



Studying international research collaboration with publication data

Dr. Hans Pohl, Program Director
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STINT

Stiftelsen för internationalisering av
högre utbildning och forskning

The Swedish Foundation for International
Cooperation in Research and Higher Education



Outline

- About STINT and Hans Pohl
- Internationalisation, innovation and academic-corporate co-publications
- Research collaboration with growth countries
- Conclusions



About STINT and Hans Pohl

The Swedish Foundation for International Cooperation in Research and Higher Education, STINT, fosters internationalisation through:

- Mobility programmes
- Strategic internationalisation
- Knowledge development about internationalisation.

Hans Pohl

- Program Director at STINT
- PhD at Chalmers University of Technology 2010 about innovation
- Affiliation at University at Albany, SUNY.



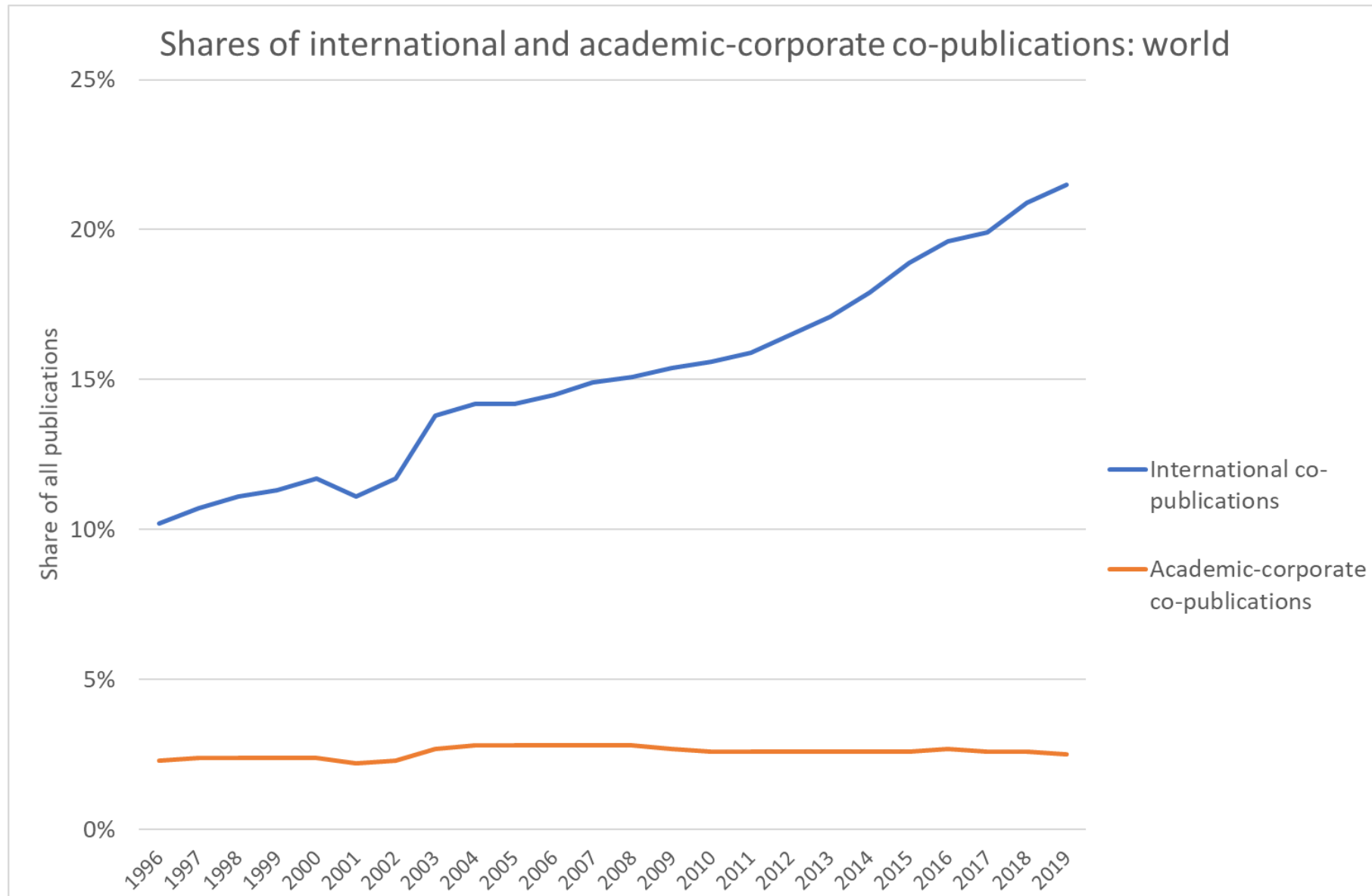
Internationalisation & innovation

Some results from a study of Scopus publications. All details are available in:

Pohl H (2021) Internationalisation, innovation, and academic–corporate co-publications, *Scientometrics*, available on-line at <https://link.springer.com/article/10.1007/s11192-020-03799-6>



Global trends - volume





Citation impact - world

Publications 2015–2019: world	Academic–corporate co-publications ≤100 co-authors*	All publications
Field-weighted citation impact (FWCI)	1.70	1.00
Top 10% percentile	17.6%	10.0%
Top 1% percentile	2.46%	1.00%
Total number of publications	403,102	15,572,701
* Citation indicators calculated as the weighted average for the period 2015–2019		



Citation impact & volumes of academic-corporate co-publications per scientific discipline

	FWCI*	Publication volume
Agricultural Sciences	1.37	19,761
Engineering and Technologies	1.30	174,594
Humanities	3.23	3,130
Medical Sciences	2.21	105,680
Natural Sciences	1.56	283,269
Social Sciences	1.68	23,976
All disciplines**	1.70	403,102

* Calculated as the weighted average for the years 2015–2019 using publications with up to 100 co-authors

** Several publications are counted in more than one discipline



Selected indicators for 10 countries

Country	Publication volume (growth*)	Share of academic– corporate co- publ (growth*)	Share of int'l co-publ (growth*)	Share of int'l among academic– corporate co-publ (growth*)	FWCI all publ	FWCI academic– corporate co-publ ≤100 authors
Brazil	395,674 (4.4%)	2.1% (0.8%)	32% (2.3%)	70% (1.1%)	0.90	2.50
China	2,799,979 (8.8%)	2.4% (1.7%)	22% (2.3%)	39% (-1.2%)	1.02	1.42
Germany	900,696 (1.3%)	6.5% (0.9%)	49% (1.8%)	74% (0.4%)	1.37	2.33
Indonesia	122,908 (54.3%)	0.7% (-16.0%)	20% (-15.6%)	92% (-0.6%)	0.92	1.87
Iran	279,547 (6.9%)	0.6% (2.8%)	23% (7.0%)	73% (1.2%)	1.05	1.84
South Africa	122,124 (6.2%)	2.9% (-3.2%)	48% (2.0%)	92% (0.7%)	1.26	2.77
South Korea	426,357 (2.0%)	4.5% (-2.1%)	28% (2.2%)	43% (0.8%)	1.05	1.86
Sweden	214,905 (2.2%)	8.3% (0.8%)	62% (2.2%)	80% (1.6%)	1.68	2.32
United Kingdom	1,060,954 (1.5%)	5.7% (0.8%)	52% (3.2%)	81% (0.7%)	1.56	2.52
United States	3,429,307 (0.9%)	4.7% (0.0%)	34% (2.9%)	60% (1.5%)	1.42	2.45
World	15,572,701 (2.8%)	2.6% (-0.9%)	20% (2.6%)	45% (0.5%)	1.00	1.70

* Annual growth rate calculated using linear regression for the period 2015–2019

⌘ Calculated as the weighted average for the period 2015–2019



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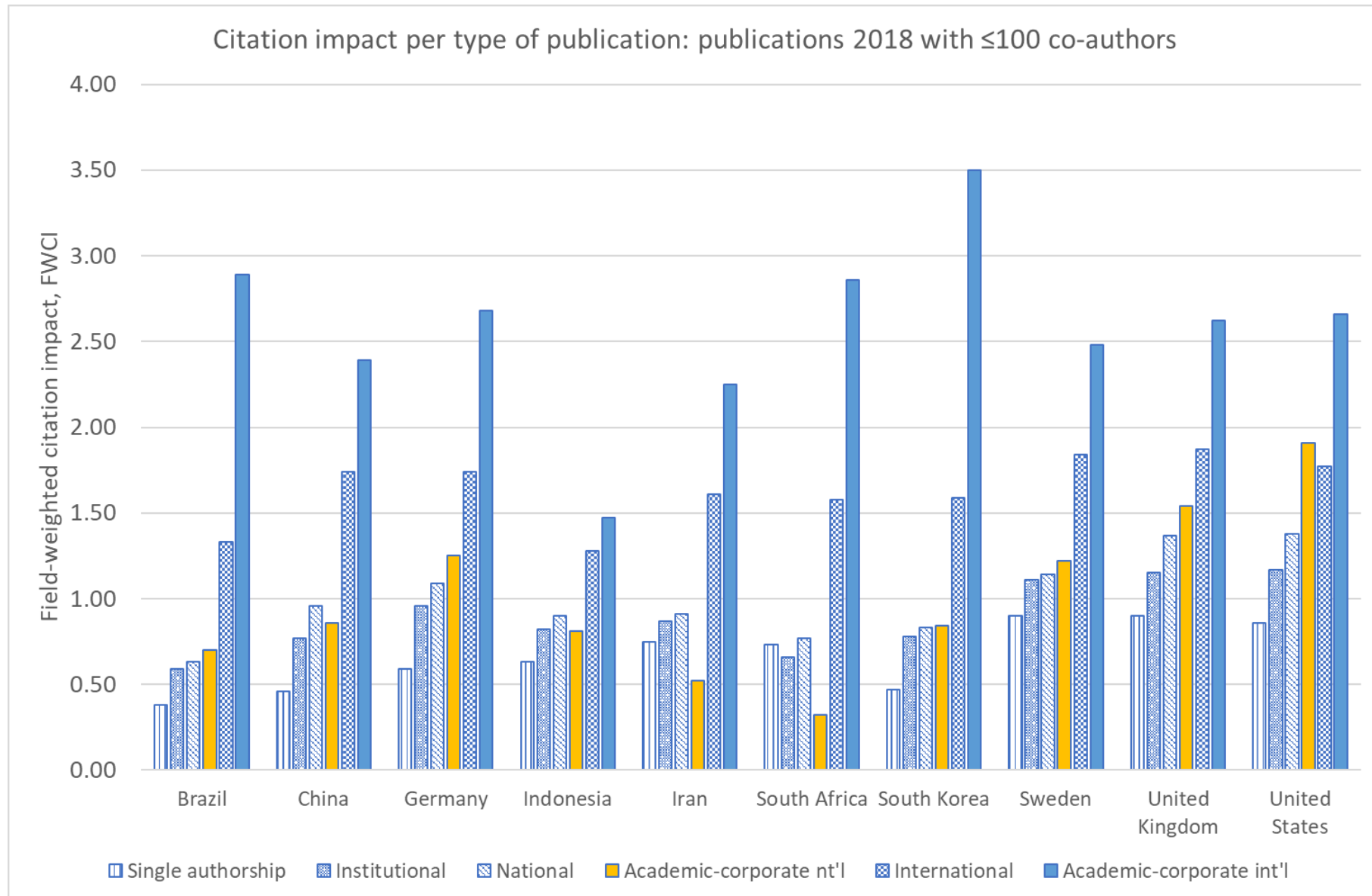
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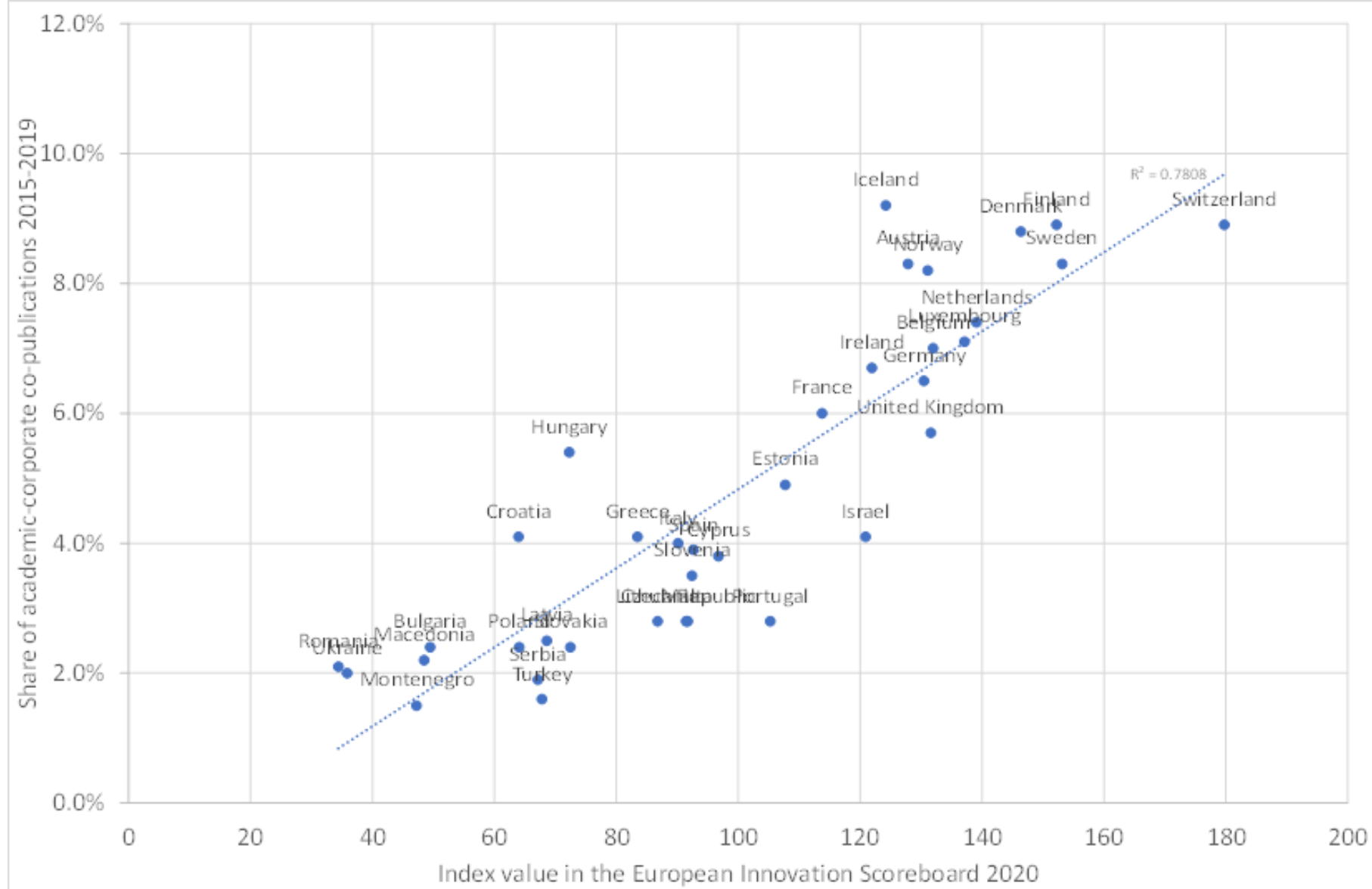


Citation impact per type of publication





Academic-corporate co-publ and innovation





Research collaboration with growth countries

The scientific world changes rapidly. Are our research collaborations adapting and thus future proof?

Some results based on a methodology published in:

Pohl H (2020) Collaboration with countries with rapidly growing research: supporting proactive development of international research collaboration, *Scientometrics*, 122(1), 287-307



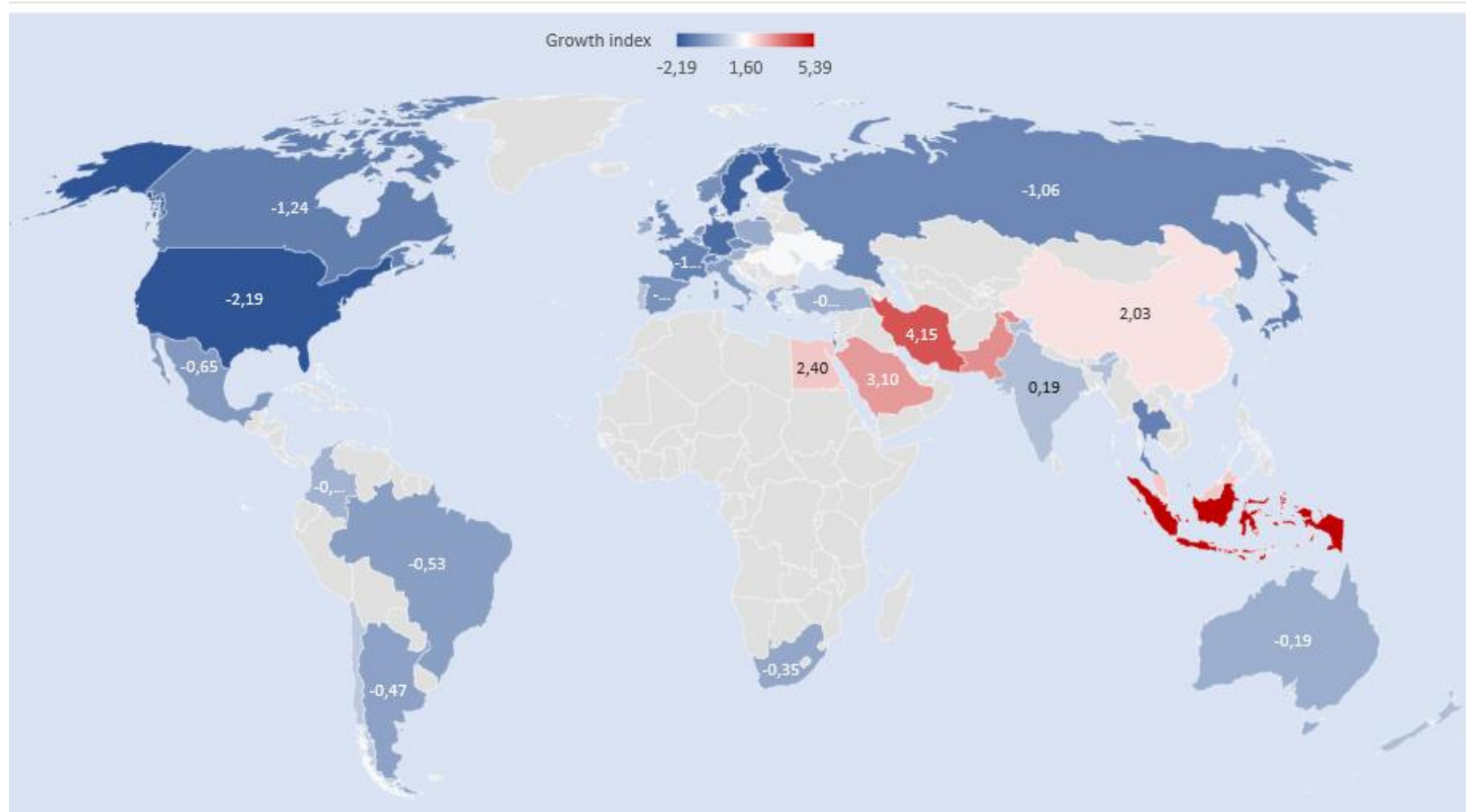
Method: growth calculations

For each country in the world:

- Two time windows: 1999-2018 and 2014-2018
- Publication volume growth in each period was calculated using exponential regression
- Citation impact growth (FWCI) in each period was calculated using linear regression
- Results were normalized and combined with 30% on the 20-year and 70% on the 5-year period and equal weight on volume and citation impact growth



Result: growth countries

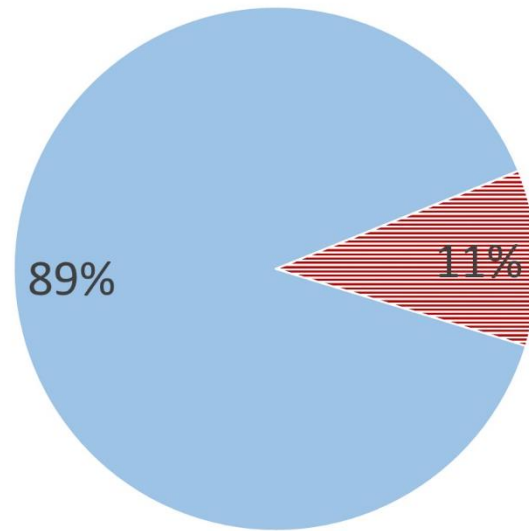


48 countries with >10,000 Scopus publications 2018

Method: collaboration indicator

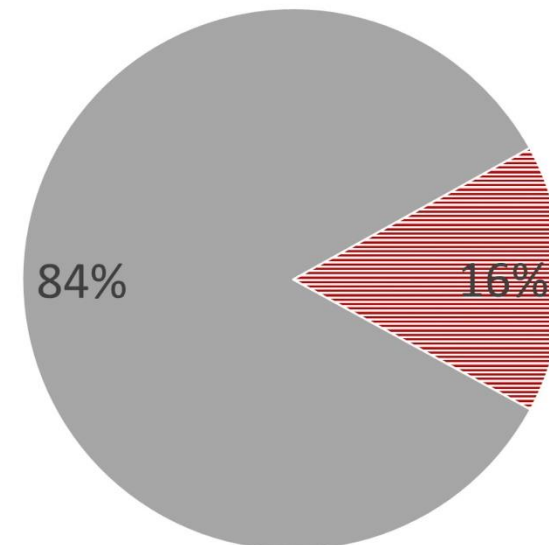
Based on co-publications, the actual co-publication volume is compared to the 'expected'. Example:

Share of co-publications with USA among all
Swedish international co-publications



ACTUAL

Share of US international co-publications
among all international co-publications

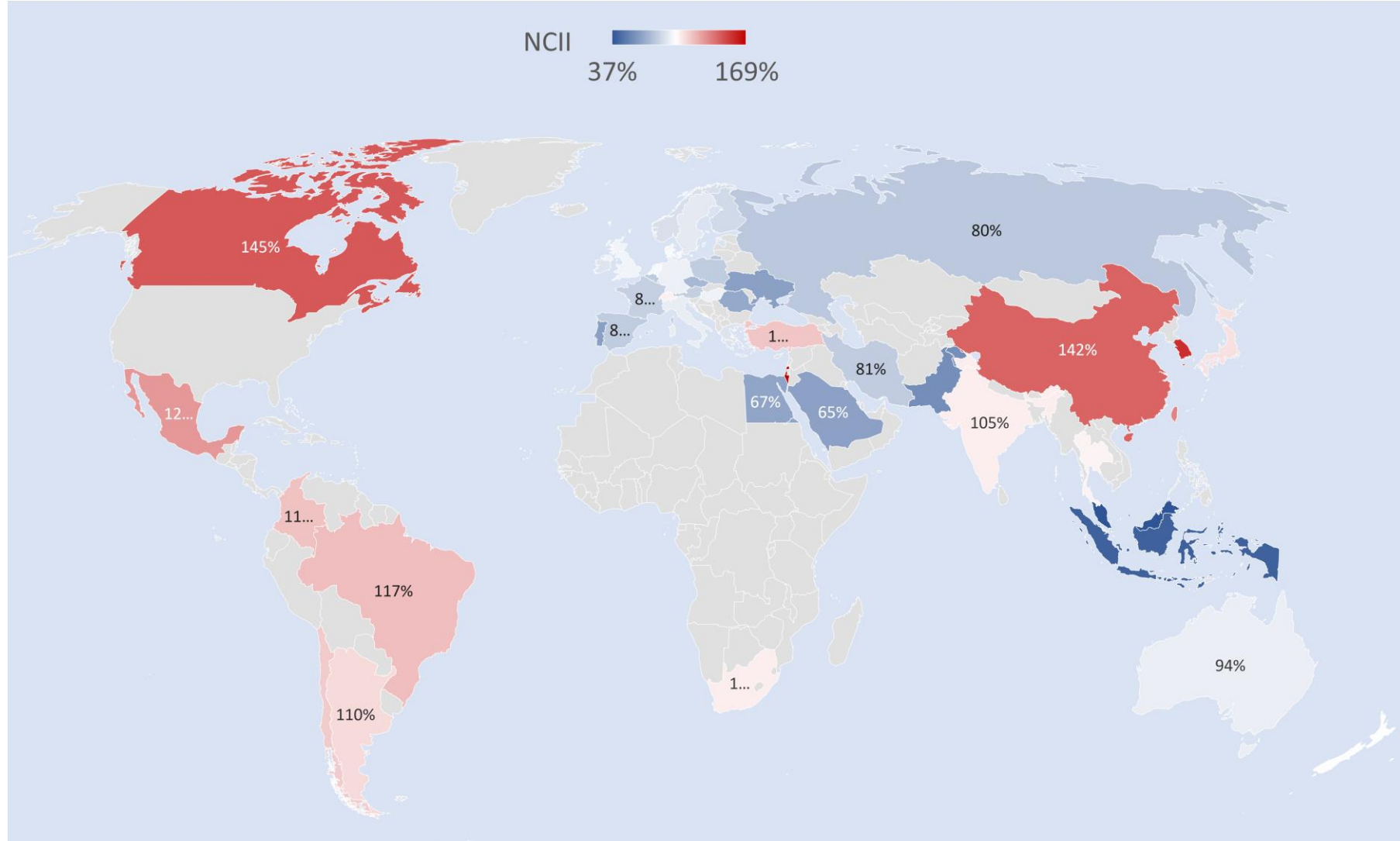


'EXPECTED'

$$\frac{\text{ACTUAL}}{\text{EXPECTED}} = \frac{11}{16} = 66\%$$



Result: US collaboration intensity

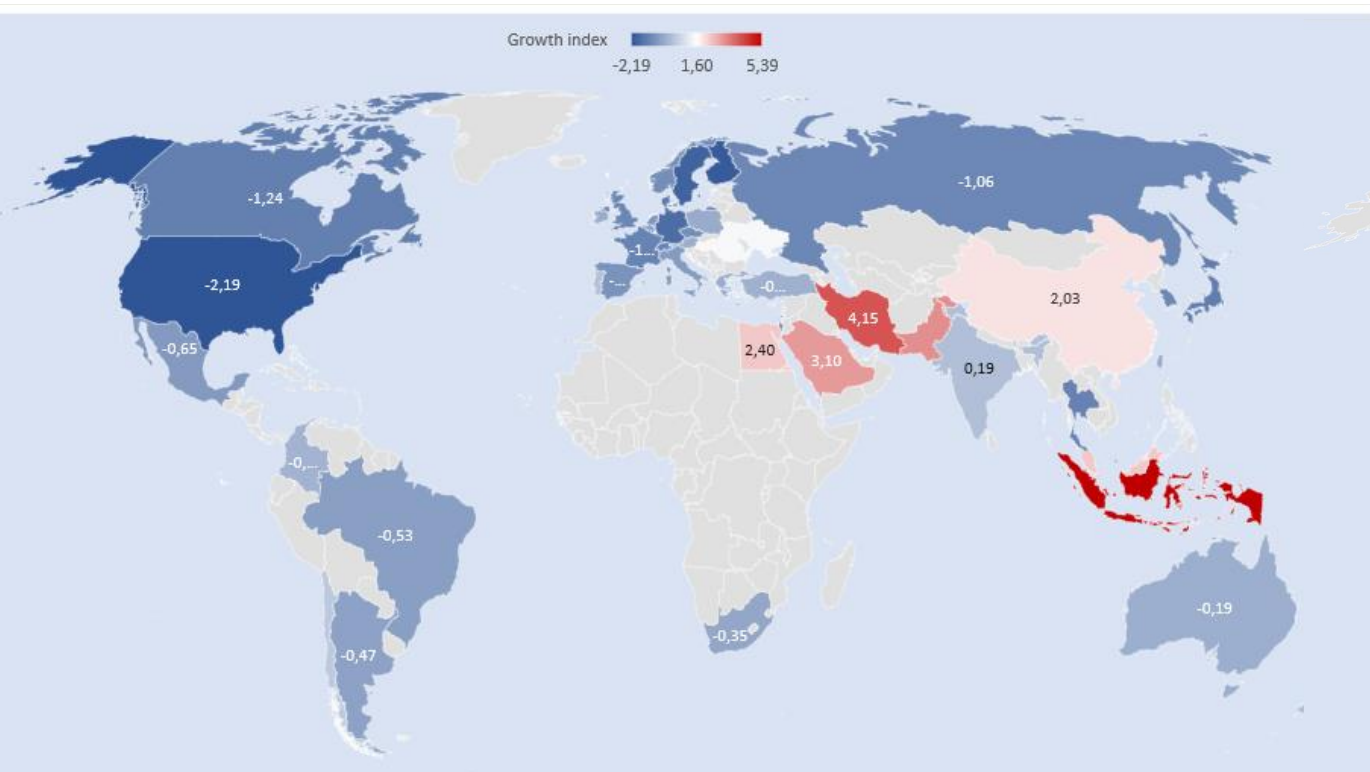


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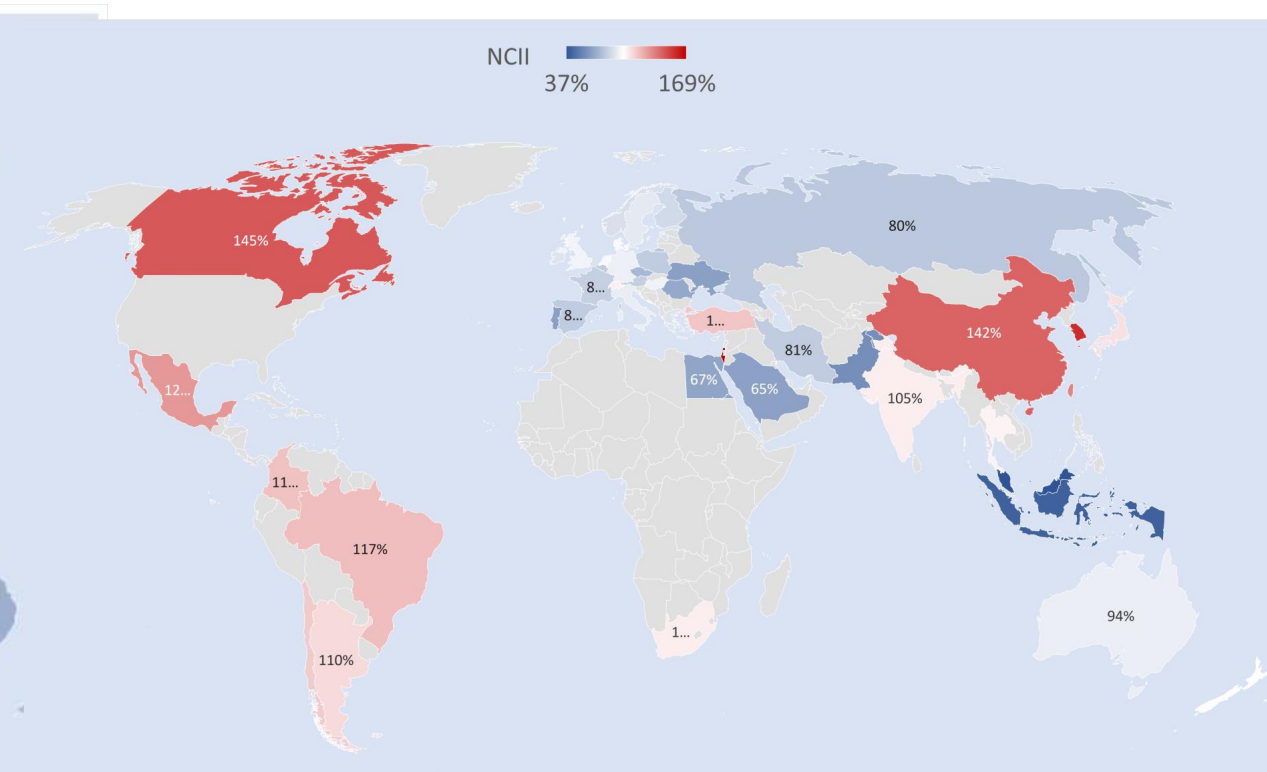


Compare: growth countries and collaboration

GROWTH



COLLABORATION



48 countries with >10,000 Scopus publications 2018



Conclusions

Compared to the average scientific publication:

- International co-publications give higher citation impact
- Academic-corporate co-publications give higher citation impact
- International academic-corporate co-publications give even higher citation impact.

There is a risk that the research world develops more rapidly than the research collaboration networks.



Questions & comments?

Always happy to discuss, now or later:

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