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HIGHER SCHOOL OF ECONOMICS

Ekaterina Dyachenko

INTERNATIONALIZATION OF ACADEMIC JOURNALS: IS THERE STILL A GAP BETWEEN SOCIAL AND NATURAL SCIENCES?

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Ekaterina L. Dyachenko[1]

INTERNATIONALIZATION OF ACADEMIC JOURNALS: IS THERE STILL A GAP BETWEEN SOCIAL AND NATURAL SCIENCES?[2]

In this study we compare internationalization of academic journals in six fields of science. Internationalization was investigated through journals' concentration on publishing papers from particular countries, relationship between the geographical distributions of editors and authors, and relationship between language of publication and the geographical distribution of papers. Having analyzed more than 1000 journals we can state that social sciences literature in the fields considered is still nationally and linguistically fragmented more than natural sciences literature, but in some cases the gap is not so big. One of the consequences concerning research output assessment is that usefulness of international databases having national disparity in coverage is still limited in social sciences.

JEL Classification: Z.
Keywords: scientometrics, Web of Science, sociology, economics, political science.

[1] National Research University Higher School of Economics. HSE Branch in Perm, Library. Electronic resources librarian; E-mail: edyachenko@hse.ru

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Introduction

While the general idea of using publication and citation counts to measure scientific productivity and impact is widely accepted in scientific community, there is a debate lasting for decades on how to use them properly to assess the output in social sciences and humanities. International citation databases like Web of Science and Scopus and indicators derived from them, like Impact Factor and h-index, quite fit the needs of those who want scientometric instruments to be simple, transparent and universal. But the primary requirement for measurement instruments is validity. Databases and indicators most widely used in research evaluation were historically developed for and even now mainly oriented to natural sciences and engineering. With social sciences being different from natural sciences in so many ways, doubts on applicability of uniform evaluation instruments will probably not be exhausted any time soon.

One of the major differences between social sciences and humanities (SSH) and natural sciences and engineering (NSE), important in the context of output assessment, is that SSH are more locally oriented, therefore social sciences community is more fragmented than natural sciences community. Generally, social scientists have more incentives to publish in national languages and in national journals, to participate in local conferences and so on. Meanwhile all the prominent citation databases are biased towards English-language literature. While these databases keep expanding their coverage of literature in other languages, there is still a considerable disparity in representation, which affects the indicators of scholars from non-English-speaking countries [Archambault et al., 2006; de Moya-Anegon et al., 2007; Hicks & Wang, 2011].

Another difference between scientific fields concerns the role of various publication types in knowledge dissemination. In SSH fields books generally present a larger share of output than in NSE fields and journal articles present a smaller share than in NSE fields [Kyvik, 2003; Nederhof, 2006]. Since major scientometric databases cover mostly academic journals and conference proceedings the indicators obtained from them are disadvantageous for scientists publishing largely in books.

Besides a larger role of locally-oriented literature and non-journal literature in SSH compared to NSE, there are other aspects which should be taken into account when assessing research output. In social sciences and humanities publications are more often written by a single author or in small collaborations, which probably affects productivity rate [Kyvik, 2003; Nederhof, 2006]. NSE have a higher degree of consensus compared to SSH on what are the core publications in the field [Hicks, 1999]. Also there are differences in citation practices, concerning the type and age of cited documents [Larivière et al., 2006]. For some of these points

the adjustment of scientometric instruments is relatively easy, but not for all. In extensive reviews written by A. J. Nederhof, D. Hicks, M. Huang and Y. Chang one can observe a plethora of studies concerning the differences between knowledge dissemination patterns in SSH and NSE fields [Hicks, 1999; Nederhof, 2006; Huang & Chang, 2008]. The strengths and weaknesses of various scientometric databases and indicators are constantly debated in natural sciences as well. Obviously, NSE do not present a homogeneous system. Publication and citation patterns may differ considerably between disciplines and the establishment of benchmarking practices both well-grounded and easy-to-use is far from being completed. What makes SSH fields stand apart in this debate is that there is still no database widely agreed upon as an adequate source of bibliographic data for research evaluation.

Today there are three multidisciplinary international citation databases widely used for research evaluation – Web of Science, Scopus and Google Scholar. Web of Science, the product of Thomson Reuters, consists of several citation indexes and covers journals, books and conference proceedings. It is most valued for its journal coverage with more than 8500 NSE journals and more than 3000 SSH journals indexed. Scopus, developed by Reed Elsevier, also covers journals, proceedings and books. As of November 2012 Scopus had about 19500 journals indexed with about 22% of them being SSH. Google Scholar is a web search engine indexing scholarly literature and enhanced with citation indexing. It covers different types of publications and its coverage is known to be extensive, but the exact details are not provided by the owner. For a number of reasons, with coverage ambiguity being not the least, Google Scholar, although highly appreciated in scientific community, is less widely used for scientometric purposes compared to Web of Science and Scopus. In addition to these international databases scholars and administrators evaluate SSH output using national/regional publication and citation databases, such as '*Russian Scientific Citation Index'* or '*Flemish Academic Bibliographic Database for the Social Sciences and Humanities'*, and journal lists developed for national evaluation initiatives, such as '*Australian Excellence in Research Journal List'*. But the evaluation based on these sources has a limited scope, particularly when it comes to evaluation of research impact or cross-national comparisons.

The usefulness of different databases for SSH research evaluation has been analyzed in a number of studies. D. Hicks and J. Wang pointed out several types of methodology used in these studies [Hicks & Wang, 2011]. Sometimes to compare the databases authors calculate the share of national or institutional bibliography covered by these databases [Norris & Oppenheim, 2007]. Another type of methodology is database overlap analysis [Norris & Oppenheim, 2007; Vieira & Gomes, 2009; Hicks & Wang, 2011]. The third approach is to compare the database to some comprehensive source of bibliography, such as Ulrich's database for the journal literature

[Archambault et al., 2006; de Moya-Anegon et al., 2007; Hicks & Wang, 2011]. When international citation databases, Web of Science, Scopus and Google Scholar, are analyzed from this perspective, in most cases the coverage of SSH literature is claimed to be wanting, with scarce coverage of books and national/linguistic disparity as the weak points.

This study deals with one of the aspects of SSH evaluation problem, namely with the national/linguistic disparity in literature coverage in international databases. The study does not focus on characteristics of specific database though. Rather we try to determine whether national/linguistic disparity is still important, in other words, whether SSH literature is still fragmented. The scientific landscape is changing constantly, and the changes have come at a great rate in the last two decades. So the question is: With globalization as one of the major trends of world development, with Internet making dramatic differences in scientific communication, with scholars being under substantial pressure to publish in English-language journals – what if SSH community and SSH literature are not so fragmented today as we used to think?

The goal of the study is to compare the levels of internationalization for several fields of science. For the comparison we chose three NSE fields – Applied Physics, Nanoscience, Biochemistry, and three SSH fields - Sociology, Economics and Political Science. To compare the levels of internationalization we analyzed the leading international journals in these fields. Having analyzed more than 1000 journals we can state that SSH literature in the fields considered is still nationally and linguistically fragmented more than that of NSE fields. Still in some cases the gap is not so big. For one of the NSE fields the publication patterns we observed were close to those of SSH.

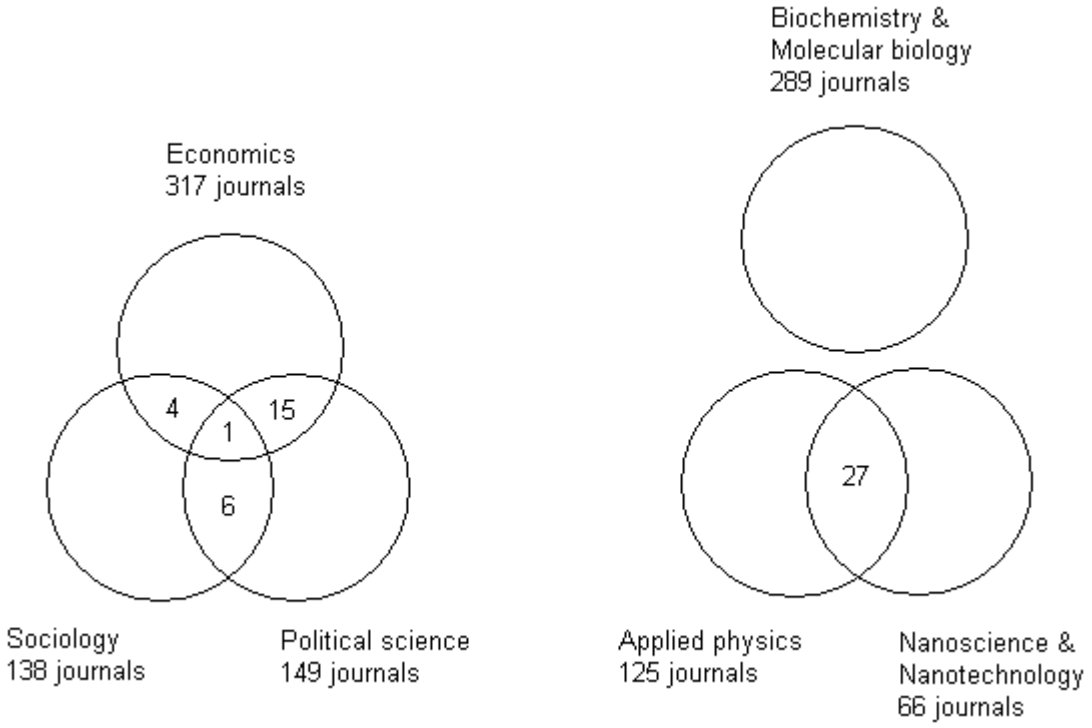
Methodology

While Web of Science (WoS) coverage is often claimed to be too narrow to benchmark SSH output, when it comes to separating high-quality journals from low-quality ones it is WoS-covered journals which present the area of consensus [Hicks & Wang, 2011]. Aiming to consider the leading international journals in the selected fields we included all publications from the respective subject categories of Journal Citation Reports (JCR) – “Sociology”, “Political science”, “Economics”, “Physics, applied”, “Nanoscience & Nanotechnology”, “Biochemistry & Molecular Biology” – in the analysis. Journal lists were extracted from the latest available

version of the database, JCR 2011. All these journals are indexed in Web of Science (WoS) and almost all have 2011 Impact Factor[3].

Totally, the set of journals included in the study consisted of 577 SSH and 453 NSE publications. The JCR journal lists for chosen fields overlap to some extent. Figure 1 presents the Venn diagrams of the overlaps. There are 26 SSH journals and 27 NSE journals belonging to more than one JCR subject category selected for study. For Economics and Biochemistry the total number of journals is slightly different from that in the JCR subject categories because we counted merged journals as a single entity while JCR does not. We excluded one Biochemistry journal from the analysis because in 2010 it transformed and left the subject category. Apart from considering the whole set of journals in each field we were interested in analyzing high-impact journals. From each of the six journal lists ranked by the Impact Factor we picked top 25 % journals to consider them high-impact[4].

Figure 1. Overlaps of journal sets selected for study.



We obtained the following data for each journal:

- journal language and whether the journal is translated or not,
- the number of papers published in 2010-2011,

[3] There are several publications that are present in JCR Science Edition 2011 but their Impact Factor cells are empty, because they have no papers published in 2009-2010 and indexed in WoS.

[4] The use of Impact Factor quartiles to classify journals by impact level is a common technique, but when the validity of classification is crucial, for example in national research evaluation systems, this approach is contested [e.g. Garcia et al., 2012]

- the most publishing country in the journal (i.e. country represented by the largest number of papers in the journal), the number of papers from this country[5],
- the number of papers written in foreign language,
- the country of origin of editor-in-chief ('editor' for short),
- the country represented by the largest number of members on the editorial board.

Table 1 shows the number of journals and papers by field. All types of documents published in the journals during 2010-2011 and indexed in WoS were included in the analysis. Papers were assigned to countries according to the addresses of authors' affiliations (full counting method was used). These data were obtained from WoS between October and December 2012. Papers containing no address information in WoS were omitted. The share of such documents varies from journal to journal, on the whole it comprises a negligible fraction of papers published in NSE journals, a considerable share in Political science, with Sociology and Economics lying between.

Table 1. The number of journal and papers included in study.

	Journals	**Papers (2010-2011), total**	**Papers (2010-2011) not assigned to any country (% of total)**
Sociology	138	15035	1457 (9.69%)
Political science	149	20366	4939 (24.25%)
Economics	317	39553	1700 (4.30%)
SSH, total	577	72125	7838 (10.87%)
Applied physics	125	92405	1185 (1.28%)
Nanoscience & Nanotechnology	66	45904	555 (1.21%)
Biochemistry & Molecular biology	289	127338	2798 (2.20%)
NSE, total	453	246261	4390 (1.78%)

The data on journal languages were taken from JCR and checked in WoS. We also searched journals websites to find whether a journal is translated (by the publisher) or not. Countries were associated with languages on the basis of The World Factbook[6]. The first and all 'official' languages were associated with the country.

We associated editors and editorial board members with countries according to their affiliations' addresses, which were obtained from journals websites. The data from journals websites were collected between January and March 2013. Not all the required data were available for all the journals. The details are provided in the further analysis.

[5] We also obtained data on the most publishing country for a 10-year time span, 2002-2011.
[6] https://www.cia.gov/library/publications/the-world-factbook/fields/2098.html

Results

When assessing the internationalization of some discipline through its academic journals one has a wide variety of options: to analyze geographic diversity of authors, or co-authorship patterns, or citation patterns, or geographic diversity of editors, or even the diversity of subscriptions. We chose to investigate the internationalization expressed in

a) concentration on publishing papers from particular countries,

b) relationship between the geographical distribution of editors and papers,

c) relationship between language of publication and the geographical distribution of papers.

First we will give a picture of the geographical distribution of journals included in the study. Table 2 presents the distribution of journals by language of publication. One can see that while the NSE sample consists almost entirely of English-language journals, in all the three SSH fields the proportion of non-English language journals is more discernible, albeit not large.

Table 2. Journal distribution by language of publication according to JCR. Three most represented languages in each field.

	N	1st	2nd	3rd	Multi-language	The rest
Sociology	138	English 81.9%	German, French, Spanish 2.2% each		5.8%	8 languages 5.8%
Political science	149	English 87.2%	Spanish 4%	German 3.4%	2%	3 languages 3.4%
Economics	317	English 88%	Spanish 2.8%	French 0.9%	5.4%	9 languages 2.8%
SSH, total	577	English 86.1%	Spanish 3.1%	German 1.6%	4.7%	14 languages 4.5%
Applied physics	125	English 96.8%			3.2%	
Nanoscience & Nanotechnology	66	English 100%				
Biochemistry & Molecular biology	289	English 94.1%*	Chinese, Danish, Serbian, Turkish 0.3% each		4.5%	
NSE, total	453	English 95.4%*	4 languages 0.2% each		3.8%	

Note: The N column presents the total number of journals in a field. Each journal in the set has a unique language attribution in JCR, with journals publishing papers in different languages coded as multi-language.

*JCR mistakenly attributes Dutch to 9 journals which have all their papers published in English. Here we count these journals as English-language ones.

In Table 3 one can see the journal distribution by country of editor. In all six fields about half of journals have editors affiliated with some institution in the USA, other countries are left far behind in this competition. Interestingly, in all the three SSH fields five most represented countries prove to be the same, and Germany is the only non-English speaking country breaking top-5, while in NSE fields we observe a wider diversity, and even the second-after-USA position is contested.

Table 3. Journal distribution by country of editor. Five most represented countries in each field.

	N	1st	2nd	3rd	4th	5th
Sociology	124	USA 44.4%	UK 23.4%	Germany 5.6%	Australia, Canada 4.8% each	
Political science	134	USA 50%	UK 27.6%	Germany 7.5%	Australia 6%	Canada 4.5%
Economics	281	USA 52.7%	UK 19.6%	Germany 9.3%	Canada 5.7%	Australia 5.0%
Applied physics	104	USA 42.3%	Germany 13.5%	UK 9.6%	France, Japan, Russia 6.7% each	
Nanoscience & Nanotechnology	59	USA 57.6%	Germany 10.2%	China, Japan, UK 8.5% each		
Biochemistry & Molecular biology	245	USA 50.2%	UK 18%	Germany 9.8%	Canada 6.5%	France 6.1%

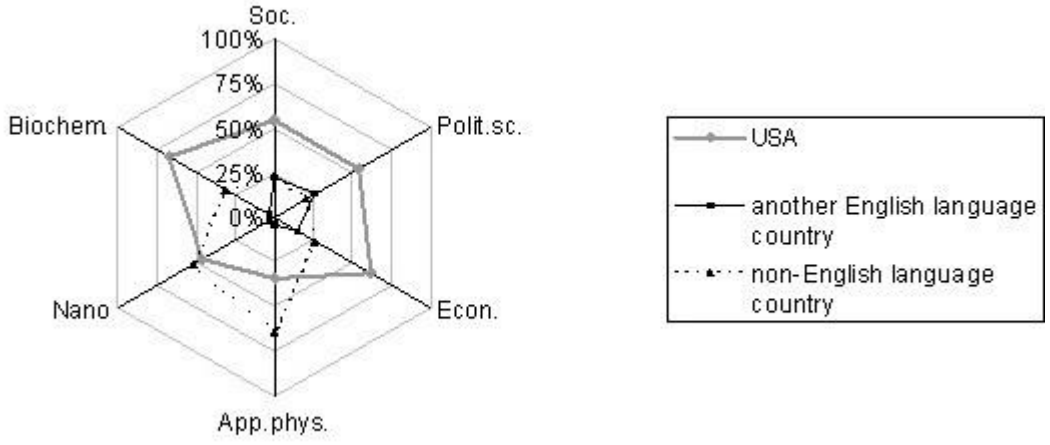
Note: The N column presents the number of journals for which the data on editors affiliations were available. This value is used as denominator for calculating the shares.
Journal can be attributed to more than one country, so the shares in each row are comparable but non-summable.

There exists wide agreement in scientometric research and practice that a paper should be attributed to a country according to the institutional affiliation of its authors. As for journals there is no common practice. Traditionally a journal has been attributed to a country by the location of the publishing company. Today when we have journals with international editorial boards and authors from all over the world, with editorial office located in one country and the publishing company located in the other, the country attribution based on the location of the publishing company is rather a convention. In addition, there is no agreement on this matter even among the leading journal databases. For example, JCR and SCImago databases provide different data on the journal's country of origin for about 30% of the SSH journals we considered. In this study we will not use journal's country of origin data provided by any particular database. We just note that the journal distribution by country according to location of publishing company (data being taken from JCR) would be less biased towards the USA in all the six fields when compared with Table 3, but still the USA would be the dominating country,

and in all the six fields one of the prominent positions would be taken by the Netherlands due to big publishing companies located in this country.

Figure 2 presents the distribution of journals based on the most publishing country. We classified journals in each field into three groups – journals where the most publishing country is the USA, journals where some other English-speaking country is the most publishing, journals where some non-English-speaking country is the most publishing – and presented the proportion of each group on the graph. One can see that in all the three SSH fields and Biochemistry the largest group consists of journals having the USA as the most publishing country. In Applied Physics and Nanoscience the largest group is the one where some non-English language countries are the most publishing. China was the leading country within this group. Concerning the group "another English language country" we should note that while in all SSH fields its share is considerable, in all NSE fields it is negligible.

Figure 2. Journal distribution by the most publishing country in the journal.



The distributions we presented here to describe the set of journals selected for study are also useful for assessment of the WoS coverage in particular fields. However, one should interpret them with caution and not to mix up a leading position with over-representation. When E. Archambault with colleagues assessed national and linguistic journal coverage rates in WoS, they reported that in SSH the only other over-represented language of publication besides English was Czech, which was rather unexpected, because the number of WoS-indexed journals in Czech was small. Still, their proportion was higher than the proportion of journals in Czech registered in Ulrich's, which was used as a benchmarking tool, and this resulted in the reported over-representation [Archambault et al., 2006]. In the same study one can find that while journals with USA-affiliated editors were over-represented in WoS for both NSE and SSH fields, still the level of over-representation was not so high for the USA as for the UK, Switzerland and Germany in NSE, and for the UK and Russia in SSH. Another important point, made by the

authors is that it is not geographic disparity in coverage per se which should be interpreted as database fault in the context of research assessment. After all, NSE journal representation is also unbalanced but this does not cause much critique of WoS-based indicators. It is the lower level of internationalization in SSH which makes disparity matter. To see if there is indeed a significant difference in internationalization we will start with comparing the concentration on publishing papers from particular countries.

a) Concentration on publishing papers from particular countries.

In this part of analysis we aimed to determine for which fields journals concentrated on publishing authors from a particular country are typical, and for which they are not typical. For each journal we calculated the share of papers coming from the most publishing country in this journal. Distribution of this indicator, which we will call max-share, was used to compare internationalization of disciplines. It is worth noting that when it comes to measuring a national orientation of a particular journal, max-share is considered to be unsatisfactory measure. For example, M. Zitt with colleagues noted that for such a purpose relative indexes should be used instead, meaning that to judge on national orientation of a journal one should compare distribution of papers in this journal with distribution of papers in the whole discipline [Zitt et al., 2003]. However, to implement this approach one needs to know the geographic profile of the discipline, which is a problem for SSH as long as we do not have a valid benchmarking tool. Anyway, here we used max-share not to evaluate separate journals, but to judge on a discipline as a whole.

The calculated max-share proved to have a wide range of values within each journal set. It started from less than 20% in each field and ended at 100% in all disciplines except Nanoscience. Figure 3 presents the median max-share for each discipline. One can see that for all NSE fields the median max-share does not exceed 40% (34% in Applied Physics, 35% in Nanoscience and 36% in Biochemistry), which is considerably lower than the median max-share for any of three SSH fields (69% in Sociology, 61% in Political Science, 49% in Economics). When comparing two combined samples – SSH journals (n=575, the median is 55%) and NSE journals (n=451, the median is 36%) – the distributions in the two groups prove to differ significantly (Mann–Whitney U test, $p < 0.05$ two-tailed).

Figure 3. The median share of papers from the most publishing country in a journal

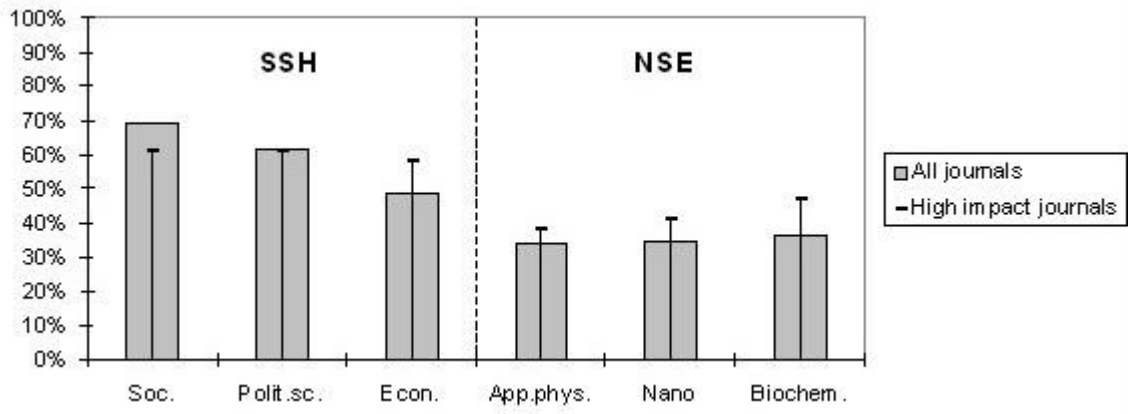


Figure 3 also shows the median share of papers from the most publishing country for high-impact journals in each field. One can observe that for most fields, all NSE fields among them, the median for high-impact journals was above the general level. But in Sociology the picture was different, with high-impact journals less focused on publishing authors from a particular country as compared with all Sociology journals. As for the cross-field comparison, the median max-share of high-impact journals in any NSE field again was lower than that of any SSH field. The difference between distributions in combined samples of high-impact SSH journals (n=143, the median is 61%) and high-impact NSE journals (n=114, the median is 44%) was also significant (Mann–Whitney U test, $p < 0.05$ two-tailed).

Finally, to find disciplines for which the most publishing country is a relatively stable characteristic of a journal we compared the most publishing countries for 2010-2011 papers and for 2002-2011 papers in each journal[7]. We found that only 3% of Sociology journals have different most publishing countries in these time-spans. In Political Science and Economics the shares of journals which have had a recent shift in national profile were also low - 6% and 8% respectively. A similar indicator in Biochemistry was 14%, which does not differ considerably from values in SSH fields. The highest rates of altered national profile were seen in Applied Physics (30%) and Nanoscience (26%). In these two fields the shift occurred most often in favor of China.

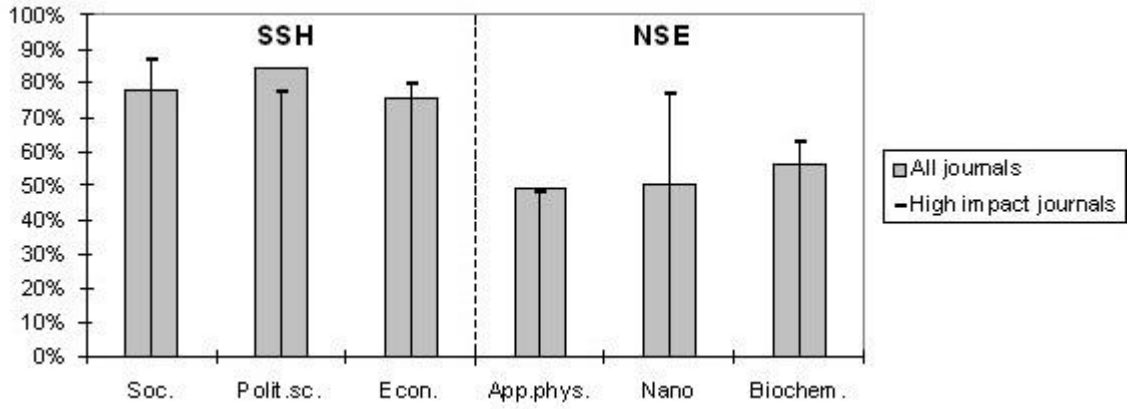
In summary, we can say that SSH journals are more concentrated on publishing authors from a particular country than NSE journals. The same holds true when only high-impact journals are considered instead of all journals in each field.

[7] Only journals indexed in WoS throughout 2002-2011 were included in this analysis.

b) Relationship between the geographical distribution of editors and papers.

In the previous part we used the concentration of papers from the most publishing country in a journal to compare the internationalization of fields, premising on the assertion that in less internationalized fields journals in general are more concentrated. Another approach is based on the assumption that in less internationalized fields journals in general have a closer relationship between editors' and authors' geographical distribution. In order to compare internationalization levels for six fields we obtained for each field 1) the proportion of journals for which the most publishing country in a journal is the country where editor works (or one of editors), and 2) the proportion of journals for which the most publishing country is the same as the 'most editing' country (the country most represented on the editorial board). The first proportion for each field is shown in Figure 4.

Figure 4. Share of journals for which the most publishing country is the country of editor.



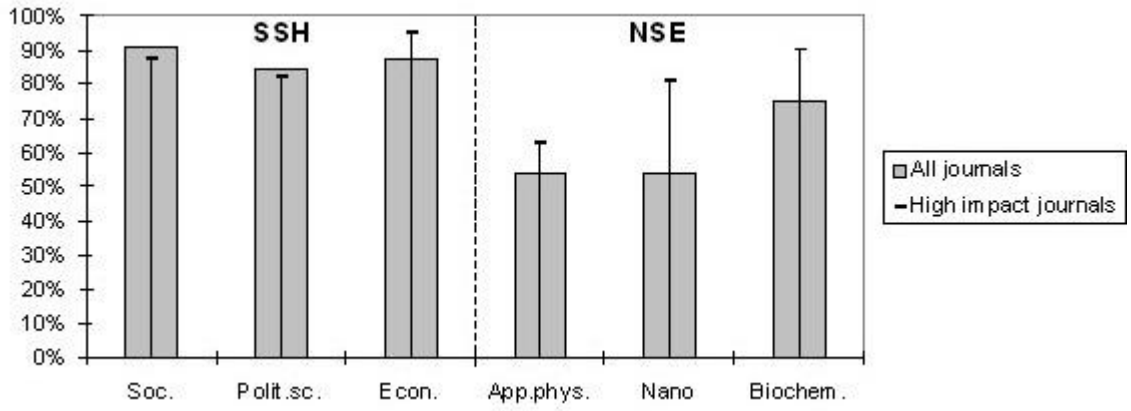
Note: The number of journals in a field for which the data on the most publishing country and editor's country were available is taken as 100%. Such journals present between 83% and 90% of the total set of journals depending on the field.

We can see that the situation when the most publishing country in a journal is the country where the editor works is quite typical for all fields. Still, the difference between SSH and NSE fields is considerable. In NSE such journals account for about half in each field (56% in Biochemistry, 49% in Applied Physics and 51% in Nanoscience). If we considered the country of editor as the journal's country of origin, we could say that in about half of NSE journals the most publishing country is not "home" country. Meanwhile, in all the three SSH fields such journals account for less than a quarter (16% in Political Science, 22% in Sociology and 24% in Economics). Figure 4 also represents the share of high-impact journals in each field for which the country leading in terms of paper counts is the country where the editor works. For all fields except Nanoscience there is no big difference between all journals and high-impact journals. As

for high-impact Nanoscience journals one should take into account that only 13 journals qualified for this part of analysis, while in other fields number of journals was much higher, which could be the reason why Nanoscience is shown as an outlier in Figure 4.

In Figure 5 one can see the share of journals in each field for which most publishing country is the country most represented in the editorial board. First we should note that in all the six fields the national composition of editorial board is more predictive of the most publishing country in a journal than the country of the editor-in-chief. Another important thing is that in all SSH fields a vast majority of journals (91% in Sociology, 84% in Political Science and 87% in Economics) have the same country as the most publishing and the most represented on the editorial board. Biochemistry also has a rather high proportion of such journals. Although its proportion is lower than in any of three SSH fields, it would be factitious to contrast NSE and SSH here because Biochemistry with 75% of such journals is closer to SSH fields than to other NSE fields (both Applied Physics and Nanoscience have 54% of such journals).

Figure 5. Share of journals for which the most publishing country is the country most represented in editorial board.



Note: The number of journals in a field for which both data on most publishing country and country most represented on the editorial board were available is taken as 100%. Such journals present between 83% and 99% of the total set of journals depending on the field.

As for those relatively few SSH journals which have the most publishing country different from the 'most editing' country we were interested if this property could be easily derived from the profile of the editorial board. In his study of three fields (Business, Genetics and Political Science) T.E. Nisonger had shown that journals published in the USA have a lower proportion of international members in editorial boards than journals published in other countries [Nisonger, 2002]. Later, Anne-Wil Harzing and Isabel Metz in a study of geographical diversity in editorial boards of management journals found a strong evidence that journals with USA-

based editor have a lower proportion of non-home country editorial board membership than journals with non-USA based editor[8] [Harzing & Metz, 2013]. We wondered if the same pattern could be applied to editors-authors relationship, in other words, if journals having the USA as the most represented country on the editorial board tend to give priority to home authors more often than other SSH journals. Having compared two groups of SSH journals – those which have USA-oriented editorial boards and those with non-USA-oriented editorial boards – we did not find a considerable difference in the proportion of the journals that have the same country leading in paper counts and editorial board members. Thus, the hypothesis of the USA/non-USA orientation of editorial board being the discriminating factor could be rejected.

c) Relationship between the language of publication and the geographical distribution of papers.

When a study of internationalization of a journal or a scientific field is based on 'country' category, the implicit assumption is that the barriers between different nations are of the same height, which in fact is a simplistic view. Language is one of the most important shaping factors of scientific communication. With high quality English-language journals posing strict requirements for the language level of submitted manuscripts and (quite often) refusing to consider poorly written papers, it is more difficult for scholars from non-English-speaking countries to prepare a paper for publication. One can suppose that in social sciences and especially humanities where the language constructions are far less standardized the language barrier is especially perceptible.

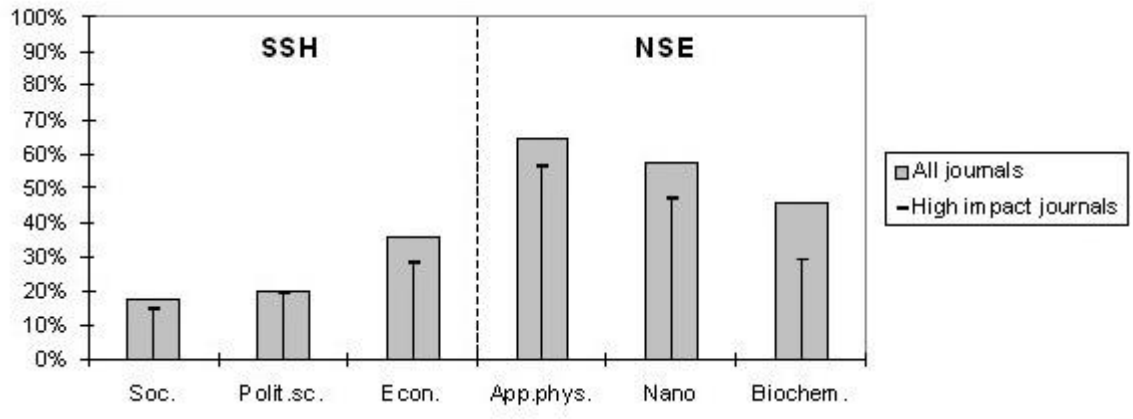
In this part of analysis we considered internationalization in context of language barriers. For each journal we found a number of papers written by authors for whom the journal language is not native. For example, for English-language journals we counted papers without authors from English-speaking countries. And then we compared six fields by the share of papers written in a foreign language. We excluded multi-language and translated journals and journals which did not have papers attributed to any country from consideration. Journals left after the filtering process present between 80% and 97% of the total set depending on the field. We should note that applying these criteria resulted in a set consisting almost entirely of English-language journals. More specific, in NSE fields only English-language publications were left for consideration (403 journals), in SSH fields about 2.4% of journals included in language analysis were non-English publications (12 of 493 journals).

[8] The home country of the journal was measured in this study as the country of affiliation of the editor

In Figure 6 one can see the share of papers published in a non-native language in each discipline. Economics has a considerably higher share of foreign-language papers (35%) than Sociology and Political Science (18% and 20%). Still the difference of all the SSH fields with Applied Physics and Nanoscience (65% and 58%) is crucial. In these two fields a typical paper is a paper written in a foreign language. As for Biochemistry (46%) it is again closer to Economics than to other NSE fields. High-impact journals did not show a significant difference from all journals.

One can assume that the presence of non-English language publications in SSH set could affect the difference between NSE and SSH. To examine this we calculated the share of foreign-language papers in three SSH fields considering only English language journals. The results were nearly the same as those presented in Figure 6 (18% in Sociology, 19% in Political Science, and 36% in Economics).

Figure 6. Share of papers written in a foreign language in each field.



If we consider the distributions of the share of foreign-language papers by journals, the medians will give a picture quite close to that shown in Figure 6. According to Mann–Whitney U test the distribution in a combined SSH sample (n=493, the median share of foreign-language papers is 24%) differs significantly ($p < 0.05$ two-tailed) from the distribution in NSE (n=403, the median is 55%). The same holds true for high-impact journals (the medians are 17% for SSH and 39% for NSE respectively).

It is worth noting that while the proportion of foreign-language papers in SSH fields is considerably less than half, we have quite a few SSH journals where this proportion exceeds 50%, with several high-impact publications among them, for example, “European Sociological Review” and “European Journal of Social Theory” in Sociology, “European Journal Of Political

Research" and "European Union Politics" in Political Science, "Technological and Economic Development of Economy" in Economics[9].

To summarize this section we can state that while the usage of English is growing and now we even have examples of non-English language regions where the largest proportion of officially recognized SSH output is published in English [Engels et al., 2012], we still can not refer to English as to a universal communication language in SSH. While in some fields (Applied Physics and Nanoscience, for example) a typical paper is a paper written in foreign language, in SSH fields such papers comprise far less than half. We found that Sociology and Political Science have the most visible language barriers among the disciplines considered, with Biochemistry and Economics taking an intermediate position in this cross-field comparison.

Conclusions

In this study we compared internationalization of six disciplines, three from social sciences and three from natural sciences. To investigate internationalization of a field we analyzed how academic journals from this field are concentrated on publishing papers from particular countries, how the editorial board composition is predictive of the geographical distribution of published papers, and how big the share of papers written in foreign language is.

Speaking of the limitations of the study we should note that indicators we have used are quite crude. Using dichotomies such as home/non-home, native/foreign is a widely accepted practice in studies of internationalization [e.g. Nisonger, 2002; Harzing & Metz, 2013]. Still, it is easy to build up examples when the results based on this approach are wrong. Robust indicators of internationalization are those that not only reflect weights of home and non-home groups but also reflect diversity. Another limitation of the study concerns the language analysis. We used authors' affiliations to assign a paper to "native language" or "foreign language" category. Today with increasing international mobility being one of global trends in science, an unprecedented and still growing number of researchers are working outside their native countries. According to survey data in some countries, including major players such as the United States, Switzerland, Canada and Australia, close to half or even more than half of researchers have come from abroad [Van Noorden, 2012]. To regard the language of the country where researcher works at the moment as his native language could be considered as somewhat out-of-date.

[9] This journal with another Lithuanian publication "Journal of Business, Economics and Management" to a large extent provide high Impact Factor values for each other.

Accepting these limitations, we can state that the results we obtained show that SSH fields, taken together or separately, are less internationalized than NSE fields. To be more specific, SSH journals in general are more concentrated on publishing papers from particular countries, they tend to publish fewer papers written in foreign language, and they expose more similarities between editors' and authors' geographical distribution. Despite the evidence of growing internationalization of social sciences and humanities [Kyvik, 2003; Archambault et al., 2006; Engels et al., 2012; Harzing & Metz, 2013], the difference between the fields is still considerable.

We should point out that according to our results, contrasting of SSH and NSE fields is quite factitious. With Applied Physics and Nanoscience demonstrating high internationalization and Sociology and Political Science occupying the other pole, the other two fields, Economics and Biochemistry, have intermediate and quite close positions. It is quite possible that having considered a wide variety of disciplines we will find some NSE fields less internationalized that some SSH fields. Still, in context of research output assessment the same level of internationalization should be interpreted differently for different fields. For most NSE disciplines we do not have many reasons to consider them locally-oriented. In such cases we can suppose that a relatively low level of internationalization is due to the existence of a considerable disparity in countries' scientific performance, and to be a valid measuring tool it is not necessary for a bibliographic database to be geographically balanced as long as we know that most high-impact publications are covered. On the contrary, in SSH fields, we can assume that at least in part the local orientation of the problems studied affects the level of internationalization, and if internationalization of a particular field is relatively low we can not ignore the disparity of databases when using them to assess scientific performance.

Nowadays multidisciplinary international databases like Web of Science and Scopus have become a little less than a standard tools used to assess and compare research performance at the individual, institutional, or national level. When we use such a database to assess the output in some SSH field, which has the majority of papers published in home journals and in native languages, the indicators we obtain are heavily influenced by the database coverage biases. When the presence of one journal in a database changes dramatically the performance indicators for university [e.g. Gorraiz et al., 2009], or even for the whole country [e.g. Savelieva & Poletayev, 2009], we should recognize that using this database is insufficient for obtaining the adequate picture.

We want to underline that the international databases we mentioned are invaluable tools for evaluation of internationally oriented research. But to obtain a comprehensive assessment of not only internationally oriented but all SSH research performed by some university or some

country today one should have, in addition to international databases, an extensive, quality-based and, desirably, citation-indexing national bibliographic database. One can only hope that some day we will have scientometric tools powerful enough to make cross-field and cross-country comparisons and balanced enough so these comparisons would be valid.

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Ekaterina L. Dyachenko
National Research University Higher School of Economics. HSE Branch in Perm, Library.
Electronic resources librarian; E-mail: edyachenko@hse.ru

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