Social Sciences and Humanities in post- soviet period in Russia: Bibliometric analysis, 1993-2022

Valentina Markusova[1], Valentina Tsvetkova[2], Anna Zolotova, Natalia Kotel'nikova[3], Alexander Libkind[4]
[1]Senior Researcher, The All- Russian Institute for Scientific and Technical Information (VINITI) of the RAS
Moscow 125119

[1]Russia Senior Researcher, The Institute for the Study of Science of the RAS
Moscow, 125119, Russia
{valentina.markusova@gmail.com}

[2]Senior Researcher, The Library of Natural Sciences of the RAS
Moscow, 119991, Russia

[3]Researcher of the VINITI of the RAS
Moscow 125119, Russia

[4]Senior Researcher of the VINITI of the RAS
Moscow 125119, Russia

ABSTRACT: *We've investigated the 30-year trends in Social Sciences & Humanities (SS&H) and STEM development in Russia and global science. Our analysis covers interdisciplinary intersections of SS&H with other fields. We've evaluated Russian SS&H research impact using citation metrics via Web of Science's Core Collection and InCites tool.*

Notably, STEM publications declined while SS&H grew in Russia and globally. Examining research productivity using 'citation topics,' we found a significant link between '6. Social Sciences' and '1. Clinical & Life Sciences' both in Russia and worldwide for the period 2018-2022. Our data highlights a significant similarity within the top 15 topics between Russia and the global scientific community in this specific area.

The citation indicators for the three selected Scientific Categories ('Economics and Business,' 'Psychology/Psychology,' and 'Social Sciences, Multi-disciplinary') linked with SS&H in InCites highlight a notably high value for the period 2018-2022. These values reflect the high quality of performance by Russian scholars.

Over the past decade in Russia, there has been a noticeable decline in the prevalence of single authorship across all studied scientific disciplines, with varying rates of change. In the three studied fields, teams of 2 to 5 members were common. Notably, in 'Economics', 84.5% of teams fell within this range, indicating that 74% of international collaborative publications in 'Economics' involve teams of 2-5 individuals

Our data presents valuable insights into the landscape of Russian scientific research in Social Science & Humanities over a thirty-year period. These findings could curry significance for science policy specialists and the broader scientific community.

Keywords: Publications, Russia, STEM, Social Sciences & Humanities, Citation Topics, Authorship, Global Science, Funding Agency, Open Access, Web Of Science, Incites

Received: 3 August 2023, Revised 6 September 2023, Accepted 19 September 2023

DOI: http://doi.org/10.6025/stm/2023/4/83-92

1. Introduction and Background

During the Cold War, the Soviet Union excelled in hard sciences like physics and engineering but considered life sciences and social sciences secondary to the "more practical" disciplines. In contrast, the United States heavily invested in social sciences research, recognizing its importance for policymaking and governance. Both nations made significant scientific contributions, albeit with different priorities.https://research.flw.ugent.be/en/projects/cold-war-social-science-and-development-human-sciences-europe-and-india.

The eminent and influential American sociologist, R. Merton (2000), emphasized the tremendous impact of Dr. E. Garfield's development of the Science Citation Index on sociology of science.

In the last 30 years we have witnessed a significant growth of research literature. This growth is mainly attributed to STEM (science, technology and medicine) research. Nevertheless, a similar pattern was observed with a lower speed in the social sciences and humanities (SS&H). SS&H are also known to have a more limited coverage in Scopus and Web of Science than (STEM) (Archambault E.,*et al*, 2010, Bourke P *et al,* 1990; Lariviere V. *at el*, 2006, Nederhof A., 2006). As it was noted by Steversen G. (2018) a growth in Social Sciences is partly a consequence of the influence of quantitative techniques on the measurement of research performance.

Recently, Abramo G. et al. (2023) published the results of a comprehensive investigation into the competitive strengths of the USA and Russia during the pre-COVID period. The authors evaluated 146 SC of WoS publications using various bibliometric and economic indicators. One of the notable findings, based on the specialization index in the field of Social Science, revealed a striking difference in its value between Russia and the USA: 0.1 and 2.4 respectively.

Bibliometric investigation among scholars on social sciences in the higher education institutions (HEI) in Germany, had shown that their researchers adapted the peer-reviewed journal publication pattern of the natural sciences at the expense of book publications. (Schneijderberg, C.., *at el,* 2022). Analysis of citation practices is quite different in various research areas on social sciences and humanities (Must U., 2014). For fair research evaluation on social sciences authority in Mexico designed the National database.

It is worthwhile to note that scholars in the field of Social Sciences were among the first to use social networks. As it was indicated by Bogorov V. (*et all*, 2018), among various research areas, the medical and life sciences, social sciences and humanities demonstrated the highest usage of altmetrics in Russia. A study analyzing citations and altmetric indicators of over 650,000 academic books indexed in the Book Citation Index (Young *et al*., 2020) revealed that books in the field of social sciences tend to exhibit relatively better performance compared to those in the arts and humanities. These findings emphasize the significance of social sciences in terms of engagement and impact.

Our study aims to explore Russian publication patterns in SS&H during the post-Soviet period, specifically examining the interdisciplinary intersections of sociology with other research areas. Additionally, we will assess the impact and visibility of Russian sociological research using citation metrics. By investigating factors such as funding initiatives, the influence of Open Access publications, and scholarly networks, we aim to understand the growth and development of sociology in post-Soviet Russia.

Our study examines 30-year trends in Russian and global science publications, focusing on SS&H and STEM. We'll analyze interdisciplinary intersections of SS&H, assess Russian SS&H research impact using citation metrics, and explore the influence of funding and Open Access on publishing activity. This helps us to understand SS&H development in post-Soviet Russia.

2. Methodology and Data collections

The primary sources of bibliometric statistics were Social Science Citation Index (SSCI), Arts & Humanities Citation Index (A&HCI) and InCites. The data frame was 1993-2022.To compare STEM research and SS&H publications (or Research Productivity-RP) and other bibliometric indicators we selected used 22 research areas (Subject Categories) classifications by the Essential Science Indicators (ESI), InCites and three five years period: 2000-2004,2012-2016 and 2018-2022. The following SC belong to STEM: "Chemistry', Clinical Medicine', 'Engineering', 'Material Sciences', 'Mathematics' and 'Physics'. Only article and review (A&R) were processed.

Three subject categories 'Economics, and Business' "Psychology/Psychology'' and 'Social Sciences, Multi-disciplinary' represent SS&H according InCites classification.

To estimate the relationship between SS&H and other disciplines, we employed a new classification method called 'citation

topics'. Since 2019, Clarivate has introduced this new classification to characterize the relationship between cited and citing references. More information about this classification can be found in their blog post: [https://clarivate.com/blog/introducing-citation-topics/.]

The calculation of each citation topic is based on an algorithm developed by a team of researchers from CWTS (Leiden, the Netherlands), as described in the paper by Traag V., et al, (2019).

https://doi.org/10.1038/s41598-019-41695-z

Evaluation of documents on three levels is conducted by Clarivate. At the macro-level, the documents are categorized into following ten broad areas. The list of this areas is following

Macro Topics

1. Clinical & Life Sciences
2. Chemistry
3. Agriculture, Environment & Ecology
4. Electrical Engineering, Electronics & Computer Science
5. Physics
6. Social Sciences
7. Engineering & Materials Science
8. Earth Sciences
9. Mathematics
10. Arts & Humanities

Each topic is also labeled with a permanent numerical prefix to identify the precise topic. For example, micro-topic 6.321.2422 'Russian Society' is sub-topic of the meso-topic 6.321 'Social Reform,' which is sub-topic of the macro topic 2.'Social Sciences'. (search on 19/06/23). While micro social work happens on an individual level, mezzo-level social work zooms out to look at groups instead of individual[1].https://clarivate.com/blog/introducing-citation-topics/

We selected the five-year period (2018-2022) to use this new type of classification for investigating Russian RP on SS&H and their connections with other research areas indexed in SSCI and A&HCI. The search strategy was as follows: CU = (RUSSIA) and PY = (2018-2022); for global science PY = (2018-2022). Option "Research Analysis" was used to rank global and Russian datasets by 'citation topics', share of funding agencies (FA) and share of open access (OA) publications. To examine the impact of FA on Russian publications and their usage of OA, we focused on the period from 2010 to 2020.

Quantity and quality of Russian publications were investigated by following indicators: publications-research productivity (RP), citation topics, category normalized citation impact (CNCI), share of highly cited articles (HCA), share of RP supported by funding agencies (FA); share of Open Access (OA).

3. Results

Throughout the entire studied period in Russia, there continues to be a significant difference in the number of documents (Research Productivity-RP) indexed in the Social Science Citation Index (SSCI), the Art & Humanities Citation Index (SS&H) compared to the Science Citation Index Expanded (SCI-E). However, our data indicates that the growth rate in absolute numbers of Russian RP in SS&H has been substantially higher (3.9 times) than the overall RP of global science on these areas growth rate (2.1 times) over the 30-year period. However, even with this significant growth, the number of Russian documents indexed in SS&H remains noticeably lower than those indexed in SCI-E. This gap is not only observed within the country but is also evident on a global scale when considering the SCI-E.

It appears that there has been a notable rise in the share of Russian RP in Social Sciences from 0.4% in 1993 to 0.9% in 2022. This growth, though modest, can be attributed to increased attention from the government towards social sciences issues.

[1]The detailed methodology for this classification can be found in the publication. Markusova V. at al. The pattern of Russian research on sociology and its interconnections with other research areas: a bibliometric analysis of the post-soviet period. Accepted for the presentation at the COLLNET-23 conference

On the other hand, the share of Russian documents in SCI-E experienced a decline from 3.2% in 1993 to 1.9% in 2014. However, there has been a slow growth observed afterward, with the share rising to 2.4% in 2020 in global science. These data are presented in Figure 1.

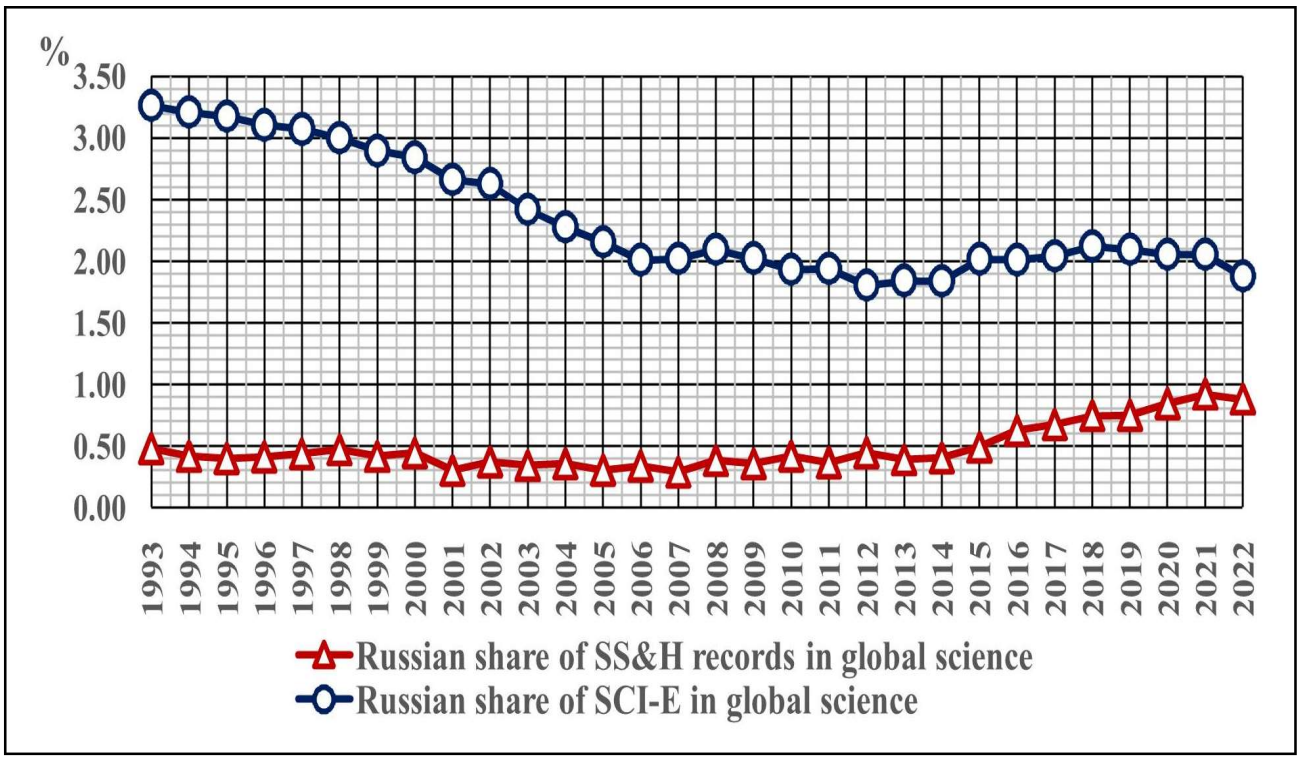

Figure 1. Trends on Russian share of research productivity in both databases: Social Science Citation Index and Art &Humanities Citation Index, and Science Citation Index in global science

The growth in the share of Russian RP in SS&H can be attributed partly to government investment policies in the Higher Education sector and requirements to include bibliometric indicators in annual research reports of any research organizations and universities (Moed et al, 2018). These measures stimulate research and improve the visibility and impact of Russian research on the global stage.

As it was mentioned before we selected three five years periods 2000-2004, 2012-2016 and 2018-2022 to compare share between of STEM and SS&H as in Russia as in global level. These data are presented in the Table 1.

Table 1. Trends on STEM and Social Sciences & Humanities RP in Russia and in Global Science, InCites

Years	2000-2004	2012-2016	2018-2022
Russia, number of records	129,084	160,012	221,397
STEM (%)	69.6	66.0	61.8
SS&H (%)	1.8	2.4	3.3
Global science, number of records	4,168,821	8,138,972	10,433,630
STEM (%)	64.5	60.9	54.1
SS&H (%)	8.7	10.8	11.1

It is seen that in Russia and at the global level, there has been a stable decline in a share of STEM publications, while there has been slow growth in the area of SS&H publications. While the decrease in STEM publications and slow growth in SS&H publications may have various factors, it's notable that Russian science policy is focused on making research more diversified. The growth and decline trends provide valuable insights into the state of Russian scientific research in these areas over 22 years.

In our research study we are focusing on the scope of research areas in Social Sciences and Humanities (SS&H) both in Russia and at the global level. To characterize their relationship with other fields of science, we used a classification method called 'citation topics' in the WoS database. Approximately 75% of all documents from 1980 onward are assigned to a topic. In our case 25% of documents on global level and 37.5% documents in Russia were not assigned to the topics.

At the global level, a total of 2,572,449 publications were categorized under 327 meso-topics. In contrast, Russian research output was notably lower, with approximately 12 times fewer documents (or 21, 389 documents) assigned to 271 meso-topics during the period from 2018 to 2022.

To offer readers a comprehensive overview of the relationship between publications in the domain of Social Sciences and Humanities (SS&H) and other research fields, we selected the top 15 'citation topics.' These selections were based on the frequency of publications within both the Russian academic landscape and the broader global scientific community. The detailed results of our analysis can be found in Table 2. We have denoted the meso-topics that appeared in both datasets with asterisks (*).

Table 2. The 'citation topics' classification of research areas, 2018-2022, InCites

WORLD			RUSSIA		
Citation Topics Meso	**Record Count**	**% of 2,572,449**	**Citation Topics Meso**	**Record Count**	**% of 21,389**
6.3 Management*	109,312	4.25	10.279 Soviet. Russian & East European History	793	3.71
6.10 Economics*	89,733	3.49	6.10 Economics*	735	3.44
6.24 Psychiatry & Psychology	74,338	2.89	6.3 Management*	723	3.38
1.7 Neuroscanning*	74,185	2.88	1.7 Neuroscanning*	692	3.24
1.21 Psychiatry*	73,515	2.86	6.321 Social Reform*	576	2.69
6.73 Social Psychology*	64,643	2.51	6.73 Social Psychology*	539	2.52
6.27 Political Science*	58,748	2.28	6.27 Political Science*	518	2.42
6.11 Education & Educational Research*	57,523	2.24	8.93 Archaeology	460	2.15
1.44 Nutrition & Dietetics	56,483	2.20	6.115 Sustainability Science*	412	1.93
1.14 Nursing	54,788	2.13	10.126 Philosophy	409	1.91
6.86 Human Geography	42,140	1.64	6.69 Language & Linguistics*	314	1.47
6.69 Language & Linguistics*	41,613	1.62	6.11 Education & Educational Research*	312	1.46
1.112 Palliative Care	41,245	1.60	6.122 Economic Theory	283	1.32

6.115 Sustainability Science*	39,755	1.55	1.21 Psychiatry*	267	1.25
1.136 Autism & Development Disorders	33,780	1.31	1.100 Substance Abuse	237	1.11

It's evident that both in the realm of global science and within Russia, there is a noticeable prevalence of meso-level topics from the '6. Social Sciences' category. This observation can be attributed to the usage of specialized databases that primarily cover this particular field. Our data underscores a substantial similarity among the top 15 topics shared between Russia and the worldwide scientific community in this specific domain, with ten topics being present in both datasets.

Moreover, there are two meso-level topics, namely '10.279 Soviet. Russian & East European History' and '10.126 Philosophy', associated with the macro-level area '10. Art & Humanities' within the top 15 'citation topics' in Russia. Among other Russian topics, three of them fall within the broader area of '1. Clinical & Life Sciences'. On a global science level, there are six topics that belong to the '1. Clinical & Life Sciences' category. This suggests a significant inter-relationship between the '6. Social Sciences & Humanities' and the macro-category '1. Clinical & Life Sciences'.

We have gathered data on a range of bibliometric indicators to access the quality and impact of the three selected Scientific Categories: 'Economics and Business,' 'Psychology / Psychology,' and 'Social Sciences, Multi-disciplinary,' linked with Social Sciences and Humanities in InCites for two five years period 2012-2016 and 2018-2022. These statistics are detailed in Table 3.

Table 3. Bibliometric quality indicators of Russian publications on SC 'Economics and Business,' 'Psychology/Psychology,' and 'Social Sciences, Multi-disciplinary,' for the period 2018-2022

Subject Category	Economics& Business	Phycology/ Psychiatry	Social Sciences
Web of Science Documents	1,407	1,910	4,393
% Docs Cited	85.1	67.8	65.9
Category Normalized Citation Impact	1.5	0.8	0.9
Citation Impact	11.3	6.4	6.0
% Documentsin Top 1%	2.3	0.94	1.5
% Documentsin Top 10%	16.3	7.4	9.0
% Highly Cited Papers	2.8	1.0	1.53
Impact Relativeto World	1.2	0.7	0.6
Journal Normalized Citation Impact	1.4	1.0	1.1
% Documentsin Q1 Journals	38.7	22.2	24.3
% Documentsin Q2 Journals	32.7	22.1	22.1
%, International collaboration	74.0	46.6	40,13
%, Domestic Collaboration	5.2	18.2	11.3

The data reveals that among the three studied Scientific Categories, 'Economics and Business' exhibits the highest impact. The CNCI value of 1.5 surpasses the global science's average. Furthermore, the proportion of HCA is 2.8 times greater than the global science average. This suggests that international collaboration (IC) contributes significantly to enhancing the visibility of research team outcomes. In the context of 'Economics and Business,' IC holds substantial influence, constituting 74% of its share. The increase of impact is attributed not only to increased international collaboration but also to publications in influential journals. As a result, the percentage of publications in top Q1 and Q2 journals exceeds the 70% threshold.

Remarkably, the level of domestic collaboration in the selected area is unexpectedly low. Given the abundance of surveys related to reforms in Russia, one might expect scholars to engage in them frequently. It's noteworthy that within the total research productivity in Russia, the share of domestic collaboration amounted to approximately 29% during the period spanning 2018 to 2022.

The co-authorship became an established bibliometric indicator to measure scientific collaboration (Bozeman et al, 2004, Gazni A. et al, 2012). As D.Price (1963) noted "the size of research teams and consequently the number of authors per paper increased after the Second World War in richer nations, driven by the cost of research, as part of the development of "big science". Results of comprehensive bibliometric analysis conducted by Thewall *et al* (2020) show that the team size varies substantially by discipline and country. The international collaboration is also quite beneficial for young scientists (2022).

Fractional counting is employed when dealing with co-authorship, both at the individual level and when co-authors are affiliated with different organizations or countries during research evaluation in Russia. Considering this, we assess the size of research teams within three selected Subject Category for two five years period 2012-2016 and 2018-2022.These data are presented at Table 4.

Table 4. Distribution of publications (À & P) by size of research team, 2018-2022, InCites

	SOCIAL SCIENCE		PSY/Psich.		ECONOMICS	
YEARS	**2012-2016**	**2018-2022**	**2012-2016**	**2018-2022**	**2012-2016**	**2018-2022**
RECORDS NUMBER	2,424	4,394	969	1,910	521	1,407
SIZE OF TEAM	**Share (%)**	**Share (%)**	**Share (%)**	**Share (%)**	**Share (%)**	**Share (%)**
SINGLE, %	48.9	35.7	27.8	17.4	25.5	11.0
FROM 2 -5	42.2	51.1	65.0	55.9	72.9	84.6
FROM 6-10	6.4	8.6	7.2	15.3	1.1	2.1
FROM 11-30	1.4	3.5	0.0	7.2	0.3	2.3
FROM 30-100	1.0	1.2	0.0	0.0		

Co-authorship is influenced by a range of factors, such as disciplines and languages, as well as fields of science, among others. It is widely acknowledged that sole authorship was once prevalent in Social Sciences and Arts & Humanities. Despite this, over the past decade in Russia, there has been a noticeable decline in the prevalence of sole authorship across all studied scientific disciplines, with varying rates of change. Nevertheless, single authorship is more common in the field of Social Science, comprising over a third of publications (35.7%) during the period 2018-2022.

The predominant research team size across all study areas typically consists of 2 to 5 members, with the highest proportion, accounting for 84.5%, observed in the field of 'Economics'. However, our data diverge from the global research output pattern as outlined by Adams et al. (2020). In their study, it was found that across the Web of Science, the most common number of authors per article is three, and a significant 95% of global research output involves 10 or fewer authors."

The concept of competitive research funding in modern Russia spans less than 30 years. Prior to the collapse of the Soviet Union in 1991, the state funded all basic research. In 1992, the Russian government established the Russian Foundation for Basic Research (RFBR) to finance research projects. Simultaneously, researchers gained access to grants from foreign organizations. Furthermore, in 1994, the Russian Foundation for Humanities (RFH)[2] was also established, administering competitive funding for basic research projects in the social sciences. The application for research grants became integral to Russian scholars' work. Since 2012, acknowledging funding agencies and grant numbers has been mandatory (Mindeli et al., 2014).

We want to emphasize that the establishment of the Russian Science Foundation (RSF) in 2013 brought a significant influx

[2]According to decree of Russian government (29.02.2016), the Russian Humanities Foundation was dissolved government and merged with the Russian Foundation for Basic Research. https://www.rsci.ru/grants/fonds/93.php

of investment for competitive funding in Russia. The RSF has played a crucial role in providing support for research projects across various disciplines, including the Social Sciences (Moed et al, 2018).

Our analysis show that there was a consistent trend of publications being supported by FA in global level from 2010 to 2022.It was a quite different picture in Russia. Figure 2 illustrates trends of publications' share supported by FA and Open Access in Russia and in global level from 2010 to 2022.

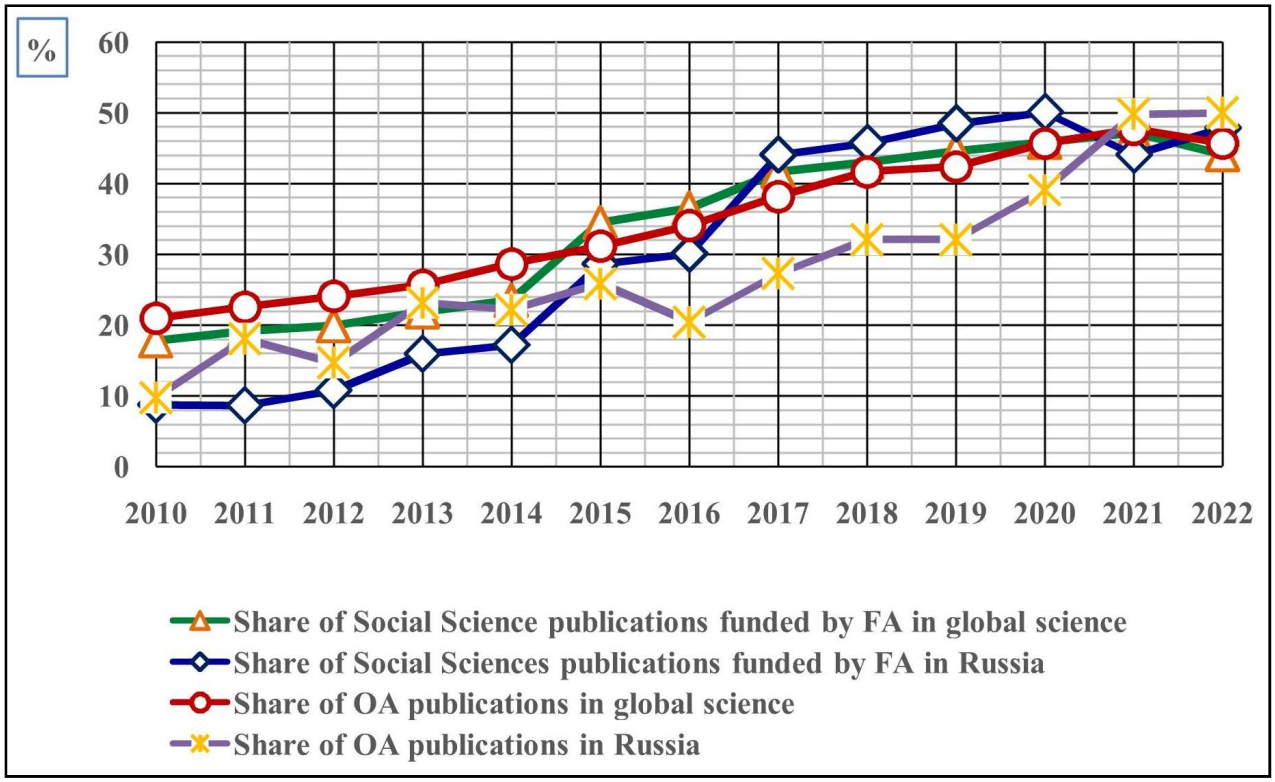

Figure 2. Growth of publications supported by funding agencies in Russia and global science, 2010-2022, SSCI

Our analysis shows that there was a consistent trend of publications being supported by FA at the global level from 2010 to 2022. However, the situation was quite different in Russia. In 2010, the share (8.8%) of publications supported by FA in Russia was only half of that in global science.

On a global level, there was a consistent trend of publications being supported by FA from 2010 to 2022.However, Russia experienced a sharp growth trajectory starting from 2015 until 2022, when its share reached 47.9%, surpassing that of global science by 3% in 2022.

Among various funding agencies, three leaders stand out: the Russian Science Foundation (RSF), the Russian Foundation for Basic Research (RFBR), and the 'Project 5-100' of the Ministry of Education and Science of the Russian Federation. Their combined share of funding publications was close to 90%. The substantial growth in government funding for Social Sciences, reflects the recognition of their important role in society.

The rise of Open Access (OA) journals is tied to global telecommunications progress, enabling online access to scientific works. Many countries promote free access to publicly funded research, boosting OA. Organizations like the US National Science Foundation, NIH, and Welcome Trust require OA publication for funded projects. The EU backs Gold OA for EU-funded programs. In Russia, RFBR and RSF endorse OA for research publishing (Markusova et al., 2018).

The distribution pattern of OA publications in Social Sciences aligns with the pattern of funding activity. Russian scholars in the field of Social Sciences have adopted the OA model of knowledge distribution since 2010. However, the share of OA publications in Russia (9.8%) was approximately half of the global level (21%) during the studied period. Nevertheless, the gap in OA usage has significantly diminished over time. In 2022, while global OA publication usage reached 45.7%, Russia

achieved a rate of 50%. This signifies an increase in the acceptance and adoption of OA publishing practices among Russian scholars in the field of Social Sciences.

4. Conclusions

We investigated trends in development of Social Science and Humanities publication activity in Russia and in global science over 30 years period. The main sources were three Core Collection database of Web of Science and analytical tool InCites. Our data shows Russian SS&H publications grew significantly faster (3.9 times) than the global average (2.1 times). The share of Russian SS&H papers rose notably from 0.4% in 1993 to 0.9% in 2022. This growth, though modest, can be attributed to increased attention from the government towards social sciences issues.

Over the past 22 years, Russia and the global science have seen consistent declines in STEM publications, contrasting with gradual growth in SS&H publications. These trends, influenced by various factors, coincide with Russian science policy's emphasis on research diversification."

Examining relationship of SS&H with other fields of science based on 'citation topics' , we found a significant link between '6. Social Sciences' and '1. Clinical & Life Sciences' for 2018-2022, both in Russia and worldwide for the period 2018-2022.

Values of bibliometrics indicators for collaborative publications indicated their high quality. The CNCI value of 1.5 surpasses the global science's average and the proportion of HCA is 2.8 times greater than the global science average.

Steady growth was observed in the publication support provided by FA and the usage of Open Access journals in Russia during the studied period from 2010 to 2022.

Our data presents valuable insights into the landscape of Russian scientific research in Social Science & Humanities over a thirty-year period. These findings could curry significance for science policy specialists and the broader scientific community

There are some limitations in our research. InCites is extremely useful due to the availability of various bibliometric indicators. However, we used the ESI classification for 22 broad areas, which includes SC 'Social Science, general,' partly encompassing Arts & Humanities publications."

5. Acknowledgments

This research was partly funded by the Government Program "VINITI-0003-2022-0001" and by the Russian Foundation for Basic Research (grants 20-07-00014 and 20-010-00179). Authors are also grateful to Clarivate Analytics for the opportunity to use their data.

References

[1] Abramo G., D'Angelo CA., Di Costa F. (2023). USA vs Russia in the scientific arena. *PLoS ONE*, 18 (7) e0288152. https://doi.org/10.1371/journal.pone.0288152

[2] Adams, J., Quashi J.E, Pendlebury D., Szomszor M. (2020). Global Research Report, Multi-authorship and research analytics 2020. https://clarivate.com/lp/global-research-report-multi-authorship-and-research-analytics

[3] Akbaritabar, A., Casnici, N., Squazzoni, F. (2020). The conundrum of research productivity: a study on sociologists in Italy. *Scientometrics,*114 (3) p. 859-882. DOI: 10.1007/s11192-017-2606-5

[4] Archambault, E., Larivière, V. (2010) World social science report: Knowledge divides, p. 251-254. http://www.vandenbesselaar.net/_pdf/2010%20wssr%20peter.pdf

[5] Binh Pham-Duc, Trung Tran and Hien-Thu-Thi Le. (2020). A spike in the scientific output on social sciences in Vietnam for recent three years: Evidence from bibliometric analysis in Scopus database (2000–2019). *Journal of Information Science and Technology*, 48 (5). https://doi.org/10.1177/0165551520977447

[6] Burke P., Butler I. (1998). Institutions and the map of science: matching university departments and fields of research (1998), *Research Policy*, 26, N9, p. 711-718. https://doi.org/10.1016/S0048-7333(97)00046-2

[7] Hicks D. (1999). The difficulty of achieving full coverage of international social science literature and the bibliometric

consequences. *Scientometrics*, 44(2), p. 193–215.

[8] Garfield E. (1979). *Citation indexing: its theory and application in science, technology, and humanities* (1979). New York: Wiley. 1979, p. 274.

[9] Ivanov V.V., Markusova V.A. Mindeli L.E., Zolotova A.V. (2018). The Open-Access System of Journals and its Use by Russian Scientists According to the Statistics of Web of Science (2008–2017. *Scientific and Technical Information Processing,* 2018, 45 (3), P. 182–191. DOI: 10.3103/S0147688218030097 Original Russian Text © V.V. Ivanov, V.A. Markusova, L.E. Mindeli, A.V. Zolotova, 2018, published in *Nauchno-Tekhnicheskaya Informatsiya, Seriya 1: Organizatsiyai Metodika Informatsionnoi Raboty*, No. 9, p. 30-39.

[10] Li, W., Aste, T., Caccioli, F. *et al.* Early co-authorship with top scientists predicts success in academic careers. (2019). *Natural Communication,* 10, 5170 (2019). https://doi.org/10.1038/s41467-019-13130-4

[11] Libkind, I.A., Markusova, V, A. Terekhov, I., Rubval'ter, R. A., Libkind, A. N. (2014). Bibliometric Analysis of Competitive Research Project Results. *Scientific and Technical Information Processing*,.41 (4), p. 254–264.

[12] Markusova, V.A., Bogorov, V. G., Libkind A.N. (2018). Usage metrics vs classical metrics: analysis of Russia's research output. *Scientometrics*, 114 (2) p. 593-603. https://doi.org/10.1007/s11192-017-2597-2

[13] Mindeli, L.E., Libkind, A.N., Markusova, V.A. (2014). The effect of grant-assisted financing on the efficiency of scientific studies in higher education. *Herald of the Russian Academy of Sciences*, 84 (6) p. 432-440.

[14] Moed H.F., Markusova V., Akoev M. (2018). Trends in Russian research output indexed in Scopus and Web of Science. *Scientometrics*, 116, p. 1153–1180.

[15] Must, U. (2014). Alone or together: examples from history research *Scientometrics*. 91(2). DOI:10.1007/s11192-011-0596-2

[16] Nederhof, A. (2006) Bibliometric monitoring of research performance in the Social Sciences and the Humanities: A Review.*Scientometrics* 66, p. 81–100. https://doi.org/10.1007/s11192-006-0007-2

[17] Puuska, H.M., Muhonen L.Y. (2014) International and domestic co-publishing and their citation impact in different disciplines. *Scientometrics,* 98 (2) p. 823-839. DOI: 10.1007/s11192-013-1181-7

[18] Schneijderberg, C., Götze, N., Müller, L. (2022). A study of 25 years of publication outputs in the German academic profession. *Scientometrics*, 127 (1) p. 1-28.

[19] Sivertsen G. (2014). Scholarly publication patterns in the social sciences and humanities and their coverage in Scopus and Web of Science. *19th International Conference on Science and Technology Indicators "Contest Counts: Pathway to Master Big and Little Data.* https://www.researchgate.net/publication/297369590

[20] Traag, V.A., Waltman, L., van Eck, N.J. (2019). From Louvain to Leiden: guaranteeing well-connected communities. *Scientific Report*. 9, article 5233. https://doi.org/10.1038/s41598-019-41695-z

[21] Yang, S. L., Xing, X., Qi, F. Q., Gracio, M. (2021). Comparison of academic book impact from a disciplinary perspective: an analysis of citations and altmetric indicators. *Scientometrics* 126 (2) p. 1101-1123. DOI: 10.1007/s11192-020-03808-8