

PUBLICATION AND CITATION PATTERNS IN THE SOCIAL SCIENCES AND HUMANITIES: A NATIONAL PERSPECTIVE

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Abstract. From the perspective of non-Anglophone countries, accountability, liability, and capacity of scientific research is often related to the process of internationalization. The article explores the effects of this process on the example of publication and citation patterns of Serbian scholars. Results of the analysis are mostly in line with the common conceptions about the differences among scientific disciplines. Authors in social sciences and humanities have manifested more nationally oriented publication and citation behavior, tendency to cite older literature, and stronger preference towards non-journal literature. However, huge individual differences among scholars and some inconsistencies between their publication and citation patterns, reveal a form of latent conflict between the accustomed publishing behavior in social sciences and humanities and the new dynamics of knowledge production. This conflict obscures the notion of typical or expected behavior of scholars in certain disciplines and has important implications for research evaluation. Scholars in social sciences and humanities were not so eager and successful in shifting their communication to the international arena. For them, national journals still play a crucial role in the “local” information exchange. But the question is how one transitional country that is facing serious structural challenges and weak economy can afford to support “locally relevant” research projects and whether national journals have become a mere tool for an ungainly customized research evaluation in the social sciences and humanities.

Keywords: Publication behavior, Citation behavior, Social sciences, Humanities, National journals, Internationalization

Résumé. Regardant de la perspective des pays non-anglophones, la responsabilité et la capacité des recherches scientifiques sont très souvent liée aux procès de l’internationalisation. Cet article explore les effets de ce procès sur l’exemple des

modèles des publications et des citations utilisées par les spécialistes serbes. Les résultats de l'analyse sont en général conformes aux conceptions communes des différences parmi les disciplines scientifiques. Les auteurs des études sociales et humaines manifestaient le comportement et la tendance plus nationaux, de citer la littérature plus ancienne, et les préférences plus fortes envers la littérature non-périodique. Cependant, les immenses différences individuelles parmi les spécialistes et quelques incohérences entre leurs modèles de publication et de citation, découvrent une forme du conflit latent entre le comportement de l'édition habituelle dans la sphère des études sociales et humaines et la nouvelle dynamique de la production du savoir. Ce conflit dissimule la notion du comportement typique ou attendu des spécialistes dans certaines disciplines et porte les implications importantes pour les évaluations des recherches. Les spécialistes des études sociales et humaines n'étaient tellement enthousiastes ni réussis en transmettre leur communications à l'arène internationale. Pour eux, les journaux nationaux jouent toujours un rôle crucial dans l'échange «locale» des informations. Mais la question est, un pays de transition qui fait face aux sérieux challenges structuraux et à une faible économie, comment il peut supporter les projets des recherches localement significatifs, et si les journaux nationaux viennent de devenir un simple instrument pour une évaluation maladroitement personnalisée des recherches dans les études sociales et humaines.

Mots clés: Comportement de publication, Comportement de citation, Sciences sociales, Humanités, Revues nationales, Internationalisation

INTRODUCTION

Discussions on methodological and epistemological differences among scientific disciplines often involve the notion of some form of dichotomy. On one side, most of the disciplines from the fields of natural sciences are considered to be hard, mature, consensual, global, and fast-paced. On the other, social sciences and humanities (SS&H) are usually perceived as soft, immature, conflictual, local, and slow-paced. During the past few decades, rapid technological development and global political and economic changes have strongly influenced the modes of knowledge production, information dissemination, and research funding (Archibugi & Filippetti, 2015). The latter was probably the main reason why the discussion on the dichotomy between hard and soft sciences is shifting from the level of philosophy and sociology of science to the level of politics and science policy. A new paradigm of knowledge production has brought new trends in research, most notably the steering of research priorities by policy institutions, increased commercialization of research, and multiple accountabilities of science (Nowotny, Scott, & Gibbons, 2003). The focus on performance-based

funding, liability, and utility of research in this new era of post-normal (Funtowicz & Ravetz, 1993) or post-academic science (Ziman, 2002) has brought to the forefront another aspect of this dichotomy that was apparently always present, but not always so explicitly and so frequently used in discussions on the value and contribution of sciences. Natural sciences are often perceived as more legitimate and real, as opposed to what should presumably be pseudo- or non-scientific knowledge¹. Natural scientists' "mistrust" of the social sciences can be traced to various schools of sociological relativism (Yearley, 2005) and is only further encouraged by some actual or nominal "peculiarities" of SS&H. The question that often arises is whether we can consider as scientific (and fundable) a "peculiar" activity that seems highly subjective and rarely leads to a consensus (Cole, 1992). Furthermore, are social scientists "peculiar" because they fail (or refuse) to adjust their behavior to the new global setting of scientific knowledge production?

In order to ensure objective performance-based research funding, science policy institutions should require a comprehensive coverage of various scholarly outputs, which is usually more difficult to achieve in the fields of SS&H (Hicks, 2004). Considerable efforts were made to improve research evaluation for SS&H², both by the governmental institutions of some countries (Ossenblok, Engels, & Sivertsen, 2012) and the bibliographic database providers (Norris & Oppenheim, 2007). However, there is hardly a consensus regarding the appropriate set of principles for measuring scholarly output in SS&H and consequently some form of skepticism among SS&H researchers towards the common research evaluation practice is still very strong. In the present paper, we will discuss the above mentioned dichotomy from the bibliometric point of view. The purpose of the study is twofold. First, we aim to describe differences in publication and citation patterns among scholars in various scientific fields, particularly in the context of the new set of rules that directly encourage authors to publish in internationally visible journals. As Whitley (2000) clearly stated, various intellectual fields shows diversity of organization patterns, which means that science itself is not a monolithic enterprise, but it consists of diverse specialties³. Furthermore, scientific disciplines also vary in their autonomy and even in the amount of the control they exhibit over their practitioners. Hence, our general assumption in this study is not only that scholars in different fields dem-

1. <http://articles.latimes.com/2012/jul/13/news/la-ol-blowback-psychology-science-20120713>

2. See, for example, Prague Manifesto by the ENRESSH team available at <http://enressh.eu>.

3. See also (Collins, 1994).

onstrate different publication and citation behavior (e.g. preferences towards publishing in international journals), but also that scholars within the same field vary in such behavior. The second aim of our study is to explore changes in editorial policies of national journals in the context of globally changing modes of scientific communication and knowledge production. We have tried to demonstrate the effects of internationalization of scholarly production by the example of a non-Anglophone scientific community, focusing primarily on changes in local and global impact of national journals. Before we present the results of our study, we shall briefly explain the main peculiarities of SS&H regarding the characteristics of scientific output and challenges of research evaluation.

How peculiar are social sciences and humanities?

In the editorial entitled “The Peculiar Institution”, the editors of *Scientific American* have tried to explain why the issue of slavery belongs in this magazine, anticipating the reaction of readers who protest when articles on social topics are published, usually suggesting the editors to stick to “real” science (The peculiar institution, 2002). The editors agreed that social sciences are “mushy” because they lack the precision of natural sciences and are more likely to have “political implications”, but, as they concluded, largely because the subject matter in social sciences is “difficult”. We could argue that the difficulty of the subject matter derives from the fact that social scientists are trying to explain phenomena outside the laboratories, focusing on attitudes, intentions, needs, and desires of people in a wider social context. For example, a biologist can justify the use of GMO based on results of some field experiment, but would probably face a difficulty if he or she tried to explain why the majority of EU citizens consider genetic manipulation of foodstuff not justifiable⁴. In this context, science itself is truly a peculiar *social* institution (Ziman, 2002) as it assumes actions and interactions of people, both scientists and members of wider community. Similarly to using “peculiar institution” as a euphemism for slavery, this term may be used to describe the intangibility of science as a social practice. But in the context of the increased emphasis on the accountability of funding for scientific research, the outcomes of such a practice cannot remain intangible. Although the terms “different” and “specific” in the context of SS&H are obviously used by some as a euphemism for non-scientific, social scientists should not (mis)use those terms to dispute the necessity of research evaluation. Being aware that the answer to the question about the peculiarity of SS&H is not a simple one, we will focus on those characteristics that became

4. <http://www.atlasofeuropeanvalues.eu/new/wereld.php?ids=250&year=2008>

most relevant in the context of the growing emphasis on responsible science, i.e. the practice of monitoring the effects of research investments using various bibliometric indicators.

The use of bibliometric indicators in SS&H

Many European countries have established performance-based research funding systems that commonly rely on bibliographic data from the major international multidisciplinary databases (Geuna & Martin, 2003; Hicks, 2012b; Moed, 2009). In most cases, research evaluation policies are more or less adjusted to the specific characteristics of publication and citation behavior in SS&H (Pajić, 2015a). We use the term “behavior” since these characteristics may not necessarily be intrinsic to researchers in those fields, but are empirically confirmed and manifested through their publishing and citing patterns. From the bibliometric point of view, there are at least four relevant characteristics that differ SS&H from sciences (Nederhof, 2006): more pronounced national orientation (both in the means of research topics and publication types), more important role of non-journal literature, slower obsolescence of literature, and larger share of non-scholarly publications. There is a considerable agreement on limitations of commonly used bibliometric indicators for SS&H (Hicks, 2004; Hicks, 2012a), but not on the possible lines of actions in order to alleviate or compensate for those limitations. Although some clear and well elaborated recommendations for the future use of bibliometric indicators in SS&H are available (Archambault & Gagné, 2004), the authors in SS&H (outside scientometrics) were hardly eager to contribute to the discussion on this matter with some concrete suggestions, for example, on how to improve the coverage of various literatures, or what would be the most appropriate citation-window to reflect the slower pace of citation accumulation in SS&H. In general, this discussion is about yet another dichotomy: whether to adjust bibliometric indicators and information sources to SS&H or to adjust behavior and specific culture of SS&H to the new modes of knowledge production marked by interdisciplinarity, orientation towards application, and an increased emphasis on social accountability.

Adjusting bibliometric indicators

The logic behind the impact factor (IF) and its use in research evaluation was criticized practically from the first appearance of *Journal Citation Reports* in 1975 (Boor, 1982). The number of papers dealing with the technical and methodological shortcomings of the IF has grown exponentially after 1995 (Archambault & Larivière, 2009), particularly after

1997 when the first online version of ISI databases were launched, hence providing access to citation data for the wider community of stakeholders. However, it was not until 2004 and the emergence of *Scopus* and *Google Scholar* that major changes were made to the IF calculation procedure and the coverage of *Thomson Reuters*⁵ databases. So basically, it was the above mentioned commercialization of science that finally initiated the adjustment of bibliometric indicators and information sources to the specifics of SS&H: the coverage of SS&H journals in ISI databases has increased by more than 40% in 2005-2010 period, almost 6.000 additional, mostly national journals are now covered within the *Emerging Sources Citation Index*, five-year IF became a standard indicator available in *Journal Citation Reports*, *Book Citation Index* was launched in 2011 and currently covers almost 40.000 books in SS&H, and finally, several national citation indices such as *Chinese Science Citation Database*, *SciELO Citation Index*, and *Russian Citation Index*, are now available through the *Web of Science* portal. Having in mind that both *Scopus* and *Google Scholar* have much larger literature coverage than the *Web of Science* (WoS), and that the increased market competition will continually motivate major scientific information providers to adjust to the new paradigm of knowledge production, we may assume that the validity of bibliometric indicators for use in SS&H will only grow further.

Adjusting publication behavior in SS&H

Researchers in SS&H fields have responded to the rules set by governments and funding agencies by adjusting their publication behavior. Proportion of journal articles in SS&H output has grown significantly, particularly in psychology and economics (Archambault, Vignola-Gagné, Côté, Larivière, & Gingras, 2006; Engels, Ossenblok, & Spruyt, 2012; Larivière, Archambault, Gingras, & Vignola-Gagné, 2006). Perhaps the most relevant aspect of this change from the aspect of SS&H peculiarities is a remarkable growth in the number of publications in English language by authors from non-English countries (Kyvik, 2003; Leite, Mugnaini, & Leta, 2011; Ossenblok et al., 2012; Vanecek, 2014). However, one can argue whether this adjustment to the new paradigm of knowledge production is genuine, essential, or even beneficial for SS&H. Some research suggests that it is not. When publishing abroad, researchers in SS&H are often targeting journals of lower and sometimes dubious quality, simply to fulfil their institutions' requirements (Allik, 2013; Mali, 2011; Segalla, 2008). Such strategy has led to the "epistemic

5. Thomson Reuters Intellectual Property was acquired in 2016 by Clarivate Analytics.

injustice” (Fricker, 2009) of research evaluation in SS&H as authors are publishing in a form and language that may run counter to cultural (national) values and goals, thus alienating academics from the general public of their own countries (Lõhkivi, Velbaum, & Eigi, 2012; Schuermans, Meeus, & De Maesschalck, 2010).

National journals and the new paradigm of knowledge production

From the perspective of non-Anglophone countries, striving for better visibility, credibility, and quality of research is usually neatly connected to the internationalization of scientific communication. One manifestation of this process is the above mentioned increased focus on publishing in international journals, which are almost by default in English. Another equally important aspect of internationalization is reflected through the efforts of editors to promote national journals by boosting multinational distributions of editorial board members, authors, and users or even by changing journal titles to sound more international (Buela-Casal, Perakakis, Taylor, & Checa, 2006). The outcomes of these strategies are not always straightforward. Although some non-Anglophone journals have managed to improve their impact on the international community, or at least its aspect measured by IF, the effects of this shift on national community and national science are not necessarily beneficial. National journals often act as mere “citation donors” for highly cited foreign journals (David, Moore, & Domuta, 2002) making them *glocal* - not fully recognized by the global community while at the same time losing the touch with the local one (Pajić & Jevremov, 2014). Furthermore, local authors feel additional pressure as they have to compete with foreign ones to publish in internationalized journals that were until recently traditionally national (Dinkel, Berth, Borckenhagen, & Brähler, 2004). We may say that the scientific market is actually globalized from the perspective of Anglophone countries as they have most benefited from non-Anglophone journals’ internationalization strategies (Lancho-Barrantes, Guerrero-Bote, & Moya-Anegón, 2013).

DATA AND METHOD

Probably the greatest challenge in analyzing scholarly output is to provide a comprehensive and representative dataset. Regarding that, all bibliometric analyses are more or less limited in scope. If one chooses to use data from the leading international bibliographic databases, there is a serious risk that significant portions of scientific production such as national journals and non-journal literature will remain undetectable. On

the other hand, very few countries maintain national citation indices, while institutional data files are usually not accessible in a form that enables simple aggregation at the global level. We have opted to analyze publication and citation patterns from the national perspective in order to cover the whole variety of researchers' scholarly output.

Two main data sources were used in the study. The first dataset was extracted from 484 promotion and tenure reports submitted at the University of Novi Sad (UNS). UNS is the second largest state university in Serbia and consists of fourteen faculties and two research institutes. Due to some technical limitation in accessing the reports, our analysis is focused on the production of professors promoted or tenured in the period between 2009 and 2013. This was the first five-year period after the new set of rules requiring authors to publish articles in international journals came into force. Dataset contained full bibliographies of 141 (29%) professors in the fields of social sciences (SS), 137 (28%) in humanities (H), and 206 (43%) in natural sciences (NS). The total of 16.119 publications were categorized according to the origin (national, international), and type (books, journal articles, conference papers, other).

The second data source used is the *Journal Bibliometric Report* (JBR) (Šipka, 2013). JBR is published annually and contains rankings of Serbian academic journals based on several indicators of bibliometric quality and impact, including the national impact factor. All JBR indicators are based on the data available from *SCIndeks - Serbian Citation Index* (Šipka, 2005)⁶. SCIndeks initially covered more than 400 Serbian journals, but due to some problems in reaching an agreement with the Serbian Ministry of Education, Science, and Technological Development, the database currently covers some 230 titles. When discussing changes in indicators over time, we have used two-year overlapping periods to explore underlying trends more accurately.

Additionally, we have used data from the *SCImago Journal and Country Rank* (SCImago, 2007) in order to put our results in a more global perspective. SCImago Journal Rank (SJR) (Guerrero-Bote & Moya-Anegón, 2012) is a measure of journal prestige based on the ratio between the number of citations and the number of papers. Key differences compared to the traditional impact factor are the use of three-year citation time frame and citation weighting according to the prestige of citing journal.

Data analysis is mostly based on descriptive statistics. Average counts were calculated and compared where appropriate, but due to the

6. SCIndeks is an open access database available at <http://scindeks.ceon.rs>. JBR is available at <http://scindeks-bic.ceon.rs> but only through the proxies of the Serbian Academic Network.

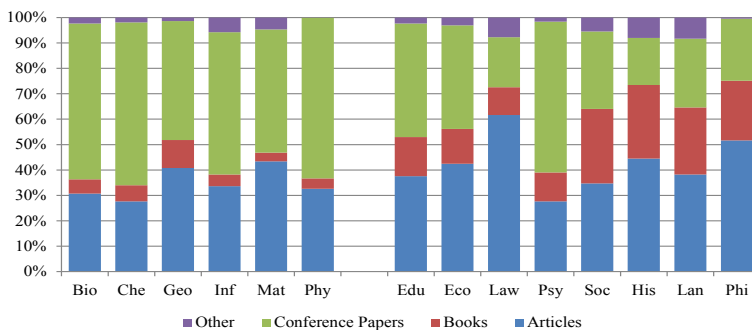
large skewness of data in some cases, Kruskal-Wallis H test was used to estimate the significance of differences among disciplines.

RESULTS

Publication patterns of professors at the University of Novi Sad

Proportions of various publication types within total production of professors at the UNS are shown in Figure 1. The most notable difference in the context of hard-soft dichotomy is related to the proportion of conference papers. The importance of conferences and meetings for scientific communication and dissemination of knowledge is evident in all fields of NS, but also in psychology, and, to some extent, in education sciences and economics. Another noticeable difference is the larger proportion of chapters, books, and monographs in SS&H fields, particularly in sociology, history, language and literature, and philosophy. The latter is in agreement with the results of previous studies and basically confirms the impression that the authors in humanities exhibit different publication behavior and communication patterns than those from the other academic fields (Huang & Chang, 2008).

Figure 1. Proportions of different publication types in total productivity of authors across disciplines⁷



The proportion of journal articles does not differ significantly across three main fields (NS, SS, H) ($H(2, 484) = 1.96, p = 0.38$). However, differences among disciplines are significant. Somewhat unexpected,

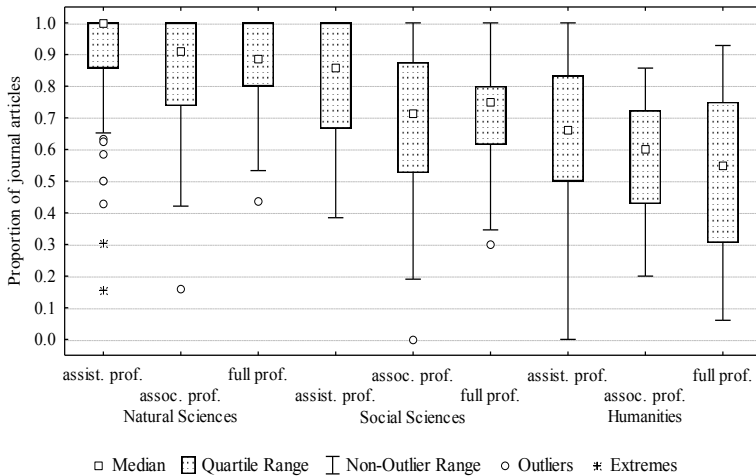
7. Disciplines from left to right: Biology, Chemistry, Geography, Information Sciences, Mathematics, Physics, Education Sciences, Economics, Law, Psychology, Sociology, History, Language and Literature, Philosophy.

proportions of journal articles are highest in law and philosophy where journal articles account for more than 50% of total productivity. This should be interpreted with caution because the number of publications and the number of authors in those fields were smaller compared to the others. However, after a closer inspection of the authors' bibliographies, it became evident that only a few national journals in law and philosophy have accounted for the majority of published articles. In most cases, those were the journals published by the very departments where the candidates were promoted or tenured. This information suggests that, in some cases, accessibility of source publication plays an important role in developing certain publication pattern.

In order to further explore the relevance of journals as dissemination media, we have excluded conference papers and compared the proportions of journal articles within the total number of published articles, chapters, books, and monographs. In addition to disciplinary categorization (SS, H, and NS), authors were classified into three groups according to their academic rank (associate professor, assistant professor, and full professor). Medians and quartile ranges of the proportion of articles for each of the nine categories of professors are presented in Figure 2. Relationship between the age and scientific productivity was shown to be rather ambiguous (Gingras, Larivière, Macaluso, & Robitaille, 2008; Kyvik, 1990). Our results show that full professors are more productive than associate and assistant professors ($H(2, N=484) = 36.41, p < 0.01$) despite the fact that the number of publications was calculated for the last five-year period for each author. This may indicate that productivity may not be simply correlated with age, but with the demands set by policy institutions. Differences in preference towards different dissemination media are now even more evident. Authors in NS do prefer journal articles while the authors in SS&H publish more books. After the exclusion of conference papers from the total number of publications this difference became statistically significant ($H(2, N=484) = 130.71, p < 0.01$). Another important result is related to large individual differences in publication behavior, particularly in humanities. Although some patterns are obviously present, it would be misleading to label certain publishing pattern as "typical". Finally, proportion of journal articles differs significantly among the authors of different academic rank ($H(2, N=484) = 22.91, p < 0.01$). Full professors are also more focused on writing books and monographs. However, one additional difference seems to be very important. As opposed to younger academics in NS who mainly publish in journals and proceedings, professors in humanities choose book chapters and monographs as a relevant communication channel from the earliest phases of their academic career. We may assume that

the way young scholars are educated and socialized in academic community directs them more towards certain publication behavior.

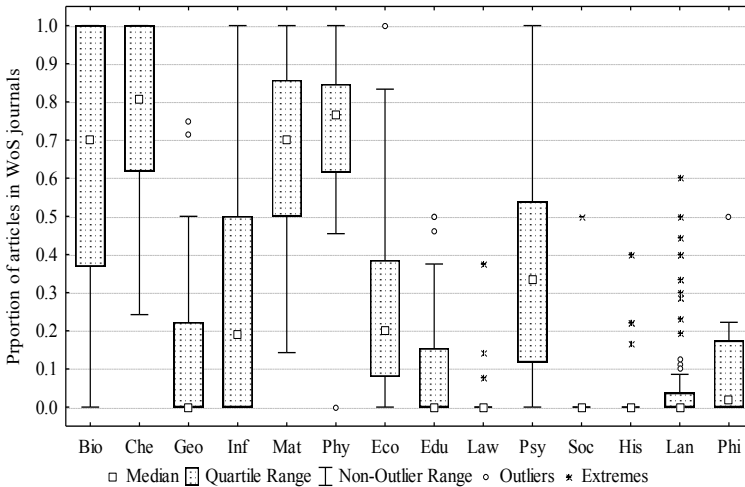
Figure 2. Proportion of journal articles in total number of articles, chapters, books, and monographs across different fields and academic ranks



In the next step, we have analyzed the proportion of articles published in WoS journals and compared them to the total number of published journal articles. Results are presented in Figure 3. Again, the most striking result is related to huge individual differences among authors. It is obvious that some authors are oriented more towards publishing abroad, while others have published an article or two in international journals simply to fulfill the demands set by government administrative and focused mainly on writing articles for national journals. It is hard to discuss the possible background of these differences, but in some cases, it could be attributed to the characteristics of a particular research topic and gradual differences among individuals (Verleysen & Weeren, 2016). This was the obvious reason behind the large number of outliers in language and literature since the authors in linguistics publish more articles in foreign journals compared to those in literature. However, this difference can equally be related to mere preferences of individual authors or the accessibility of certain journal. Only two Serbian journals in SS&H fields were available in WoS at the time of the analysis, one in psychology and one in economics. Those were the two SS&H disciplines with the largest number of professors with at least one article published in WoS journal. National journals hence play an important role in the com-

munication of SS&H scholars both at the local and global level. This is evident even after they become “internationalized” by the inclusion in major bibliographic databases. The importance of national journals for academics in humanities is clearly apparent, but the opposite is not so obvious for professors in NS. Publications in international journals prevail in chemistry and physics, and also to a large extent in biology and mathematics, while professors in geography and information sciences seem to prefer national journals to international. This last result could be partially attributed to the heterogeneity of certain fields and the larger number of researchers in some specific sub-disciplines, e.g. in human geography compared to those in physical geography.

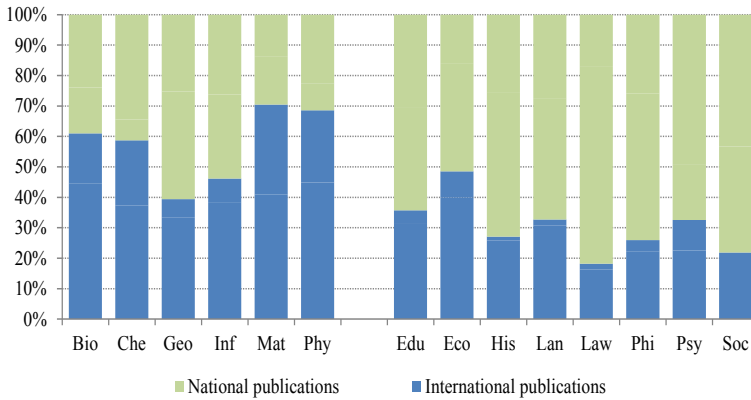
Figure 3. Proportions of articles published in WoS journals in total number of articles published by authors from different disciplines



It is evident that scholars in some disciplines are directed more towards publishing in international rather than national journals. A different issue is whether they generally communicate through international sources or not. Figure 4 shows the proportion of publications of UNS professors in (inter)national sources, regardless of the publication type. Although national-international dichotomy between NS and SS&H is generally manifested, it would be wrongful to say that communication through international sources can (and should) act as an overall substitute for national dissemination channels. Even in some traditionally hard disciplines such as biology and chemistry, academics fairly rely on local journals, publishers, and conferences to disseminate research results. Hence,

focusing on proportions of (international) journal articles as a measure of internationalization would give an incomplete picture of internationalization as a broader phenomenon.

Figure 4. Proportions of publications by UNS professors in national and international sources across disciplines



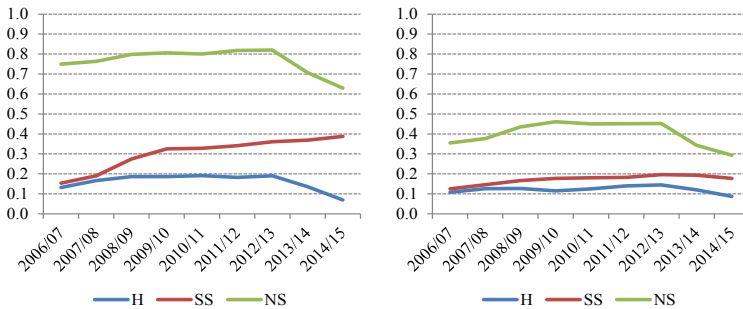
Editorial policy and international status of Serbian journals

In the second set of analyses, we have used data from the national JBR, focusing on several indicators of journal internationality and authors' citation patterns. Figure 5 shows the trend of changes in proportion of articles published in languages other than Serbian and proportion of articles written by the authors with non-Serbian affiliations. We need to point out that these are all average values and may not be representative of typical disciplinary characteristics due to large individual differences. However, some trends and patterns are obvious. Proportion of articles written by foreign authors and particularly the proportion of articles written in foreign languages are significantly higher in NS compared to SS&H. The most obvious growing trend is that of proportion of articles in languages other than Serbian published in SS journals. The editors of those journals have obviously encouraged authors to publish their articles in English. On the other hand, this trend is different in Humanities where the absolute majority of articles are published in Serbian.

Another valuable result visible in Figure 5 is a sudden drop in both the average proportion of articles written in other languages and the articles written by foreign authors in NS journals. We may interpret this as an effect of some form of *in vivo* experiment. In 2014, Serbian Ministry of Science has suspended funding the maintenance of the Serbian

Citation Index. As a consequence, a new financial model was introduced and journals were asked to pay an additional fee in order to be visible in national citation index. Many journal editors were not willing to do so, particularly the editors of journals already covered in international citation indices such as Scopus and WoS and those that have already established their international reputation. Some of the most influential Serbian journals in NS are currently not present in the national citation index and it is highly possible that this was reflected to the above mentioned indicators. Journal editors that were not so exclusive regarding the publication language seem to value more the benefits of being present in the national database.

Figure 5. Average proportions of articles published in Serbian journals in languages other than Serbian (left) and by authors outside of Serbia (right)

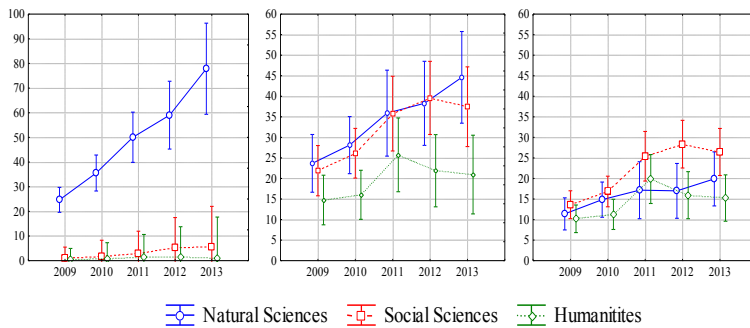


Regarding the proportion of articles published by the authors with non-Serbian affiliations, it should be noted that “foreign” most often means “regional”. Indeed, a rather constant or a slightly growing proportion of articles published in Serbian SS&H journals by non-Serbian authors were written by scholars from neighboring and other ex-Yugoslav countries. This partially blurs the concept of internationalization in its basic form, but still provides a relevant feedback on how much certain scientific community is open for information exchange. As some previous results about publication patterns in Eastern European countries show (Pajić, 2015a) this exchange is still largely based on regional and cultural proximities and as such it determines certain publication patterns.

In order to explore possible effects of journal internationalization strategies, we have calculated the least square means for the number of national and international citations during 2009-2013. We have excluded data for the last two years of the previously analyzed period due to large fluctuations in the number of journals in the national citation

index. National citations were those registered in SCIndeks, while the international were those registered in WoS. Trends in various types of journal citation counts in different fields are shown in Figure 6. National and international citation rates are obviously two complementary aspects of journal impact, at least in SS&H. The most apparent trend is an impressive growth of international citation rates of journals in NS. Serbian journals in the fields of NS were obviously targeting international community of readers and did manage to improve their international impact. A slight increase in the number of international citations is noticeable in the case of SS journals, but due to large individual differences among journals, the question is whether this trend is a characteristic of the field in general. In fact, only a few national SS&H journals improved their international impact, most notably the ones that are indexed in WoS. In general, international citation rate of national SS&H journals is almost negligible. More than 75% of SS&H journals had less than three citations per year during the analyzed period. If we exclude citations by the authors from Serbia, 75% of journals were receiving less than one citation per year.

Figure 6. Least squares means of international (left), national (middle) and national without self-cites (right) citation counts of Serbian journals in three different fields

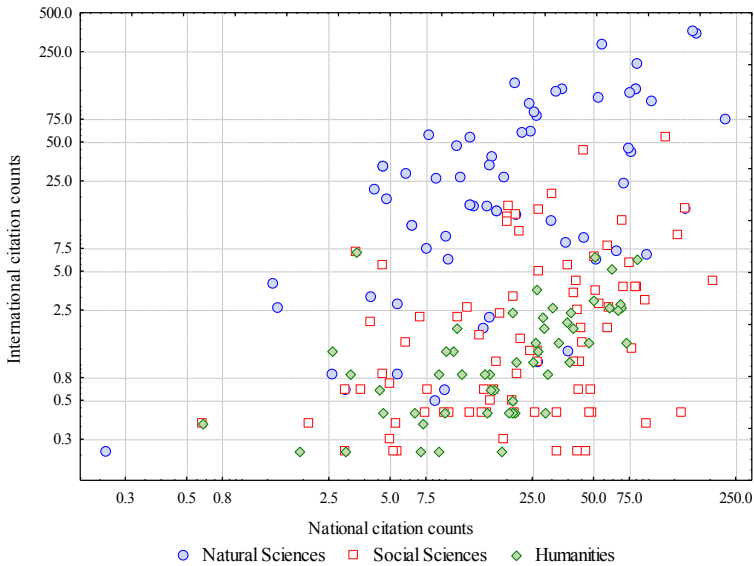


It is obvious from the data in Figure 6 that communication (citation exchange) among authors in SS&H is more intensive at the national level (middle chart). Unlike international citation count, national one has some discriminative power and allows comparisons among journals based on their impact. However, a decreasing trend of national citation count in SS&H is noticeable at the end of the analyzed period. This should not be directly related to the Ministry's decision to suspend financial support to SCIndeks, but it may raise an alert to Serbian scientific com-

munity. Researchers in SS&H are already torn between the pressure to globalize their production and the need to communicate with their colleagues locally. Now they have to face additional problem of accessing the sources in their own language. Serbian journals in SS&H fields have managed to attract some attention at international level but this growing trend is aligned with the decrease of national citations count. We may notice the importance of this local communication by further examining data in Figure 6. When journal self-cites are excluded (right chart), citation rates of all journals decline, but this decrement is more obvious in NS than SS&H. It means that researchers in SS&H rely on the network of national journals to disseminate knowledge in the absence of a similar network at the international level.

Correlations between the number of national and international citations to Serbian journals are generally very high and positive. This means that journals highly cited at the local level, generally do manage to attract citations at the global level. However, these correlation coefficients may be affected by the low values and low variability of international citation counts. Hence, the relationship between two aspects of impact is visualized on the scatterplot in Figure 7 showing the correlation between the average numbers of national and international citations in 2009-2013. Upper left quadrant of the scatterplot is empty, which means that there are no national journals that are recognized (highly cited) internationally and at the same time not equally acknowledged by the local community. On the other side, the opposite is not true, particularly for SS&H journals. Journals with high citation rates on local level are in most cases cited only sporadically in WoS. There are several “bright examples” among SS&H journals that made international breakthrough and reached the average international citation rate of Serbian journals in NS, mostly due to their inclusion in international databases.

Figure 7. Relationship between national and international citation counts of Serbian journals in three different fields (logarithmic axes)

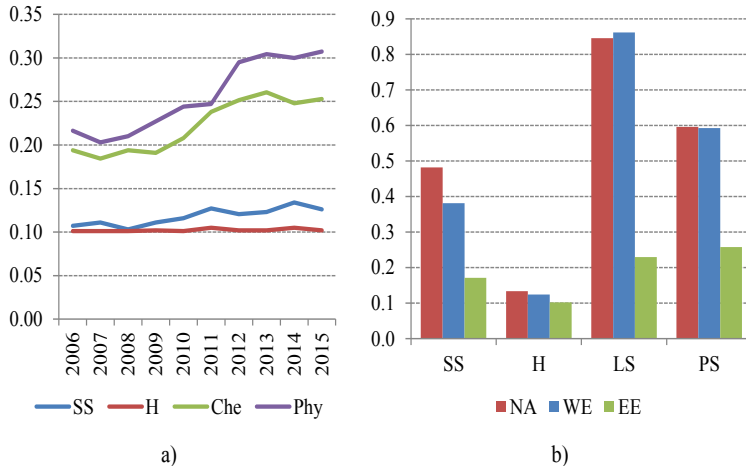


We have further explored the status of national journals in international databases by analyzing median SJR values for journals from different fields from Eastern Europe (EE), Western Europe (WE), and North America (NA). Results are presented in Figure 8. Growing trend in international impact of EE journals that we have observed earlier on the sample of Serbian journals is also visible at the global level. On the basis of some previous results (Pajić, 2015b) we could assume that this is mostly the effect of massive inclusion of journals from this region in Scopus. It seems that journals in the fields of NS have benefited more from this shift of communication to the international level than SS&H journals (Figure 8a). However, even with the growing trend of international citation rates, EE journals are still far from reaching the impact of those from NA and WE (Figure 8b). This lagging is most evident in life sciences while practically undetectable in humanities. The most trivial explanation for the latter is that there is nothing to lag behind, at least if we accept the number of citations as a measure of impact. Another interesting result is that median SJR values for WE and NA journals are basically the same, except for SS where NA journals could be regarded as more influential on the basis of their SJR values. If we join the line of critics

regarding the Westernization of science, it seems that Americanization would be a more proper term in the case of SS&H.

Figure 8. Median SJR values of journals from different regions and fields⁸

a) Median SJR values of Eastern European journal in 2006-2015
b) Median SJR values of North American, Western European, and Eastern European journals

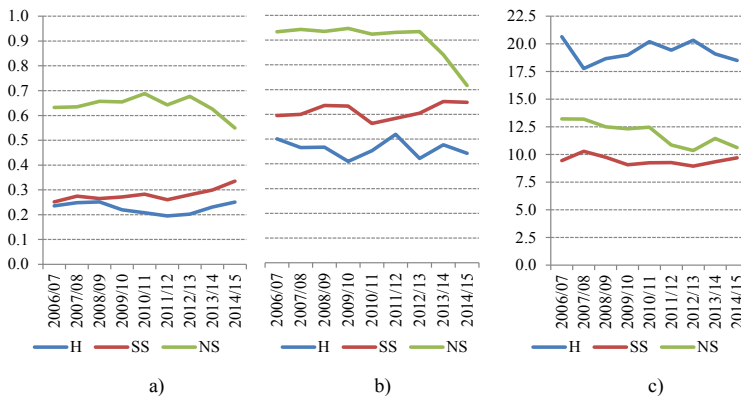


At the end, we have analyzed several aspects of citation behavior of authors publishing in Serbian journals. Characteristics of references cited in national journals are shown in Figure 9. Several clear and expected citation patterns across scientific fields are evident. Authors in the fields of NS cite journal articles more frequently and almost exclusively cite references published in international sources. Regarding the origin and type of references, authors in humanities show similar citation patterns as those from the fields of SS, although an increasing trend in the proportion of cited journal articles is evident in SS disciplines. The fact that the authors in SS&H publish predominantly in national sources somehow contradicts the result that half of the cited references in H and around 60% in SS are from international sources. Proportion of foreign-language references cited in some leading Serbian journals in psychology, sociology, economics, education, history, and political sciences ranges up to 95%. This clearly shows a growing need among Serbian authors in SS&H to address local issues from the global perspective which makes the notion of “national” disciplines a bit cursory and perhaps even ob-

8. Che - Chemistry, Phy - Physics, LS - Life Sciences, PS - Physical Sciences

solete. The age of references cited by authors in H ranges around 20 years which is twice as much as the average age of references cited in SS. It is also worth noticing that the authors in NS actually don't cite the most current literature as one could expect. The effects of journal dropout which was previously shown to affect results on publication patterns are also visible in citation patterns. The first is a sudden drop in the number of citations to international sources in NS, and the second one is a growing trend of citing journal articles in SS. This does not mean that the authors have changed their behavior, but that those authors who are publishing in journals still available in national index show different citation patterns.

Figure 9. Characteristics of references cited in Serbian journals: a) average proportion of references to journal articles, b) average proportion of non-Serbian references, c) average age of references



DISCUSSION AND CONCLUSION

In the presented case study, we have compared publication and citation patterns of scholars in various scientific fields from a national perspective. The fact that Serbia is among the few countries having local citation index, enabled us to provide a more objective analysis of the role of national journals, unlike most of the other studies based on data from international databases that are often biased and selective in coverage. In general, our results are in line with the results of similar studies, showing that Serbian scholars manifest typical differences in publication and citation behavior, but also face same challenges as the other transition or scientifically small countries. We have shown that authors in humanities

and to some extent in social sciences, when compared to those from natural sciences, exhibit more nationally oriented publication and citation behavior, tendency to cite older literature, and stronger preference towards non-journal literature. This last difference is evident both when scholars choose what to cite and where to publish. However, productivity and impact as two main aspects of academic performance are not related in the same way in NS and SS&H. For example, the importance of periodical literature is visible in both publication and citation patterns of scholars in NS, but in the case of SS&H some inconsistencies are noticeable. Journal articles are relatively rarely cited in SS&H although they account for a significant proportion in total productivity of the authors in those fields. It is obvious that non-journal literature plays important role in scholarly communication in SS&H, but it may not necessarily be a dominant aspect of productivity as much as it is a crucial component of impact. Earlier research also confirms that monographs often generate more citations than journal articles in SS&H (Lindholm, Romantschuk & Warner, 1996). Another facet of this inconsistency is that scholars in SS&H are more oriented towards national sources when they choose where to publish, but not nearly that much when they choose what to cite. One possible explanation would be that scholars in SS&H act as bearers of the torch, transferring global knowledge and adapting it for use at the local level. Another, more cynical explanation would be that they are still highly reluctant to confront international competition and accept the challenges of the global knowledge market. In our previous research on similar data (Pajić & Jevremov, 2015) it was shown that scholars in SS&H tend to target regional journals and journals of low impact and even of dubious quality when trying to publish their papers abroad. We have to ask whether this strategy is the reflection of cultural specifics of SS&H fields or merely the model of behavior developed in a rather privileged environment of local productivity where national journals are mostly published by faculties or departments that are not particularly motivated to assert more rigorous quality control.

The process of science globalization is unstoppable. More efficient communication among researchers, emergence of multinational research-funding programs, growing demand for interdisciplinary and collaborative research, and improved accessibility of international conferences have led to the “death of geography” (Zitt & Bassecoulard, 2004). Regarding this process, scholars in SS&H seem to be most concerned with the fate of national languages. Although they are beginning to accept the new reality of English as *lingua franca* of global science communication, this acceptance is not always genuine and intrinsic (López-Navarro, Moreno, Quintanilla, & Rey-Rocha, 2015). In this context, well-coordin-

ated efforts to promote national journals can be rather successful, such as *SciELO Citation Index* of Latin American journals. *SciELO* has provided national journals with strong collaboration and citation networks within the *Web of Science* and enabled them to reach a considerable impact during the initial year of coverage, rather than to act as mere citation donors to already established high-ranked journals (Pajić & Jevremov, 2014). We have shown that without such consistent national strategy small scientific communities and their communication network can be very fragile. Unlike scholars in NS, those from SS&H fields cannot easily shift their communication to the global level. There are several reasons for that: insufficient funding, small scientific community, absence of internationally invisible colleges, constant lagging with respect to international hot topics that are defined in core scientific countries, weak institutional infrastructure (Arunachalam, 2004). Furthermore, epistemic interests of foreign and domestic readers in SS&H are usually quite different, not always in the sense that global audience is interested in global issues. For example, in two studies of Polish sociology (Winclawska, 1996; Webster, 1998), it was shown that social scientists from other countries were more attentive to Polish consequences of the fall of communist regime, while domestic researchers found papers on core topics more interesting. General issues were more or less ignored because the most influential theorists came from Western countries and journals published in English predominantly dictated topics of interest. The situation seems to be very similar regarding the Spanish authors (López Piñero & Hicks, 2015). National policies hence play a crucial role in preserving national science because the Westernization of SS&H merely reflects the global distribution of economic and political power. Our results have shown that national journals still play an important and seemingly irreplaceable role in scientific communication of scholars in SS&H, but we have to ask whether one small, transitional country that is facing serious structural challenges and weak economy can afford to support locally relevant research projects and a rather large number of national journals. Some 20% of researchers in Serbian R&D sector are from SS&H fields and they will compete for only 14% of the total science budget allocated through the current governmental funding program. In this context, national journals are often perceived as mere policy tools in the most formal way (Pajić, 2015a) and their principal role is simply to avoid conflicts and obstructions within the SS&H community. Disagreements regarding the implementation of performance-based evaluation in SS&H are (temporarily) mitigated by the Ministry's decision to allow SS&H researchers to select a number of national journals that will act and be valued as international. However, the question for Serbian and all

similar, relatively small scientific communities is whether local journals are prone to evaluation bias and whether their visibility, liability, and accountability are at the level of international ones that are targeting much wider academic audience.

Our results confirm that general typologies of publication and citation behavior or local journals across scientific fields does not have sufficient support in real data and should be avoided (Tijssen, Mouton, van Leeuwen, & Boshoff, 2006). In fact, it is not so relevant to discuss what is expected or typical behavior, but rather why certain patterns should be labeled that way at all. One possible reason is to understand and explain more easily the nature of scientific communication that is obviously not the same in NS, SS and H. Another possible reason is to justify that behavior. If the productivity of an author consists mainly of articles in journals published by his or her home faculty, than he or she will embrace every result in favor of the crucial importance of national journals for scientific communication. This leads us to the third reason, which is to modify behavior. Assistant professors in chemistry at the University of Novi Sad are expected to publish two articles in international journals, while only one is sufficient in sociology. Full professors in chemistry are expected to publish at least one book chapter, while full professors in sociology are obliged to publish a full-length monograph. In the situation when government bodies are obviously encouraging certain (mis) conceptions about publication and citation patterns in various disciplines, scholars in SS&H seem to be torn, far more than those in NS, between their usual behavior and the rules that reflect new dynamics of knowledge production, dissemination, and usage. As a consequence, most of the authors manage to fulfill basic formal criteria for promotion and tenure, for example to publish an article in an international journal, and apart from that retain their own publishing strategies. Those strategies differ among scholars in SS&H so much that the notion of typical behavior is highly disputable and their ambivalence is making SS&H more *glocal* than global or local. The global part of this *glocalization* is that references in SS&H publications are becoming increasingly internationalized, but the local part is the fact that there will always be the necessity to elaborate certain cultural specifics and differences that could be communicated only through national publications. Peripheral and semi-peripheral countries seem to be more vulnerable to the emergence of such *transnational regional* level of the globalizing social sciences field as they become increasingly dependent on dominant global organizations: journals, networks, and project funders (Heilbron, 2014).

Bibliometric indicators and bibliographic databases have co-evolved with SS&H, at least with the manifested behavior of researchers in those

fields. One can say that this was simply the result of *laissez faire* attitude toward the changes in SS&H (Archambault & Gagné, 2004) because the major scientific information providers had a central role in this process, both by (un)intentionally promoting current science polices and by investing additional effort to improve the coverage of their databases. But we should not disregard the proactive role of several countries in building their own citation indices and developing quality control mechanisms for national journals. Despite some apparent setbacks typical for any transition period, we may say that we are now a large step closer to the more acceptable bibliometrics for SS&H than a decade ago. This does not mean that the skepticism toward quantification of research output (in SS&H) will and should perish. On the contrary, it is now more articulated (American Society for Cell Biology, 2013; Hicks, Wouters, Waltman, de Rijcke, & Rafols, 2015) and sometimes even more radical than before (Callaway, 2016). However, authors in SS&H fields cannot rely on the same *laissez faire* attitude and wait for these criticisms to change the new reality of science accountability as this is very unlikely to happen. Instead, they should ask whether they were, and whether they are willing to be proactive in creating “borderless social sciences” (Michalski, 2008), promoting the quality of local journals, and supporting the enlightenment role of research in SS&H, for example by being more visible and accessible by embracing the emerging concept of open science.

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