

# Appendix to: The scientific impact of Danish research 1980–2020

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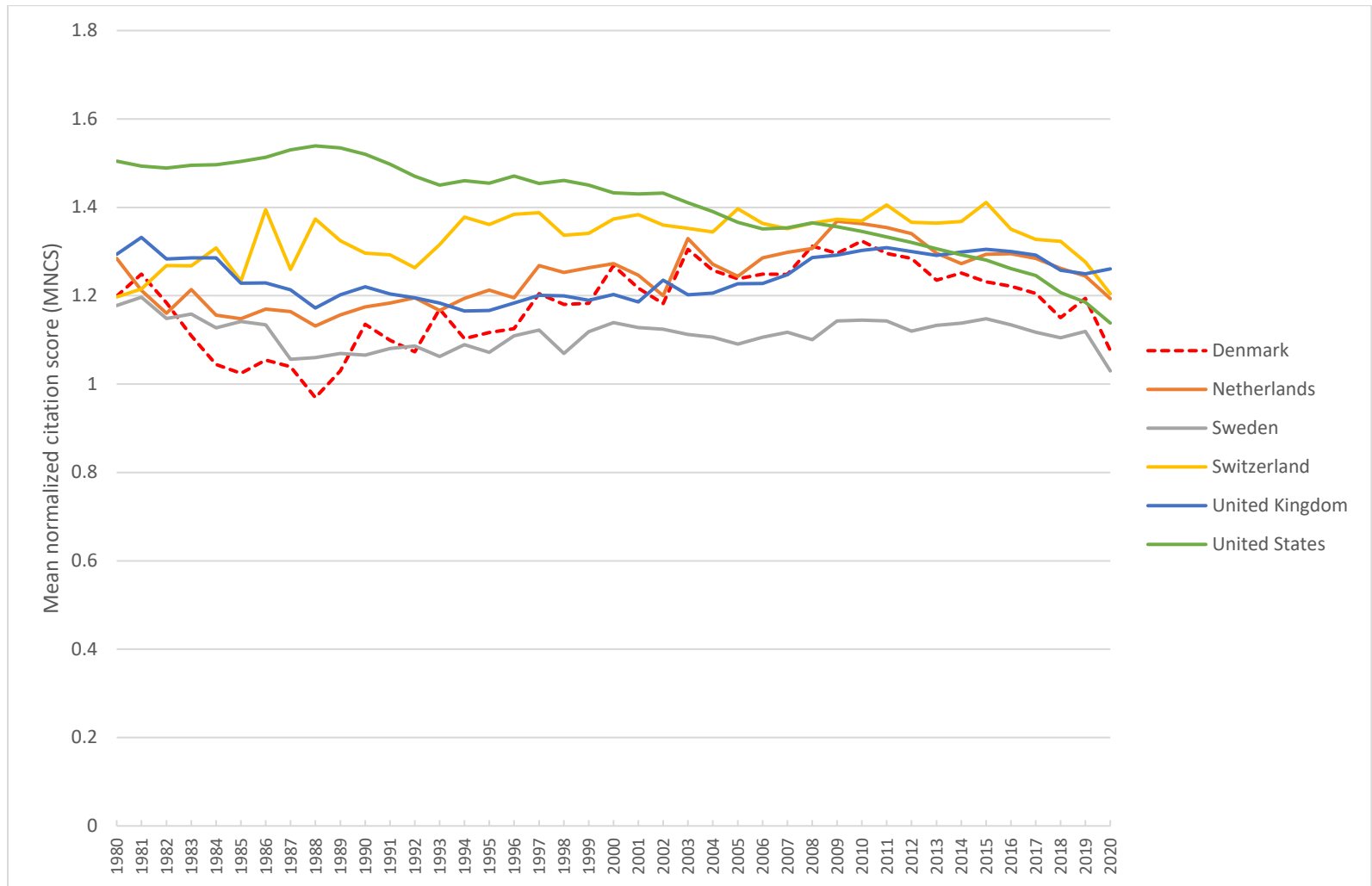
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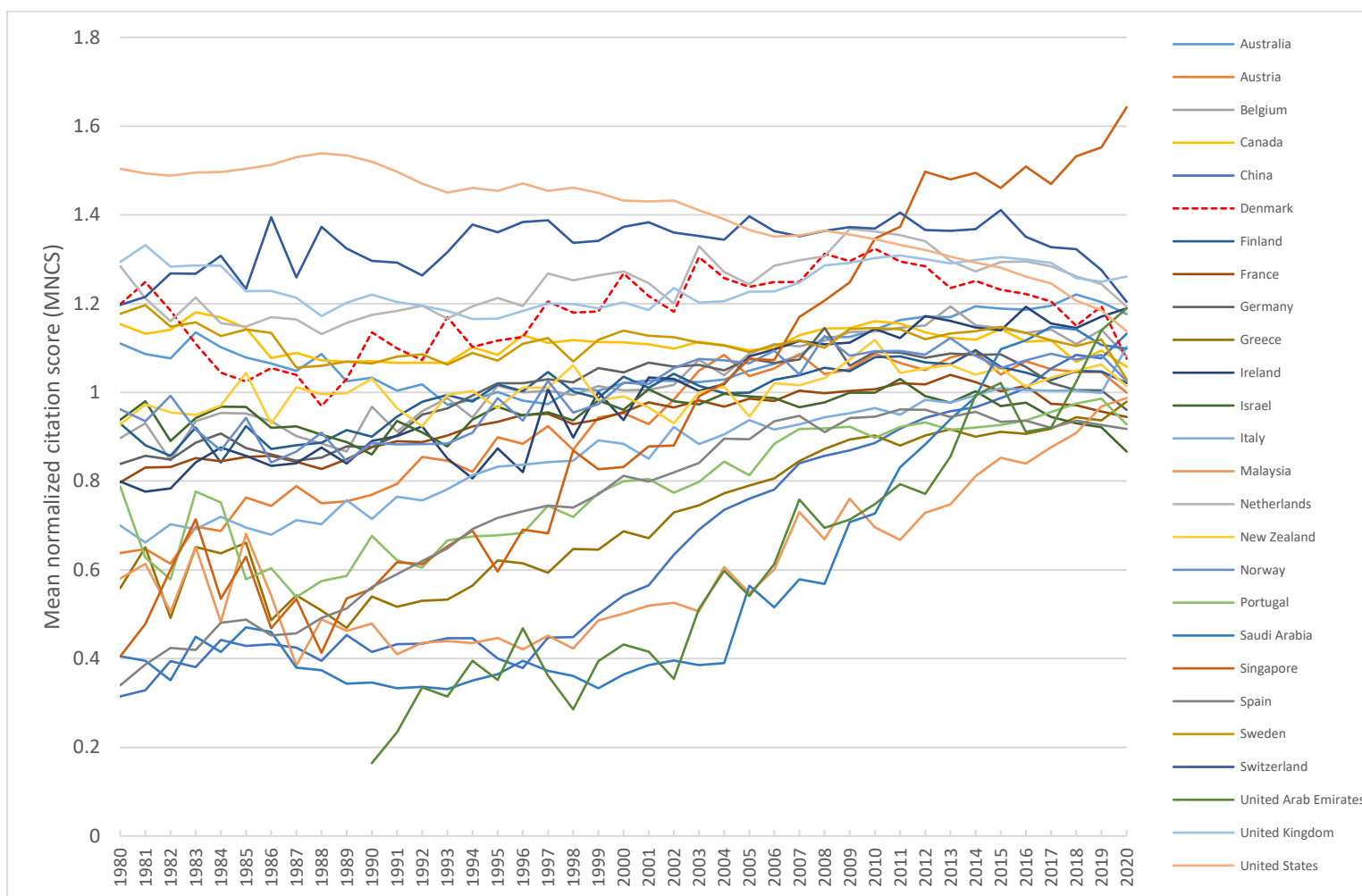
**Figure A1: The development in relative citation impact: Selected countries**

The indicator is the mean normalized citation score (MNCS). The impact of papers published in a given year (horizontal axis) is calculated using a three-year citation window. The indicator is field normalized, and author contributions are fractionalized and weighted at the country level.



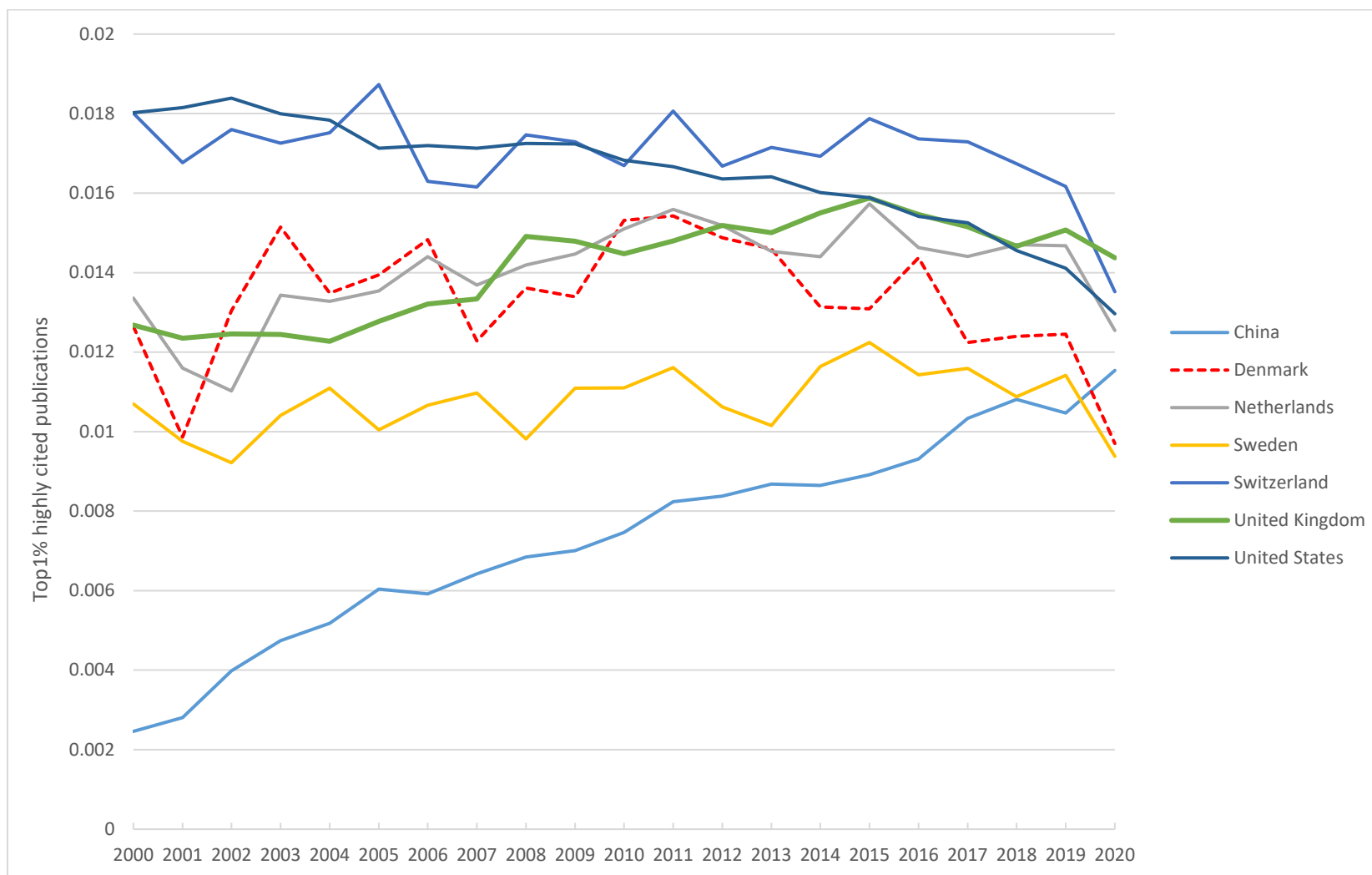
**Figure A2: The development in relative citation impact for 26 countries with the highest MNCS scores in 2018-20 among 51 countries with at least 4,000 fractionalized publications in the period**

The indicator is the mean normalized citation score (MNCS). The impact of papers published in a given year (horizontal axis) is calculated using a three-year citation window. The indicator is field normalized, and author contributions are fractionalized and weighted at the country level.



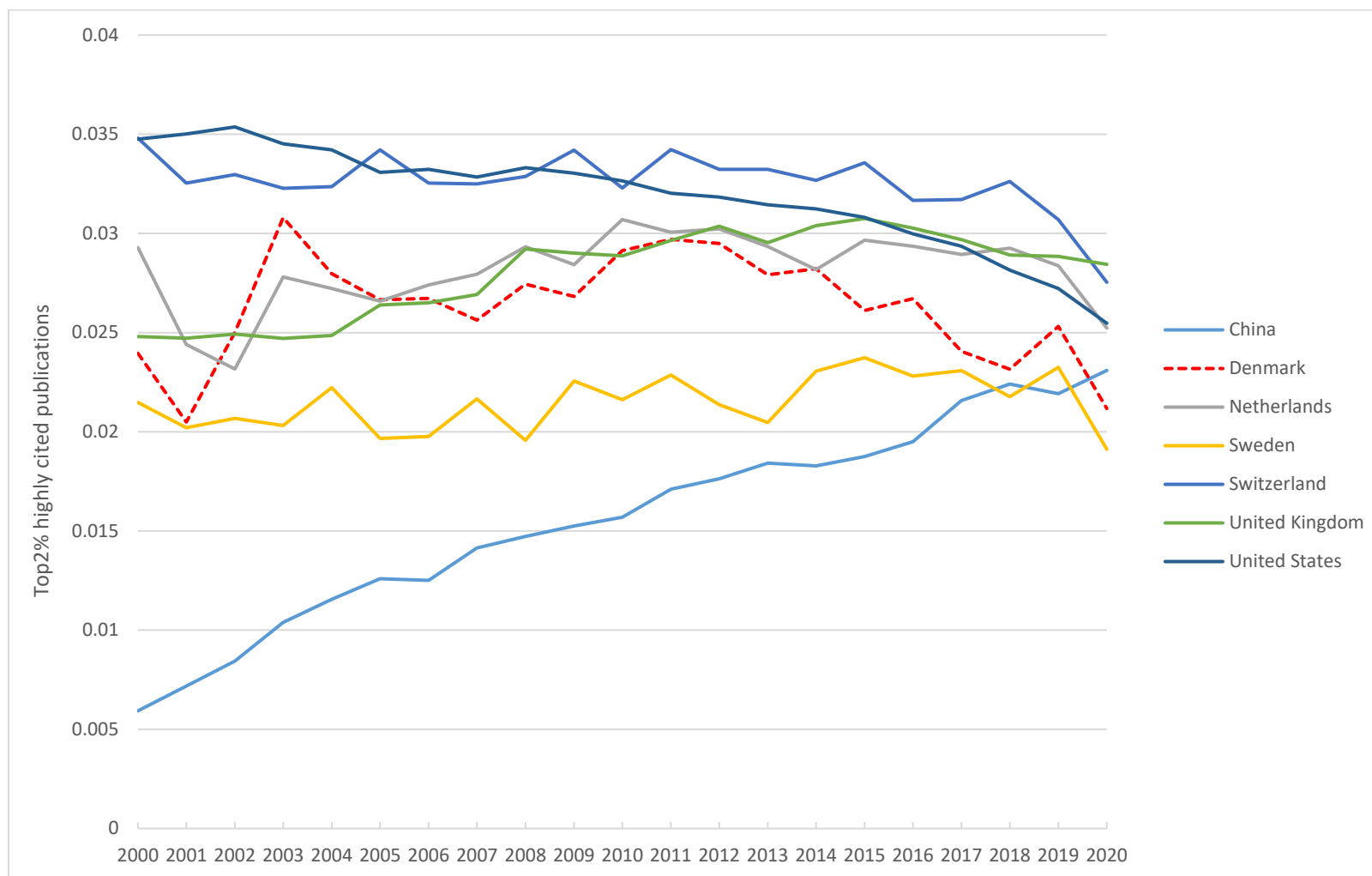
**Figure A3a: The development in relative citation impact for the 1% highest cited papers: Selected countries**

The indicator is the share of papers among the 2% most cited in the database (top 1%). The impact of papers published in a given year (horizontal axis) is calculated using a three-year citation window. The indicator is field normalized, and author contributions are fractionalized and weighted at the country level.



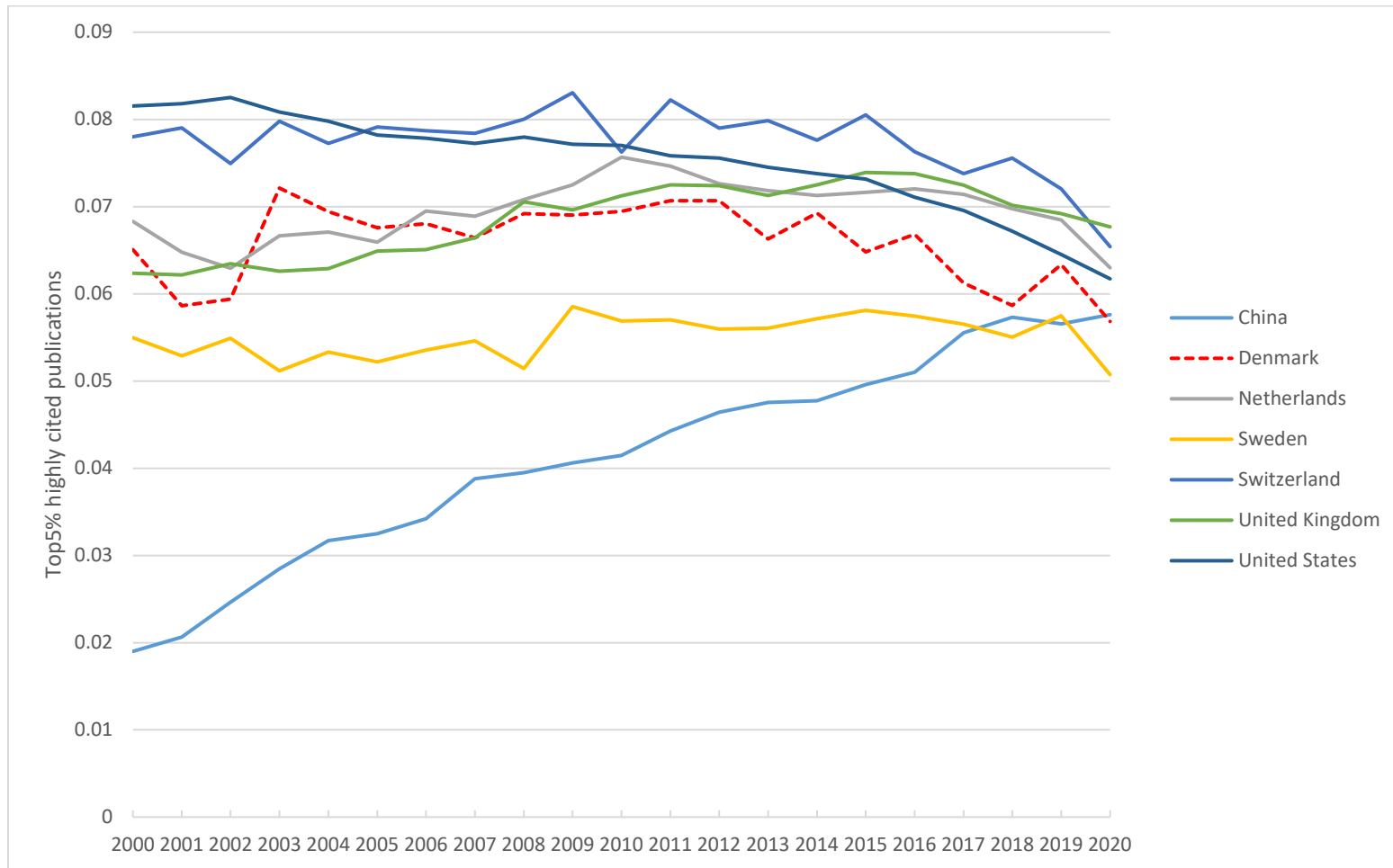
**Figure A3b: The development in relative citation impact for the 2% highest cited papers: Selected countries**

The indicator is the share of papers among the 2% most cited in the database (top 2%). The impact of papers published in a given year (horizontal axis) is calculated using a three-year citation window. The indicator is field normalized, and author contributions are fractionalized and weighted at the country level.



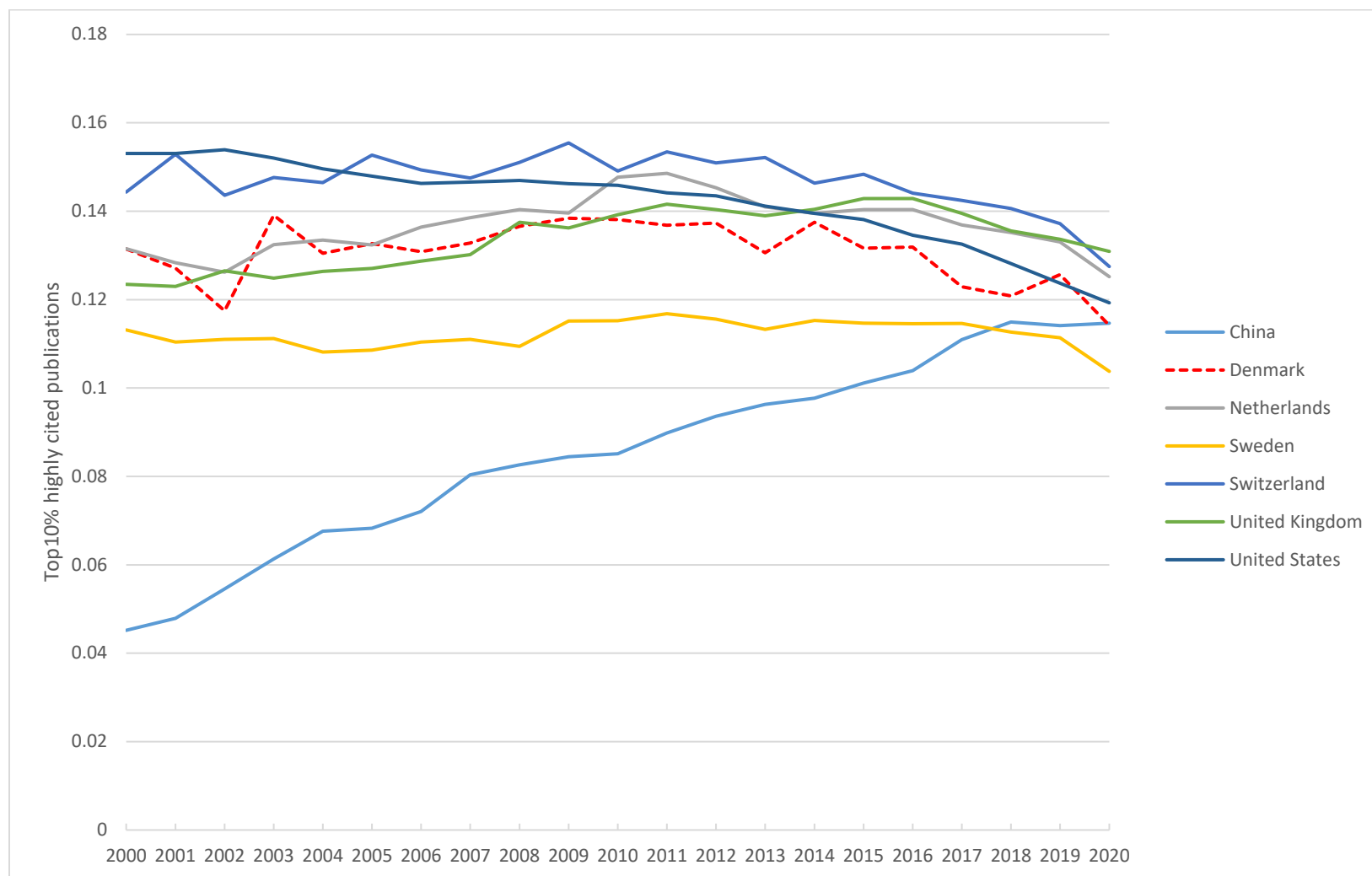
**Figure A3c: The development in relative citation impact for the 5% highest cited papers: Selected countries**

The indicator is the share of papers among the 2% most cited in the database (top 5%). The impact of papers published in a given year (horizontal axis) is calculated using a three-year citation window. The indicator is field normalized, and author contributions are fractionalized and weighted at the country level.



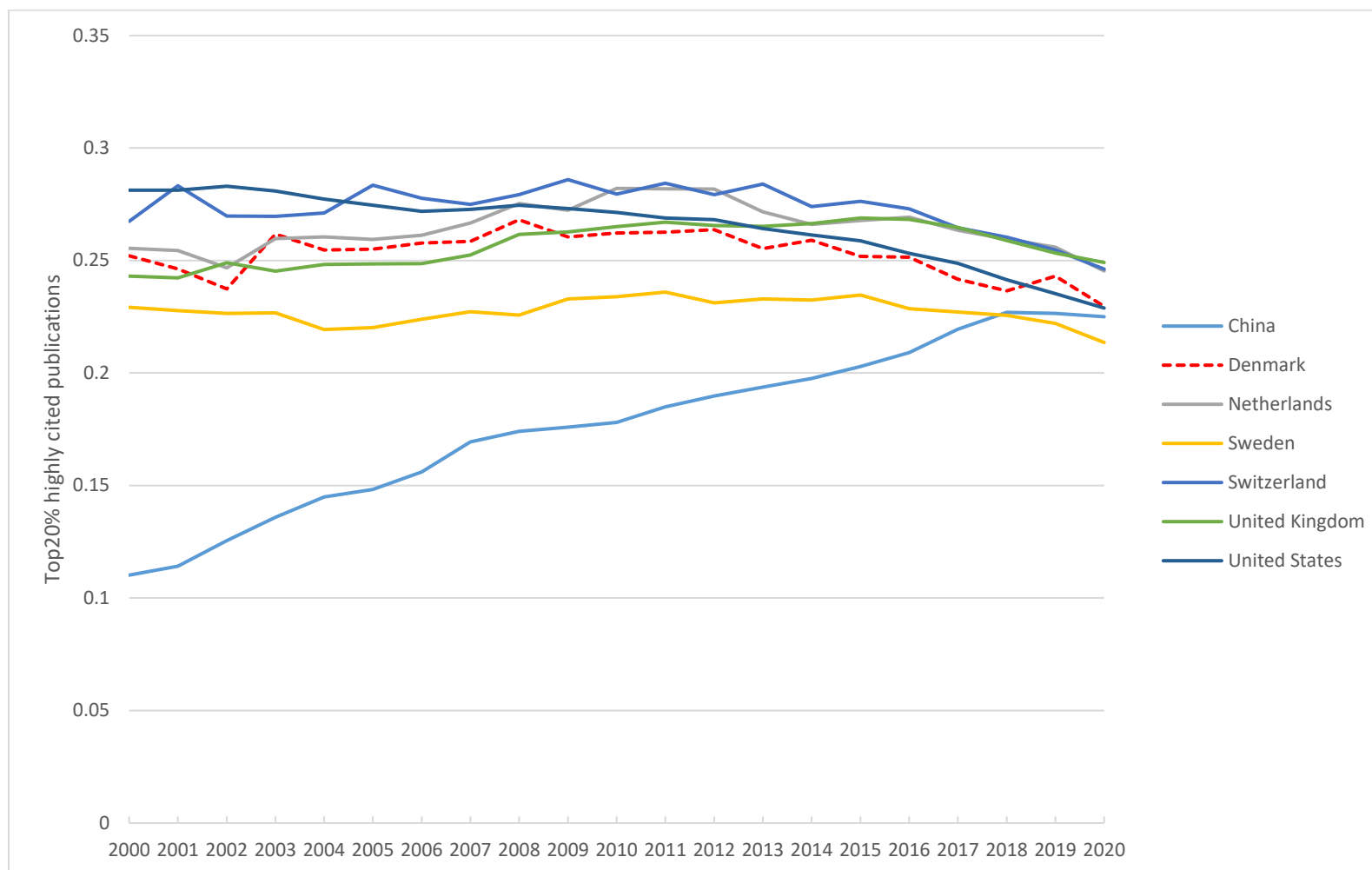
**Figure A3d: The development in relative citation impact for the 10% highest cited papers: Selected countries**

The indicator is the share of papers among the 2% most cited in the database (top 10%). The impact of papers published in a given year (horizontal axis) is calculated using a three-year citation window. The indicator is field normalized, and author contributions are fractionalized and weighted at the country level.



**Figure A3e: The development in relative citation impact for the 20% highest cited papers: Selected countries**

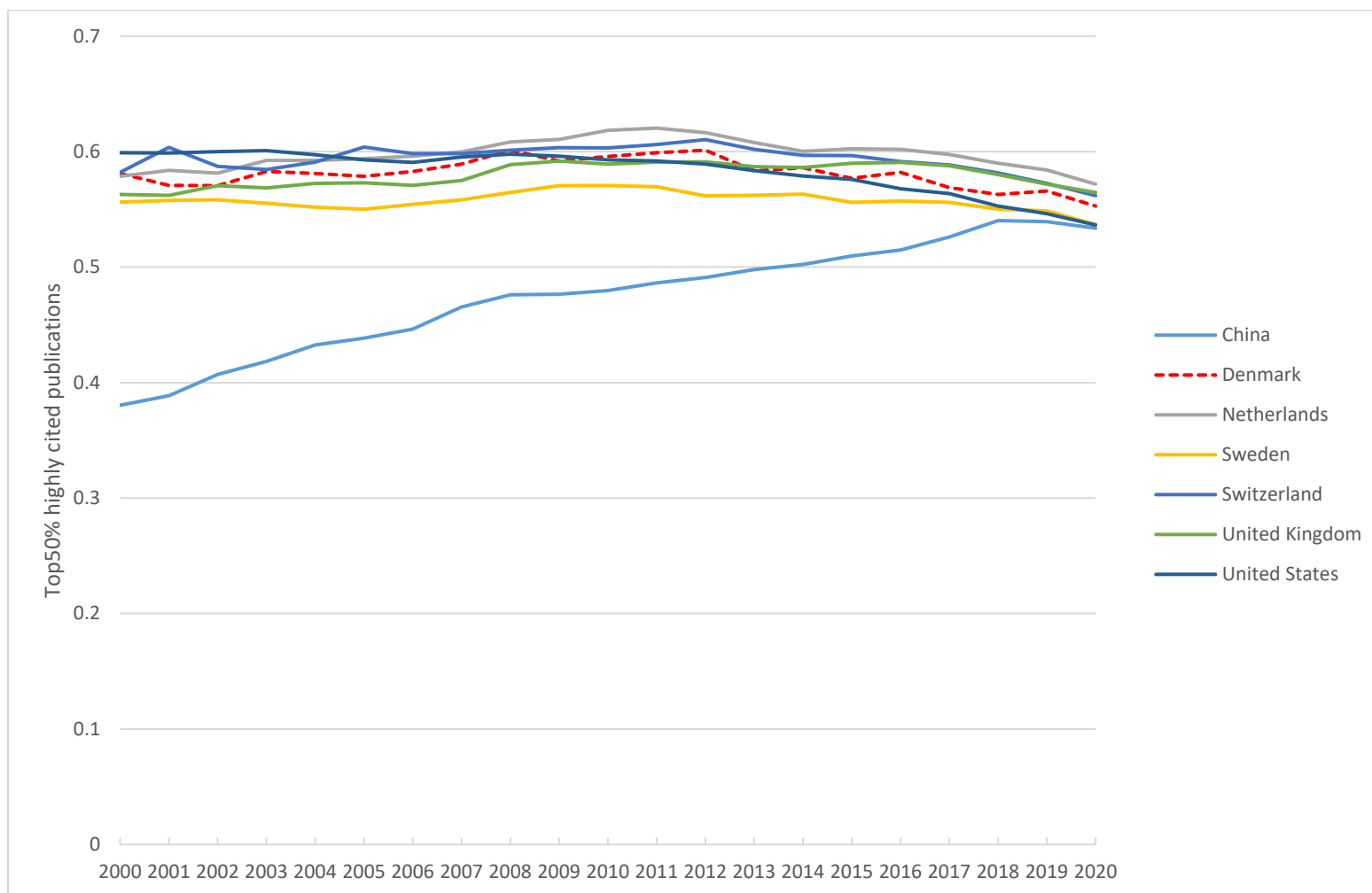
The indicator is the share of papers among the 2% most cited in the database (top 20%). The impact of papers published in a given year (horizontal axis) is calculated using a three-year citation window. The indicator is field normalized, and author contributions are fractionalized and weighted at the country level.





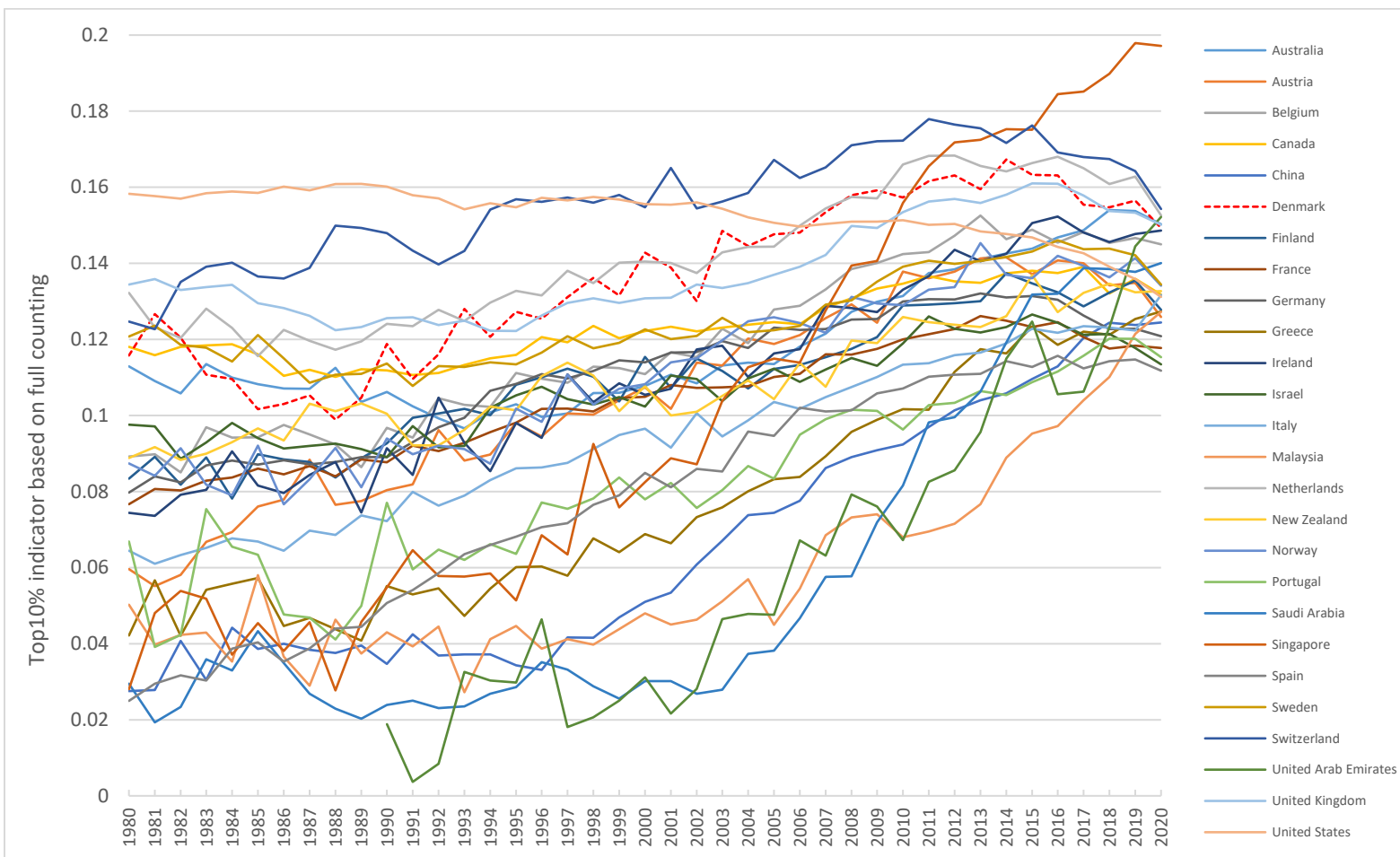
**Figure A3f: The development in relative citation impact for the 50% highest cited papers: Selected countries**

The indicator is the share of papers among the 2% most cited in the database (top 50%). The impact of papers published in a given year (horizontal axis) is calculated using a three-year citation window. The indicator is field normalized, and author contributions are fractionalized and weighted at the country level.



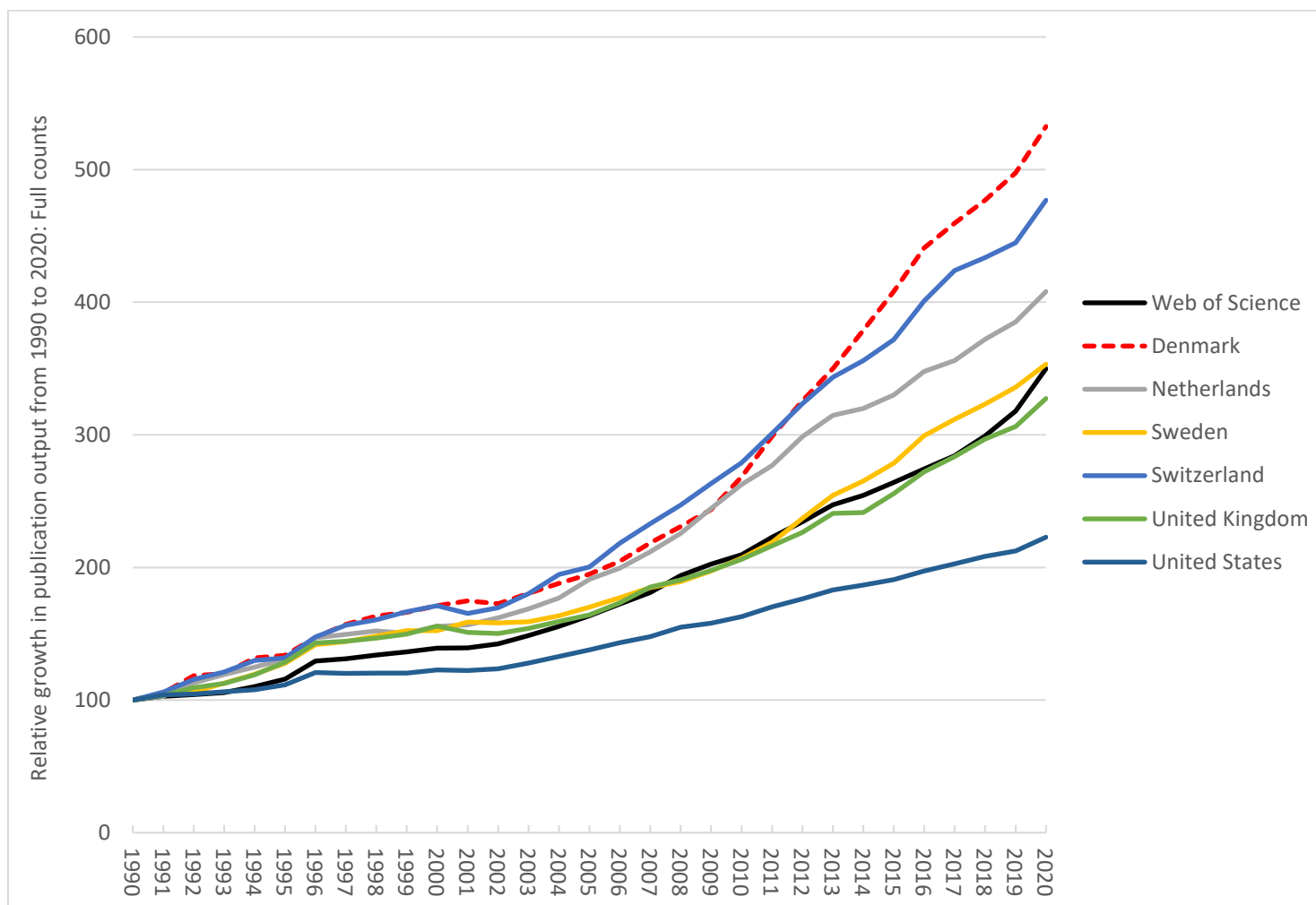
**Figure A4: The development in full count citation impact for 26 countries with the highest top 10% in 2018-20 among 51 countries with at least 4,000 fractionalized publications in the period**

The indicator is the share of papers among the 10% most cited in the database (top 10%). The impact of papers published in a given year (horizontal axis) is calculated using a three-year citation window. The indicator is field normalized, but based on full counting which means that standard database thresholds such as 10% does not hold due to double counting of publications.



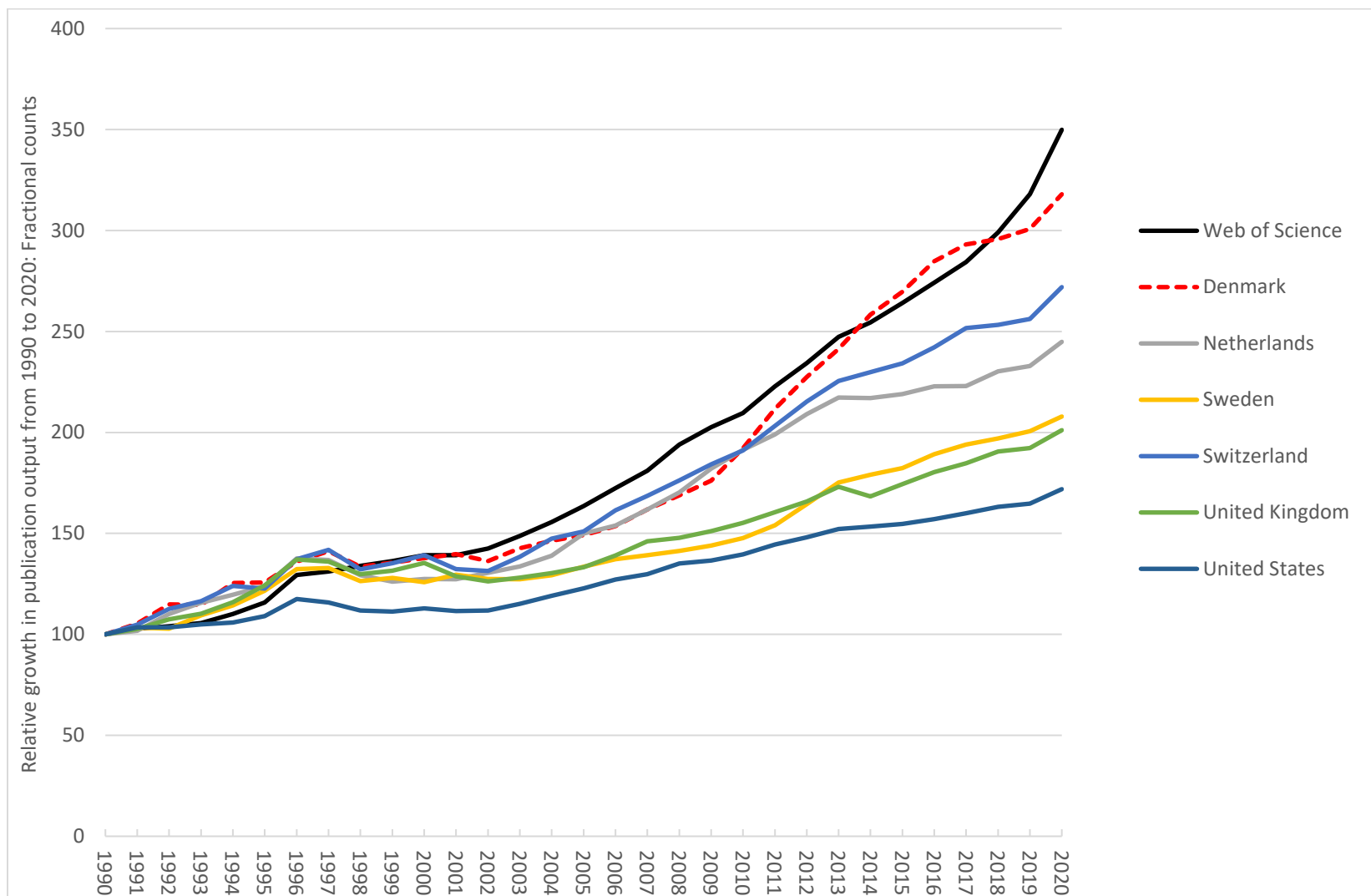
**Figure A5: The development in relative publication output, full counts: Selected countries**

Full counts at the country level can be seen as reflecting a country's participation, i.e. multi-country co-authorships. A consequence of full counting is that publications are counted multiple times, each unit gets 1/1 credit. Developments are indexed at 100 in 1990 (horizontal axis).



**Figure A6: The development in relative publication output, fractional counts: Selected countries**

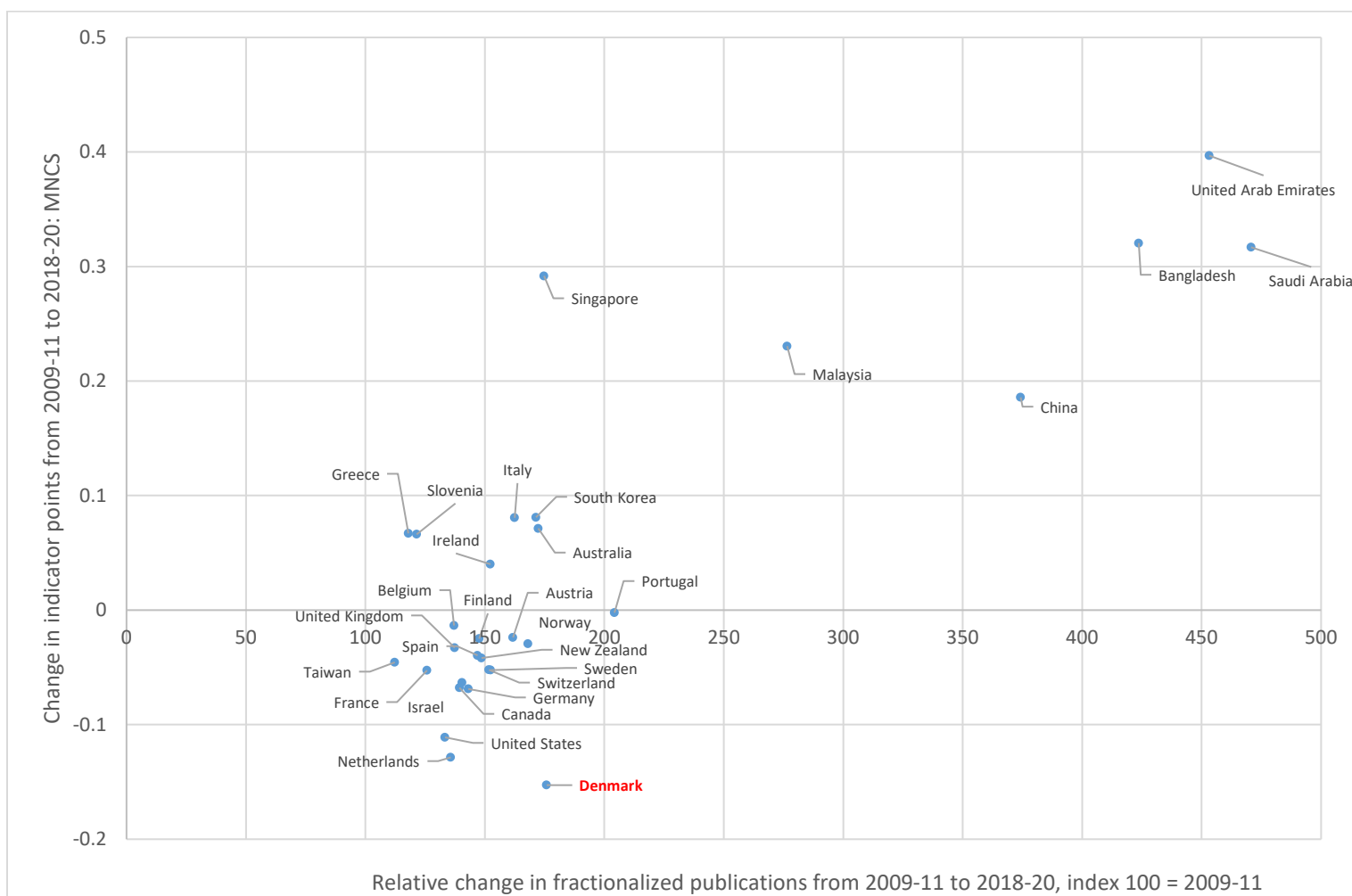
Fractionalized counts credit a country's contribution to a publication as a fraction of the whole (1/n). Developments are indexed at 100 in 1990 (horizontal axis).





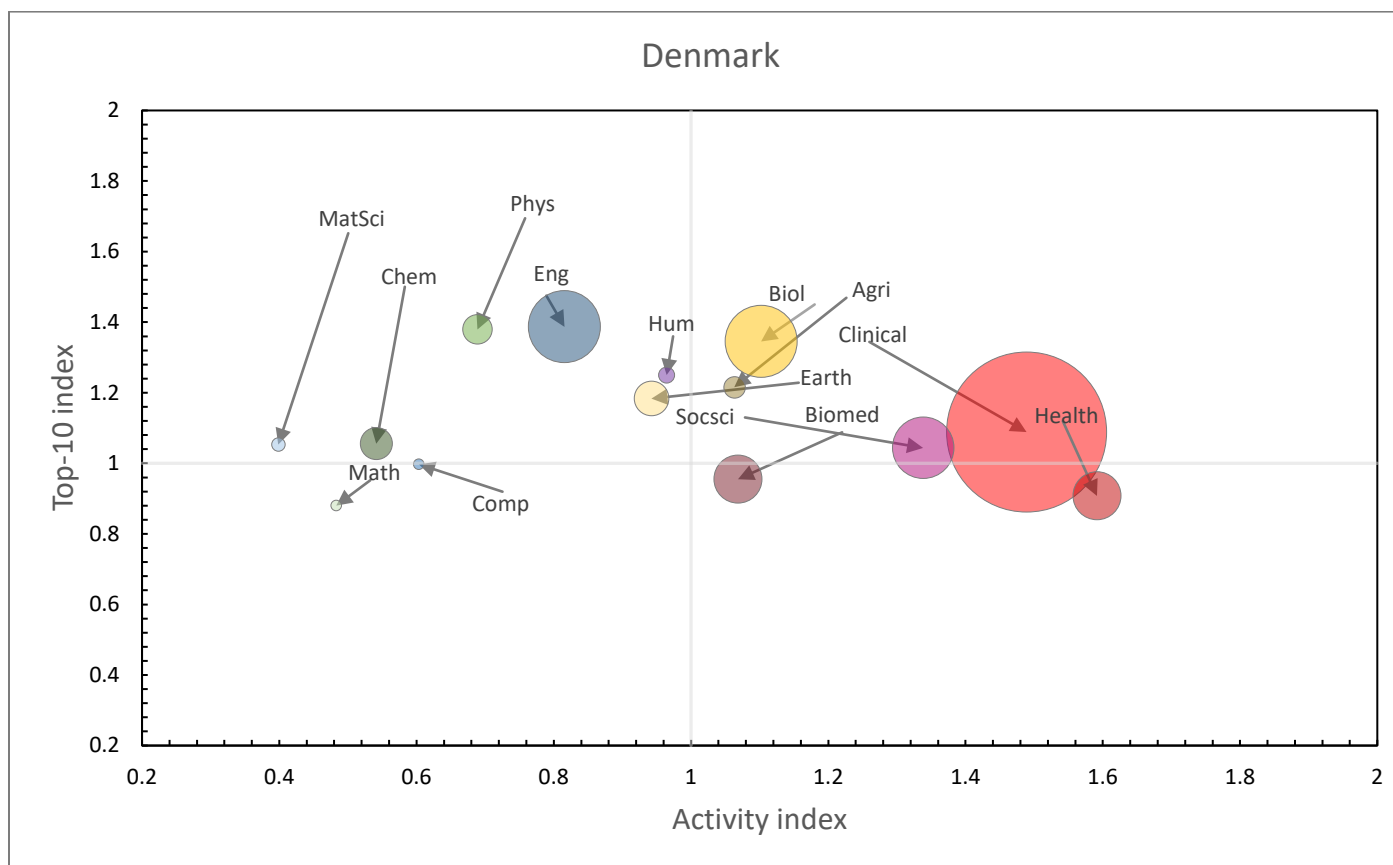
**Figure A7: Change in the MNCS indicator points from 2009-11 to 2018-20 as a function of publication growth for 30 countries**

Countries are those with highest MNCS indicator in 2018-20 among 51 countries with at least 4,000 fractionalized publications in the period. The vertical axis shows change in indicator points. The horizontal axis shows the relative growth in fractionalized publication output from 2009-11 to 2018-20. Index 100 = output in 2009-11.



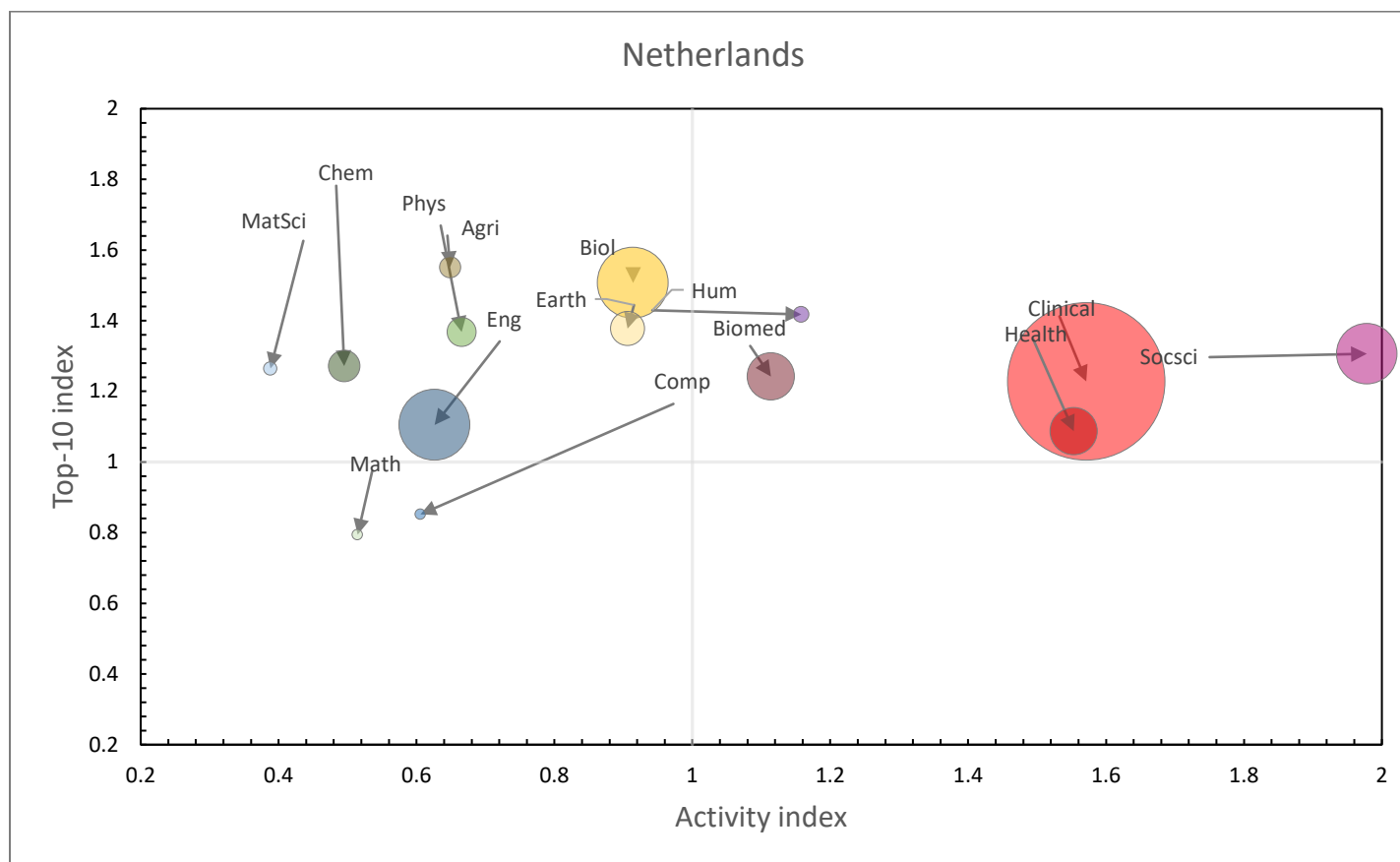
**Figure A8: Activity index in relation to top10%: Development for Denmark from 2009-11 to 2018-20**

The activity index is the national publication growth in a field, relative to the database growth in the same field, between two periods. The horizontal axis shows the activity index, i.e., the proportion of the national output of publications found in a particular field relative to the database proportion. A value of 1 indicates that a country has the same proportion as expected from the database average, a value of 1.5 means that the country has a 50% greater proportion in that field than expected from the database average. The vertical axis shows the top 10% indicator. Colours of the circles indicate the 14 subject field and circle size reflects the publication volume in 2018-20. Grey arrows show the shift in positions of the subject field between 2009-11 and 2018-20.



**Figure A9: Activity index in relation to top10%: Development for the Netherlands from 2009-11 to 2018-20**

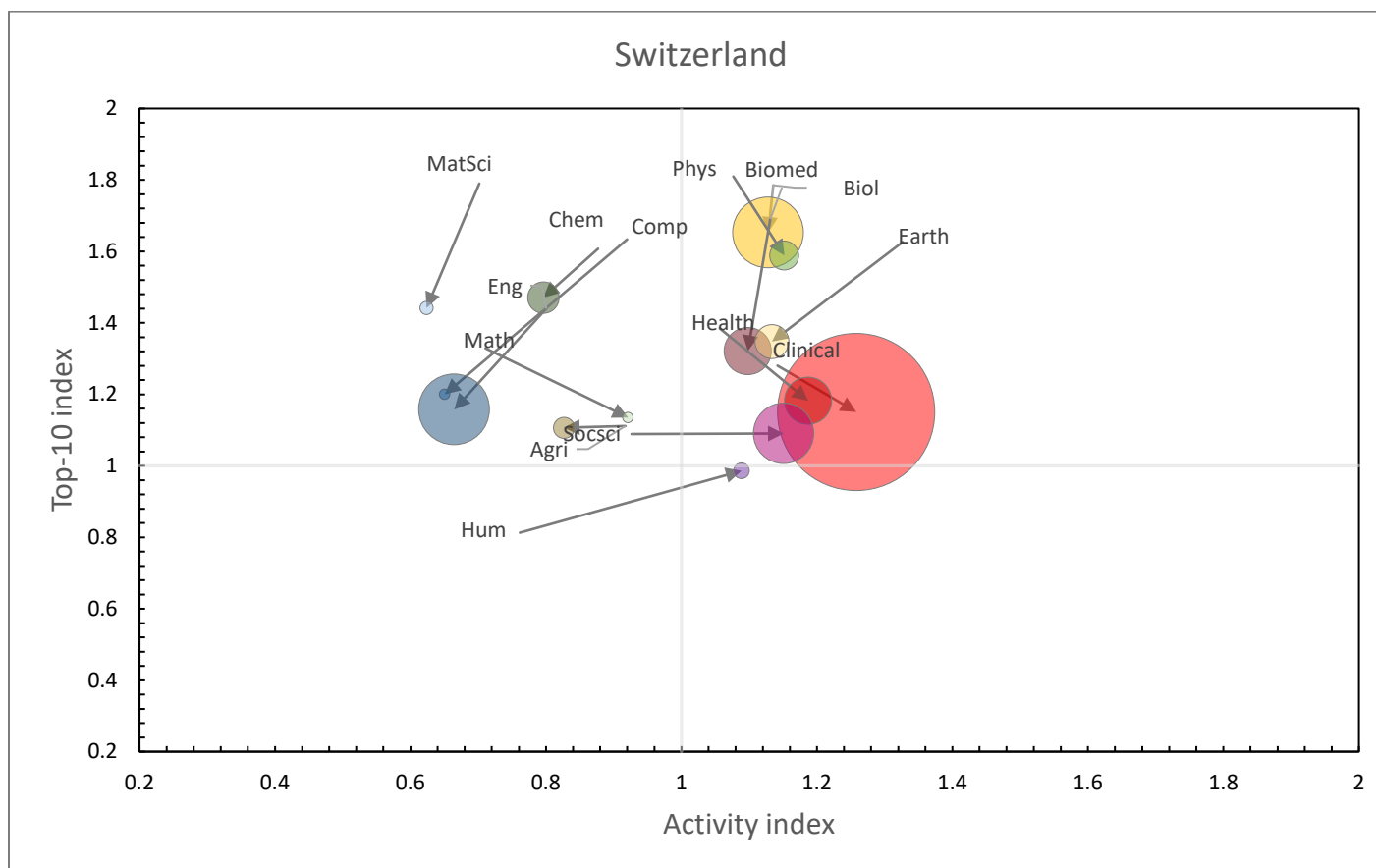
The activity index is the national publication growth in a field, relative to the database growth in the same field, between two periods. The horizontal axis shows the activity index, i.e., the proportion of the national output of publications found in a particular field relative to the database proportion. A value of 1 indicates that a country has the same proportion as expected from the database average, a value of 1.5 means that the country has a 50% greater proportion in that field than expected from the database average. The vertical axis shows the top 10% indicator. Colours of the circles indicate the 14 subject field and circle size reflects the publication volume in 2018-20. Grey arrows show the shift in positions of the subject field between 2009-11 and 2018-20.





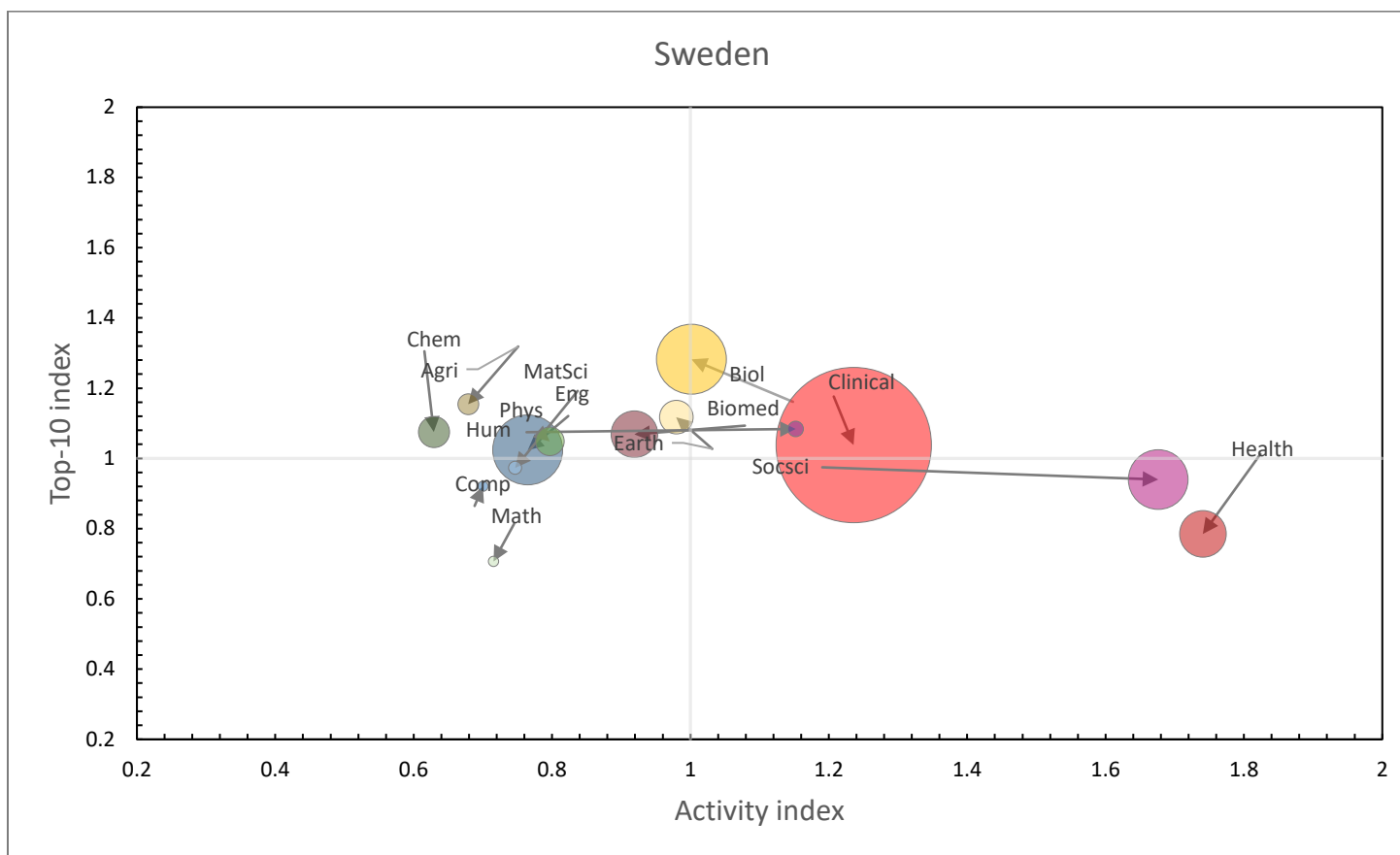
**Figure A10: Activity index in relation to top10%: Development for Switzerland from 2009-11 to 2018-20**

The activity index is the national publication growth in a field, relative to the database growth in the same field, between two periods. The horizontal axis shows the activity index, i.e., the proportion of the national output of publications found in a particular field relative to the database proportion. A value of 1 indicates that a country has the same proportion as expected from the database average, a value of 1.5 means that the country has a 50% greater proportion in that field than expected from the database average. The vertical axis shows the top 10% indicator. Colours of the circles indicate the 14 subject field and circle size reflects the publication volume in 2018-20. Grey arrows show the shift in positions of the subject field between 2009-11 and 2018-20.



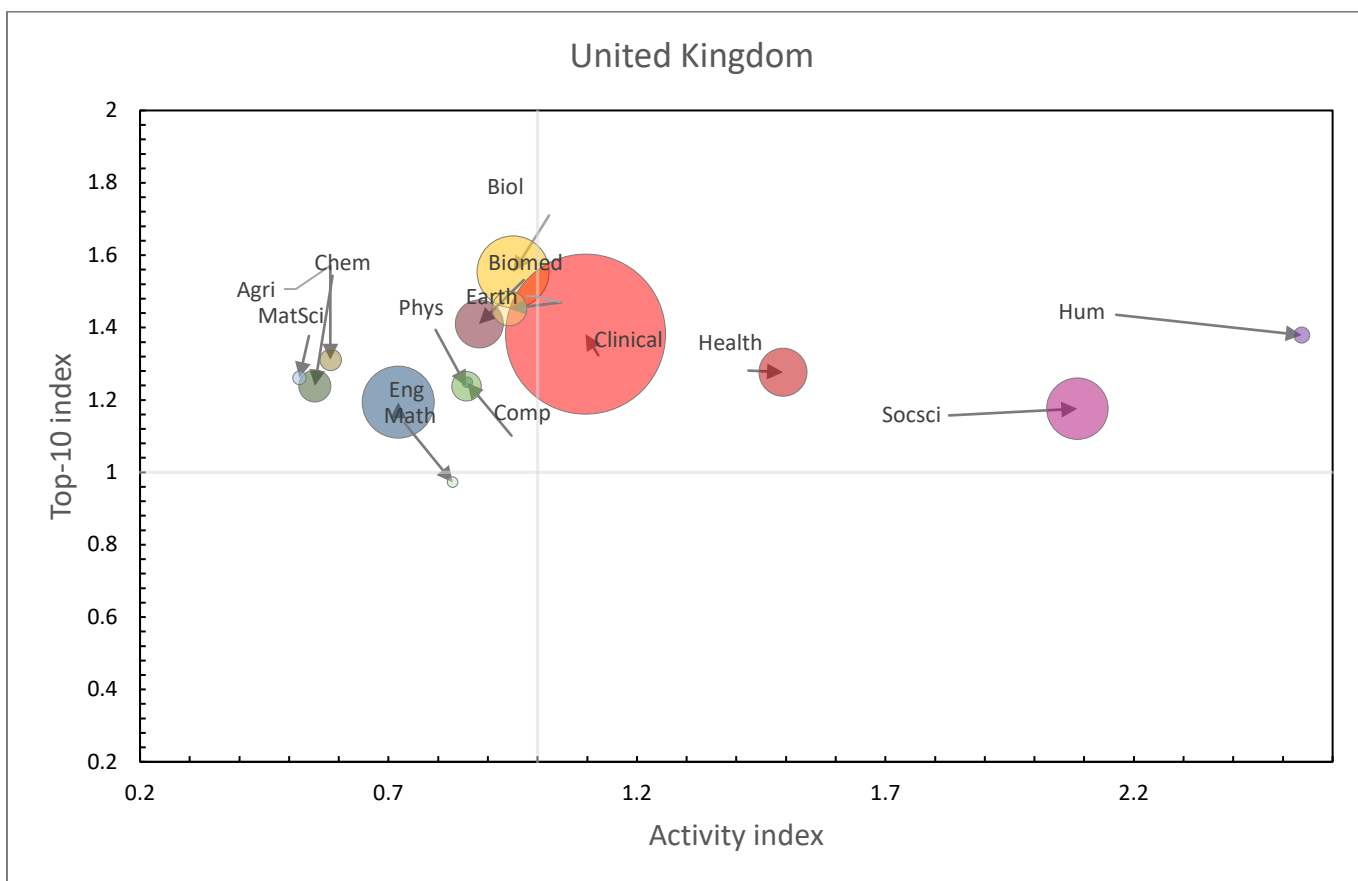
**Figure A11: Activity index in relation to top10%: Development for Sweden from 2009-11 to 2018-20**

The activity index is the national publication growth in a field, relative to the database growth in the same field, between two periods. The horizontal axis shows the activity index, i.e., the proportion of the national output of publications found in a particular field relative to the database proportion. A value of 1 indicates that a country has the same proportion as expected from the database average, a value of 1.5 means that the country has a 50% greater proportion in that field than expected from the database average. The vertical axis shows the top 10% indicator. Colours of the circles indicate the 14 subject field and circle size reflects the publication volume in 2018-20. Grey arrows show the shift in positions of the subject field between 2009-11 and 2018-20.



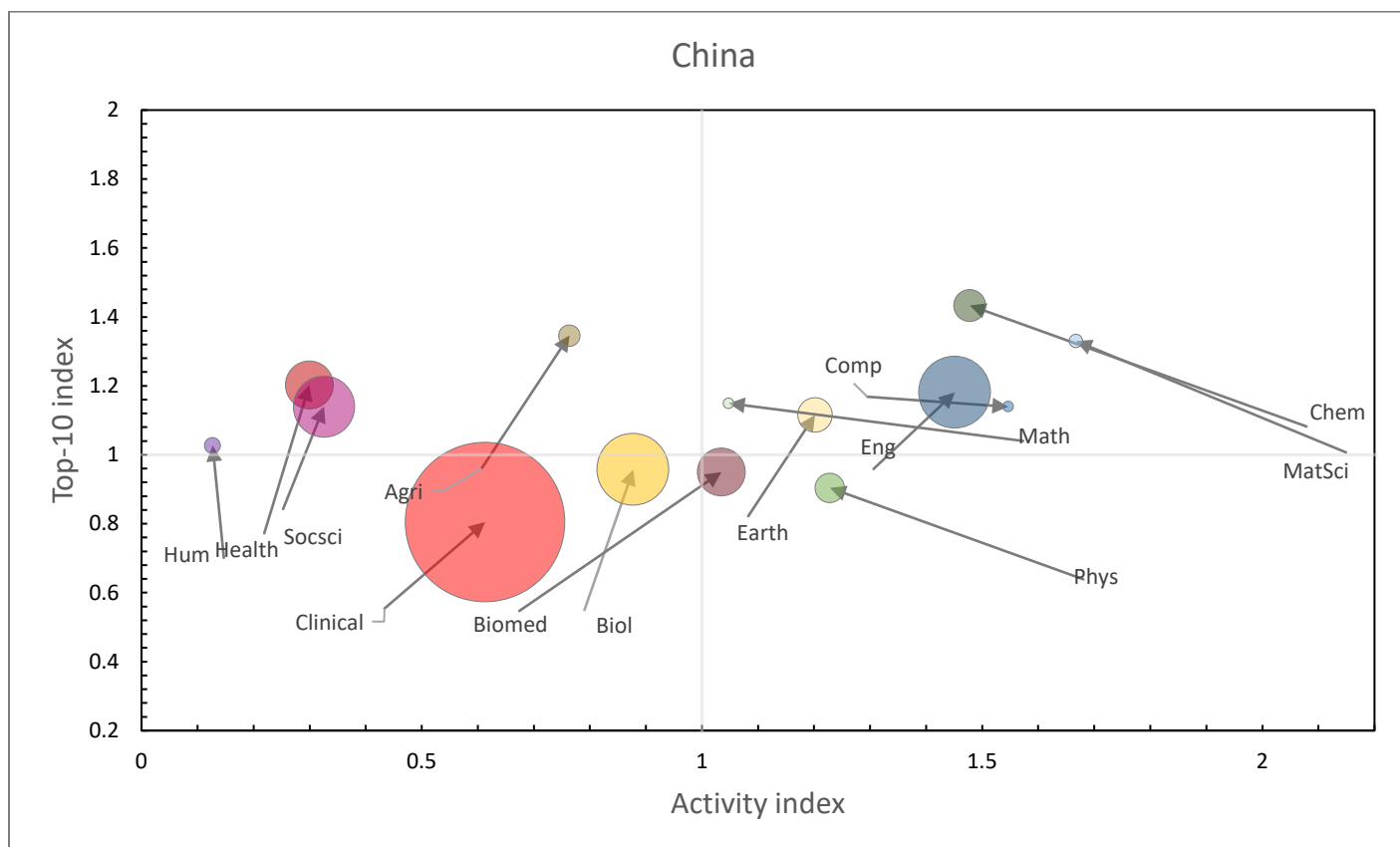
**Figure A12: Activity index in relation to top10%: Development for the United Kingdom from 2009-11 to 2018-20**

The activity index is the national publication growth in a field, relative to the database growth in the same field, between two periods. The horizontal axis shows the activity index, i.e., the proportion of the national output of publications found in a particular field relative to the database proportion. A value of 1 indicates that a country has the same proportion as expected from the database average, a value of 1.5 means that the country has a 50% greater proportion in that field than expected from the database average. The vertical axis shows the top 10% indicator. Colours of the circles indicate the 14 subject field and circle size reflects the publication volume in 2018-20. Grey arrows show the shift in positions of the subject field between 2009-11 and 2018-20.



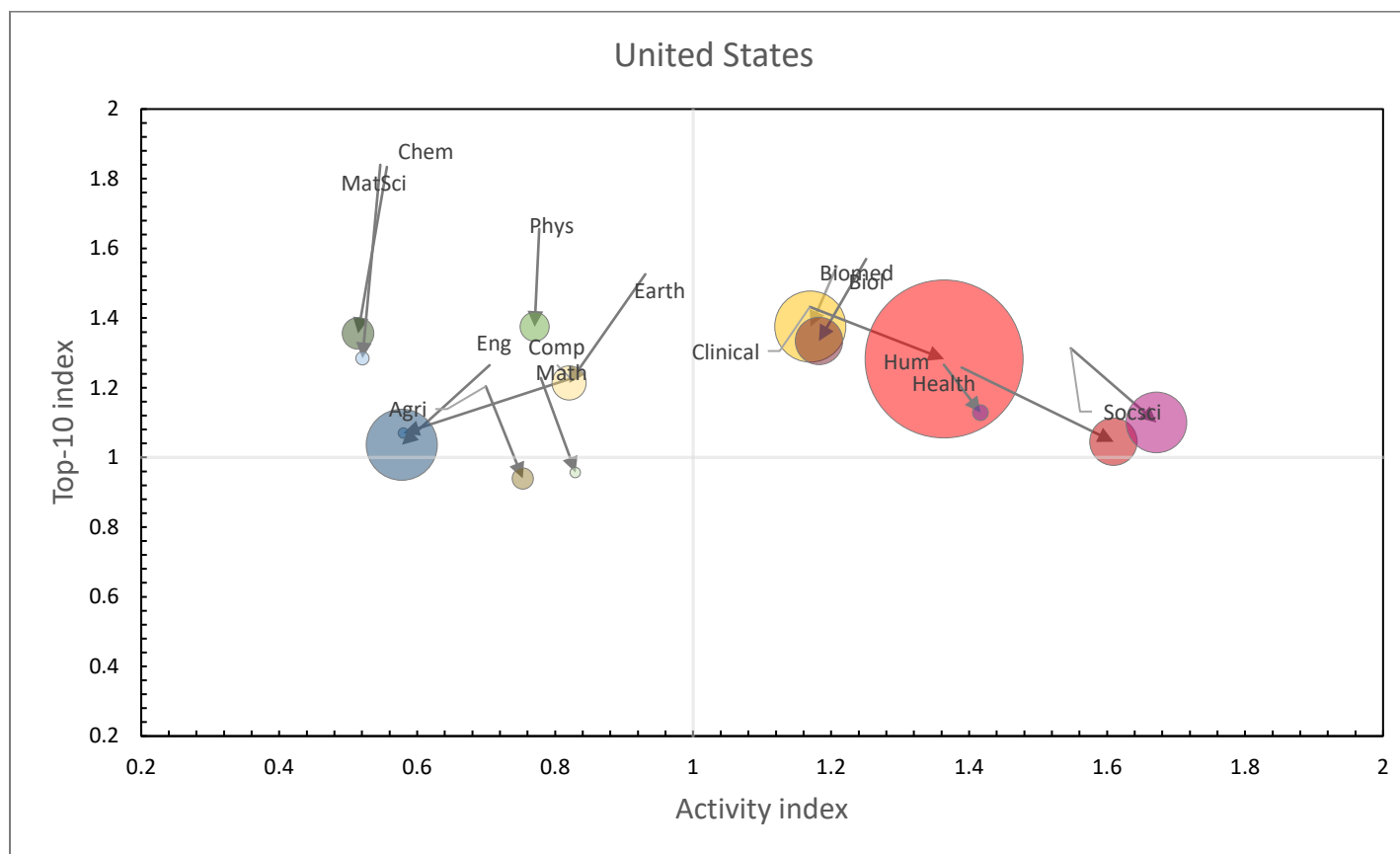
**Figure A13: Activity index in relation to top10%: Development for China from 2009-11 to 2018-20**

The activity index is the national publication growth in a field, relative to the database growth in the same field, between two periods. The horizontal axis shows the activity index, i.e., the proportion of the national output of publications found in a particular field relative to the database proportion. A value of 1 indicates that a country has the same proportion as expected from the database average, a value of 1.5 means that the country has a 50% greater proportion in that field than expected from the database average. The vertical axis shows the top 10% indicator. Colours of the circles indicate the 14 subject field and circle size reflects the publication volume in 2018-20. Grey arrows show the shift in positions of the subject field between 2009-11 and 2018-20



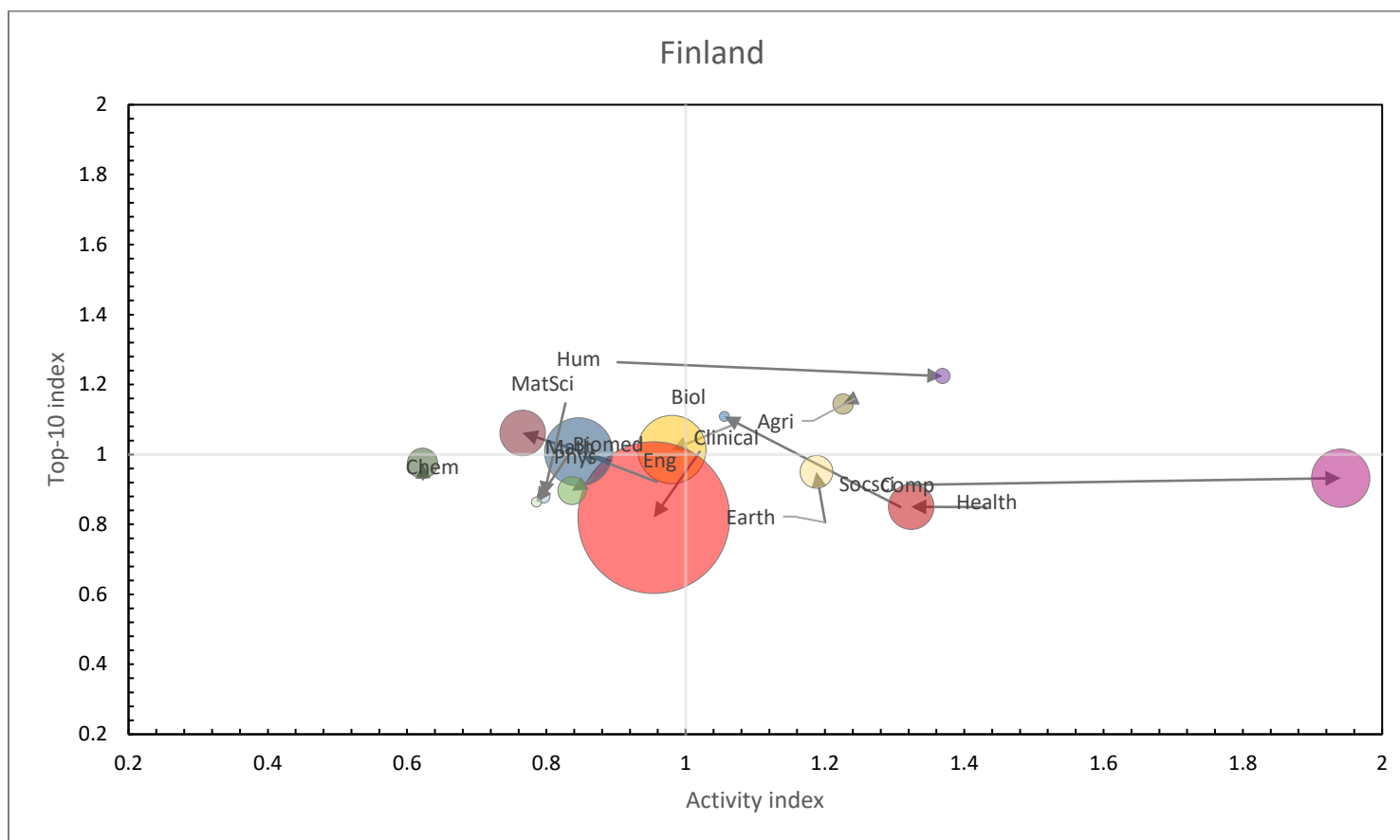
**Figure A14: Activity index in relation to top10%: Development for the United States from 2009-11 to 2018-20**

The activity index is the national publication growth in a field, relative to the database growth in the same field, between two periods. The horizontal axis shows the activity index, i.e., the proportion of the national output of publications found in a particular field relative to the database proportion. A value of 1 indicates that a country has the same proportion as expected from the database average, a value of 1.5 means that the country has a 50% greater proportion in that field than expected from the database average. The vertical axis shows the top 10% indicator. Colours of the circles indicate the 14 subject field and circle size reflects the publication volume in 2018-20. Grey arrows show the shift in positions of the subject field between 2009-11 and 2018-20.



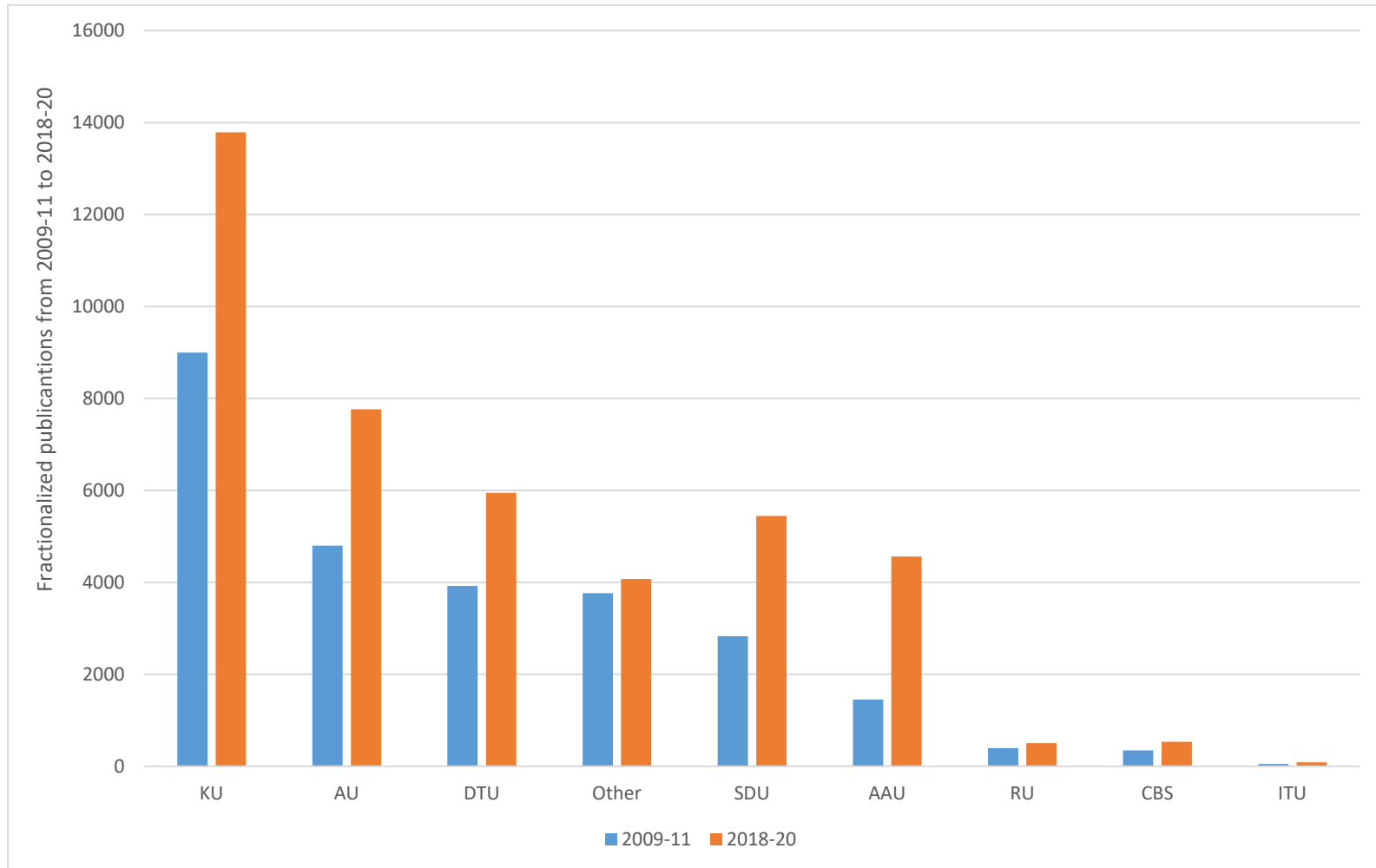
**Figure A15: Activity index in relation to top10%: Development for Finland from 2009-11 to 2018-20**

The activity index is the national publication growth in a field, relative to the database growth in the same field, between two periods. The horizontal axis shows the activity index, i.e., the proportion of the national output of publications found in a particular field relative to the database proportion. A value of 1 indicates that a country has the same proportion as expected from the database average, a value of 1.5 means that the country has a 50% greater proportion in that field than expected from the database average. The vertical axis shows the top 10% indicator. Colours of the circles indicate the 14 subject field and circle size reflects the publication volume in 2018-20. Grey arrows show the shift in positions of the subject field between 2009-11 and 2018-20.



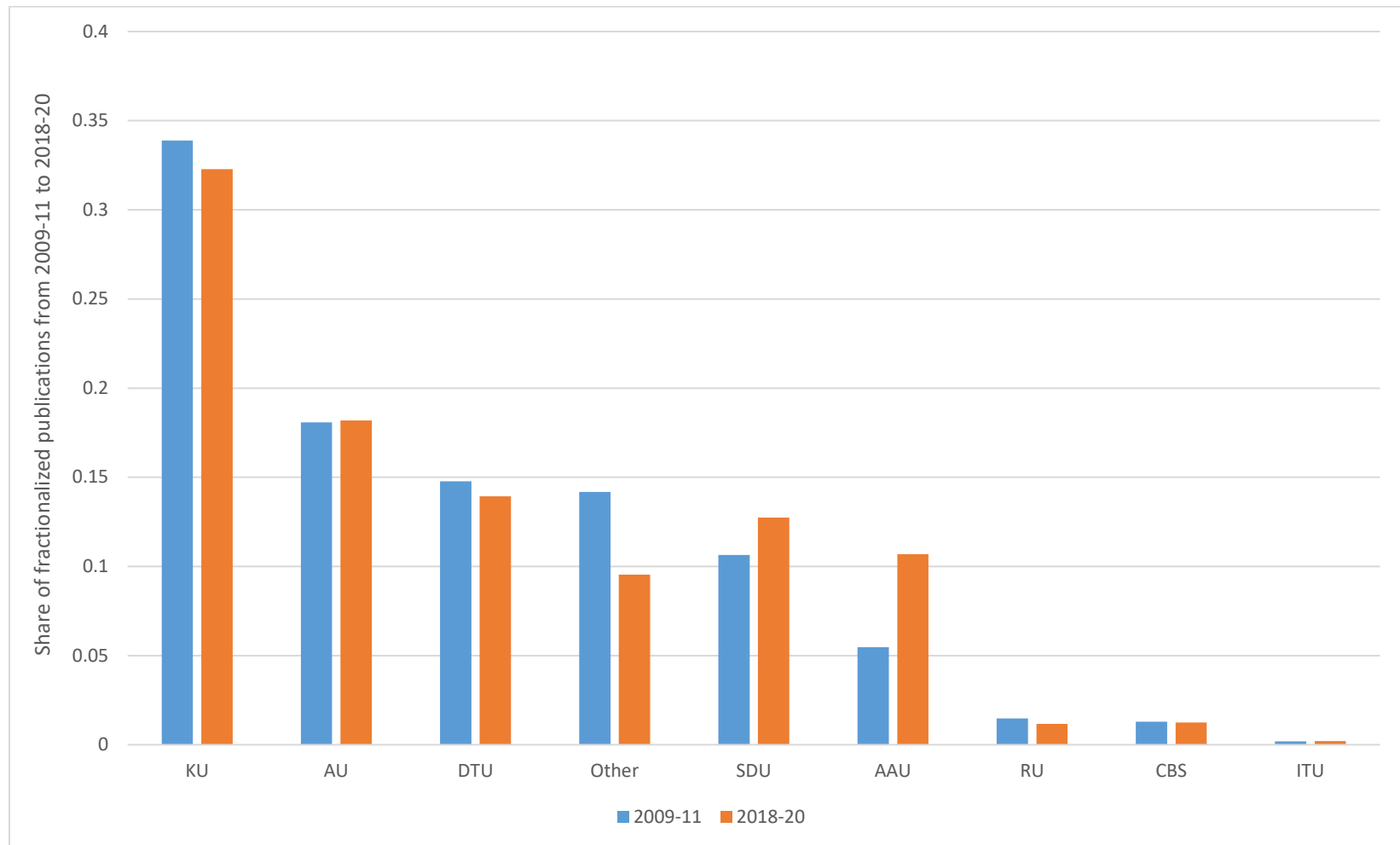
**Figure A16: The development in publication output for the Danish universities from 2009-11 to 2018-20: Absolute numbers (fractional count)**

Three-year cumulated fractional publication counts for two periods. Copenhagen University (KU), Aarhus University (AU), Danish Technical University (DTU), other research institutions (Other), University of Southern Denmark (SDU), Roskilde University (RU), Copenhagen Business School (CBS), and IT-University (ITU).



**Figure A17: The development in publication output for the Danish universities from 2009-11 to 2018-20: Share of Danish output (fractional count)**

Three-year cumulated shares of fractional publication counts for two periods. Copenhagen University (KU), Aarhus University (AU), Danish Technical University (DTU), other research institutions (Other), University of Southern Denmark (SDU), Roskilde University (RU), Copenhagen Business School (CBS), and IT-University (ITU).





**Figure A18: The development in number of authors per paper from 2000 to 2020 in publications with Danish affiliations**

The percentage of annual papers according to 6 author groups: 1, 2-5, 6-10, 11-15, 16-25 and > 25 authors. The development is across all scientific disciplines.

