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**Editors**

Wolfgang Glänzel, Sarah Heeffer, Pei-Shan Chi, Ronald Rousseau

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# Publish more or publish differently? New aspects of relationship between scientific mobility and performance of young researchers

Maxim Kotsemir<sup>1</sup>, Ekaterina Dyachenko<sup>2</sup> and Alena Nefedova<sup>3</sup>

<sup>1</sup> [mkotsemir@hse.ru](mailto:mkotsemir@hse.ru)

National Research University Higher School of Economics, Institute for Statistical Studies and Economics of Knowledge, Myasnitckaya 11, 443, Moscow (Russia). Corresponding author.

<sup>2</sup> [dyachenko-el@ranepa.ru](mailto:dyachenko-el@ranepa.ru)

The Russian Presidential Academy of National Economy and Public Administration (RANEPa), Prospect Vernadskogo 84, bldg. 9, 1204, Moscow (Russia)

<sup>3</sup> [anefedova@hse.ru](mailto:anefedova@hse.ru)

National Research University Higher School of Economics, Institute for Statistical Studies and Economics of Knowledge, Myasnitckaya 11, 443, Moscow (Russia)

## Abstract

The paper presents the preliminary results of a research project on the international mobility of young Russian researchers. This study is focused on the impact of education or work experience abroad on their future scientific careers, particularly their publication activity. The case study of the one large Russian university was examined: a unique for Russia database combining both biographical data (information from CV published openly) and publication activity indicators (data from Scopus) of employees of this university was collected. A positive relationship between the international mobility and scientific productivity of scientists was revealed. Those involved in international mobility not only publish more scientific articles on average but their papers are published in journals of higher level and are cited more often. We also found some differences in the choice of topics and collaboration behavior between mobile and non-mobile scientists.

## Introduction

Academic mobility is one of the key issues in the S&T policy for the last four decades in developed countries. For nations, mobile researchers are seen as a good source for enhancing their national innovation system. For research organizations, scientists with experience working abroad can be a valuable source for international collaboration. According to the results of previous studies, the experience of studying or working abroad increases involvement in the process of exchange of knowledge and technologies both with other countries and within their own country (De Filippo et al., 2009; Edler et al., 2011; Scellato et al., 2012, 2017). Moreover, the experience of mobility can significantly impact the cognitive career of researcher, bringing new perspectives or new theoretical or empirical approaches; as well as community career, by gaining new links with peers in the scientific community (Gläser & Laudel, 2015), or even impact on the change of research practice (Gläser et al., 2014). However, the effects of mobility can vary on different career stages of researchers and mobility duration (Cañibano et al., 2020) or even scientific discipline (Laudel & Bielick, 2019).

There is a well-known assumption that mobile researchers show higher publication activity. However, the empirical evidence is contradictory so far. Most studies have shown that scientists with international experience have higher research performance (Gureyev et al., 2020; Netz, Hampel & Aman, 2020). Still, there is evidence that mobile researchers failed to demonstrate higher research productivity than their local counterparts (Horta et al., 2019; Shin et al. 2014). There is a possible explanation that this difference comes from national research systems where mobile researchers come back. Within the last 15 years, many studies devoted to returnee's career tracks and their publication activity (those specialists who left the country and then returned). A study based on the example of scientists from Argentina showed that international work experience does not affect the total number of publications, but it does affect the share of

publications in high-impact journals (Jonkers & Cruz-Castro, 2013). Similar results were in a study of Chinese researchers (Jonkers & Tijssen, 2008). In addition, an analysis of the career growth of 370 professors in Japan showed that work experience abroad was statistically associated with faster subsequent career advancement, even though there was no effect on publication activity (Lawson & Shibayama, 2015). A study devoted to Chinese mobile researchers showed, returnees are encountering significant barriers in publishing their work in international journals after their change in affiliation from an overseas to a Chinese university (Gao & Liu, 2020). Moreover, they are struggling to change their research focus when they returned to China because the previous one fails to fit the domestic research agenda (Ibid.).

To the best of our knowledge, Russian scientists are not studied thoroughly in this way. The 'brain drain' was the dominant framework during the 1990s, when scientists were leaving the country en masse. For a long time, the mobility of scientists was analyzed only from that perspective. However, in the last decade, the agenda has begun to change. In this study, the case of one large Russian university was examined. The study is focused on the impact of education or work experience abroad on the scientific career of young researchers, particularly on their publication activity.

Following the goal of our study, we compiled the unique for Russia database with the combination of biographical data got from their CVs and bibliometric information derived from the Scopus database. The goal was to overcome the significant incompleteness of the data extracted from bibliography descriptions of publications alone. This approach is not the most common in studies of mobility and research performance, since the data sets required are not easily available. Implementation of such an approach in Russia is even more limited due to specificities of public availability of bibliographical data of Russian scientists. Most Russian universities and research organizations post very brief information about their employees. It is also unusual practice for Russian scientists to publish their CVs in open access.

One of our aims was to look beyond the performance indicators to understand what exactly changes in the research profile of a scientist after he or she moves to another country and then returns. The novelty of our study is as follows: when exploring the relationship between mobility and productivity of researchers we try to reveal the mechanisms of this relation. When it is discovered that mobile researchers publish more or get more citations than non-mobile, sometimes the authors make suggestions that mobility could affect this in several ways – mobile researchers could be more motivated to publish, they probably have a bigger circle of potential coauthors, they gain access to new knowledge and develop new skills in new places, they transfer knowledge themselves, they also can get access to resources and infrastructure. While the plausibility of these factors is confirmed in qualitative studies there is a lack of quantitative research on these factors (Netz, Hampel & Aman, 2020). Today we still do not know what factors are the main drivers of productivity and impact.

In this exploratory study, we analyze several aspects of relationship between mobility and the publication profiles of researchers. The first one is the overall researcher performance. The first hypothesis (H1) is that mobile researchers will have higher number of publications better citation indicators and publish in journals of higher quality. The second one is a collaboration. The second hypothesis (H2) is that mobile researchers tend to have more professional ties which affect productivity. It was tested in some studies with the data on co-authorship but usually was discussed in the context of international collaboration (for example Jonkers & Cruz-Castro, 2013; Jöns, 2007; Netz, Hampel & Aman, 2020). We were interested in whether mobile researchers collaborate more than non-mobile, considering not only international collaboration. The third factor we study here is research topics. The third hypothesis (H3) is that mobile scientists have more diverse research portfolios in terms of research topics. Mobility can cause a shift in the topics researchers are working on, which can affect performance. A researcher can start a new topic in a new place, probably more "fruitful", can drop old ones. To our knowledge,

this subject has not been investigated in quantitative studies scientific mobility. In general, mobile researchers not only publish more – they make research and publish differently, and bibliometric analysis can be used to trace some of this difference.

## Methodology

For our study, we chose the case of the National Research University Higher School of Economics (HSE University), a large university situated in Moscow with branches in three other cities (Saint-Petersburg, Nizhniy Novgorod, and Perm). Despite the title, HSE University has a very diverse range of departments and research units, from physical to philosophical<sup>1</sup>. HSE University has its own internal programs to support international mobility, is actively working to integrate researchers and teachers into the international academic community, and is recruiting specialists from leading foreign universities and research organizations.

HSE University is among Russian leaders in terms of completeness and availability of data on employees located in the public domain<sup>2</sup>. Each HSE University employee has a personal page on university web-portal with data on education, professional experience, publications etc. including the info on his/her professional/academic/studying mobility. Many HSE employees post their CVs on personal pages. We've collected a database of young mobile and non-mobile researchers affiliated with HSE University where bibliometric data (information about Scopus-indexed publications) were combined with the biographical information of researchers (experience of international mobility) gathered from their personal pages at HSE University web-portal. Among all HSE employees, we've selected those who held a research position as main position marked on the employee's personal page. Further among all researchers we've selected HSE those who as of March 2020, were 39 years old or younger, and who explicitly marked on his/her personal page (or in CV) at least one episode of scientific or educational mobility lasting more than three months. Processing of personal pages and CVs of HSE employees was done in an automatic mode with further manual check and correction of controversial cases. As a result, we have selected the initial sample of 193 young mobile researchers working at HSE University – those who were under 40 year (as of March 2020), held a research position and had at least one episode of international mobility lasting 3 months or more.

To form the group of non-mobile researchers, we've used matched pairs method<sup>3</sup>. The aim was to create two groups for comparison, where members are as close as possible in several significant parameters. For each mobile researcher, a non-mobile "pair" was selected manually from the pool of HSE researchers without mobility experience – a researcher working in the same or close by profile department, of about the same age (the difference in the year of receiving the first diploma was no more than two years). In addition, control was carried out for the region of the first higher education – for mobile researchers who received it in Moscow or St. Petersburg, non-mobile pair with the same educational background were selected. The selection resulted in 119 pairs of mobile and non-mobile researchers.

To analyze whether the length of the mobility episodes makes a difference to research performance, we divided all mobile researchers to two sub-samples – researchers with episodes

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<sup>1</sup> See more about HSE University at: <https://www.hse.ru/en/info/>

<sup>2</sup> Implementation of some measures on openness of data on academic mobility of employees and their publications is observed in the universities participating in the so-called 5-100 project (Russian Academic Excellence Project 5-100. Read more at: <https://www.Stop100.ru/en/about/more-about/> ), but none of them had enough data for calculations in the framework of our approach and research design.

<sup>3</sup> This method is widely used in medical research as part of the design of an experiment to study the effectiveness of a particular treatment. In social research it is more often used in non-experimental design. The approach has been applied in studies of science, in particular in the analysis of the relationship between mobility and career achievements of scientists [Bäker 2015; Lawson, Shibayama 2015].

of long-term mobility and researchers with episodes of short-term mobility. As researchers with long-term mobility (long-mobile researchers) we determined those who on their personal pages or in CV marked at least one episode of abroad mobility with the length of one year and more. As a result, we have selected 78 long-mobile researchers (and 78 their non-mobile matched pairs) and 40 short-mobile researchers (and 40 their non-mobile matched pairs). For one researcher we could not detect the length of mobility.

Publication activity data for mobile researchers and their non-mobile matched pairs was taken from the largest international scientific citation database Scopus. If available, Scopus Author Identifiers (IDs) were derived from the personal pages of the studied sample of researchers; otherwise, we have run the search of Scopus author IDs. Further all the Scopus author IDs collected were checked on their correctness and completeness. Due to small size of our sample, author name disambiguation was performed in manual mode. Duplicate author profiles (cases when there are several Scopus author IDs for one author) were merged<sup>4</sup>.

Further using the functionality of the Scopus SciVal analytical toolbox, we have created the synchronized corpus of Scopus author IDs for mobile and non-mobile researchers. In this database each row represents a specific mobile or non-mobile researcher from our sample with time series of some key bibliometric indicators like number of publications, number of citations received etc. for this specific researcher.

The preliminary analysis shows that first publications of mobile researchers appeared in 2004. We've further divided the 2004-2020 period onto three five-year sub-periods: 2005-2009, 2010-2014 and 2015-2019. We focus our analysis on 2015-2019 sub-period since during this period mobile and non-mobile researchers have published the highest number of Scopus-indexed publications.

We've integrated further all the publications of mobile and non-mobile researchers into two special corpuses of publications. In each corpus each row represents a single Scopus-indexed publication of mobile or non-mobile researcher with various data on this publication like a year of issue, a number of citation received, name of source issued, CiteScore value of this source etc. Aggregation of information from two corpuses of publications allowed us to calculate some basic bibliometric indicators (like number of publications, number of citations received, share of publication in international collaboration etc.) for two groups of researchers. All the calculations were performed for the Scopus data collected in October 2020.

To analyze the relationship between international mobility and the content of publications of mobile and non-mobile researchers we used data on so-called Scopus Topics Prominence in Science that is available in the SciVal analytical toolbox<sup>5</sup>. Among the various number of bibliometric indicators available in SciVal for each publication of mobile and non-mobile researchers we select for content analysis indicators like Topic Cluster name, Topic Cluster number, Topic name, Topic number, Topic Cluster Prominence Percentile, Topic Prominence. With these data, we can see for each researcher in what topics and clusters he or she has

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<sup>4</sup> Merging of author profiles was done in the following cases: different versions of the transliteration of the surname and / or first name of a specific author; combining several author profiles with the same spelling of the surname, but different spelling options for the name and patronymic; combining profiles of the same author with different affiliations; unification of maiden surname and husband's surname for women. In some cases, instead of unification of duplicate profiles, we did the clearing of author profile (exclusion of publications that obviously do not belong to a specific author). Merging of Scopus Au-IDs in different formats and/or clearing of author profiles was done for about 40 cases of mobile and non-mobile researchers.

<sup>5</sup> Assigning of topic prominence in science to Scopus-indexed publications works as follows. To each specific publication indexed in Scopus special clustering algorithm automatically assigns one topic and one topic cluster (broader topic). Assigning of this or that topic to a specific publication is defined in the result of clustering based on direct citation analysis of almost all publications indexed in Scopus. As a result 96000+ topics and 1500+ topic clusters is defined for almost all Scopus-index publications. See more about topic prominence in Science at: <https://www.elsevier.com/solutions/scival/releases/topic-prominence-in-science>

published papers. The question we are interested in is there a difference in the size of "repertoire" of a researcher (the number of topics and the number of clusters) between mobile and non-mobile groups. Analysis of Scopus topics was done for the whole period: 2004-2020.

## Results

### *Mobility and general research performance*

Key results of bibliometric analysis of publication activity of short- and long-term mobile young researchers and their non-mobile matched pairs from HSE University in Scopus in 2015-2019 were summarized in Table 1.

**Table 1. Key indicator of publication activity for the studied groups of mobile and non-mobile researchers from HSE University in Scopus for 2015-2019**

Group of researchers and Type of mobility length → Indicator name ↓	Publications of mobile researchers			Publications of non-mobile matched pairs		
	All types	Long-term	Short-term	All types	Long-term	Short-term
Number of publications	724	475	250	595	398	185
Number of researchers who had at least one publication in Scopus	113/119	73/78	38/40	112/119	74/78	38/40
Average number of publications per one researcher of a group	6.08	6.09	6.25	5.00	5.10	4.63
Number of citations received	3 393	2 430	945	1 525	1 097	383
Average number of citations per one publications	4.67	5.12	3.78	2.56	2.76	2.07
Average value of field-weighted citation impact of all publications, points	0.96	1.03	0.83	0.70	0.72	0.62
Number of publications in Top 1 Citation Percentile (top-1% of the most cited publications)	3	3	0	0	0	0
Average value of CiteScore <sup>1</sup> of sources <sup>2</sup> where publications are issued, points	2.46	2.70	2.07	1.66	1.81	1.28
Share of publications in Q1 sources <sup>1</sup> by CiteScore (to publications in all sources with CiteScore calculated), %	35.3	37.5	32.3	25.2	26.4	20.8
Number of publications in top-1% sources <sup>1</sup> by CiteScore value	13	11	2	2	1	1
Share of publications in international collaboration, % <sup>2</sup>	42.0	46.5	34.4	19.8	21.3	17.3

Notes. 1. According to methodology of Scopus "Calculating the CiteScore is based on the number of citations to documents (articles, reviews, conference papers, book chapters, and data papers) by a journal over four years, divided by the number of the same document types indexed in Scopus and published in those same four years" – see more at: [https://service.elsevier.com/app/answers/detail/a\\_id/14880/supporthub/scopus/](https://service.elsevier.com/app/answers/detail/a_id/14880/supporthub/scopus/). 2. Vast majority of sources for which CiteScore is calculated are journals, indexed in Scopus, and some conference proceedings, book series and books. 3. As publications in international collaboration we treat publications where the sole author or at least one co-author is affiliated with at least two different countries.

Source: authors' calculations based on Scopus SciVal data collected at October 2020. All types of documents indexed in Scopus are taken into account

Table 1 provides key bibliometric indicators for the corpuses of Scopus-indexed publications for the selected groups of researchers. As we can see from Table 1 almost all mobile researchers as well as their non-mobile matched pairs had at least one Scopus-indexed publication for 2015-2019. Our analysis shows that mobile researchers have in general better research performance indicators of Scopus-indexed publications than their non-mobile matched pairs. Mobile researchers outperform their non-mobile matched pairs by the average number of publications per one researcher.

Mobile researchers are especially stronger than their non-mobile matched pairs in terms of citation indicators, journal quality indicators and involvement in international research

collaboration. Mobile researchers have much higher average number of citations per one publication, higher field-weighted citation impact of their publications, and publish their papers in journals with much higher average CiteScore metrics. Mobile researchers also have higher share of publications in Q1 journals and much higher number of publications in top-1% journals by CiteScore value. In addition, mobile researchers authored all publications in “top-1% most cited” category from the studied corpuses of publications. All these prove the first hypothesis (H1) that mobile researchers have better overall researcher performance.

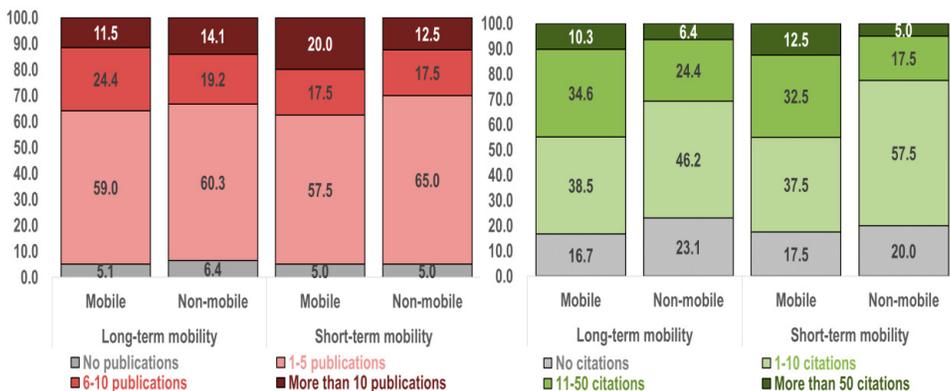
Higher average CiteScore value of journals where mobile researchers publish their work can be caused by a variety of factors. During their work or studying abroad mobile scientists can acquire new competencies that let them make better studies. Among these new competencies one can learn how to select research topics and questions to make the study eligible for publication in high-level international journal. Mobile researchers can also find new collaborators and join new projects producing high quality work. Apart from that mobile researchers could have some first-hand experience with editors or regular authors of high quality journals while working abroad. These social ties can also boost their chances to be published. Some of these possible explanations find evidence in bibliometric data we have.

Mobile researchers are much more actively involved in international research collaboration. It is not surprising that mobile researchers especially strongly outperform their non-mobile pairs by the level of integration into international research collaboration. After returning to Russia, mobile researchers bring their contacts with foreign co-authors, accumulated abroad, to their Russian places of work. The results of our analysis prove the second hypothesis (H2) about much higher collaboration of mobile researchers with foreign colleagues.

We found that that researchers who have in their career longer-than-one-year episode(-s) of international mobility in many aspects have better research performance indicators of their Scopus-indexed publications in comparison to researchers with short-term episodes of international mobility. Short-term mobile have slightly higher average number of publications per one researcher, but they lose in terms of involvement in international collaboration, average citation level and the average value of CiteScore indicator of journals where the publications were issued. We also see that vast majority of publications in top-1% sources by CiteScore value and all publications in Top 1 Citation Percentile are published by long-term mobile researchers. The conclusions that can be derived from the comparison of long-term mobile researchers with short-term mobile are rather limited though. These groups can differ in many aspects significant for publication performance. To analyze how the length of mobility is related to research performance we compared each group of mobile researcher to the appropriate control group of non-mobile researchers (matched pairs).

#### *Differences between mobile and non-mobile researchers*

Further we go to the level of individual authors to compare key indicators of publication activity of mobile researchers vs. their non-mobile pairs. Figure 1 shows the distribution of short- and long-term mobile researchers and their non-mobile matched pairs by the number of publications and number of citations received in Scopus for 2015-2019.



Source: authors' calculations based on Scopus SciVal data collected at October 2020. All types of documents indexed in Scopus are taken into account.

**Figure 1. Distribution of researchers with long- and short-term mobility and their non-mobile matched pairs by number of publications and number of citation received in Scopus in 2015-2019**

As we can see from this graph, the difference between mobile and non-mobile researchers by the level of publications activity is not dramatic. On the other hand, the differences by number of publications for mobile researchers vs. non-mobile pairs are stronger for the group with short-term mobility. Mobile researchers are in general slightly more productive than non-mobile researchers are. Among all groups studied short-term mobile researchers show the highest share of authors with 10+ publications in Scopus for 2015-2019. The differences in the number of citations received between mobile and non-mobile researchers are much stronger. Among mobile researchers, we can see a much less share of non-cited authors and much more share of authors who received 10 and more citations in comparison to non-mobile researchers. Meanwhile, there is no dramatic difference between short-term and long-term mobile researchers in distributions by number of citations received. Non-mobiles pairs of short-term mobile researchers show the “worst” distribution by number of citations received.

**Table 2. Results of paired two-sample Student's t-test for mean number of publications and citations received for 2015-2019 in Scopus for mobile vs. non-mobile researchers**

Type of distribution → Type of mobility length → Indicator name ↓	Mean number of publications			Mean number of citations received		
	All types	Long-term	Short-term	All types	Long-term	Short-term
N. of pairs	119	78	40	119	78	40
Mean value for mobile group	6.24	6.18	6.45	29.55	32.62	24.30
Mean value for non-mobile group	5.18	5.24	4.95	13.49	14.50	10.60
t-statistics	1.287	0.838	1.344	2.103	1.662	1.705
P-value (T ≤ t) one-sided	0.100	0.202	0.093	0.019	0.050	0.048
t critical one-sided	1.658	1.665	1.685	1.658	1.665	1.685

Notes: 1. Significance level (alpha-value) for all test is set as 5%. 2. Null hypothesis is that there are no differences in mean values of number of publications and citations received between mobile and non-mobile researchers. 3. Mean values of number of publications in Table 2 differs from Average number of publications per one researcher differs since some publications are coauthored by several from the studied samples.

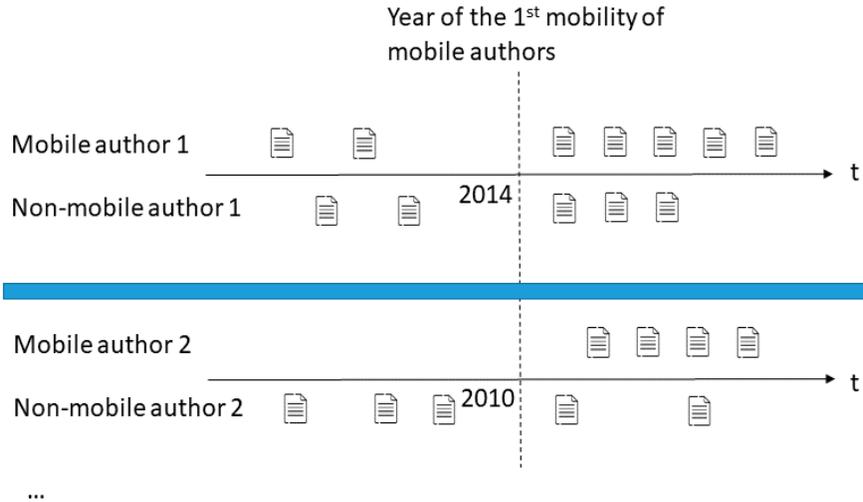
Table 2 shows the results of the paired two-sample Student's t-test that was used to test the hypothesis about the difference of mean number of publications and citations received for 2015-2019 for two dependent samples of mobile vs. non-mobile researchers. The results of this test support our observations from Figure 1: differences between mobile and non-mobile researchers by number of citations received are stronger than differences by number of

publications. The difference in number of publications between mobile and non-mobile researchers proves statistically significant for short-term mobile group and all mobile, but not for the group of long-term mobile researchers. In case of citations received the difference between mobile and non-mobile is significant for all three groups (all, long-term, short-term).

*Publication activity before and after international*

The observed difference in bibliometric indicators for the two groups of researchers, even when proved statistically significant, does not automatically mean that it is an effect of international mobility. Despite the matched pairs selection procedure, the difference may be due to other factors that are not directly observable. For example, some personality traits could be the factor of both gaining foreign experience and publication activity.

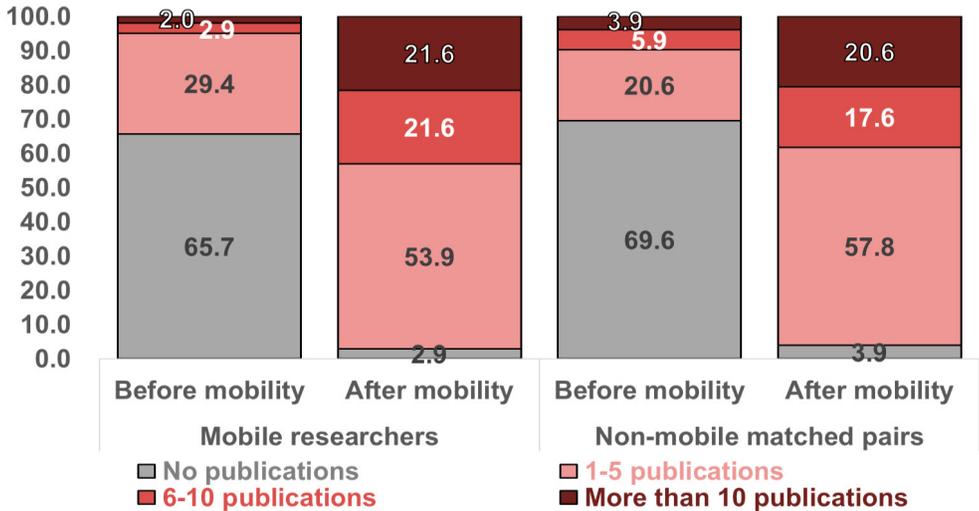
Availability of data on the publications of researchers, and on the periods of their study and work abroad allows us to conduct additional analysis to partially exclude unaccounted factors. We compared the research performance of mobile and non-mobile researchers in periods before it could be affected by mobility. To do this analysis, for each mobile researcher we take into account only the papers published before the year of the first episode of mobility. For the non-mobile pair of this specific mobile researcher, we also take into account publications issued before the same year (Figure 2). As a result we have detected 102 mobile researchers (and 102 their non-mobile matched pairs) for whom we can detect the year of the first episode of international mobility.



**Figure 2. Publication activity of mobile researchers and their non-mobile matched pairs before and after the “treatment” (the first mobility).**

Distribution of researchers according to number of papers published during two periods is shown on the Figure 3. On average, mobile researchers published 0.99 papers in Scopus before the first episode of international mobility, while the group of non-mobile researchers had published more intensively during the same periods – a mean is 1.44 publications. The median is 0 papers in both groups, and the difference of the means is not significant (p-value for a t-test is 0.268). As for publications in high-level journals, mobile researchers showed somewhat higher productivity at the start of a career – a mean is 0.22 papers in Q1 journals vs. 0.13 for non-mobile authors, but this difference is also not statistically significant. Thus, the advantage

in publication activity of the group of mobile researchers was not noticeable at the start of their careers and appeared definitely after their work or studying abroad.



**Figure 3. Distribution of mobile researchers and their non-mobile matched pairs according to number of papers in Scopus published before and after the year on the 1st mobility (and the same years for matched pairs).**

*Publication portfolios of mobile and non-mobile researchers*

One of our goals was to investigate the difference between publication portfolios of mobile and non-mobile researchers beyond the traditional productivity and impact indicators. Particularly we are interested in research topics. One topic and one topic cluster are assigned to each publication in Scopus. Topic cluster is a group of closely related topics and can be regarded as a broad topic. Figure 4 shows the distribution of researchers in mobile and non-mobile groups by the number of topics and number of topic clusters in their papers.

We see that the distributions are not quite different. Mobile researchers tend to have more topics in their portfolio, than non-mobile. This is true for both long-term mobile researchers (mean number of topics is 5.3 vs 4.8 for non-mobile, medians are 4 vs 3) and short-term mobile ((means are 5.2 vs 3.8, medians are 4 vs 4)). The difference is statistically significant only for short-term mobile researchers (t-test, p-value < 0.09). When topic clusters (broad topics) are considered, there is no much difference in portfolio size of mobile and non-mobile researchers, it is not statistically significant at least. We can conclude that the hypothesis H3 is somewhat confirmed – mobile scientists make research on more diverse subjects than non-mobile – although the difference is not big, and is significant only in case of short-term mobility.

The difference observed does not mean that mobile researchers are actively engaged in research on more topics than non-mobile. On the contrary, the chances are that mobility actually helps researchers to focus, to find an "oilfield" and drill it. To investigate this in detail one need to look how the portfolio changes what a researcher moves to another country. We compared "active portfolios" of mobile and non-mobile researchers – the research topics in relatively recent publications (published in 2015-2019). Mobile group again turned out to have more diverse portfolios (mean number of topics 4.2 vs 3.4 for non-mobile, medians are 3 vs 3; t-test for means shows the difference is marginally significant with p-value =0.108).

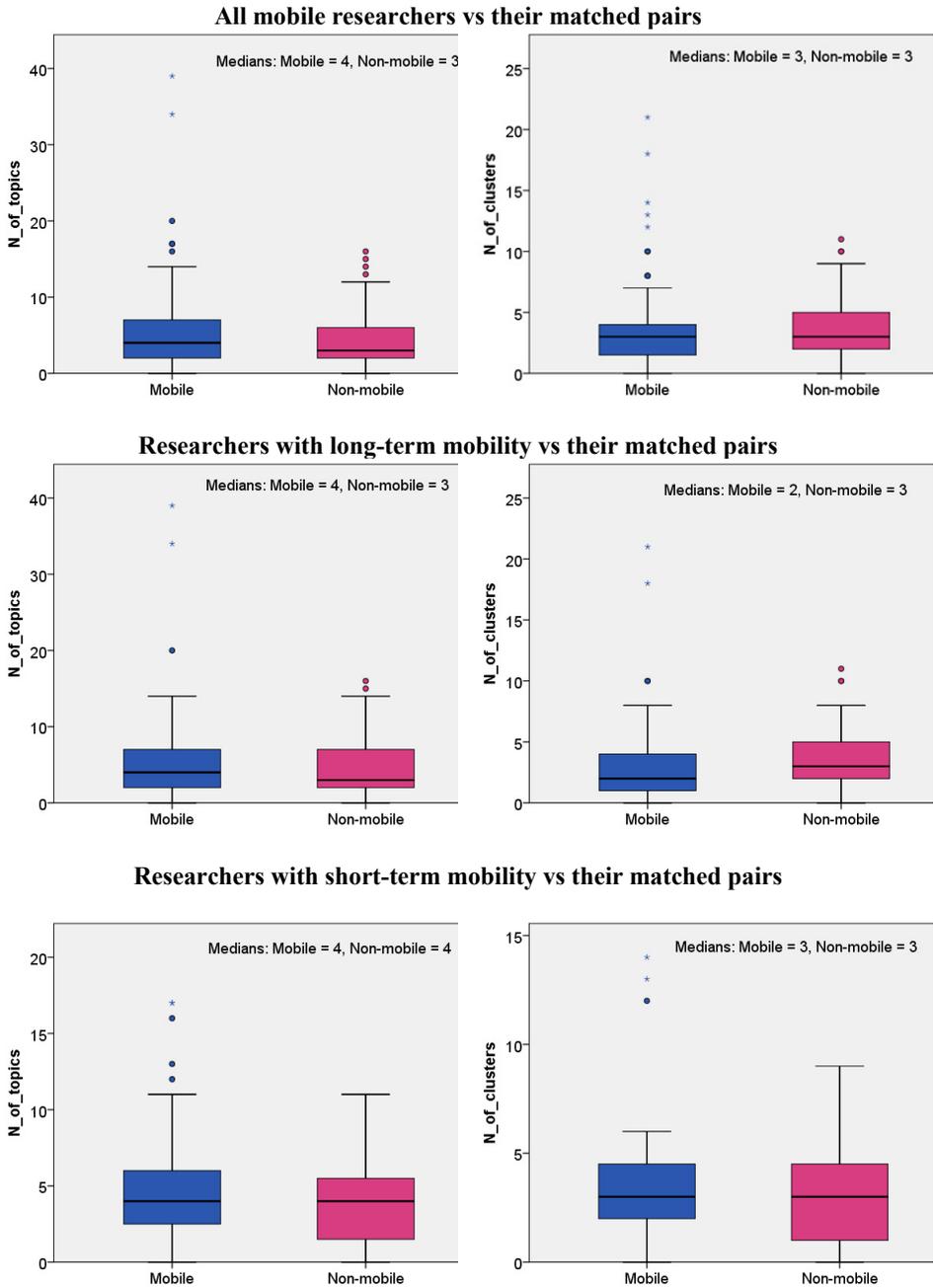


Figure 4. Distribution of number of topics (left) and topic clusters (right) in papers published by mobile researchers and their matched pairs.

## Discussion

In terms of basic indicators of activity, our results can be summarized as follows. Mobile researchers from HSE University have much better indicators of research performance in Scopus than researchers who have never worked or studied outside of Russia. Our findings support the similar others (Franzoni et al., 2015; Gibson & McKenzie, 2014; Gureyev et al., 2020; Netz, Hampel & Aman, 2020) and contradict to some others (Halevi et al. 2016; Cañibano et al. 2008). Moreover, continuing the discussion, opened by (Cañibano et al. 2020), we claimed that the period of mobility matters. Researchers with long episodes of international research or education mobility show even better research performance in Scopus.

In this paper, we open a direction in the analysis of publications of mobile researchers that seems promising to us – research topics analysis. We saw that researchers with mobility experience tend to make research in more topics than non-mobile researchers. The question is: “Whether it was the mobility that pushed the scientists to diversify their research interests?”. One way to answer this question, which we hope to develop in future studies, is to analyze how the "repertoire" of researchers evolves over time – what are the most common patterns in research topics change associated with moving to another country. The evolution of the topic's portfolio can be related to a performance advantage, which is often registered for mobile researchers. It also contributes to the discussion about the pattern of change in research practices (Gläser et al. 2014).

We see the possible ways of development of our researcher as follows. One way – to analyze how the career stage when first episode of international mobility occurred matters for the further pattern of researcher performance, following the discussion by (Cañibano et al., 2020). The other way – is the analysis of disciplinary profiles of researchers (i.e. whether the difference between mobile researchers vs. non-mobile researchers is stronger in natural sciences vs. social sciences, following the work by (Laudel & Bielick, 2019).

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