

Does an Asia-Pacific Research Area Exist from a Bibliometric Point of View?

Dirk Tunger*¹, Stefanie Haustein^{1,2}

¹{*d.tunger, s.haustein*}@fz-juelich.de
Forschungszentrum Jülich, Central Library
52425 Jülich (Germany)

²Heinrich-Heine-University Düsseldorf, Department of Information Science
Universitätsstraße 1, 40225 Düsseldorf (Germany)

Introduction

This contribution focuses on eleven countries¹² in the Asia-Pacific region by evaluating their national research output with the help of bibliometric indicators. Over two million journal articles published by these countries between 1998 and 2007 in ISI-listed periodicals are analysed (HAUSTEIN, MITTERMAIER AND TUNGER, 2008). Further it describes the different forms of international scientific collaboration in general and tries to give reasons for them (HAUSTEIN, S., TUNGER, D., HEINRICHS, G. AND BAELZ, G, to be published in *Scientometrics*).

Method

Consideration is given to the following aspects in order to reveal the strengths and weaknesses of countries in the different research disciplines:

- International comparison of publication activity
- Co-publications between the countries studied
- Discipline-specific publication and citation profiles making use of a global benchmark

With the aid of the publication profiles it can be shown that China, for example, displays a high degree of publication activity in the materials sciences and is involved in about 30 % of all research articles and reviews published worldwide in this field in 2007. China is also very active in the field of chemistry, and contributes about 20 % of articles produced worldwide in 2007. However, China has a very low proportion of medical publications, which represent a major focus in the Science Citation Index and account for about one third of the database. Altogether, the publication profiles provide detailed insights into a country's major scientific priorities¹³ (GLÄNZEL, DEBACKERE AND MEYER, 2008; LEYDESDORFF AND WAGNER, 2008; LEYDESDORFF AND RAFOLS, 2009).

The present contribution focuses on addressing the question of whether scientific cooperation intensified in the Asia-Pacific area from 1998 to 2007. In order to answer this question, in addition to the aspects mentioned above, co-publication networks are generated among the eleven countries to observe the development of cooperation

¹² This contribution focuses on the following countries: Australia, China, Indonesia, Japan, Malaysia, New Zealand, Singapore, South Korea, Taiwan, Thailand and Vietnam.

¹³ It has been discussed, that the measured increase in Chinese publication output is caused by recent changes in Thomson Reuters' WoS coverage policy only. However, a general increase of Chinese publications can be observed in well-established ISI journals as well.

bonds in the region. A strengthening can be observed in the network diagrams. The lines indicate the number of co-authored journal articles in 1998 and 2007 within the eleven countries analysed. The number of joint publications has been normalized with respect to the total output of the two countries by applying Salton's measure of *international collaboration strength* (GLÄNZEL AND SCHUBERT, 2007; SALTON AND MCGILL, 1986). Thus, the strengthening of the network cannot be explained by the overall increase in scientific output. Comparing the co-publication network of the Asia-Pacific countries to a network for a set of sample countries, it was confirmed that inner-Asian scientific collaboration has developed more extensively than the global average.

Results

The results of all aspects studied finally permit the conclusion to be drawn that scientific work and also scientific collaboration within the Asia-Pacific area has intensified in the period under observation from 1998 to 2007. The present contribution provides details of the corresponding priorities and actors on the level of the individual countries.

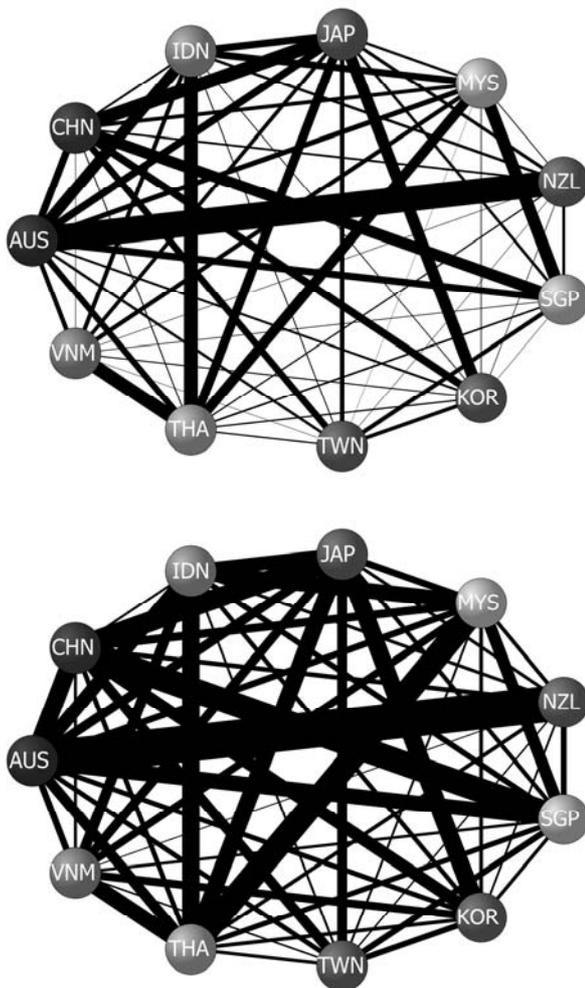


Figure 1. Co-publications between Asia-Pacific Countries in 1998 and in 2007 normalized with Salton's international collaboration strength.

References

- Glänzel, W., Debackere, K. and Meyer, M. (2008). 'Triad' or 'tetrad'? On global changes in a dynamic world. *Scientometrics* 74, 71-88.
- Glänzel, W. and Schubert, A. (2007). Analysing Scientific Networks Through Co-Authorship. In *Handbook of Quantitative Science and Technology Research. The Use of Publication and Patent Statistics in Studies of S&T Systems*, H.F. MOED, W. GLÄNZEL AND U. SCHMOCH Eds. Kluwer Academic Publishers, Dordrecht / Boston / London, 257-276.
- Haustein, S., Mittermaier, B. and Tunger, D. (2008). Bibliometric Analysis Asia-Pacific Research Area. Commissioned by the International Bureau of the BMBF at DLR. Jülich: Forschungszentrum Jülich. Retrieved March 8, 2010, from <http://www.kooperation-international.de/china/themes/info/detail/data/45180/backpid/12/>
- Haustein, S., Tunger, D., Heinrichs, G. and Baelz, G. (to be published in *Scientometrics*). Reasons for and Developments in International Scientific Collaboration: Does an Asia-Pacific Research Area Exist from a Bibliometric Point of View?
- Leydesdorff, L. and Rafols, I. (2009). A Global Map of Science Based on the ISI Subject Categories. *Journal of the American Society for Information Science and Technology* 60, 348-362.
- Leydesdorff, L. and Wagner, C.S. (2008). International collaboration in science and the formation of a core group. *Journal of Informetrics* 2, 317-325.
- Salton, G. and McGill, M.J. (1986). *Introduction to Modern Information Retrieval*. McGraw-Hill Inc., New York.