

C7 Scientific Publications⁴⁸⁰

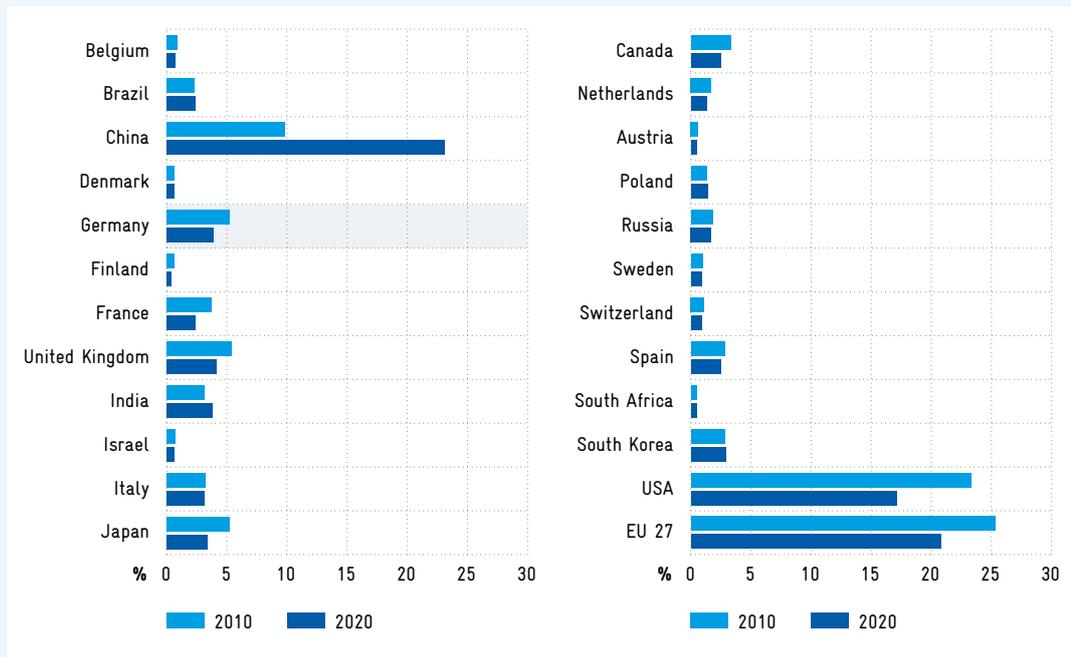
A large part of new technologies and services is based on developments and results from science. Bibliometric indicators and metrics are therefore regularly used as a measure of scientific performance to assess the performance of a research and science system in quantitative and qualitative terms. The bibliometric database Web of Science records publications in scientific journals and citations of these publications worldwide. The indication of the location of the scientists' research institutions makes it possible to assign individual publications to countries. If several authors from different countries are involved in a publication, they are included in the calculations in a fractionated counting method. Indicators regarding the quantity and quality of scientific 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 the Web of Science (C 7-1) show significant changes for the comparative view of the years 2010 and 2020. Most countries, including the large western European countries of Germany, France and the UK, as well as the USA, have lost publication shares. The German publication share has fallen from 5.2 to 3.9 percent, the British from 5.4 to 4.1 percent, the French from 3.7 to 2.4 percent and the US-American from 23.3 to 17.1 percent. This contrasts with an enormous increase in China's share of publications from 9.8 to 23.1 percent.

The international alignment (IA) of selected countries and regions in publications in the Web of Science (C 7-2) is an indicator of the relative quality of scientific publications. Germany's index score was 8.5 in 2018, down from 15.4 in 2010. Publications by authors from Germany have thus relatively lost quality. The publication quality of almost all countries that performed above average in 2010 has declined in relative terms. China was again able to improve its relative publication quality, achieving an index value of 7.1 for 2018.

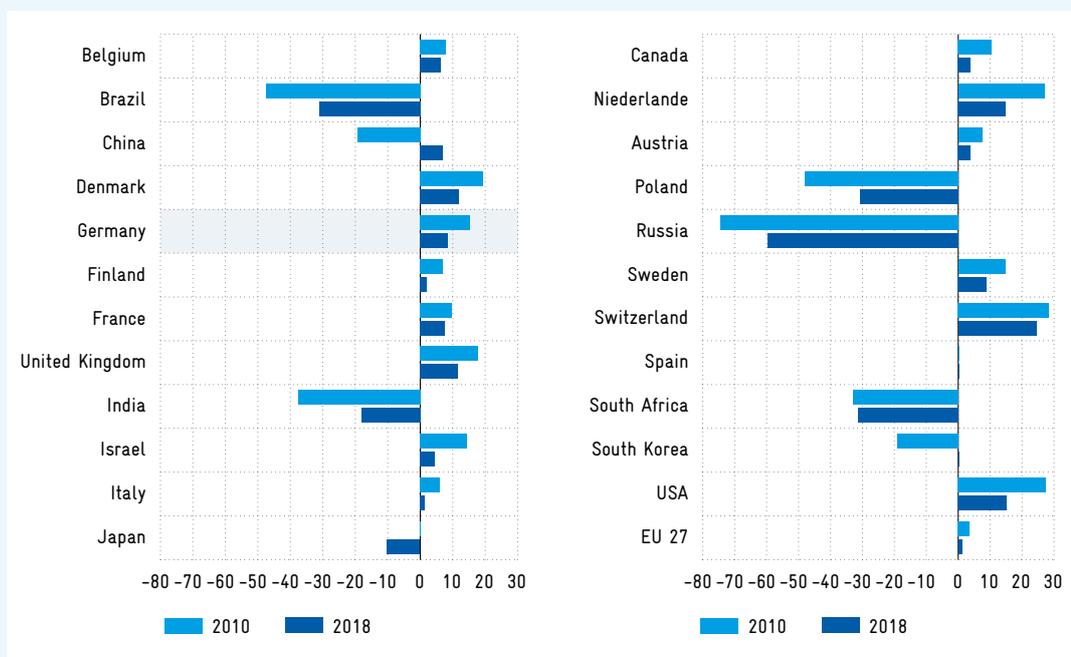
The scientific regard (SR) indicator for publications in the Web of Science (C 7-3) shows that the index value for articles from Germany has fallen from 7.3 to 0.1 during the observation period. Articles from Germany were thus cited on average almost as frequently in 2018 as other articles in the journals in which they appeared. In 2010, on the other hand, German articles were still cited with above-average frequency compared to other articles in the respective journal. This weakening trend is evident in most countries that had an above-average index value for 2010. In contrast, Italy, China and India achieved significant improvements to an above-average index score.

Fig. C7-1 Shares of all publications from selected countries and regions in 2010 and 2020 in percent



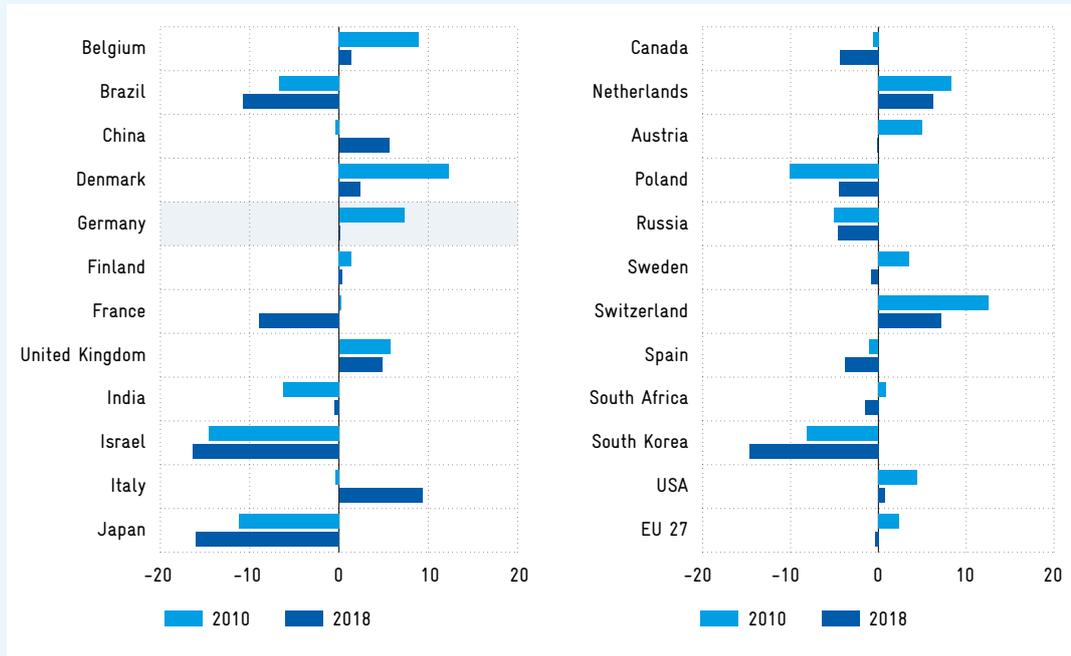
Fractional counting.
Source: Web of Science. Research and calculations by DZHW in Stephen und Stahlshmidt (2022).
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Fig. C7-2 International alignment (IA) of publications from selected countries and regions in 2010 and 2018 (index values)



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 und Stahlshmidt (2022).
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Fig. C7-3 Scientific regard (SR) of publications from selected countries and regions in 2010 and 2018 (index values)



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. The index is calculated without self-citations.

Fractional counting.

Source: Web of Science. Research and calculations by DZHW in Stephen und Stahl Schmidt (2022).

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