

Researchers who change country produce more influential work

SCIENCE is an international affair. Researchers from different countries frequently collaborate with each other, a process made ever easier by the rise of electronic communications. Sometimes, they actually change country to do so. Marie Curie moved from Poland to France. Guglielmo Marconi moved from Italy to Britain. Nikola Tesla moved from Austria-Hungary to America.

Those are famous historical examples, but these days such migration is commonplace. Presumably, all the gadding about leads to better research. But scientists do not like to work on presumption, so two studies published in *Nature* this week have tested the idea. Both conclude that yes, it probably does.

Cassidy Sugimoto of Indiana University, in Bloomington, and her colleagues looked at papers listed in “Web of Science”, a database that tracks how often an article is cited by another. They restricted their analysis to studies published between 2008 (the first year for which the database held complete listings of a paper’s authors and their institutional affiliations) and 2015. That narrowed the field to around 14m papers, on one or more of which some 16m different researchers had been listed as an author. Dr Sugimoto classified researchers whose country of affiliation remained unchanged during the period studied as “non-mobile”. This was true of 96% of them. The remaining 4%, who had changed country at least once, Dr Sugimoto classed as “mobile”.

She then looked at the number of citations each scholar’s published papers had received. More influential work would be expected to garner more citations. Thus researchers’ citation records are commonly regarded as proxy measurements for the quality of the science they produce. She and her colleagues found that, whatever their country of origin, mobile researchers produced more highly cited works than did their non-mobile peers. The boost in citations ranged from 10.8% for North American scholars up to 172.8% for scientists from eastern Europe.

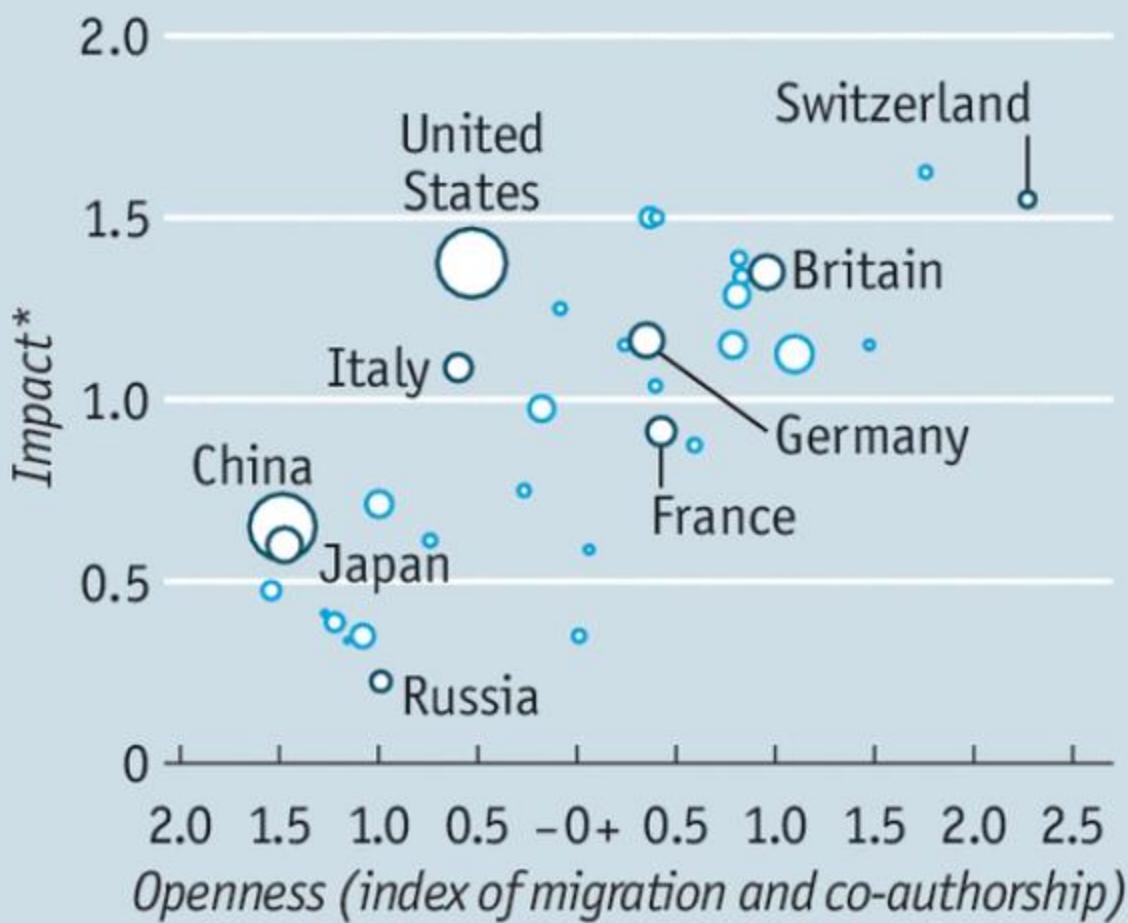
Dr Sugimoto’s analysis does not, admittedly, show whether high citation is a result of moving country or merely a consequence of only the brightest and best making such moves. But the second paper, by Caroline Wagner of Ohio State University, in Columbus, and Koen Jonkers of the European Commission’s Joint Research Centre, in Brussels, suggests that these peripatetic individuals certainly do benefit the countries that host them.

Abroad effect

Impact of scientific papers, 2013

No. published, '000

1 100 400 800



Source: *Nature* *Index based on field-weighted citations

Economist.com

Dr Wagner and Dr Jonkers used regression analysis, a statistical technique, to look for correlations between a country's spending on research and development (R&D), the flow of scientists in and out of it, and the quality of the science produced by its researchers (as indicated by the number of citations they received). The pair discovered that places with large numbers of scientists coming and going did indeed produce papers that were more highly cited (see chart). They found no such relationship between a country's R&D spending and its scientific impact. High-spending countries produced more papers, but proportionately no more of the highly cited ones than countries which spent less.

One notable outlier, the United States, was ranked highly for scientific impact by the analysis, despite scoring poorly on openness. But, compared with the others on the list, the United States is both huge and has a large home-grown scientific workforce that is mobile between the member states of the union.

The best analogy to this that Dr Wagner and Dr Jonkers could come up with was the European Union. This has more people than the United States (510m compared with 320m), also permits unfettered travel between its members and, like the American federal government, has research programmes that provide cash for scientists from different institutions to collaborate. According to Dr Wagner and Dr Jonkers, EU scientists published around 40% of the top tenth of the world's most-cited papers in 2014, while America produced around 35%. Per head, that is a victory for the Yankees. But the EU's share of those highly cited papers has risen since 2000, while America's is in decline.

Many politicians have done a good deal of head-scratching over how to get the best scientific bang for their buck. Though it may be an unpopular message in some countries, these two studies suggest that an open door for eggheads will help.

Source : The Economist