage formalistic approaches to publishing.

The policy of internationalizing science has also encouraged active collaboration between Kazakhstani researchers and their international colleagues in co-authoring and publishing articles in reputable journals. However, a negative consequence of this process has been the "internationalization of unethical practices." For instance, Kazakhstani researchers frequently engage with foreign paper mills that offer services such as (a) publishing an author’s completed article, (b) selling authorship slots in pre-written articles, or (c) article writing and publishing in international journals. These schemes often involve collaboration with authors from other countries, primarily from the post-Soviet region. For example, the main clients of a Russian paper mill during 2019–2022 included researchers from Russia (2,715 articles), Kazakhstan (542 articles), and Ukraine (111 articles) (Abalkina, 2023).

Results

Publishing joint articles with foreign researchers is a key indicator of the integration of Kazakhstan's scientific community into the global research landscape. Furthermore, articles co-authored with international scholars positively impact citation metrics (Chankseliani et al., 2021).

The level of international collaboration (the proportion of articles co-authored with foreign researchers in Scopus-indexed journals) increased from 46.6% in 2011 to 53.2% in 2023. The lowest value was observed in 2013, at 35.4%, while the highest value was recorded in 2021, at 57.4% (Figure 2).

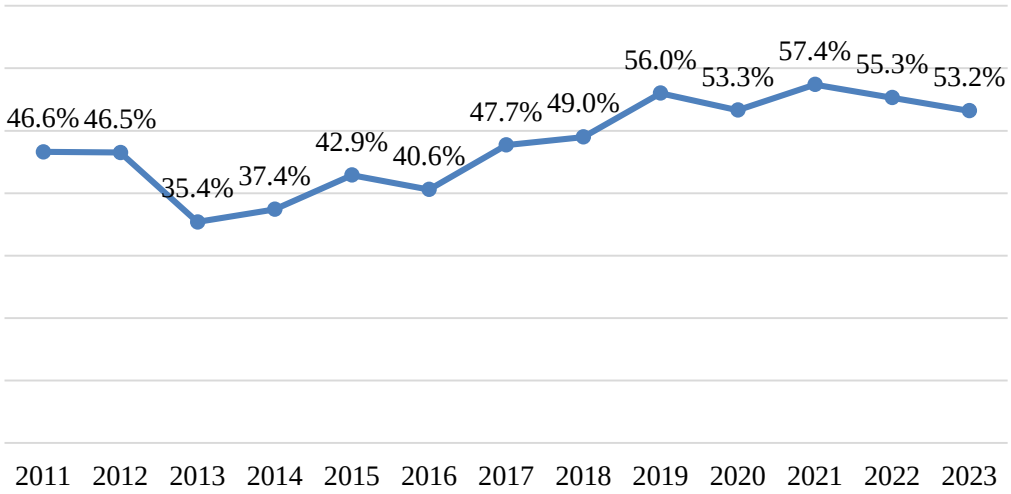


Figure 2. Proportion of publications by Kazakhstani authors in international collaboration in Scopus-indexed journals.

According to Scopus data, Kazakhstani authors collaborated with researchers from 68 countries in 2011, while this number increased to 174 in 2023. This indicates that the policy aimed at internationalizing Kazakhstani scientific research and integrating it into the global scientific community has been effective.

Since 2015, the top 10 countries with which Kazakhstani authors collaborate most frequently have remained relatively stable, with 9 leading countries consistently appearing across the years (Table 1). Throughout the analyzed period, the majority of articles authored by Kazakhstani researchers in Scopus-indexed journals have been co-authored with Russian scientists. This trend is attributed to the strong historical ties between Kazakhstan and Russia in the scientific domain, rooted in the Soviet era. These connections exist both on a personal level (e.g., university education, joint work experiences) and at the institutional level (e.g., collaborative educational programs and projects). This suggests that post-Soviet countries, including Kazakhstan, find it difficult to move away from empirical approaches that are still oriented toward Russia (Chankseliani, 2017).

Table 1. Top 10 countries collaborating with Kazakhstani authors in Scopus-indexed journals by year.

	2011	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*	*2023*
Russia	113	132	210	301	351	557	719	774	1177	1293	1419	1291	1299
United States	64	100	102	151	146	224	260	349	322	336	363	433	462
Ukraine	15		48	47	92	124	178	181	321	243	323	321	315
China		29	33	38	53	102	108	142	255	235	363	357	353

United Kingdom	21	53	66	89	76	146	153	183	190	179	270	301	269
Poland		30	37	75	97	94	185	187	278	216	276	257	220
Germany	31	58	86	101	89	104	116	114	168	169	210	236	207
Turkey	11				75	72	97	115	141	133	237	253	284
Italy	14	33	32	50	54	77	100	125	139	140		208	184
India								95		136	206	205	229
France	16			39		62	61		122				
Saidi Arabia											200		
Japan	18	39	39	44	40								
Spain		36	29										
Pakistan		30											
Uzbekistan	10												

It is important to highlight that scientific collaborations between Kazakhstani authors and researchers from former Soviet Union countries remain dominant. Between 2011 and 2023, 51.03% of joint publications by authors affiliated with Kazakhstan were co-authored with researchers from these countries. This dynamic has remained relatively stable over the years: 53.3% of all Kazakhstani publications in international collaboration in 2011 and 50.6% in 2023 (Figure 3).

Remarkably, this stability has persisted despite a significant increase in the absolute number of publications in international collaboration, which grew from 259 in 2011 to 3,808 in 2023—an increase of 14.7 times.

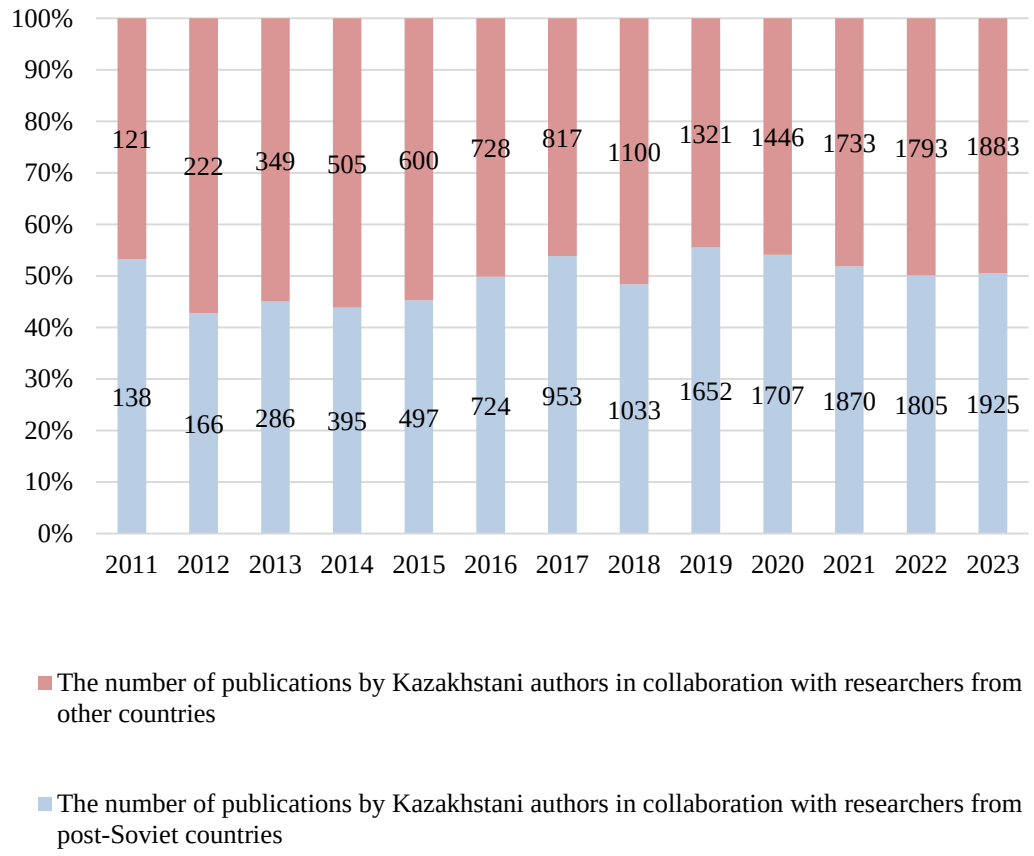
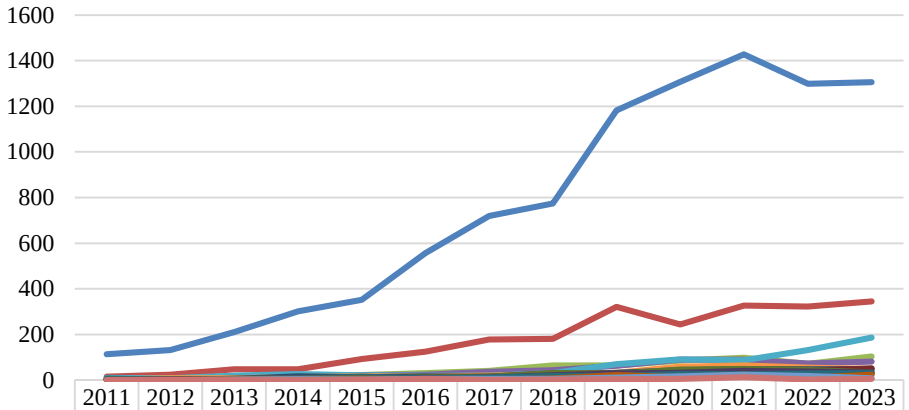


Figure 3. The number and share of publications by Kazakhstani authors in collaboration with researchers from post-Soviet countries and other countries.

This suggests that Kazakhstani authors continue to leverage existing ties or establish new connections with researchers from former Soviet Union countries. Notably, many of these countries are also pursuing policies to internationalize their science and higher education sectors by increasing the number of publications in international journals (Figure 4).



	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Russia	113	132	210	301	352	557	719	774	1182	1307	1428	1298	1306
Ukraine	15	23	48	47	92	124	178	181	321	244	326	322	345
Kyrgyzstan	5	8	12	20	22	31	41	65	65	85	98	71	103
Belarus	7	5	15	14	21	23	36	43	63	89	89	73	81
Uzbekistan	10	8	20	26	21	19	20	30	70	91	87	131	187
Latvia	3	8	8	14	16	17	20	25	32	59	64	55	49
Lithuania	2	3	6	16	13	16	14	24	32	43	48	48	48
Azerbaijan	1	2	3	6	9	10	15	29	28	31	33	41	51
Estonia	3	1	1	6	5	13	15	31	28	46	49	45	34
Georgia	2	3	2	7	7	9	11	21	29	32	40	38	34
Armenia	7	1	6	8	15	7	11	18	19	27	27	29	30
Tajikistan	1	1	5	6	7	4	3	7	22	12	24	9	23
Moldova	0	0	2	4	3	6	5	6	11	16	24	18	8
Turkmenistan	0	1	0	0	1	5	1	2	4	5	13	3	6

Figure 4. The number of publications by Kazakhstani authors with scientists from post-Soviet countries in Scopus journals, 2011-2023.

The decrease in the number of publications by Kazakhstani scientists in collaboration with Russian authors may be related to a particular factor. In 2022, following the imposition of sanctions by Western countries against Russia, the authorized body in Russia's science sector introduced a moratorium on the recognition of articles published in Scopus/WoS journals as part of the qualification evaluation for scientific and teaching personnel (Vedomosti, 2022).

On the other hand, there is an increase in the number of joint publications between Kazakhstani scientists and authors from certain post-Soviet countries. This trend is primarily influenced by the adoption of policies in these countries aimed at increasing the visibility of their research results in the global research community (Berekeyeva et al., 2024). For example, in 2018, Uzbekistan adopted an evaluation system for the qualifications of candidates for academic degrees and titles based on publications in WoS and Scopus journals. As a result, the number of publications by Kazakhstani authors in collaboration with Uzbek colleagues more than doubled in 2019 compared to 2018. Accordingly, authors from post-Soviet countries may be

seeking collaborators from other former Soviet countries to publish joint articles. The shared historical background makes such collaborations more accessible than establishing new ties with scholars from other countries.

Given that Russia leads as the country with which Kazakhstani authors have the highest number of publications, Russian institutions are also represented in the top 10 international collaborators. Specifically, seven foreign organizations, with which Kazakhstani authors have published the most articles in Scopus-indexed journals from 2013 to 2022, are Russian, while one institution each is from Poland, France, and Ukraine (Figure 5).

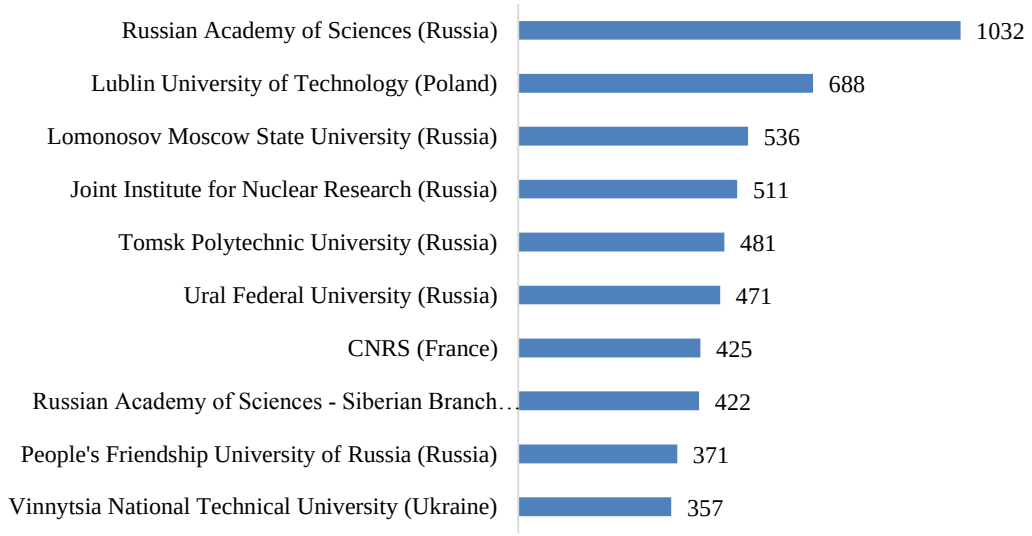


Figure 5. Top 10 foreign institutions with which Kazakhstani authors have published the most articles in Scopus-indexed journals, 2013-2022.

According to SciVal data, between 2014 and 2023, the share of publications by Kazakhstani authors written in international collaboration is 51.2%. Among the 73 considered Kazakhstani organizations, only the following groups have values exceeding this figure (51.2%): universities where teaching is predominantly conducted in English and/or another foreign language (Nazarbayev University – NU, Kazakh-British Technical University – KBTU, KIMEP University, Suleyman Demirel University – SDU) – 62.4%; research institutes (RI) – 56.5%; and organizations based in the capital (Astana) – 55.9% (Table 2).

Table 2. Comparative analysis of international collaboration indicators according to SciVal data for 73 Kazakhstani organizations, grouped into categories, from 2014 to 2023.

	Number of publications with post-Soviet authors	*Number of publications in international collaboration*	*Share of publications with post-Soviet authors*	*Share of publications in international collaboration*
Total across 73 considered organizations	14 665	28 348	51,73%	48,23%
Universities	12 337	24 963	49,42%	47,41%
RI	1 797	2 667	67,38%	56,54%
Organizations in Astana	3 608	9 732	37,07%	55,98%
Organizations in Almaty	6 648	12 612	52,71%	47,51%
Regional organizations	4 409	6 004	73,43%	40,45%
Organizations in Astana and Almaty	10 256	22 344	45,90%	50,86%
Excluding NU, KIMEP, KBTU, SDU	13 652	21 975	62,13%	45,25%
Only NU, KIMEP, KBTU, SDU	1 013	6 373	15,90%	62,42%

The median share of publications by Kazakhstani authors from the 73 organizations considered over the period 2014-2023, co-authored with researchers from post-Soviet countries in relation to the total number of publications in international collaboration, stands at 64.47%. This value is exceeded by the following groups: regional organizations (73.4%) and research institutes (67.4%). Only 22 (30.1%) of the 73 Kazakhstani organizations have a share of publications with post-Soviet authors that is less than 50% of their total publications in international collaboration (Table 3).

Table 3. Indicators of international collaboration according to SciVal for 73 Kazakhstani organizations over the period 2014-2023.

Institutions	*Number of publications with post-Soviet authors*	*Number of publications in international collaboration*	*Share of publications with post-Soviet authors*	*Organization type*	*City*
Ministry of Energy of the Republic of Kazakhstan	136	142	95,77%	Ministry	Astana
Yessenov University	137	147	93,20%	University	Aktau
Institute of Nuclear Physics, National Nuclear Center of the Republic of Kazakhstan	794	863	92,00%	RI	Almaty
Karaganda Economic University of Kazpotrebsoyuz	74	81	91,36%	University	Karagandy
Karaganda State Technical University	402	459	87,58%	University	Karagandy
Rudny Industrial Institute	99	116	85,34%	University	Rudny
Pavlodar State Pedagogical University	61	72	84,72%	University	Pavlodar
Zhangir Khan West Kazakhstan Agrarian - Technical University	148	177	83,62%	University	Uralsk
Caspian University	35	42	83,33%	University	Almaty
KAZGUU University	33	40	82,50%	University	Astana
S. Toraighyrov Pavlodar State University	266	323	82,35%	University	Pavlodar
Korkyt Ata Kyzylorda State University	137	169	81,07%	University	Kyzylorda
National Nuclear Center of the Republic of Kazakhstan	132	163	80,98%	RI	Kurchatov
Karaganda State Industrial University	105	132	79,55%	University	Karagandy
South Kazakhstan Medical Academy	83	108	76,85%	University	Shymkent
M.Kh. Dulaty Taraz State University	196	258	75,97%	University	Taraz
Kazakh Research Institute of Processing and Food Industry	50	66	75,76%	RI	Almaty

South Kazakhstan State University (SKSU)	325	429	75,76%	University	Shymkent
Sarsen Amanzholov East Kazakhstan State University	103	137	75,18%	University	Ust-Kamenogorsk
Atyrau Oil and Gas University	36	48	75,00%	University	Atyrau
M. Kozybayev North Kazakhstan State University	84	112	75,00%	University	Petropavlovsk
Academy of Logistics and Transport	131	175	74,86%	University	Almaty
Shakarim University	175	234	74,79%	University	Semey
Esil University	44	59	74,58%	University	Astana
Buketov Karaganda State University	357	479	74,53%	University	Karagandy
D. Serikbayev East Kazakhstan Technical University	389	523	74,38%	University	Ust-Kamenogorsk
Baitursynov Kostanay Regional University	132	181	72,93%	University	Kostanay
Dosmukhamedov Atyrau University	62	86	72,09%	University	Atyrau
Institute of Ionosphere	47	66	71,21%	RI	Almaty
Ministry of Education and Science of the Republic of Kazakhstan	294	417	70,50%	Ministry	Astana
Institute of Information and Computational Technologies	296	422	70,14%	RI	Almaty
L.N. Gumilyov Eurasian National University	1781	2547	69,93%	University	Astana
Almaty Technological University	178	256	69,53%	University	Almaty
K. Zhubanov Aktobe Regional State University	138	206	66,99%	University	Aktobe
National Academy of Science of Kazakhstan - NASK	61	92	66,30%	Academy of Sciences	Almaty
Abay Kazakh National Pedagogical University	300	461	65,08%	University	Almaty
Turan University	49	76	64,47%	University	Almaty
Khoja Akhmet Yassawi International	259	405	63,95%	University	Turkestan

Kazakh-Turkish University					
Almaty Institute of Power Engineering and Telecommunication	259	410	63,17%	University	Almaty
Ualikhanov Kokshetau State University	104	167	62,28%	University	Kokshetau
Zhetysu State University named after I. Zhansugurov	33	53	62,26%	University	Taldykorgan
Kazakh National Women's Teacher Training University	66	109	60,55%	University	Almaty
Ministry of Health of the Republic of Kazakhstan	40	67	59,70%	Ministry	Astana
Astana IT University	85	146	58,22%	University	Astana
Institute of Mathematics and Mathematical Modelling	238	417	57,07%	RI	Almaty
Astana Medical University	167	296	56,42%	University	Astana
West Kazakhstan Marat Ospanov State Medical University	140	249	56,22%	University	Aktobe
Kazakh National Medical University	314	559	56,17%	University	Almaty
Satbayev University	916	1658	55,25%	University	Almaty
Kazakh Ablai Khan University of International Relations and World Languages	16	29	55,17%	University	Almaty
Saken Seifullin Kazakh Agrotechnical University	275	510	53,92%	University	Astana
Institute of Combustion Problems	76	158	48,10%	RI	Almaty
Karaganda State Medical Academy	89	186	47,85%	University	Karagandy
South Kazakhstan State Pedagogical University	28	49	45,90%	University	Shymkent
Almaty Management University	38	83	45,78%	University	Almaty
International Educational Corporation	37	81	45,68%	University	Almaty
NASK - Zoology Institute of the Republic of Kazakhstan	34	75	45,33%	RI	Almaty

Al Farabi Kazakh National University	1860	4110	45,26%	University	Almaty
Semey Medical University	115	255	45,10%	University	Semey
Narxoz University	50	111	45,05%	University	Almaty
National Center for Biotechnology	64	149	42,95%	RI	Astana
Kazakh National Agrarian University	295	693	42,57%	University	Almaty
University of International Business	18	43	41,86%	University	Almaty
Kazakh-British Technical University	266	675	39,41%	University	Almaty
International Information Technology University	89	226	39,38%	University	Almaty
Academy of Public Administration under the President of the Republic of Kazakhstan	11	29	37,93%	University	Astana
Institute of Plant Biology and Biotechnology, Almaty	39	118	33,05%	RI	Almaty
Suleyman Demirel University, Almaty	54	197	27,41%	University	Almaty
Research and Production Center of Microbiology and Virology	12	49	24,49%	RI	Almaty
Institute of Geological Sciences Kazakhstan	12	60	20,00%	RI	Almaty
Nazarbayev University	678	5330	12,72%	University	Astana
KIMEP University	15	171	8,77%	University	Almaty
Kazakhstan Highway Research Institute	3	61	4,92%	RI	Almaty
	14 665	28348	**51,73%**		

The internationalization of science is least developed in the regions of Kazakhstan (i.e., excluding the cities of Almaty and Astana). Thus, the share of publications in international collaboration in relation to the total number of publications in regional organizations is 40.45%, with nearly 3/4 of the articles co-authored with foreign researchers being from post-Soviet countries. This indicates that scientists from the regions of Kazakhstan predominantly collaborate with authors from former Soviet Union countries, whereas connections with researchers from other countries may not be as well developed. For example, at Yessenov University and Karaganda Economic University of Kazpotrebsoyuz, more than 90% of the articles in international collaboration are co-authored with authors from the post-Soviet space (Table 3).

Moreover, stronger scientific ties with post-Soviet researchers are observed among research institute staff: 2/3 of publications in international collaboration are written jointly with authors from the former Soviet Union. This trend is characteristic of those research institutes that were involved in classified developments during the Soviet era. For example, the share of articles with post-Soviet authors in relation to the total number of publications in international collaboration at the Institute of Nuclear Physics, National Nuclear Center of the Republic of Kazakhstan, and National Nuclear Center of the Republic of Kazakhstan is 92% and 81%, respectively (Table 3).

Large international collaborations, defined as publications co-authored by more than 1,000 authors, account for only 7 articles, or 0.17% of all internationally co-authored publications from 2014 to 2023. In contrast, articles co-authored by more than 100 researchers amount to 33 publications (0.8%), while those with more than 50 authors total 47 publications (1.14%).

According to data from Scopus/SciVal, 56% of the articles by Kazakhstani authors in the social sciences, out of all internationally co-authored publications from 2013 to 2022, were written in collaboration with researchers from post-Soviet countries. This percentage increased from 21.4% in 2013 to 56.5% in 2022. Similarly, in the humanities and arts, Kazakhstani authors published 66.2% of their internationally co-authored articles with researchers from post-Soviet countries during the same period.

Thus, the analysis indicates that Kazakhstani researchers in the social sciences, as well as in the humanities and arts, are more likely to collaborate with authors from post-Soviet countries. Several factors may explain this trend. First, national science policies in post-Soviet states and institutional requirements, often aligned with Scopus metrics, serve as a unifying factor, encouraging researchers from the former USSR to collaborate and publish in Scopus-indexed journals to meet national and institutional criteria for scientific productivity. Second, post-Soviet authors share a Soviet-era approach to academic writing (Yessirkepov et al., 2015), which remains particularly evident in the social sciences and humanities. This is compounded by lower English proficiency (Demeter, 2019), limited exposure to diverse research methodologies, and insufficient familiarity with the publishing standards of English-language journals (Kurambayev & Freedman, 2021). Consequently, some post-Soviet, including Kazakhstani, researchers co-author papers that are frequently published in journals of questionable reputation. The methodological legacy of the Soviet academic tradition in these fields does not align with the expectations of contemporary English-language journals indexed in Scopus. Furthermore, many Scopus-indexed journals require diverse methodologies that are underdeveloped or less widely recognized in post-Soviet countries, contributing to lower research quality. Additionally, scholars in the social sciences and humanities often struggle with adapting to the article structure and formatting standards required by international journals. In contrast, researchers in the natural sciences are generally more familiar with international publishing standards due to the universal nature of scientific methods and their active participation in global research projects.

An analysis of international collaboration indicators among Kazakhstani authors using the SciVal analytics tool showed that articles co-authored with scholars from post-Soviet countries are, on average, cited more frequently than those written with researchers from other countries (Table 7).

Table 7. Comparison of Kazakhstani authors international collaboration metrics according to SciVal, Elsevier, 2014-2023.

	Citation Count	*Citations per Publication*		*Q1**	*Q2*	*Q3*	*Q4*	*Scholarly Output*	*Share of Citations in International Collaboration*		*Share of Scholarly Output in International Collaboration*
Collaboration with post-Soviet countries	249 001	19,87		22,45%	19,96 %	29,83 %	27,76%	12 533	60,44%		50,98%
Collaboration with other countries	162 972	13,52		46,73%	24,12 %	18,71 %	10,44%	12 053	39,56%		49,02%

* - Journal quartiles by Scopus CiteScore Percentile

The average Citations per Publication of Kazakhstani authors' publications co-authored with post-Soviet colleagues between 2014-2023 is 19.87, whereas publications with scholars from other countries equals to 13.52. This is despite the fact that both groups account for approximately half of all articles written in international collaboration. Consequently, publications with post-Soviet scholars were cited 249,001 times (60.44% of all citations for Kazakhstani authors' articles in international collaboration), while those with authors from other countries were cited 162,972 times (39.56%).

It is worth noting, however, that a large proportion of articles co-authored with researchers from post-Soviet countries were published in journals ranked in the third (Q3) and fourth (Q4) quartiles based on CiteScore percentile: 29.83% and 27.76%, respectively. In contrast, publications with scholars from other countries were published in journals from quartiles 1 and 2 (Q1 and Q2) – 46.73% and 24.12%, respectively.

Thus, the effectiveness (Citations per Publication) of Kazakhstani authors' publication activity with scholars from post-Soviet countries, according to Scopus, is higher than with authors from other countries. This success may be attributed to a shared linguistic environment, which facilitates communication between authors, or to other factors, such as long-term involvement in research projects on a specific topic, which fosters stable scientific groups and, consequently, higher productivity. Another factor might be that a certain group of scholars, particularly those who worked on classified research during the Soviet era, harbor stereotypes of mistrust toward foreign researchers who might steal their ideas. In contrast, there is a degree of mutual trust among post-Soviet researchers.

Conclusion

Thirty-three years after the collapse of the Soviet Union, the scientific connections of Kazakhstani researchers with other post-Soviet authors, as demonstrated by the conducted analysis, have not only remained but even strengthened. Paradoxically, this trend was influenced by the implementation of an indicator-based research evaluation system and policies for the internationalization of science and higher education adopted in post-Soviet countries, including Kazakhstan. These changes prompted researchers to collaborate with colleagues from other countries, with former Soviet Union countries being the first to establish scientific ties. In Kazakhstan, nearly 70% of organizations have more than half of their international collaborations with post-Soviet countries.

Moreover, the effectiveness of these collaborations (with post-Soviet authors) has shown positive results within the Kazakhstani context, with higher average citation rates for articles compared to those co-authored with researchers from other countries.

For a more detailed assessment of the effectiveness of international collaboration and a comparison of the publication activity of Kazakhstani authors with post-Soviet scholars and those from other countries, an analysis of Kazakhstan's emerging institutions is required. For instance, universities where teaching is predominantly conducted in English and/or another foreign language. This analysis will allow for a determination of the level of international collaboration within these institutions, the quality of journals in which their employees publish in collaboration with foreign colleagues, and the average citation rates of these articles. This will provide a more objective comparison of the effectiveness of collaborations between Kazakhstani new formation institutions (which mostly collaborate with non-post-Soviet countries) and organizations where post-Soviet scientists are the predominant collaborators.

A limitation of this study is that, in certain cases, Kazakhstani authors' joint articles with post-Soviet scholars may have been part of a larger international collaboration that also included representatives from other countries, not solely former Soviet Union states.

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