



An analysis of the mobility patterns of Canadian researchers in three research fields

BRIC

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Summary

Research question: What are the mobility patterns of Canadian researchers?

The flow of ideas across geographies is essential for a healthy research ecosystem.

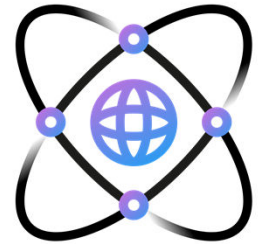
- Graduate students
- Postdocs/early career researchers
- Established researchers

Prior studies have shown the benefits of this cross-pollination to research and innovation outcomes (Halevi et al. 2015).

Significance: Mobility data can help university leaders and government policy makers understand changes occurring in the Canadian research workforce and inform their funding and policy decisions to sustain and strengthen the national research system.

Implications for universities:

- Tuition from foreign students
- Rankings
- Hiring/retention
- Collaboration



Methodology

Source- Web of Science Core Collection

Web of Science journal categories-

- Virology
- Finance
- Environmental sciences

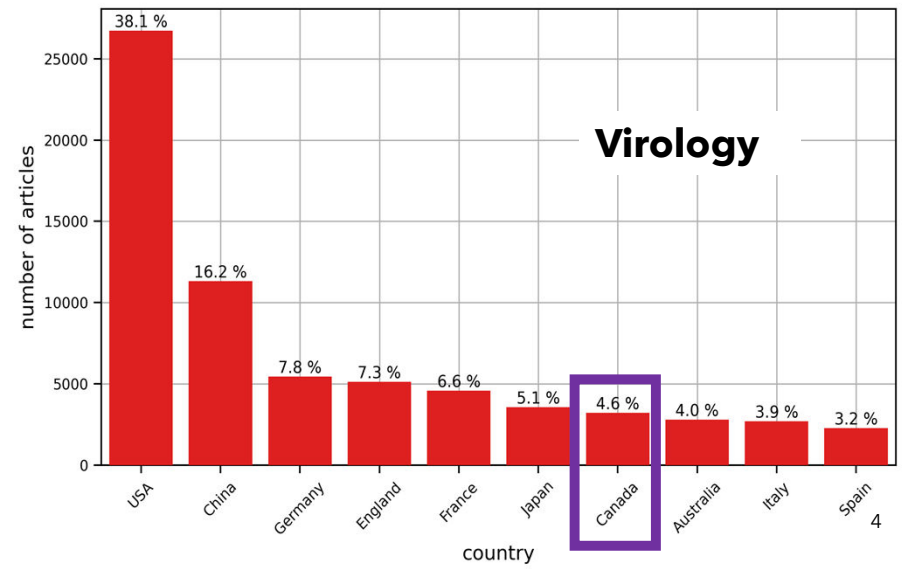
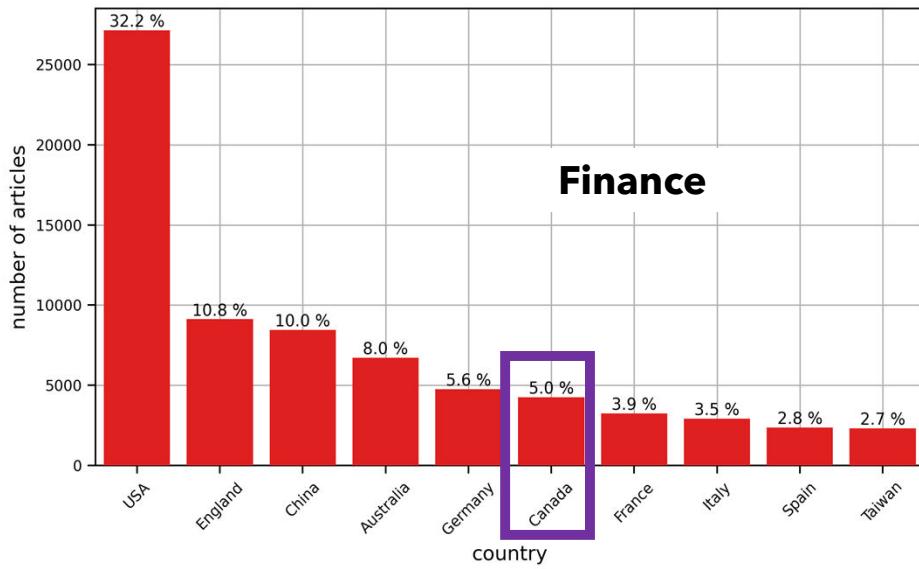
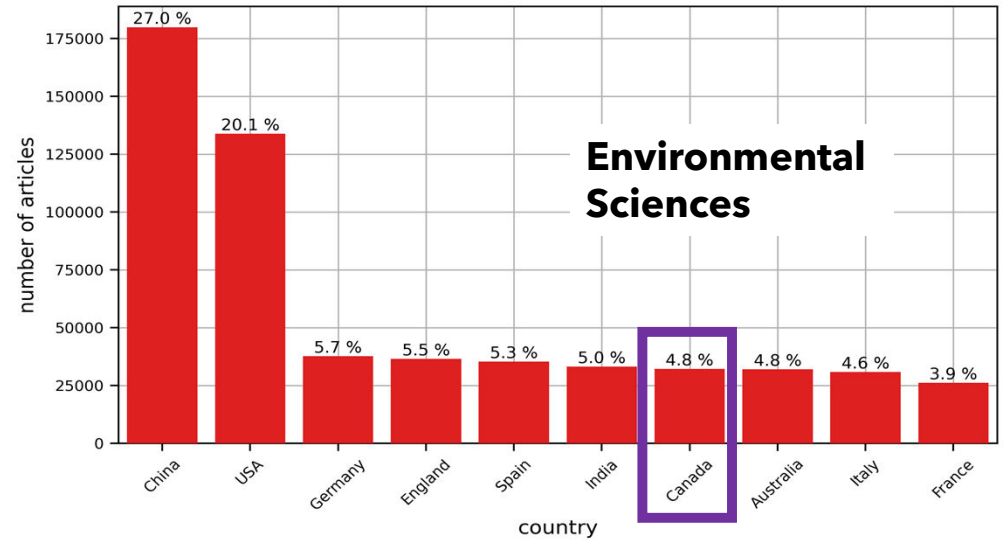
Time period- 2012-2021

Document types- Articles, Reviews

Country- Canada

Landscape

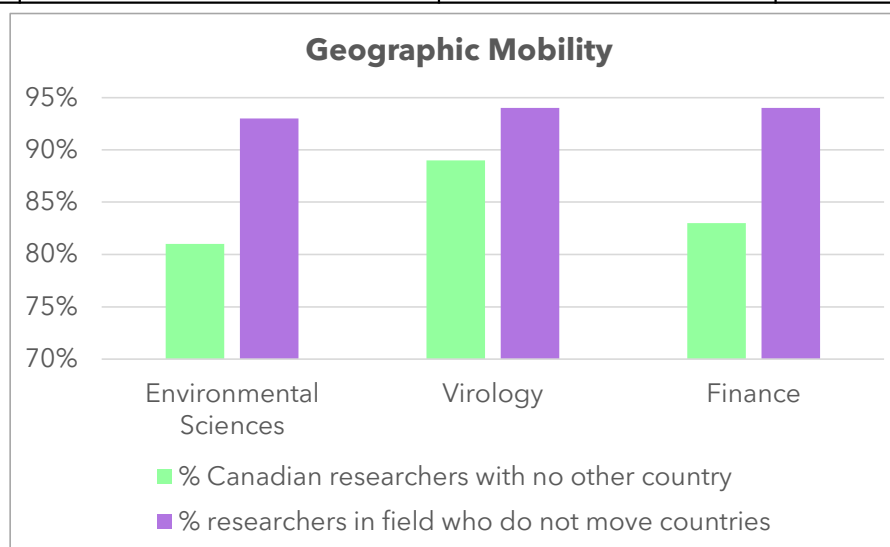
Canada's contribution to these three categories



Geographic mobility

Affiliated= defined by address affiliation in article

	# researchers affiliated with Canada	# Canadian researchers with no other countries	% Canadian researchers with no other country	% researchers in field who do not move/add countries
Environmental Sciences	33,731	27,419	81%	93%
Virology	5,895	5,239	89%	94%
Finance	2,480	2,057	83%	94%



Country movement

Top 10 countries that mobile Canadian researchers are also affiliated with

Environmental Sciences

Country	researchers	articles
USA	1719	6533
China	1541	15732
France	440	1267
England	404	1361
Australia	358	1220
Germany	248	804
Iran	172	482
Switzerland	158	561
India	141	503
Spain	137	523

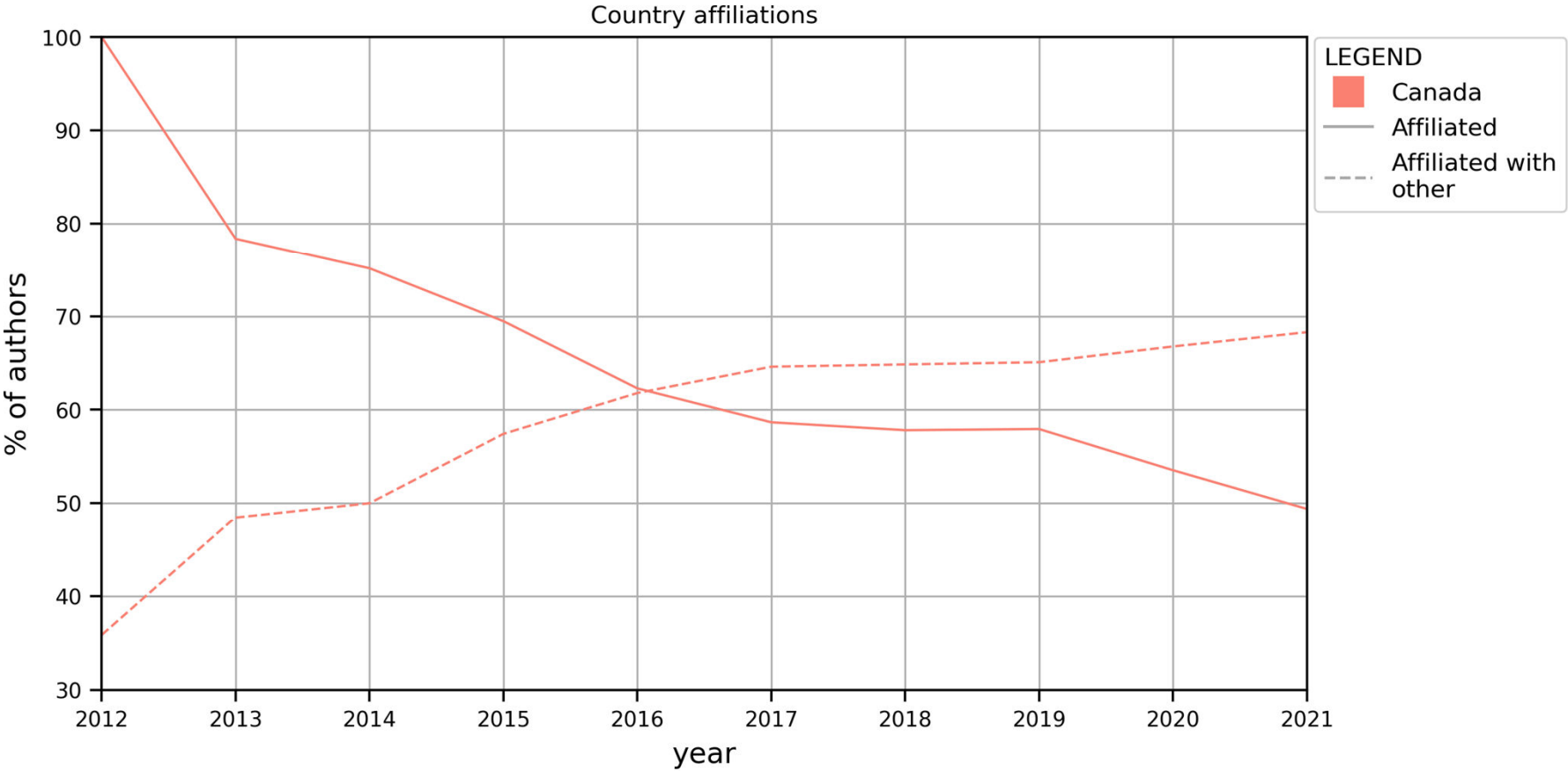
Virology

Country	researchers	articles
USA	241	1113
China	98	1676
France	49	114
Germany	41	193
England	36	160
Australia	35	178
Kenya	21	61
Egypt	18	43
Netherlands	16	74
Japan	16	48

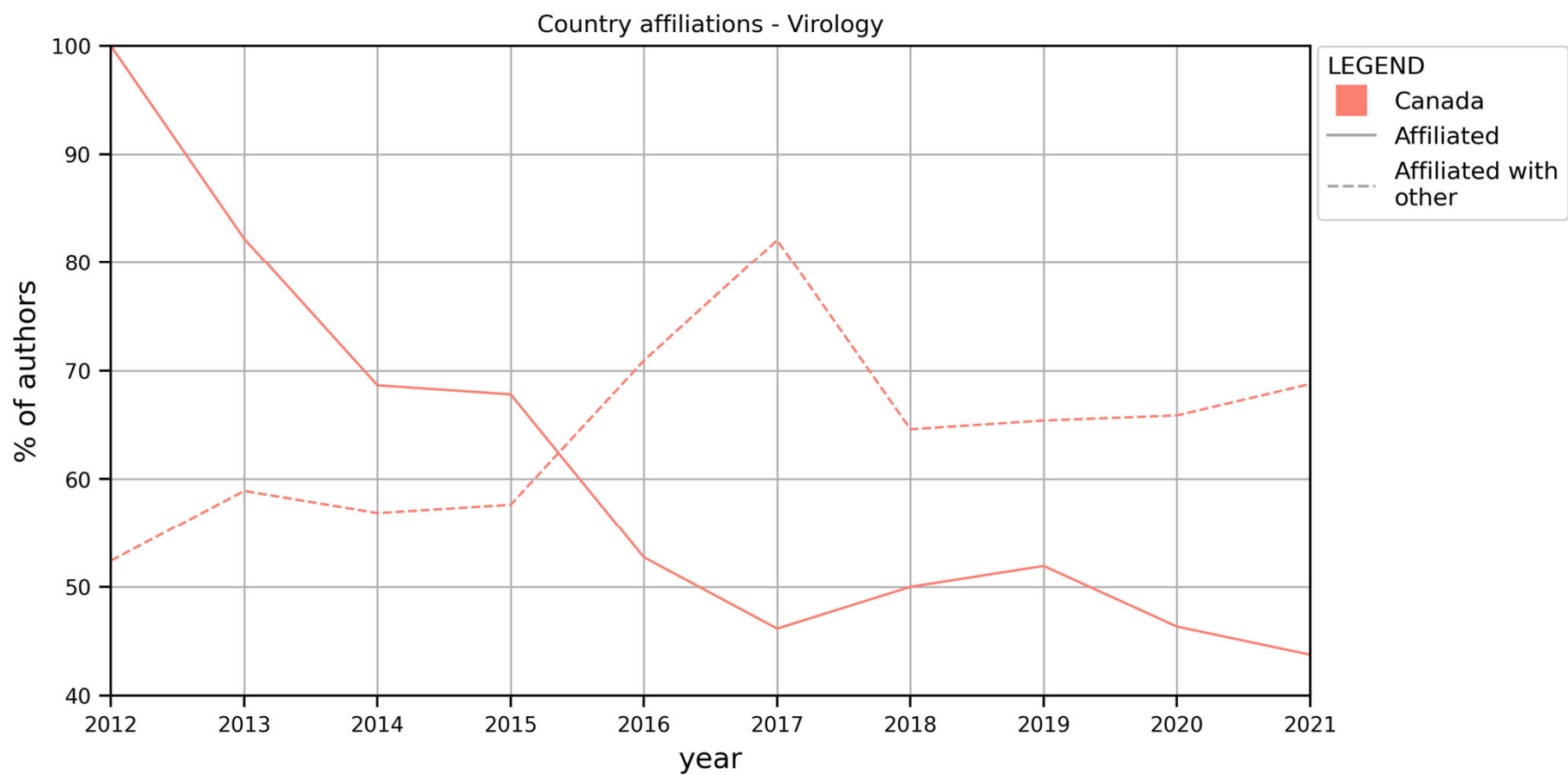
Finance

Country	researchers	articles
USA	169	673
China	66	434
France	47	140
England	39	123
Australia	34	128
Germany	16	54
Denmark	11	47
Netherlands	10	37
Belgium	8	16
Scotland	7	15

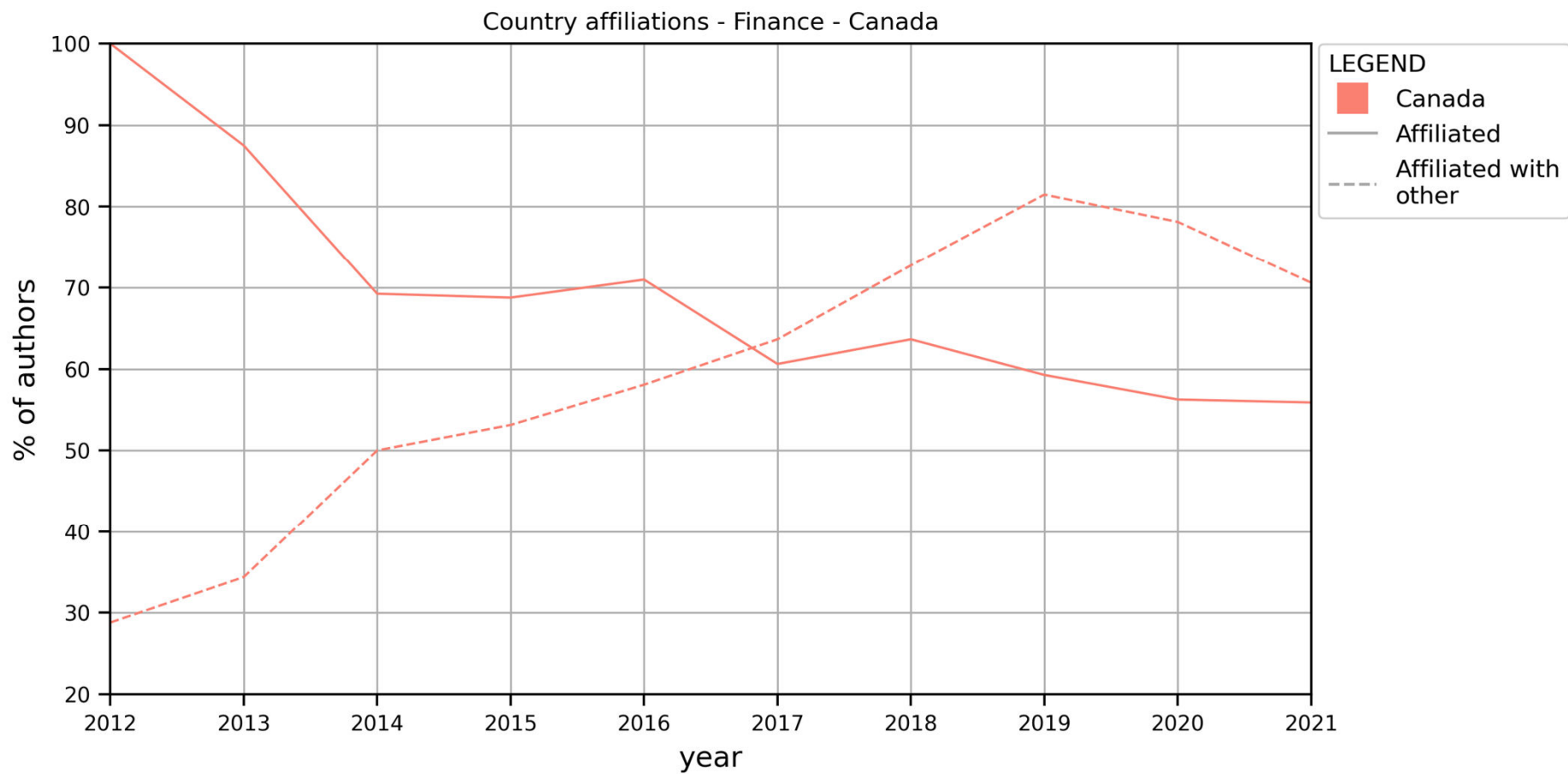
Environmental Sciences: Canada geographic mobility trend



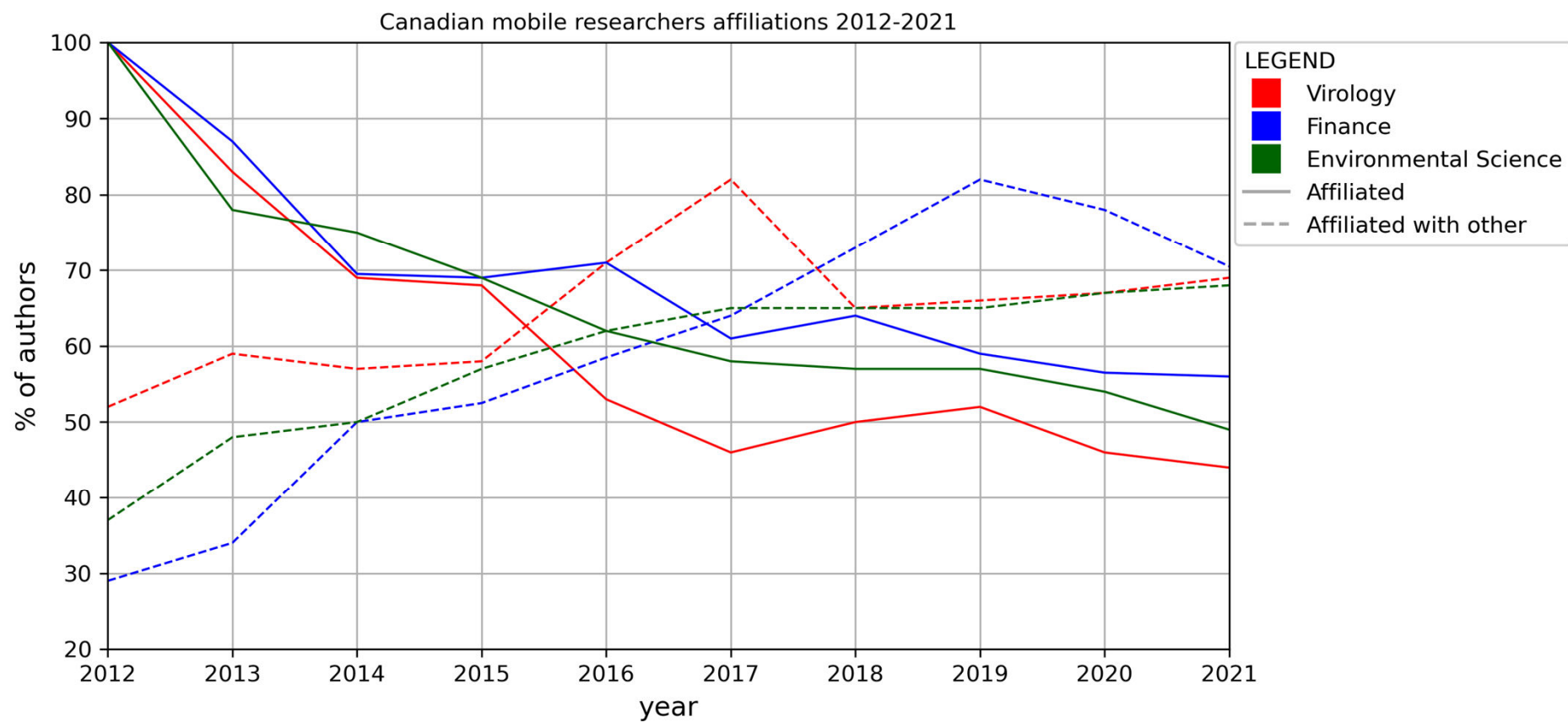
Virology - Canada geographic mobility trend



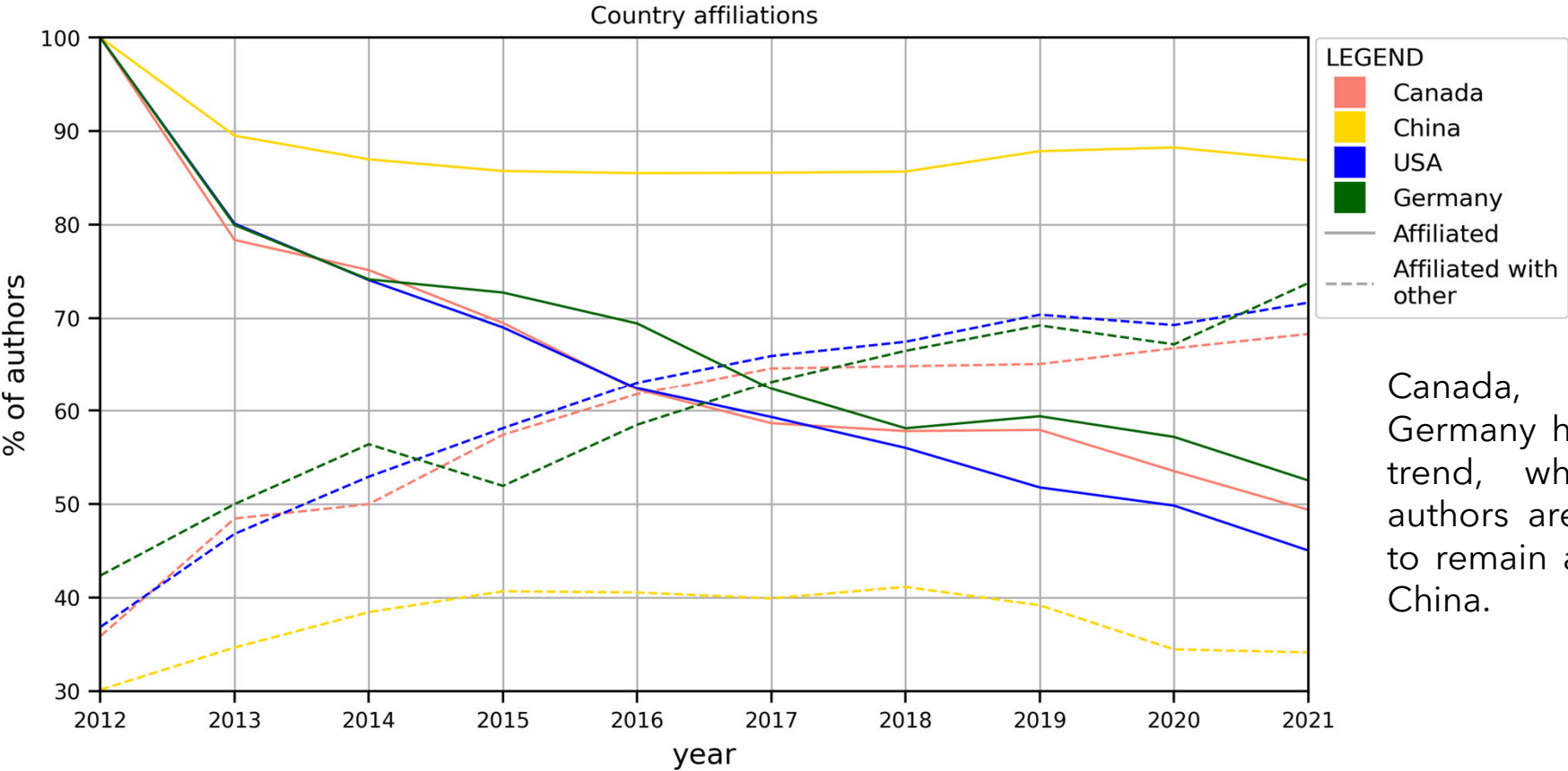
Finance - Canada geographic mobility trend



Three fields - Canada geographic mobility trend

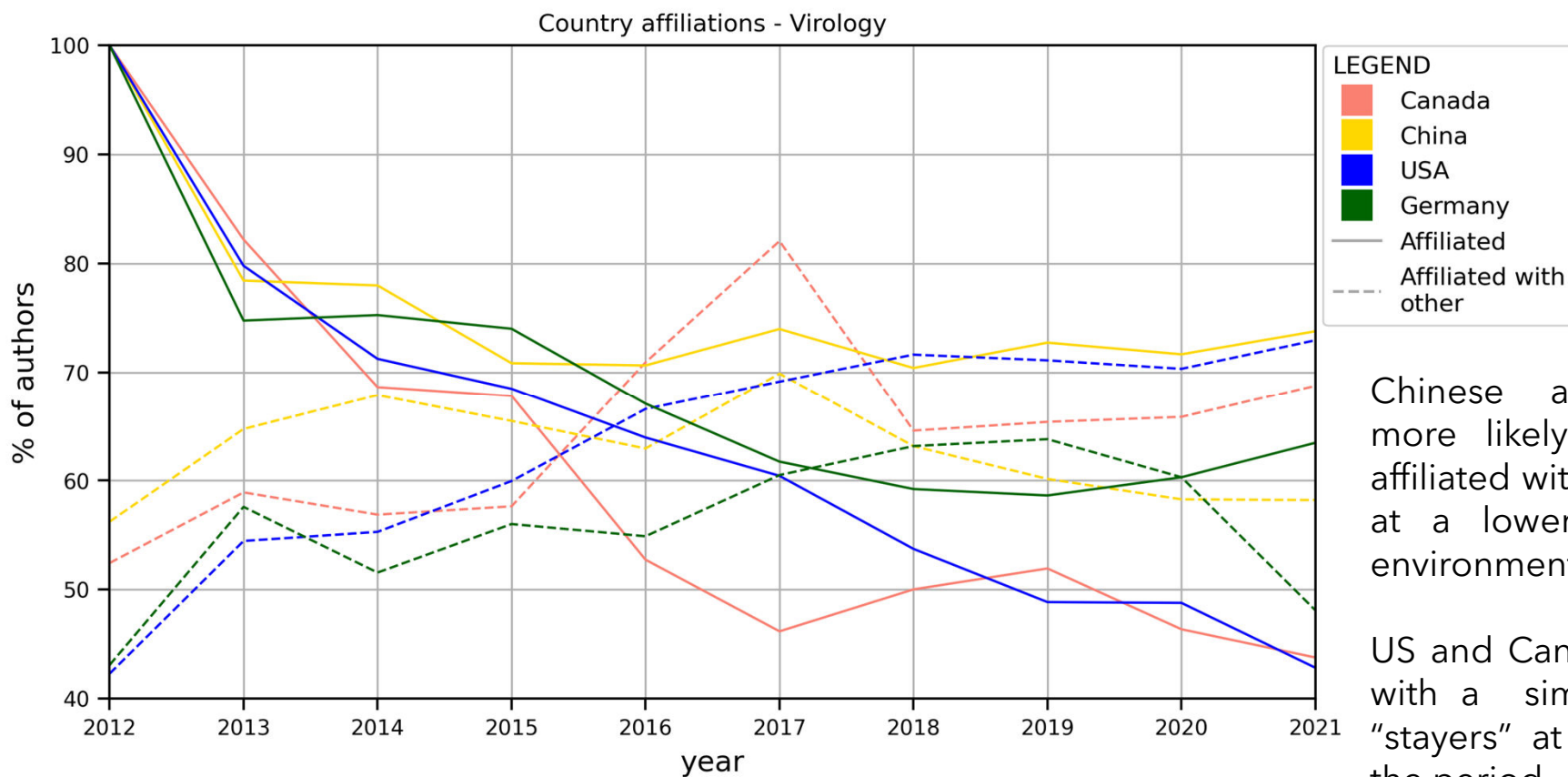


Environmental Sciences- Canada compared to top three research economies



Canada, USA and Germany have a similar trend, while Chinese authors are more likely to remain affiliated with China.

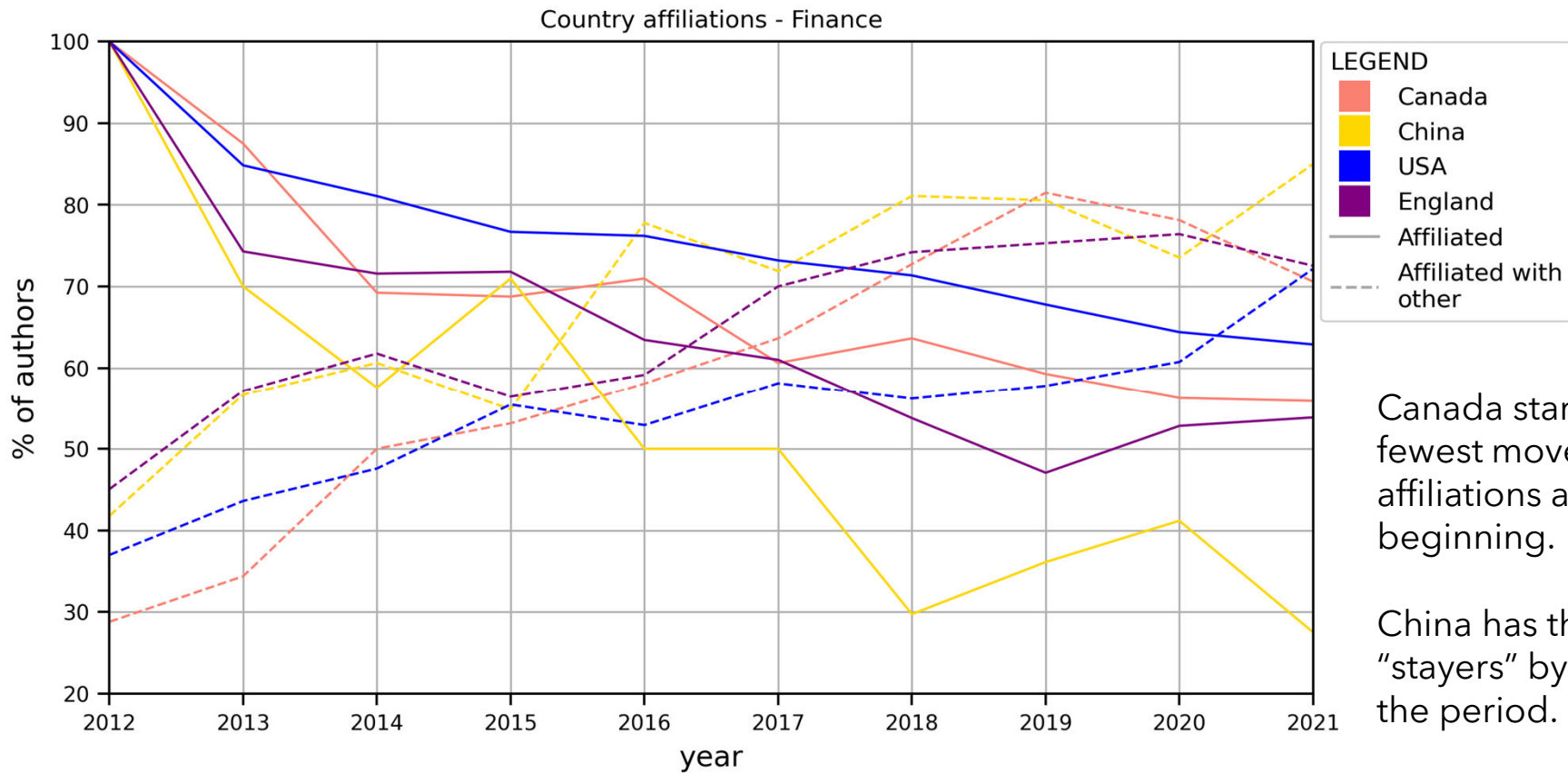
Virology - Canada compared to top three research economies



Chinese authors are more likely to remain affiliated with China, but at a lower rate than environmental sciences.

US and Canada end up with a similar rate of "stayers" at the end of the period.

Finance - Canada compared to top three research economies



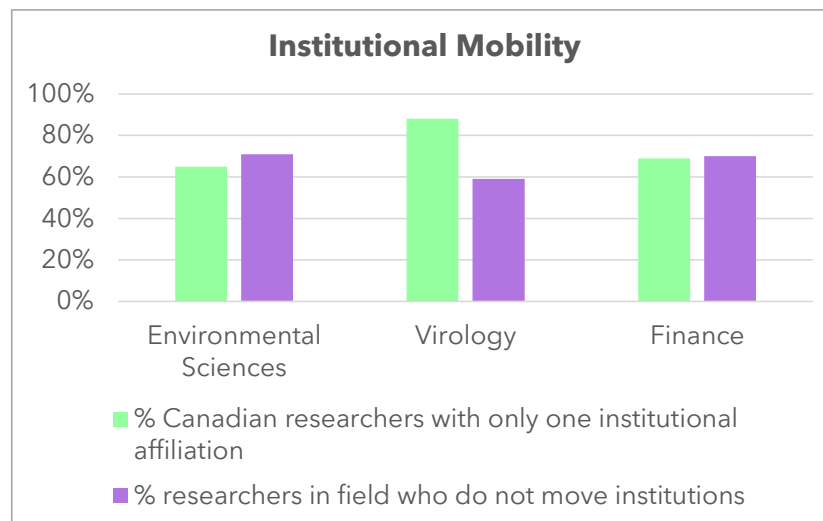
Canada starts with the fewest movers/dual affiliations at the beginning.

China has the fewest "stayers" by the end of the period.

Institutional mobility

Affiliated= defined by address affiliation in article

	# researchers affiliated with Canada	# Canadian researchers with only one institutional affiliation	% Canadian researchers with only one institutional affiliation	% researchers in field with only one institutional affiliation
Environmental Sciences	33,731	21,808	65%	71%
Virology	5,895	3,731	88%	59%
Finance	2,480	1,699	69%	70%



Institutional mobility

Top foreign institutions for Canadian researchers (by the number of affiliated researchers)

Environmental Sciences

Organization	Country	# researchers	# papers
UFZ Helmholtz Center for Environmental Research	Germany	48	374
Max Planck Institute for Chemistry	Germany	45	447
Forschungszentrum Julich	Germany	39	286

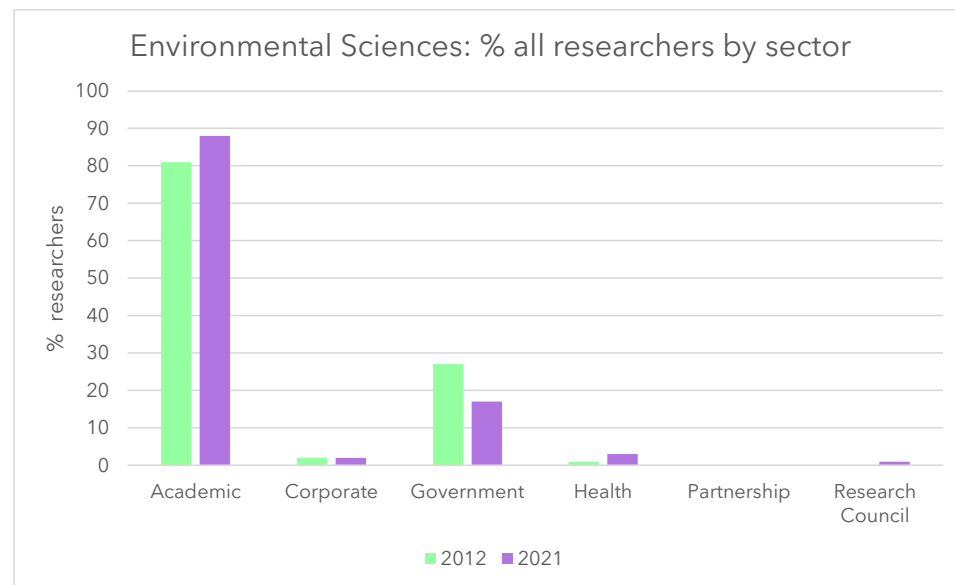
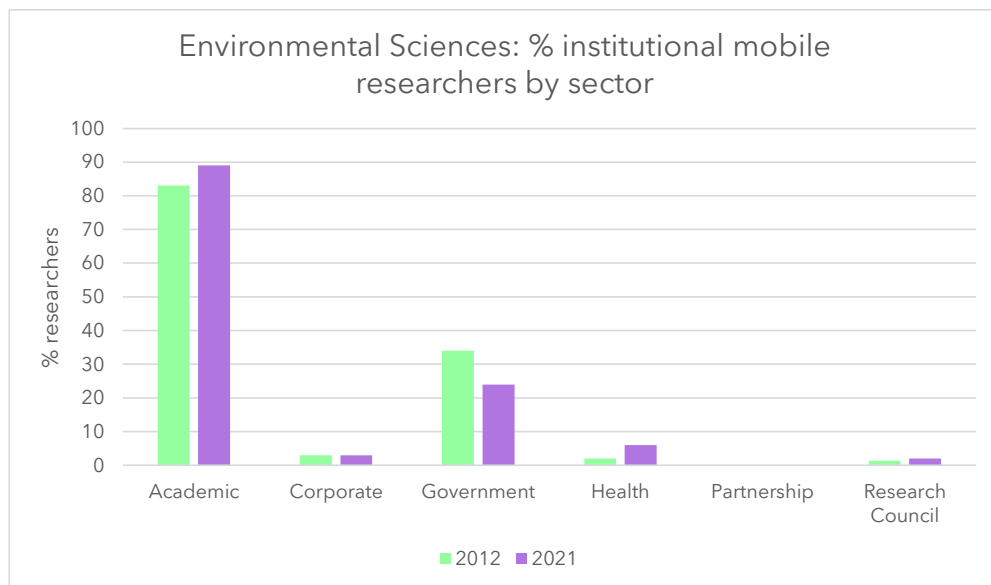
Virology

Organization	Country	# researchers	# papers
University of Nairobi	Kenya	10	29
National Institutes of Health (NIH)	USA	10	115
University of Paris Cite	France	7	22

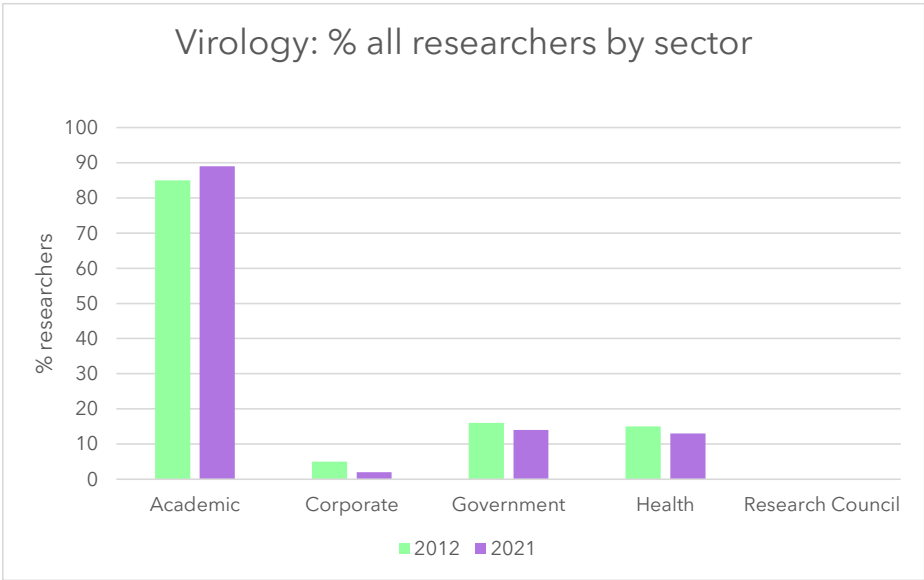
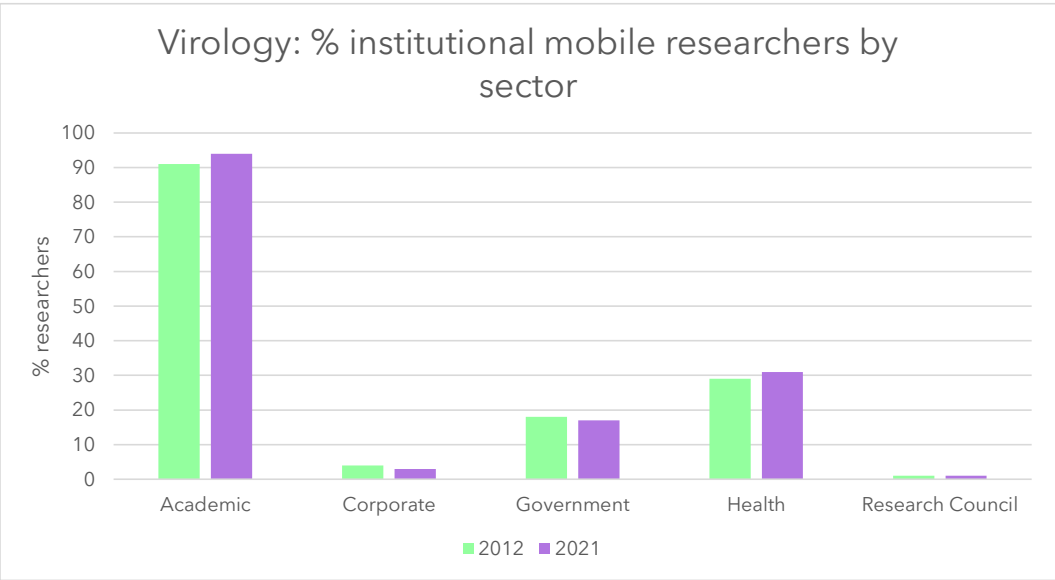
Finance

Organization	Country	# researchers	# papers
Pennsylvania State University	USA	5	7
IPAG Business School	France	3	15
University of California Irvine	USA	2	22

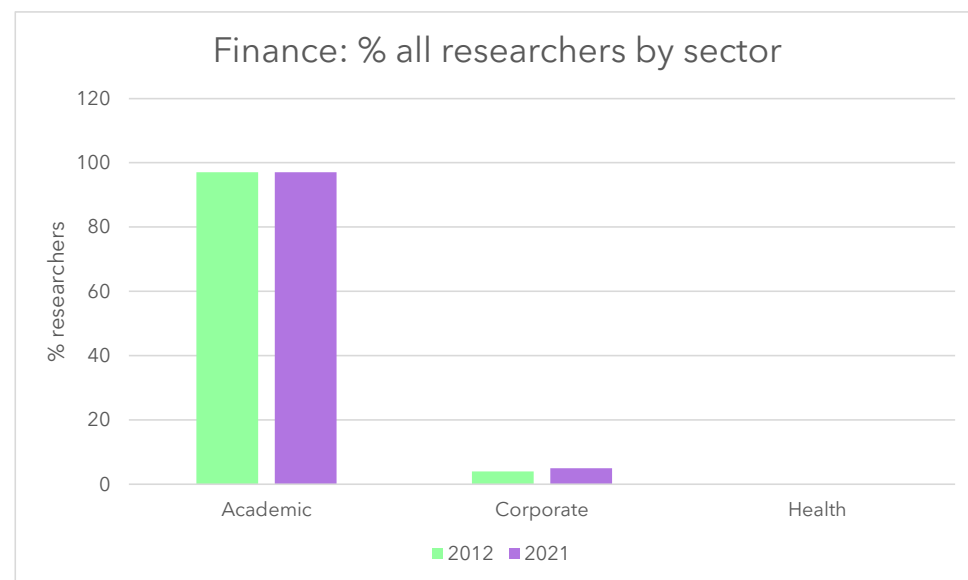
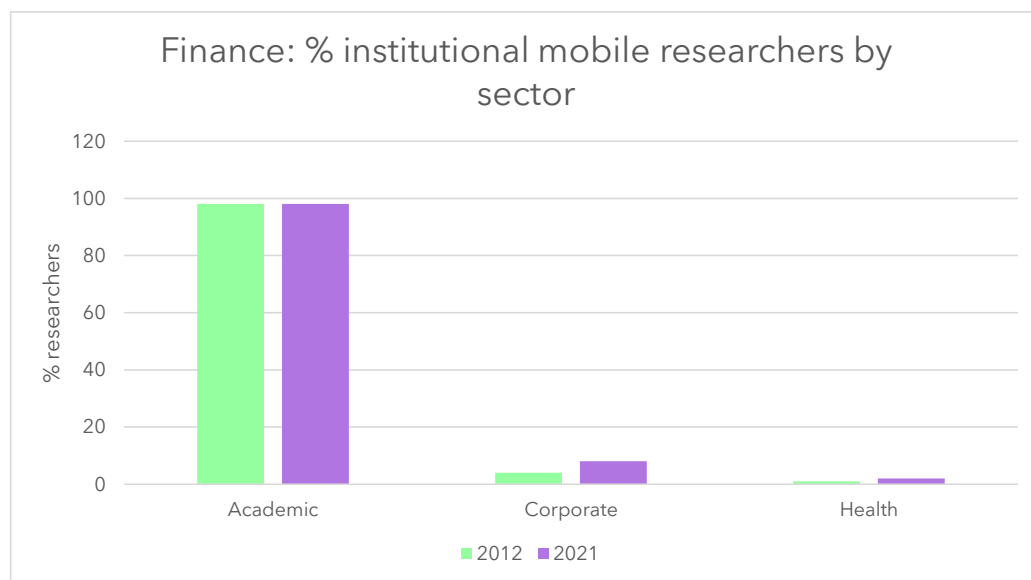
Environmental Sciences/Canada: by sector



Virology/Canada: by sector



Finance/Canada: by sector



Observations

Geographic mobility

- In all three fields, Canadian researchers are more mobile than the global average; environmental sciences has the highest percentage of “movers.”
- Some interesting countries of movement include Iran (environmental sciences) and Kenya and Egypt (virology).
- Canadian virology “movers” change/add countries earlier in the period than the other fields and other major countries do.
- China has lower rates of mobility in environmental sciences and virology compared to the other countries, and a higher rate of mobility in finance.

Observations

Institutional mobility

- Canadian environmental science and finance researchers change/add institutions at around the global rate.
- Canadian virology researchers are less institutionally mobile than the global average for the field.
- Academia gained Canadian environmental sciences researchers over the 10 years, while government lost.
- Institutionally mobile Canadian researchers in virology work in healthcare at a higher rate than all Canadian virology researchers.
- Finance is highly concentrated in academia; institutionally mobile researchers had a higher uptick in corporate than all Canadian finance researchers.

Further research

- Explore additional fields
- Add the dimension of academic age/career stage
- Compare foreign-born to native researchers
- Add dimension of country of origin for foreign-born researchers
- Explore dual affiliations



Thank You

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