Impact of national science policy on academic migration and research productivity in Russia

Russian science had derived its structure and basic organization principles from the USSR. Basically, fundamental research was carried out in academic institutions, applied science was concentrated in research organizations subordinate to ministries and departments. Industry-specific applied science has suffered greatly from the reforms and recession during 1990th and was practically destroyed.

In 1996 Russian science passed the most dramatic period and started to recover and from 2006 steadily grew on the basis of increase of funding (fig. 1). During 2007 – 2011 share of publications affiliated with Russian state academies of sciences was more than 50%. But later this share decreased by the effect of radical change of national science policy consisting in reliance on higher education institutions (HEI) as a foundation of basic research in Russia. Several initiatives – establishment in 2006 – 2010 of Federal universities (now 10 universities), assignment of National research university status to 29 HEIs in 2009 – 2010 and start of 5/100 project in 2013 covering 21 HEIs and aiming to advance Russian HEIs in international rankings lead to dramatic increase of research productivity of higher education sector.

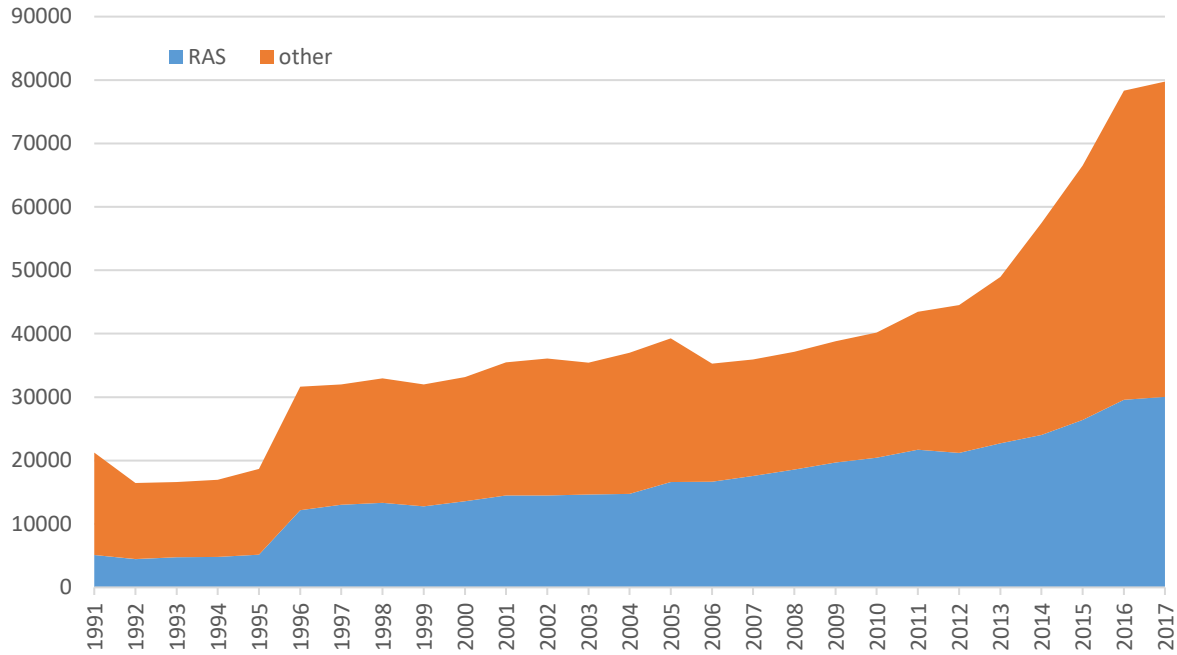

Fig. 1. Number of Russian publications according to Scopus database.

Major shift to project-oriented approach to planning and managing of basic scientific research in accordance with the Programs of fundamental scientific research of the State academies of sciences since 2008 and transition to service-oriented model of the public administration, which was expressed in the introduction of the concept of the state assignment in 2007 determined increased attention to basic bibliometric indicators of research productivity, especially to the number of publications indexed in Web of Science Core Collection database that was selected as main indicator by the government. Actually there are only two key performance indicators in state assignments for basic research for scientific organizations which are a number of ongoing research projects and a number of publications in peer-reviewed scientific journals indexed in international (WoS and Scopus) and Russian (Russian science citation index) databases.

This circumstances led to impressive growth of research productivity of Russian organizations substantially according to the Goodhart's law[1]. This growth is accompanied by increase of average number of coauthors of publication and average number of affiliations of single author. These processes partly can be explained by

[1] In Mario Biagioli formulation: "All metrics of scientific evaluation are bound to be abused" (Biagioli, 2016)

the fact that single publication written in collaboration counts as a unit in each of affiliated organizations and even in each of affiliations of a single author. Universities, especially participants of 5/100 project struggle to achieve their goals and often have stimulation payments for publications that results in a) increasing number of authors published in indexed in WoS / Scopus journals; b) intensification of domestic and international collaborations; c) synchronous (more than one affiliation) and asynchronous (change of affiliations) migrations of authors.

This processes can be studied by analysis of pure bibliometric data (Moed & Halevi, 2014). Authors conducted a research of strategies to improve publication activities of the universities participating in 5/100 project (Guskov, Kosyakov, & Selivanova, 2017). Data analyzed shows that publication number growth has mainly extensive character and is linked with increase in number of contributing authors (fig. 2). Average productivity slightly increase during 2010 -2016 years from 0.8 to nearly 1 publication per author.

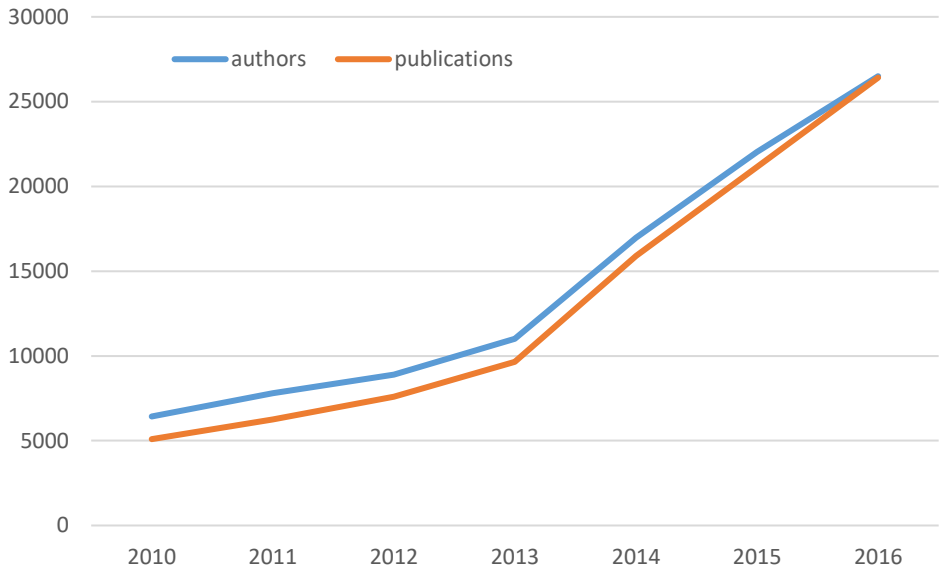

Fig. 2. Number of contributing authors and number of publications affiliated with universities of 5/100 project in 2010-2016 years according to Scopus data.

By analyzing of an affiliation history of authors from bibliometric data we can separate them into several categories: a) HEI is unique affiliation; b) HEI is the main affiliation; c) author constantly shows two or more affiliations; d) author shows HEI as an affiliation only in part of his publications (temporary affiliation). Fig. 3 shows the dynamics of each of this categories of authors affiliated with universities of 5/100 project in 2010-2016 years. Despite that the major and fast growing category is authors with unique affiliations we can see that the number of authors with different types of part-time work also increases significantly. Part of these authors moved from academic institutions that formed the rich source of researchers and base of collaboration for the universities.

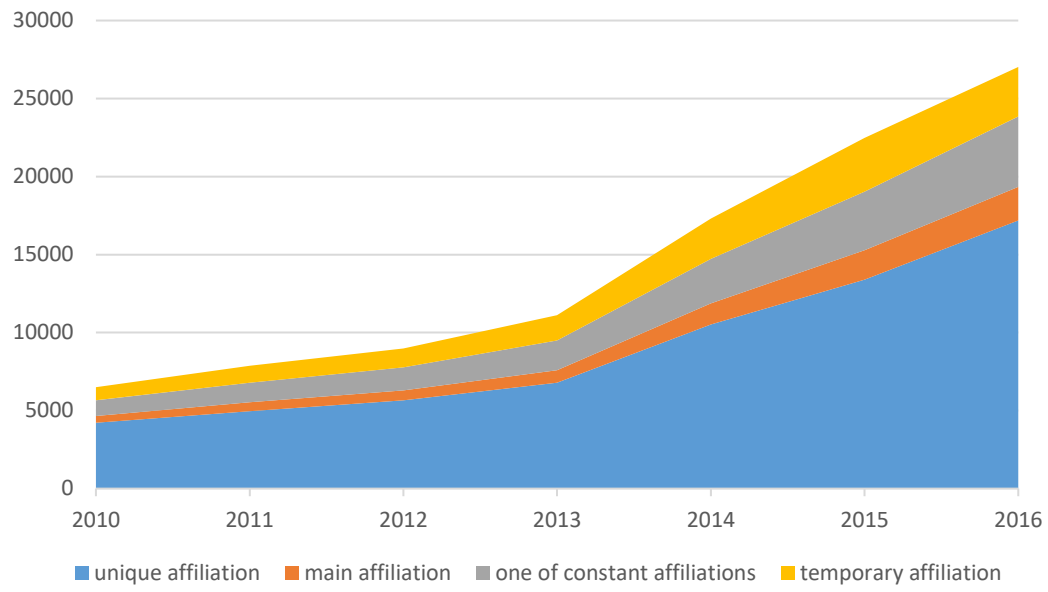

Fig. 3. Number of authors affiliated with universities of 5/100 project by categories in 2010-2016 years.

The next step in this research is to extend the dataset to all Russian publications and wider time boundaries to study migration processes, collaborations and nature of publication number increase by bibliometric data analysis. This research is in progress and the aim of this presentation is to identify and justify methods of analysis and to check the usability of Scopus data for such kind of analysis for the selected time period 1991-2017.

References

Biagioli, M. (2016). Watch out for cheats in citation game. *Nature*, *535*(7611), 201–201. https://doi.org/10.1038/535201a

Guskov, A., Kosyakov, D., & Selivanova, I. (2017). Strategies to improve publication activities of the universities participating in Project 5-100. *Scientific and Technical Libraries*, (12), 5–18.

Moed, H. F., & Halevi, G. (2014). A bibliometric approach to tracking international scientific migration. *Scientometrics*, *101*(3), 1987–2001. https://doi.org/10.1007/s11192-014-1307-6