



The negative effects of citing with a national orientation in terms of recognition: National and international citations in natural-sciences papers from Germany, the Netherlands, and the UK

Lutz Bornmann^{a,*}, Jonathan Adams^{b,c}, Loet Leydesdorff^d

^a Division for Science and Innovation Studies, Administrative Headquarters of the Max Planck Society, Hofgartenstr. 8, 80539, Munich, Germany

^b The Policy Institute at King's, King's College London, 22 Kingsway, London, WC2B 6LE, UK

^c Institute for Scientific Information, Clarivate Analytics, USA

^d Amsterdam School of Communication Research (ASCoR), University of Amsterdam, PO Box 15793, 1001 NG, Amsterdam, The Netherlands

ARTICLE INFO

Article history:

Received 3 February 2018

Received in revised form 25 July 2018

Accepted 25 July 2018

Keywords:

Bibliometrics

Regression analysis

Cited references analysis

Germany

The Netherlands

The UK

ABSTRACT

Nations can be distinguished in terms of whether domestic or international research is cited. We analyzed the research output in the natural sciences of three leading European research economies (Germany, the Netherlands, and the UK) and ask where their researchers look for the knowledge that underpins their most highly-cited papers. Is one internationally oriented or is citation limited to national resources? Do the citation patterns reflect a growing differentiation between the domestic and international research enterprise? To evaluate change over time, we include natural-sciences papers published in the countries from three publication years: 2004, 2009, and 2014. The results show that articles co-authored by researchers from Germany or the Netherlands are less likely to be among the globally most highly-cited articles if they also cite “domestic” research (i.e. research authored by authors from the same country). To put this another way, less well-cited research is more likely to stand on domestic shoulders and research that becomes more highly-cited is more likely to stand on international shoulders. A possible reason for the results is that researchers “over-cite” the papers from their own country – lacking the focus on quality in citing. However, these differences between domestic and international shoulders are not visible for the UK.

© 2018 Elsevier Ltd. All rights reserved.

1. Introduction

The sciences develop internationally, but the funding is mainly national. In a time of “America first” and similar developments in other countries, national governments are challenged to legitimate funding in terms of national priorities. The tensions and trade-offs between international and national perspectives can be expected to differ among disciplines. While one can legitimately dispute positivism in “German sociology” (Adorno et al., 1969; Leydesdorff & Milojević, 2015), alternative approaches in physics, e.g., “Deutsche Physik” or biology on the basis of national aspirations can be considered

* Corresponding author.

E-mail addresses: bornmann@gv.mpg.de (L. Bornmann), jonathan.adams@clarivate.com (J. Adams), loet@leydesdorff.net (L. Leydesdorff).

obscure (Graham, 1974; Lecourt, 1976). However, there can be a tension between national and international research agencies. Hagendijk and Smeenk (1989) used the metaphor of “national subfields” which may be specific in the dependency on domains and resources like a specific lake district. Merton (1973) distinguished between the development of the international literature and national “styles” in the social sciences responsive to local conditions. Scientific elites can play a mediating role in appeasing the tensions that emerge between national resources and international main-stream research (Mulkay, 1976).

Adams (2013) has argued that there is a “fourth age” of research in which the growing divide between international and domestic research will influence each nation’s ability to draw on the global knowledge base and influence its national scientific wealth. From this perspective, one can expect that a comparative analysis of references in highly-cited papers may show some differences in the degree to which the most impactful (relatively highly-cited) research and its mainstream “platform” research might draw on an international or a relatively domestic knowledge base. Policy interventions might be deemed necessary where the disparity and connection between the domestic base and the international network grows too large, and the related management considerations might apply equally at institutional and national levels.

In this study, we review a diversity of specific bibliometric studies at the country level and identify a gap of policy significance. We suggest that one needs to ask not only “which country produces the highly-cited papers” but also “can we determine the countries on whose research the highly-cited papers build”? Whom do researchers cite given the pressures to maintain both a national and international profile? Is the orientation *tout-court* international (Merton, 1942) or are national contributions nevertheless cited above expectation? Abramo and D’Angelo (2018) noted that country affiliations of the citing authors can be used to trace the countries benefiting from results produced in a national research system.

To test national benefits we focus on the research output of three leading European research economies in the natural sciences and ask where their researchers look for the knowledge that underpins their most highly-cited papers. Is this restricted to national resources or does it reflect a growing differentiation between the domestic and the international research enterprise? Which implications does this have for growing international networks and the way knowledge is shared? And does the outcome indicate differences in the degree to which each country’s knowledge is useful for itself and other countries?

2. Literature overview

Bibliometric results at the national or country level can be found not only in research papers (e.g. Bornmann, Wagner, & Leydesdorff, 2015), but also in reports (e.g. Kamalski et al., 2017; Michels, Fu, Neuhäusler, & Frietsch, 2014; National Science Board, 2016), in news items (e.g. Marshall & Travis, 2011; Van Noorden, 2014) and on web sites (see statistics e.g. by SCImago at <http://www.scimagojr.com/countryrank.php> or by Nature at <https://www.natureindex.com>). The foundation of most studies, published in print or on the Web, is a global comparison of national publication outputs and citation impacts.

An alternative focus for studies that do not address the global research system, may be (1) specific countries, such as China, the UK, and the USA, (2) specific alliances, such as the European Union, and (3) specific country types, such as emerging economies. For example, Leydesdorff and Wagner (2009) and Wagner (2011) studied the dominance of the USA in the global science system; while Adams (2010) investigated the international comparative performance of the UK. Adams, Pendlebury, and Stembridge, (2013) reported on the global research and innovation impact of the BRICK economies (Brazil, Russia, India, China and South Korea). Aagaard and Schneider (2016) analyzed the relationship between research policy inventions and academic performance in Denmark.

Many analyses concur with established views of relative national performance, but some lead to controversial conclusions. Rodríguez-Navarro and Narin (2018) address the so-called EU paradox of high scientific performance (in terms of bibliometric indicators) but apparently low innovation performance (in terms of technology indicators) (see also Rodríguez-Navarro & Brito, 2018). The authors suggest that the paradox rests on a false assumption based on erroneous performance indicators (i.e., the use of simple publication counts). The authors argue that it is just the frequently-cited papers that critically underpin innovations. On this indicator, the EU falls behind the USA in research performance.

Many country-level studies include China because of the disruptive effects of its economic growth on a previously stable world order. Most of these studies describe China’s explosive increase in publications (e.g. Xie, Zhang, & Lai, 2014) whilst finding that citation impact remains relatively low (e.g. Leydesdorff, Wagner, & Bornmann, 2014; Wagner, Bornmann, & Leydesdorff, 2015; Zhou & Bornmann, 2015). However, Confraria, Godinho, and Wang (2017) use more recent data and find that “the average Chinese citation impact is very close to the world average, and that China is already performing considerably better than the world average in some scientific areas, such as ‘Agricultural Sciences’, ‘Engineering’, ‘Mathematics’, ‘Plant & Animal Science’, and ‘Social Sciences’” (p. 269). The reasons for China’s rise in research performance have been discussed (Sun & Cao, 2014) and suggestions made around increasing the quality of research (Yang, 2016).

Many bibliometric studies at the country level use only simple indicators such as raw paper counts and citation averages. Some studies, however, have investigated bibliometric data in more elaborate and revealing ways, e.g. by using country-shares of world citations in relation to shares of publications. Hassan and Haddawy (2013) explored the knowledge flows among countries and developed the web-based tool Knowledge-MAPPER. Based on a new source of bibliometric data (Microsoft Academic), Dong, Ma, Shen, and Wang, (2017) presented numbers on country-shares of global citations and related them to productivity: “During the early 20th century, the US, Germany, and the UK created 95% and collected 97%

Download English Version:

<https://daneshyari.com/en/article/6934055>

Download Persian Version:

<https://daneshyari.com/article/6934055>

[Daneshyari.com](https://daneshyari.com)