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## Developments in the Russian scientific production indexed in Scopus and Web of Science<sup>1</sup>

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### Introduction

During the past two decades, major changes took place in the research system of the Russian Federation. A series of government initiatives was launched, aimed to increase competition among Russian universities, and enhance their international status and visibility. In May 2012, President of the Russian Federation V. Putin released decree № 599, in which he set the goal: "that the Russian share of research output (RO) has to reach 2.44% of the global RO, and five Russian universities have to be among the top hundred universities included in one of three world ranking systems in 2015" (Decree 599, 2012), namely the Shanghai Ranking (Academic Ranking of World Universities), Times Higher Education (THE) Ranking, or QS (Quacquarelli Symonds) ranking. A new project, denoted as Project 5-100 started in January 2014 when funding for 2013 was transferred to a selected group of universities (5top100, n.d.).

In this Russian science policy, the assessment of national research performance using bibliometric indicators plays an crucial role. Insight into differences in source coverage between bibliographical databases and into its changes over time, as well as their effects upon bibliometric indicators, is essential for a proper interpretation and use of bibliometric indicators in research assessment. The three authors of the current paper conducted a bibliometric study presenting a comparative, longitudinal study of the coverage of the publication output from Russian institutions in Scopus and the Web of Science (Moed, Markusova & Akoev, 2018). It addresses the following research questions.

- i. How can the large increase in the number of documents from Russia indexed in Scopus be explained? Which factors are responsible?
- ii. How does Scopus compare with Web of Science (WoS) in this respect?

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<sup>1</sup> This paper is based on the article "Trends in Russian research output indexed in Scopus and Web of Science", by Moed, H.F., Markusova, V. & Akoev, M. (2018), *Scientometrics*, DOI 10.1007/s11192-018-2769-8. This paper is partly supported by the Russian Foundation of Basic Research (Grant: 17-02-00157).

- iii. What is the annual trend in the number of documents from Russian institutions in Scopus and WoS, disaggregated by document type, publication language, and research discipline?
- iv. How does the trend in number of documents from Russia indexed in Scopus and WoS compare to those calculated for documents from fellow BRIC countries Brazil, China and India?
- v. To what extent can the observed patterns be attributed to an increase in research performance, and to what extent to changes in the source coverage of the database?

The current paper presents a number of important findings from this study. The presentation of empirical outcomes focuses on the “2.44-norm” in the above mentioned 2012-Decree, and addresses the following questions: What is the trend in the percentage of Russian research papers during 2012-2016; how does this percentage differ between the two databases; and how does it depend upon changes in the subject coverage of these databases over time? The next section briefly sketches the background of the study, and is followed by an overview of the datasets that were analysed. Next, key findings are presented and discussed. Finally, a summary of the main conclusions from the wider study (Moed, Markusova & Akoev, 2018) is presented.

## **Background**

The Russian research system is very different from that of other developed nations as was described by Graham (1995), Wilson (2004), and Karaulova (2016). During the last 20 years the Russian science community has been struggling to hold a leading place on the international science stage. Reform of two main Russian academic sectors, namely the Russian Academy of Sciences (RAS) and the Higher Education Sector (HES), has been going on for the last thirteen years, with the government shifting its attention and financial resources toward the HES.

In June 2013, a new bill introduced and adapted quickly by Russian Parliament, related to the drastic reform of three government academies: the Russian Academy of Sciences (RAS), the Russian Academy of Agriculture and the Russian Academy of Medical Sciences. This reform caused controversy and strong resistance by the Russian research community. On November 1, 2013 D. Medvedev - the Prime Minister of the Russian Federation - released the decree № 979 ordering to include in any research organization’s evaluation the following bibliometric indicators: number of papers, citation score and impact factor by Web of Knowledge or Scopus. (see for instance <http://www.ras.ru/news/shownews.aspx?id=613a30f8-1475-4d9a-a6a3-75df1501be7a>)

The bibliometric performance of the RAS and the HES played a very important role in this reform (Ivanov et al., 2014). Recent papers published in *Scientometrics* (Karaulova et al. 2016) and in the *Herald of Russian Academy of Sciences* (Turko et al., 2016) were devoted to the impact of this reform on the bibliometric performance by RAS and HES, and on the collaboration among these two science bodies. The paper by Turko et al. (2016) was based on statistics from the Russian Index of Science Citation (RISC) and from Scopus. The time frame was 2010-2014.

The Russian government assigned for Project 5-100 implementation 44 billion Rub. (around 730 million US\$) for the time period 2013-2016. After two tiers of competition 14 universities were selected; in a later phase, one was added, and in 2015 another six. Each year, all universities were divided for 3 groups according to their results. Each university belonging to

the first group receives about 960 MLN Rub.; universities in the second group receive 450-540 MLN Rub each. Finally, each university of the third group obtains about 100 MLN Rub.

On 23.05.2016. D. Medvedev - the Prime minister of the Russian Federation signed the allocation of about 11 Billion Rub. (around 187 Million US\$) to 21 universities. This input forms an additional budget beside the annual budget of each university assigned by the Ministry of Education and Science in 2017. The amount of government funding is changing yearly and depends on university performance and on the capability of elaborating and implementing competitiveness required by the Project.

On Sept.1.2017 in the framework of the Project 5-100 a new project was announced, named "Universities as a Drivers of Region's Development". 121 universities sent applications to participate in the competition as a center of innovation and social development in the region. Two independent peer-review councils were set up. 51 Universities were selected; among them were 10 universities-participants of Project 5-100. Detailed information on various aspects of the Russian science system can be found in Graham (1995); Wilson (2004); Karaulova et al. (2016); Mindeli (2013), Schiermeier (2007; 2010; 2012); Turko et al. (2016).

## Data

### *Scopus*

Scopus data were extracted manually from the online version (Scopus.com). According to the Scopus website, in the selection of sources a Content Selection and Advisory Board (CSAB, n.d.) plays an important role. In the current study, Elsevier's SciVal was not used. On 28 January 2018 Elsevier published a list of 424 Scopus source journals that will be discontinued (Elsevier, 2016). In most cases Elsevier indicated "publication concerns" as the reason for discontinuation. It seems plausible to assume that these concerns are based on evidence that these journals are potentially or actually predatory (e.g., Beall, n.d.; "Predatory Open Access", n.d.). The effect of this decision is further analysed below.

### *WoS*

The publication counts from the Web of Science Core Collection were derived from the following databases: The Science Citation Index – Expanded (SCI-E), Social Science Citation Index (SSCI), Arts & Humanities Citation Index (AHCI), Conference Proceeding Citation Index-Science, Conference Proceeding Citation Index-Social Sciences & Humanities, Book Citation Index-Science, Book Citation Index & Social Sciences & Humanities. The total collection of these databases will be indicated as WoS throughout this paper. Sources in the WoS are selected using a combination of quantitative indicators and expert review. Clarivate Analytics sells also a bibliometric information product named InCites, derived from the WoS. Most of the counts presented in the current paper are extracted with permission from InCites.

## Results

### *The 2.44 per cent norm for the share of Russian publication output*

Table 1 shows the trend during 2012-2016 in the percentage of documents from Russian institutions by database and type of document. It shows that this trend depends upon the database analysed, and the type of document included. Counting articles, reviews and proceedings papers, the percentage of Russian output exceeds in both databases the 2.44 per cent norm released by President Putin in May 2012. Leaving out proceedings papers, the Russian share in 2016 does exceed the norm in Scopus, but *not* in WoS. Deleting the 424

journals on the Beall list and discontinued in Scopus, this share further declines but remains still above the norm, but if papers in Russian language are discounted as well, it declines to 2.18 per cent, substantially below the 2.44 per cent norm. Figures 1 and 2 below provide more information on changes in the coverage of Russian output broken down by type of source (proceedings versus journal articles) and publication language (Russian versus other).

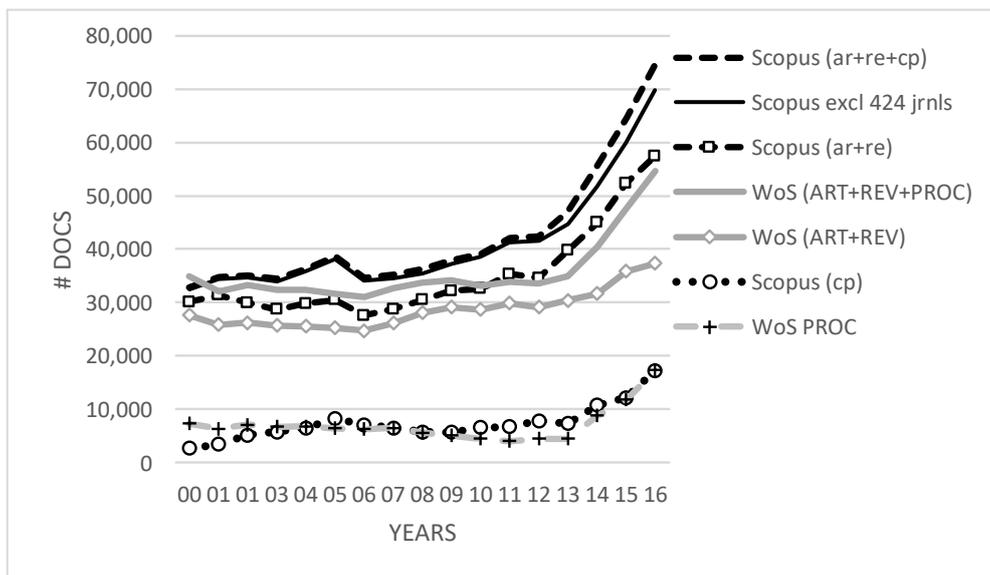
Table 1. Trends 2012-2016 in percentage of documents from Russia by database and document type

	Scopus ar+re+cp	Scopus ar+re	Scopus excl. 424 "Beall" jrnls ar+re	Scopus excl 424 jrnls excl Russian Lang ar+re	WoS ART+REV+PROC	WoS ART+REV
2012	1.79 %	1.87 %	1.92 %	1.75 %	1.87 %	1.95 %
2013	1.91 %	2.01 %	2.03 %	1.82 %	1.86 %	1.94 %
2014	2.19 %	2.18 %	2.16 %	1.93 %	2.08 %	1.97 %
2015	2.60 %	2.52 %	2.37 %	2.08 %	2.39 %	2.18 %
2016	2.99 %	2.77 %	2.60 %	2.18 %	2.72 %	2.25 %

*Counts per document type*

Figure 1 displays the numbers of documents indexed in Scopus and WoS during 2000-2016, disaggregated by document type. In this figure, ar, re, and cp indicate articles, reviews and conference papers in Scopus. ART, REV, PROC indicate these three types in WoS.

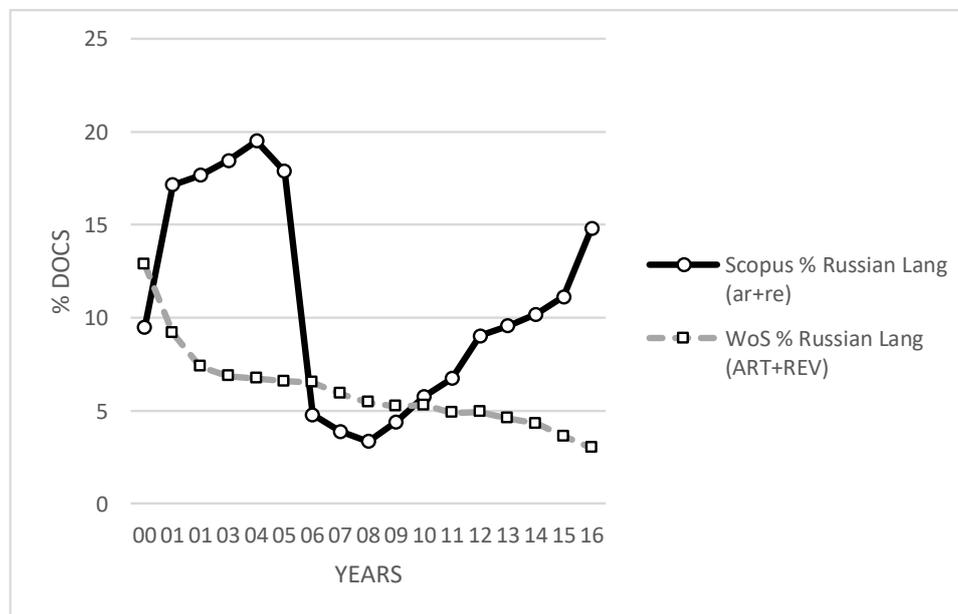
Figure 1. Number of documents from Russian institutions during 2000-2016 per year and per document type.



It was found that during 2012-2016, the Compound Annual Growth Rate (CAGR) in the total number of documents from Russia is in Scopus slightly higher than that in WoS (15.2 versus 12.9). But in Scopus the number of journal articles and reviews increased much faster than that in WoS (13.5 versus 6.4), and the number of proceedings papers slower (21.9 versus 40.2). In fact, the percentage of proceedings papers in WoS declined during 2007-2011 from 20 to 12 per cent, followed by a sharp increase during 2014-2016. In 2016, the *percentage* of conference papers is 23 for Scopus against 32 for WoS. But the *absolute* numbers of conference papers in Scopus and WoS are both around 17,000. There is a substantial degree of overlap of 60 per cent between the top 25 proceedings volumes in Scopus and that for WoS

*Counts per publication language*

Figure 2: Percentage of documents from Russian institutions by publication language



The increase in number of documents from Russian institutions indexed for Scopus is to a considerable extent due to an increase in the number of documents using Russian as *publication language*. It was found that (CAGR) during 2006-2016 for documents from Russian institutions published in non-Russian languages (mainly English) is for Scopus about 40 per cent higher than it is for WoS (6.4 against 4.6), while for all articles and reviews, regardless their publication language) it is as much as 81 per cent higher (7.6 versus 4.2). WoS shows a decline in % papers in Russian language.

*Analysis by discipline*

The five Scopus disciplines showing during 2013-2016 the largest CAGR in the number of publications from Russia are *Economics, Econometrics & Finance* (CAGR=73%), *Business, Management, Accounting* (64%), *Social Sciences* (60%), *Arts & Humanities* (56%) and *Pharmacology, Toxicology & Pharmaceuticals* (43%). Scopus and WoS or InCites use different subject classification systems. For most disciplines, Scopus numbers of papers from Russia increase faster than WoS counts do in the most similar WoS discipline.

*Analysis of BRIC countries*

During the entire period 2006-2016, CAGR of papers from Russia is in Scopus larger than it is for WoS (7.6 versus 4.2 per cent). During 2013-2016 the Scopus annual growth rate is for Russia disproportionately large not only compared to that for WoS, but also compared to that of the other three BRIC countries in Scopus. Apparently, Scopus has given a high priority to indexing Russian publication output, and WoS to publications from China.

### *Analysis by source in Scopus*

To which extent is the increase of documents from Russian institutions in Scopus journals due to an *expansion* of the source coverage? An analysis of the *50 journals with the largest number of 2016-documents from Russia* (accounting for 28 per cent of the total number of Russian 2016-documents), found that a vast majority of 80 per cent was published in journals that were already used by Russian institutions in 2012. This outcome suggests that a substantial part of the increase in journal output from Russia is due to the fact that Russian researchers started publishing more in journals they were already using in the past. A *second* analysis found that 73 percent of the *Russian language* journals used by Russian institutions in 2016 were “new” journals in 2016 compared to the situation in 2012.

### **Main conclusions**

The analyses presented in the wider study allow for the following conclusions.

- The calculation of numbers and growth rates of documents published by Russian institutions strongly depends upon *the database* that is used. This finding points towards a serious problem from a user perspective: while both WoS and Scopus strive to be a standard in bibliometric research assessment, a user is confronted with substantial differences in outcomes between the two, and is without additional information about the coverage of these databases not able to assess which outcome is the most valid.
- When using a single database, outcomes are affected by *changes* in database coverage over time. Scopus has substantially expanded the coverage of Russian language journals, and WoS of conference proceedings, even though *both* databases show an exponential increase in the *total* number of indexed documents from Russia, and statistically *similar* compound annual growth rates.
- In 2016, the percentage of conference papers is 23 for Scopus against 32 for WoS. But the absolute numbers are almost identical. There is a substantial overlap between Scopus and WoS in proceedings titles covered, especially *conference series*. The ‘big’ series tend to be covered in both. But their citation impact upon research activities outside Russia is found to be low.
- Russian institutions did also increase their publication output in internationally oriented journals. The extent to which these ‘new’ publications displaced articles that Russian scientists in earlier years tended to publish in national journals not covered by Scopus or WoS, cannot be assessed with the data presented in this paper. An analysis of the Russian output in the Russian Index of Science Citation (RISC) produced in Russia by E.Library, or in the Russian Science Citation Index (RSCI-C) included in the Web of Science Platform (but *not* indexed in the WoS) could reveal relevant insights into displacement but falls beyond the scope of the current paper.
- From a bibliometric point of view, it is questionable whether a positive trend in the number of documents from Russian institutions published in Russian language journals indexed in Scopus or in conference proceedings indexed in Scopus or WoS reflects a genuine internationalization of Russian research.
- What the precise effects of the observed differences between databases – and of changes in database coverage over time – will be upon an assessment of the performance of the Russian research system, strongly depends upon the assessment methodology that is applied, and, if bibliometric indicators are to play a role, which indicators are used. If database features influence the value of multiple indicators, their effects may be in different directions.

- For instance, an increase of the number of indexed publications in Russian language journals has probably a *positive* effect upon a size-independent publication output indicator. But there is strong evidence that domestic, non-English publications have a *negative* influence upon relative citation rates, comparing the citation-per-publication ratio of an institution with the world average citation rate in the subfields in which it is active (Van Leeuwen et al., 2001).
- All in all, the results obtained in the current study provide evidence that one should be cautious when using WoS, and especially Scopus, as a measuring device of changes in research performance from an international perspective, and, hence, as a valid tool in the assessment of the key objectives of the Project 5-100.

## References

5top100 (n.d.). <https://5top100.ru/news/70290/>.

Beall, J. (n.d.). *Scholarly Open Access. Critical analysis of scholarly open-access publishing.* <https://web.archive.org/web/20161202192038/https://scholarlyoa.com/individual-journals>

CSAB (n.d.). <https://www.elsevier.com/solutions/scopus/content/scopus-content-selection-and-advisory-board>. Last retrieved: 8 January 2018.

Decree 599 (2012). [www.rg.ru/2012/05/09/nauka-dok.html](http://www.rg.ru/2012/05/09/nauka-dok.html).

Elsevier (2018).

[https://www.elsevier.com/\\_data/assets/excel\\_doc/0019/212275/Discontinued-sources-from-Scopus\\_Jan-24-2018.xlsx](https://www.elsevier.com/_data/assets/excel_doc/0019/212275/Discontinued-sources-from-Scopus_Jan-24-2018.xlsx)

Graham L.R. (1998). *What have we learned about science and technology from the Russian experience?* Stanford University Press: Stanford, California.

Ivanov, V. V., Libkind, A. N., & Markusova, V. A. (2014). Publication activity and research cooperation between higher education institutions and the Russian Academy of Sciences. *Herald of the Russian Academy of Sciences*, 84 (1). 28-34. DOI 10.1134/S101933161401002X.

Karaulova, M., Abdullah, G., Shackleton O, & Shapira, P. (2016). Science System Pass-Dependencies and Their Influences: Nanotechnology Research in Russia. *Scientometrics*, 100(3), 365-383. DOI: 10.1007/s11192-016-1916-3

Mindeli, L. (2013) (ed.). *Russian Academy of Sciences in numbers (2013). Statistical issue.* IPRAN RAS, Moscow.

Moed, H.F., Markusova, V. & Akoev, M. (2018). Trends in Russian research output indexed in Scopus and Web of Science. *Scientometrics*, DOI 10.1007/s11192-018-2769-8.

“Predatory Open Access”, n.d.

[https://en.wikipedia.org/wiki/Predatory\\_open\\_access\\_publishing](https://en.wikipedia.org/wiki/Predatory_open_access_publishing).

Schiermeier, Q. (2007). The Battle for Russia’s brains. *Nature*. 449, 524-527. DOI: 10.1038/449524a.

Schiermeier, Q. (2010). Russia to boost university science. *Nature*. 464, 1257. DOI: 10.1038/4641257a.

Schiermeier, Q (2012). Higher Education: Russia shakes up its universities. *Nature*, 492, 120.

Turko, T., Bakhturin, G., Bagan, V., Poloskov, S.& Gudym, D. (2016). Influence of the program "5-top 100" on the publication activity of Russian universities. *Scientometrics*, 109, 769-782. DOI 10.1007/s11192-016-2060-9.

Van Leeuwen, T.N., Moed, H.F., Tijssen, R.J.W., Visser, M.S. & Van Raan, A.F.J. (2001). Language biases in the coverage of the Science Citation Index and its consequences for international comparisons of national research performance. *Scientometrics* 51, 335-346.

Wilson, C. & Markusova, V.A. (2004) Changes in the Scientific Output of Russia from 1980-2000, as Reflected in the Science Citation Index in Relation to National Politico-economic Factors. *Scientometrics*, 59, 345-389.