Research Policy xxx (2016) xxx–xxx

Contents lists available at ScienceDirect

Research Policy

journal homepage: www.elsevier.com/locate/respol

Determinants of citation impact: A comparative analysis of the Global South versus the Global North

Hugo Confraria[a,*], Manuel Mira Godinho[b,c], Lili Wang[a]

[a] UNU-MERIT, Maastricht University, Boschstraat 24, 6211AX Maastricht, The Netherlands
[b] ISEG (Lisbon School of Economics and Management), Universidade de Lisboa,Rua do Quelhas 6, 1200-781 Lisboa, Portugal
[c] UECE (Research Unit on Complexity and Economics), Rua Miguel Lupi 20, 1249-078 Lisboa, Portugal

ARTICLE INFO

Article history:
Received 21 June 2016
Received in revised form
17 November 2016
Accepted 21 November 2016
Available online xxx

JEL classification:
O38
O39
O57

Keywords:
Science policy
Development
Global South
Bibliometrics
Scientific impact
Citation impact

ABSTRACT

The impact of the scientific output produced by different nations in different fields varies extensively. In this article, we apply bibliometric and econometric analysis to study how citation impact varies across countries. This paper differs from previous research in that a cross-section model is put forward to account for such variation. A special focus is given to the Global South, as countries in this group have been converging with the Global North recently. We find that previous citation impact, level of international collaboration and total publications in a specific scientific field are important determinants of citation impact among all nations. However, specialization in particular scientific fields seems significantly more important in the Global South than in the Global North. These findings imply that most lower- and middle-income countries would better concentrate their resources in generating higher critical masses in specific fields, in addition to pursuing long-lasting international collaboration partnerships, as these actions may lead to higher impact research.

© 2016 Elsevier B.V. All rights reserved.

1. Introduction

There is a widely held assumption that scientific research has positive effects on economic development, namely by increasing human capital, by driving productivity growth, or by providing evidence to inform policies and practice (DFID, 2014; Salter and Martin, 2001). However, the process by which this happens is complex, and there has been extensive debate about the extent to which development funders and governments in the Global South, or more generally in the peripheries, should invest in research.

A crucial aspect for analysing the scientific performance of countries is to understand whether their scientific output is having an international impact or influence. The impact of published articles can be regarded as being one crucial aspect of scientific quality, and is thus a "proxy" for quality, as follows from the bibliometrics literature (Moed, 2005). Studies that focus on measuring the scientific impact of countries usually use citation analysis, as this arguably enables international comparisons to be more objective (Garfield, 1979).

There are numerous studies in this field that assess research at the country level, however only a few try to understand what the determinants of citation impact are. This type of analysis can help to understand why some scientific systems are performing better than others. Overcoming this gap in the literature can be particularly helpful to provide relevant insights for science policy, for furthering the policy learning cycle and ultimately for increasing the accountability of public policies.

Using the *InCites*™ tool of Web of Science/Thomson Reuters (*WoS*™), this article applies bibliometric and econometric analysis to evaluate which countries in the world are producing research with higher research citation impact, and to account for those factors that lead to higher results. The ability to estimate the expected number of citations of countries, by taking country characteristics and other variables at the subject category level, can be helpful for policy-makers in low-income and middle-income countries (the

* Corresponding author at: UNU-MERIT, Maastricht University, Boschstraat 24, 6211AX Maastricht, The Netherlands.
E-mail addresses: confraria@merit.unu.edu, hugoconfraria@gmail.com (H. Confraria), mgodinho@iseg.ulisboa.pt (M. Mira Godinho), wang@merit.unu.edu (L. Wang).

http://dx.doi.org/10.1016/j.respol.2016.11.004
0048-7333/© 2016 Elsevier B.V. All rights reserved.

Please cite this article in press as: Confraria, H., et al., Determinants of citation impact: A comparative analysis of the Global South versus the Global North. Res. Policy (2016), http://dx.doi.org/10.1016/j.respol.2016.11.004

Global South), where public funds for financing the research system are scarce.

Our main objectives are: first, to create a comprehensive framework that can be used in the interpretation of different countries' citation impact, particularly in the Global South; second, to contribute to citation theory by understanding how the citation impact indicators commonly used in high-income countries can be used in lower income contexts, and; third, to provide assistance to policy-makers by identifying those independent variables that significantly influence the citation impact of countries.

In what follows, we will first focus on the framework aspects of our analysis, then we will describe the data and methodology used, and afterwards we will discuss the results obtained. Finally, conclusions will be put forward.

2. Background

2.1. Science in the Global South

The North–South divide is generally considered based on its political and socio-economic dimensions. Commonly, definitions of the Global North include North America, Western Europe, and developed parts of East Asia, while the Global South is perceived as being made up of Africa, Latin America, and developing Asia, including the Middle East. In this study we define Global North and Global South in two ways: firstly, by using the World Bank definition of low & lower-middle-income countries versus upper-middle & high-income countries[1]; and secondly, by dividing the world between OECD countries[2] and non-OECD countries. This possible division of the world into Global South and Global North has been perceived to be not only in terms of wealth or human development, but also in terms of scientific development.

In this context, the understanding of the links between research investment and development has attracted an increasing attention. Although it has been recognized that there is no unique path to successful economic development which should be emulated by every country, scholars such as Bernardes and Albuquerque (2003), Fagerberg and Godinho (2004) and Lall (2000) have stated that, in recent decades, countries that have caught up rapidly have tend to invest in their higher education system and have developed indigenous research efforts. According to Mazzoleni and Nelson (2007), the research programmes that effectively contributed to catch-up did not operate within "ivory towers", but were rather oriented towards an actual, or potential user-community. These programmes were projected to help solve problems, and to advance technology, being applicable to a particular economic area.

There are several ways in which research carried out within national borders can help provide both effective and focused responses to domestic problems, namely by being an enabler for providing up-to-date and qualified training for the new generations of university graduates, and also by helping to attract qualified people to the country, whilst improving the quality of local advice to government and industry (Goldemberg, 1998). Investments in science can not only provide knowledge and skills for increasingly knowledge-intensive industries, but they also generate a "domestic base of good scientists, which can break into the international networks where new technologies are being hatched" (Nelson, 2005). These scientists can act as important conduits of frontier knowledge into the local academic research community (Barnard et al., 2012), which can potentially diffuse that knowledge to students, the economy, and the general public.

Hence, the "scientific culture" of nations (Godin and Gingras, 2000) has been recognised as being a relevant dimension which is achieved through countries investing in science. As stated in the latest *UNESCO Science Report*, "the critical thinking that comes with science education is vital to train the mind to understand the world in which we live, make choices, and solve problems. Science literacy supplies the basis for solutions to everyday problems, reducing the likelihood of misunderstandings by furthering a common understanding. It provides answers that are testable and reproducible and, thus, provides the basis for informed decision-making and effective impact assessments" (UNESCO, 2015).

These arguments reveal the importance of science for international development, although from an economic perspective, one has to take into account the opportunity costs arising from investing in research. Therefore, a necessary and integral part of science policy is to monitor and evaluate the various facets of the scientific enterprise. By measuring the different characteristics of the scientific systems, it is possible to create and manage policies for improving the scientific performance of countries.

2.2. Can the Global South use the same bibliometric indicators as those used in the North?

The use of bibliometric indicators for assessing the impact of scientific publications has been on the rise in recent years. The ability of the use of such indicators to lower costs and time of assessment, without being invasive, and to enlighten political choices by carrying out international comparisons, as well as their perceived objectivity, have all been some of the main forces behind its growing popularity (Moed, 2005). However, the bibliometric assessment of research performance is based on a central assumption: namely that scientists who have to communicate something important, do so by publishing their findings in international peer-reviewed journals. This choice unavoidably introduces a limited view of a complex reality (van Raan, 2004). For instance, regionally focused papers in the Global South (e.g. in Agricultural Sciences) may make particularly important contributions to the local economy, yet remain uncited, as researchers elsewhere are indifferent to those topics. Citation patterns can also differ for other reasons: there are considerable database coverage biases (Moed, 2005; Rafols et al., 2015); the research focus can be locally or more internationally oriented (van Raan, 2003); there is a language bias, as most journals in *WoS*™ are written in English (Leeuwen et al., 2001), and; finally, countries have different levels of access to some journals, due to their financial constraints, selectivity, or publication policies (Lawrence, 2003). This last limitation is particularly relevant in the Global South and may have acted in the past as a stimulus for researchers from those countries to seek publication through other channels, namely through other means that are not registered in *WoS*™, or in other similar databases. This problem was challenged recently by the Research4life[3] partnership, which intends to provide developing countries with easy access to peer-reviewed content. This initiative, which aims to reduce the "e-gap" between rich and poor countries, could contribute to a "normalization" of access to the international circuit in the future. Yet this is still a limitation that we have to keep in mind when interpreting our results.

At the same time, both *WoS*™ and other indexing systems have considerably enlarged the database's coverage of Latin American and Caribbean (LA-C) journals in recent years. According to

[1] See the list of countries here: http://data.worldbank.org/about/country-and-lending-groups.

[2] See the list of countries here: http://www.oecd.org/about/membersandpartners/list-oecd-member-countries.htm.

[3] http://www.research4life.org/.

Please cite this article in press as: Confraria, H., et al., Determinants of citation impact: A comparative analysis of the Global South versus the Global North. Res. Policy (2016), http://dx.doi.org/10.1016/j.respol.2016.11.004

Download English Version:

https://daneshyari.com/en/article/5103857

Download Persian Version:

https://daneshyari.com/article/5103857

Daneshyari.com