

## **THE GLOBAL RACE FOR INVENTORS' BRAINS: A new indicator based on patent data**

The United States is the most popular destination for migrating inventors, followed by Canada and Australia. European countries – including Germany, Italy and the UK – are less successful in attracting inventors from abroad. These are among the findings of research by **Carsten Fink**, **Ernest Miguelez** and **Julio Raffo**, three economists at the World Intellectual Property Organization (WIPO)

Their study, to be presented to the NORFACE migration conference at University College London this week, shows that the difference in inventor immigration rates between the US and other countries is even larger when looking only at migrants from non-OECD countries – in large part due to the sizeable inflows of skilled Indian and Chinese nationals.

The research analyses for the first time internationally comparable data on the international mobility of inventors and studies why those highly skilled workers move from one country to another.

Although the use of patent data for migration studies is not new, this is the first study to assemble inventor mobility data for a large number of sending and receiving countries, and over a long time period. Applications under the Patent Cooperation Treaty (PCT), unlike other patent systems, contain information on the nationality and residence of inventors at the time of application.

Compared with other migration datasets, the PCT-based data include two important features. First, patent information (and inventors' migratory background) is recorded on a yearly basis, enabling time-series analysis – as opposed to census data, for example, which only become available every ten years.

Second, this new dataset characterises international mobility at the upper tail of the distribution of skills. Inventors are arguably of special economic importance, as they are behind the new technologies and products that spur economic growth and create better paid jobs.

The authors argue that patent data can provide new insights into the determinants of the international mobility of highly-skilled workers. In addition, they can shed light on a wide range of phenomena, ranging from the migration decisions at the level of individuals, to the contribution of immigrants to economies' innovation performance and the international diffusion of knowledge and ideas.

Existing studies suggest that the migration rate for the general population irrespective of schooling levels stood at 1.9% around 2005 and that for tertiary educated workers at around 4.8%.

The study's patent data point to a considerably higher migration rate for inventors of 8-9% during the 2000s. They also show that this rate varies with the level of development of the emigrating country. While the emigration rate of inventors in high-income countries stood at only 5-6%, low- and middle-income countries showed emigration rates of 35-40%.

When looking at the determinants of inventor migration flows, the authors find that migrating inventors respond to similar characteristics as the general population of migrants – underlining the suitability of patent data for migration analysis.

In particular, economic incentives positively affect inventors' decisions to migrate and the costs of relocating to another country exert a negative influence on these decisions. But they also find evidence of skill-selective immigration policies in the main receiving countries.

Ernest Miguelez, one of the co-authors, says:

'One of the most striking features of our inventor migration data is that the implied migration patterns resemble what we know about the mobility of engineers, scientists and information technology personnel from anecdotal evidence, the media, as well as country studies and surveys.'

He also observes that:

'During the 2000s, we find that four to five out of ten international innovations under the PCT system generated by African nationals originated from outside their home countries.'

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'The global race for inventors' brains' by Carsten Fink, Ernest Miguelez and Julio Raffo from the Economics and Statistics Division of the World Intellectual Property Organization (WIPO)

The new inventor migration database is described in the paper 'Measuring the international mobility of inventors: A new database' by Ernest Miguelez and Carsten Fink, forthcoming at: [http://www.wipo.int/econ\\_stat/en/economics/publications.html](http://www.wipo.int/econ_stat/en/economics/publications.html)