

Identifying research labs of MNEs and analyzing Global Innovations based on patent data

Introduction

'Global Innovations' is a term used to describe new products and new technologies that are not only made for global markets, but where the ideas and inventions stem from global teams.

When it comes to measuring the internationalization of R&D with the help of patent indicators, usually co-patents are used in the literature. Patel and Vega (1999), for example, specifically address the issue of internationalization of technologies using patent data of a set of multinational enterprises. They find that companies tend to internationalize in areas of their individual strengths and they interpret this finding as a proof of the adaptation to the host market and an enrichment of the preceding production processes. In addition, this also supports the efforts to look for complementary technologies and knowledge.

More recently, however, a discussion of Global Innovations as results of a special form of innovation processes in multinational companies occurred (e.g. Boutellier et al. 2013; Thomson and de Rassenfosse 2016). Global Innovations make use of global knowledge resources, access global markets and they benefit from a division of labor between research teams in different time zones and with different cultural background.

Research Question

This presentation suggests a method for the identification and analysis of the trends and characteristics of Global Innovations based on patent data as well as a method for the identification of foreign research labs of (German) multinational companies. We define Global Innovations as patent applications with inventors from at least two continents – Europe, Americas, Asia/Pacific, and Africa. The assignment of patents to continents is based on the address of the inventor to be able to also count global innovations within a firm. The labs are identified by a rule-based approach using individual thresholds (critical mass). The method is validated against a small set of companies where the labs are known (Gold Standard). Company data from BvD's Orbis database is taken into account, especially to identify dependent firms and companies. For this purpose Orbis was matched with PATSTAT based on a similarity measure of company/applicant names. We also briefly present the matching procedure and the quality – in terms of recall and precision – of this approach.

Preliminary results

First results show: Global Innovations have been on the rise in the last decade. About 4.5% of all transnational patent filings are global innovations, i.e. research projects that are handled by teams in different continents, and the number has grown quite significantly since the 1990s. Global innovations have also gained importance in international cooperations per se. In 2013, nearly 70% of all international co-patents were global innovations. Europe and North America show the highest numbers of global innovations in absolute terms, however, in relative terms, the countries from the "rest of the world" show the highest engagement in global innovations.

References

- Boutellier, R.; Gassmann, O.; von Zedtwitz, M. (2013): *Managing Global Innovation: Uncovering the Secrets of Future Competitiveness*, Springer, Berlin.
- Patel, P.; Vega, M. (1999): Patterns of internationalisation of corporate technology: location vs. home country advantages. In: *Research Policy*, 28, pp. 145-155.
- Thomson, R.; de Rassenfosse, Gaétan, (2016): *R&D Offshoring and Home Industry Productivity*, available at SSRN: [https://ssrn.com/abstract= 2812184](https://ssrn.com/abstract=2812184) or <http://dx.doi.org/10.2139/ssrn.2812184>