

Scientific Publications³⁵⁰

C 7

A large proportion of new technologies and services is based on developments and results from science. Bibliometric indicators and metrics are therefore used as a measure of scientific performance to assess the performance of a research and science system in quantitative and qualitative terms.

The bibliometric database Web of Science (WoS) records publications in scientific journals and citations of these publications worldwide. The research affiliation of scientists as referenced in the database makes it possible to assign individual publications to a specific country. If several authors from different countries are involved in a publication, they are included in the calculations in a fractioned counting method. Indicators regarding the quantity and quality of specialist publications can be used to assess the performance of a research and science system.

The publication shares of selected countries and regions in all publications in Web of Science (C 7-1) show significant changes for the comparative view of the years 2009 and 2019. Most countries, including the large western European nations of Germany, France, and the UK, as well as the USA, have lost publication shares. The German publication share has fallen from 5.3 to 4.1 percent, the British from 5.5 to 4.3 percent, the French from 3.8 to 2.5 percent and the USA's from 23.7 to 17.8 percent. This contrasts with an enormous increase in China's share of publications from 9.3 to 22.5 percent.

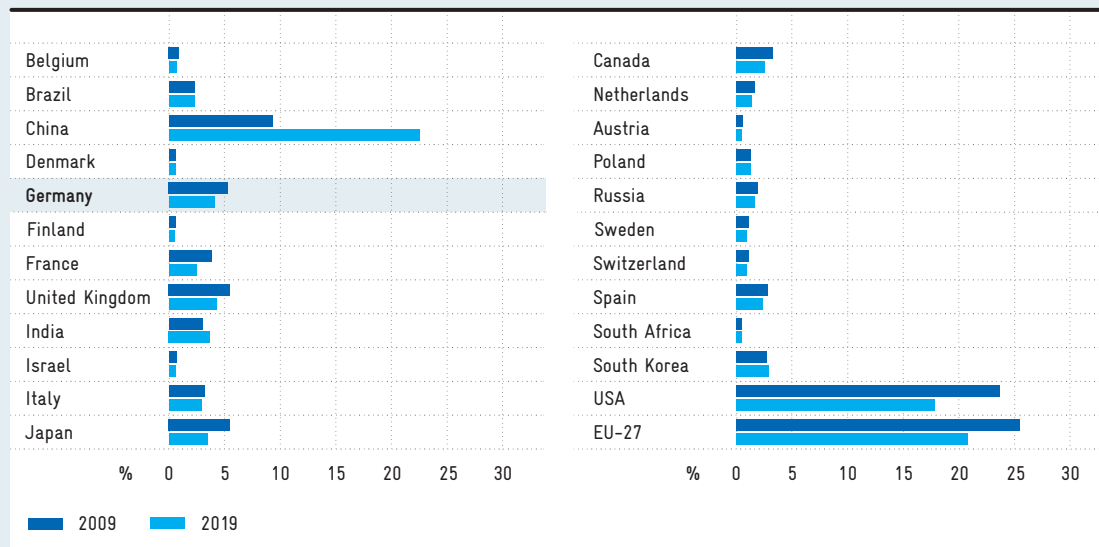
The international alignment (IA) of selected countries and regions in publications in Web of Science (C 7-2) is an indicator of the relative quality of scientific publications. Germany's index score was 10 in 2017, down from 14 in 2009. Publications by authors from Germany have thus relatively lost quality. The publication quality of almost all countries that performed above average in 2009 has declined in relative terms. China was again able to improve its relative publication quality, achieving an index value of 4 for 2017.

The scientific regard (SR) indicator of selected countries and regions for publications in Web of Science (C 7-3) shows that the index value for articles from Germany has fallen from 7 to 2. Articles from Germany were thus cited less frequently in 2017 compared to 2009 than other articles in the journals in which they appeared. This weakening trend is evident in most of those countries that had an above-average index value in 2009. Significant improvements to an above-average index score were achieved by China and Italy.

Fig. C 7-1

Percentages of all publications from selected countries and regions in 2009 and 2019

Download data



Fractional counting.

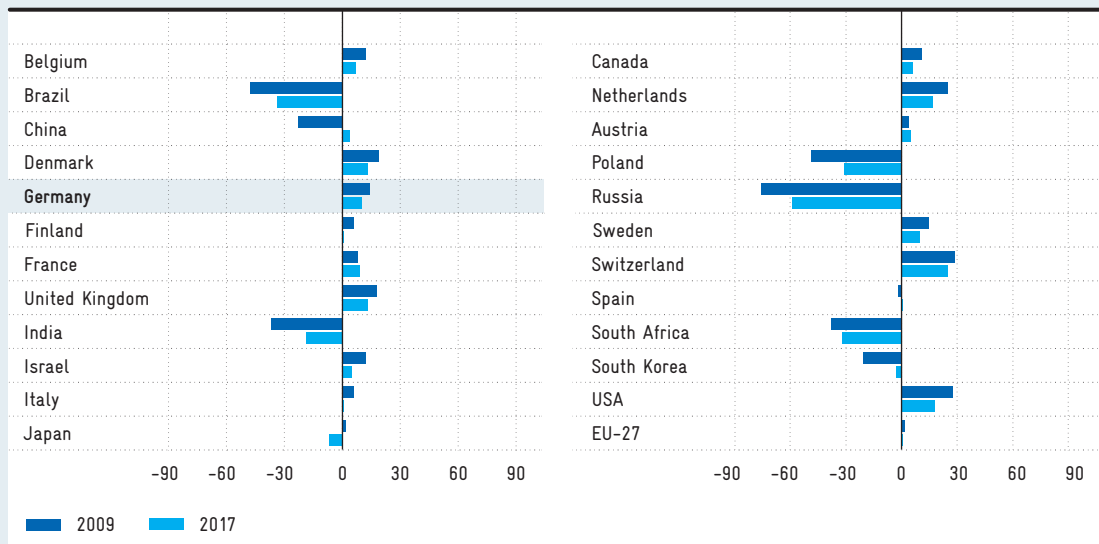
Source: Web of Science. Research and calculations by DZHW in Stephen and Stahlschmidt (2021).

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Fig. C 7-2

International alignment (IA) of publications from selected countries and regions in 2009 and 2017 (index values)

Download data



The IA index indicates whether a country's authors publish in internationally more highly recognized or less highly recognized journals relative to the world average. Positive or negative values indicate an above-average or below-average IA.

Fractional counting.

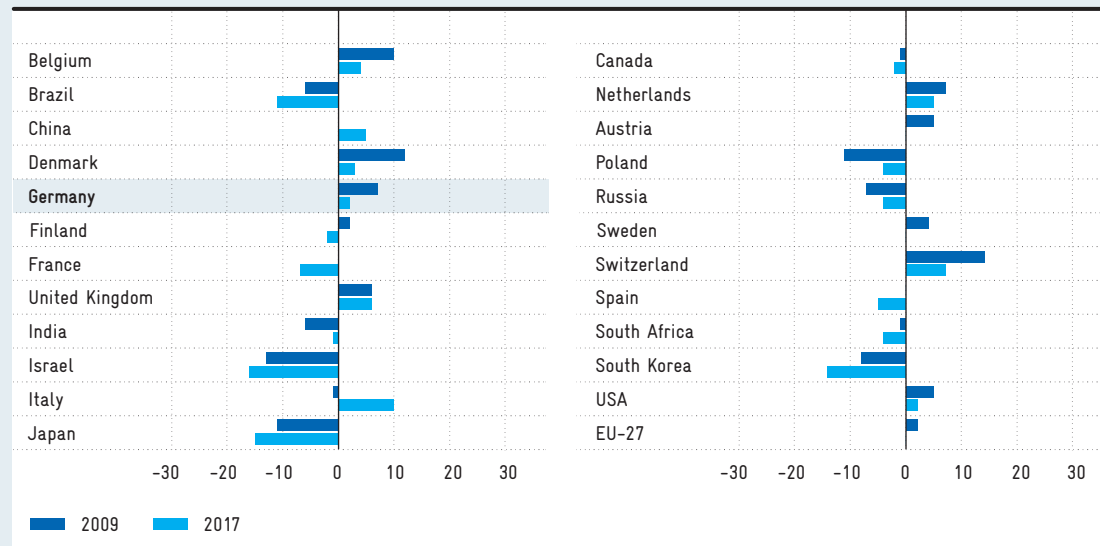
Source: Web of Science. Research and calculations by DZHW in Stephen and Stahlschmidt (2021).

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Scientific regard (SR) of publications from selected countries and regions in 2009 and 2017 (index values)

Fig. C 7-3

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The SR index indicates whether a country's articles are cited on average more frequently or more seldom than other articles in the journals in which they appeared. Positive or negative values indicate an above-average or below-average scientific regard. Fractional counting.

Source: Web of Science. Research and calculations by DZHW in Stephen and Stahlschmidt (2021).

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