

Internal versus international scholarly mobility and migration worldwide

Aliakbar Akbaritabar (Ali); Xinyi Zhao; Emilio Zagheni

Max Planck Institute for Demographic Research (MPIDR)

Rostock, DEU

[akbaritabar; zhao; zagheni]@demogr.mpg.de
(@akbaritabar; @XinyiZhao16; @ezagheni on Twitter)

Other scholars investigating scholarly mobility and migration in MPIDR (and friends)



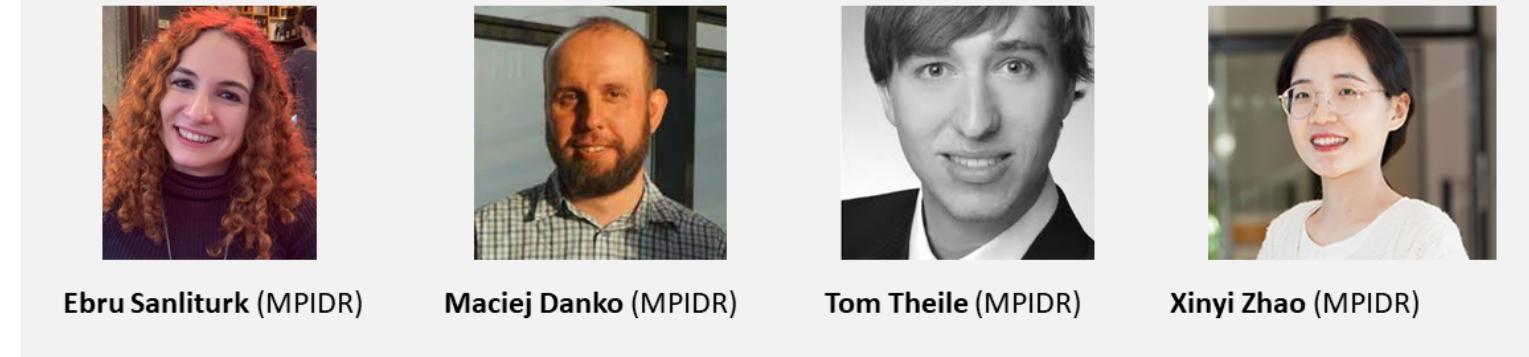
Emilio Zagheni (MPIDR)



**Andrea Miranda-Gonzalez
(UC Berkeley)**



Samin Aref (U. of Toronto)



- Zhao, X., Aref, S., Zagheni, E., & Stecklov, G. (2021b). Return migration of German-affiliated researchers: Analyzing departure and return by gender, cohort, and discipline using Scopus bibliometric data 1996–2020. ArXiv:2110.08340 [Cs]. <http://arxiv.org/abs/2110.08340>
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- Abel, G. J., Muttarak, R., Bordone, V., & Zagheni, E. (2019). Bowling Together: Scientific Collaboration Networks of Demographers at European Population Conferences. European Journal of Population, 35(3), 543–562. <https://doi.org/10.1007/s10680-018-9493-1>

Outline of the talk

- Introduction
 - Theoretical and methodological inspirations of our work
- Data, processing and re-purposing
- Methodological framework and prototype
- Global mobility based on Scopus
 - International, country level
 - International, region level
 - Internal, region level
- Five exemplar cases: USA, Germany, Italy and France

Introduction

- Theoretical impressions
 - Internal versus international migration¹
 - Research Trails^{2,3}
- Methodological impressions
 - Using bibliometric data alongside demographic life events⁴
 - Repurposing bibliometric data for migration research^{5,6,7}
 - Repurposing bibliometric data for knowledge transfer^{8,9}
- **Our proposal:** repurposing bibliometric data for:
 - Internal versus international mobility
 - Internationalized scholarly collaborations
 - Forming ties before (or during) mobility
 - *Integration in host country/institution's collaborations*

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- [2] Gläser, J., & Laudel, G. (2015). A Bibliometric Reconstruction of Research Trails for Qualitative Investigations of Scientific Innovations. *Historical Social Research*, Vol. 40, No. 3. <https://doi.org/10.12759/HSR.40.2015.3.299-330>
- [3] Laudel, G., & Gläser, J. (2017). Manual for Constructing Research Trails (Sciences). <http://www.laudel.info/downloads/research-trail-download/>
- [4] Cole, J. R., & Zuckerman, H. (1987). Marriage, Motherhood and Research Performance in Science. *Scientific American*, 256(2), 119–125. JSTOR. <https://doi.org/10.1038/scientificamerican0287-119>
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- [6] Vaccario, G., Verginer, L., & Schweitzer, F. (2020a). Reproducing scientists' mobility: A data-driven model. ArXiv:1811.07229 [Physics]. <http://arxiv.org/abs/1811.07229>
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Data (gathering & processing)

For methodological prototype

- Publications from Scopus web interface (APR 2021)
- Gold standard from publicly available CVs; or, ORCID record (education and experience sections)

For Global scholarly mobility

- All organizations from Scopus 1996-2020 (5.4m), joined to only *article* and *review* publications (36 million, and 16 million scholars)
- Provided by German Competence Centre for Bibliometrics via Max Planck Digital Library

Processing (on all sources)

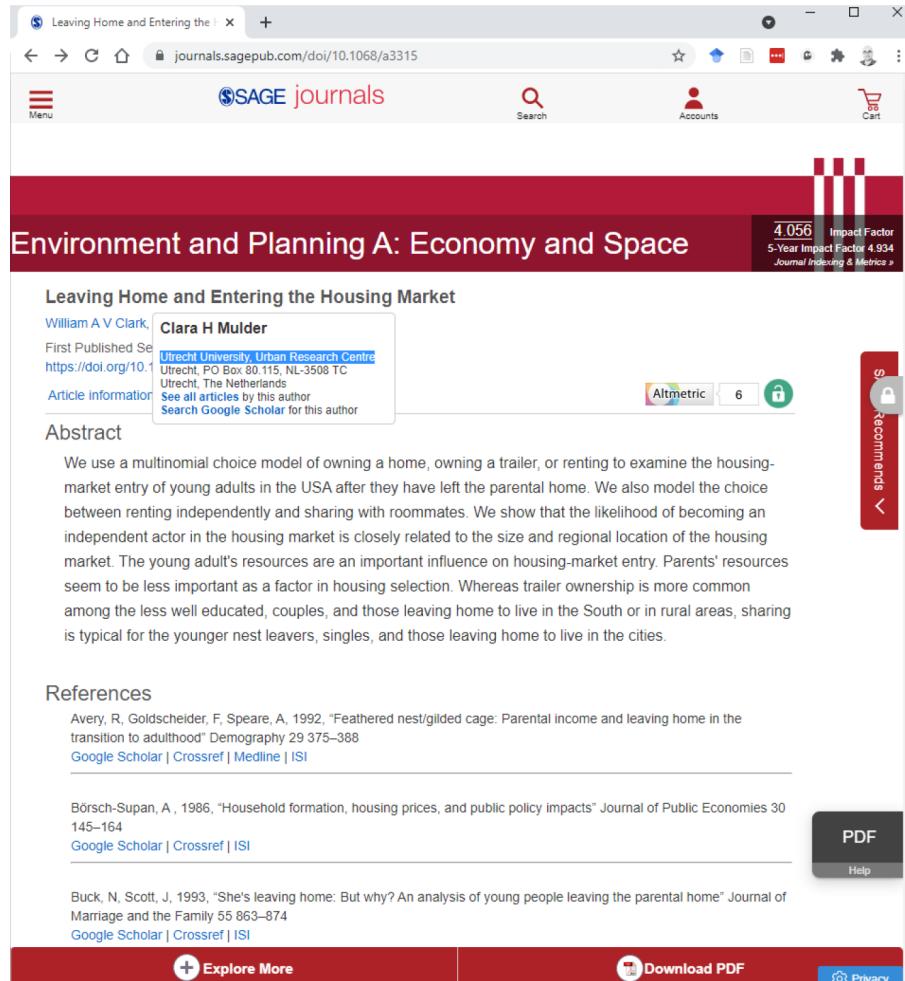
- Processing time entries in CV which is not coherent
- Need to clean the bibliometric data even from web interface (example follows)
- Encoding country of affiliation from bibliometric record (not perfect, need proper disambiguation)
- Organization name disambiguation using **ROR API**, based on Akbaritabar (2021)
- Author name disambiguation based on Scopus author IDs (98.3% precision (no publication by others) and 90.6% recall (all publications by X))
- Coverage of GeoNames codes for intra-country regions is dependent on previous step (example follows)
- Using specific coordinates in network visualization with stress minimization, Leiden algorithm for community detection
- **Net Migration Rate:**

$$NMR_{i,t} = \frac{I_{i,t} - E_{i,t}}{N_{i,t}} \times 1000$$

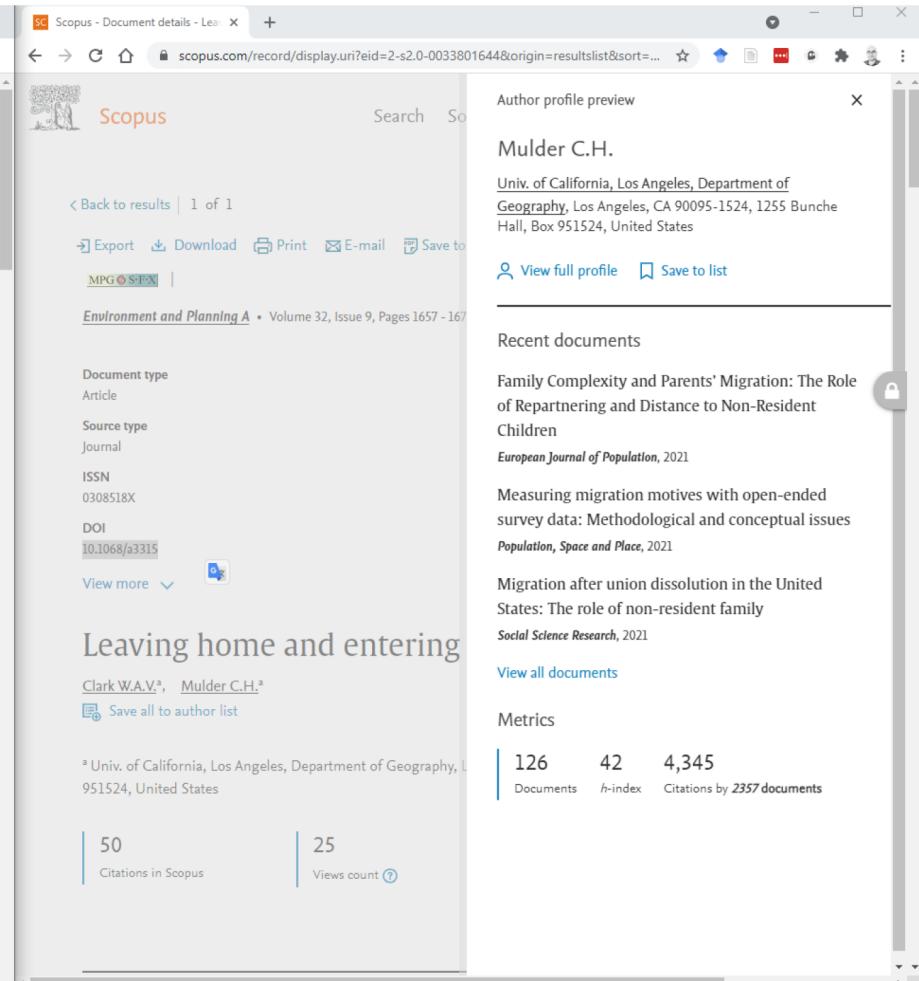
Affiliations based on public CV (top) and bibliometrics (bottom)

row_id	authorsid	name	highest_level_affiliation	country	city	start_date	end_or_max_date	year	country
authorsid	authorswithaffiliations							year	country
1	23494432900	Emilio_Zagheni	Max Planck Institute for Demographic Research	DEU	rostock	2018-09-01	2021-03-30	2020	DEU
2	23494432900	Emilio_Zagheni	University of Washington	USA	seattle	2014-09-01	2018-08-30	2020	DEU
3	23494432900	Emilio_Zagheni	City University of New York	USA	new york	2012-08-01	2014-08-30	2020	DEU
4	23494432900	Emilio_Zagheni	Max Planck Institute for Demographic Research	DEU	rostock	2010-08-01	2012-07-30	2020	DEU
5	23494432900	Emilio_Zagheni	University of California	USA	berkeley	2005-08-01	2010-04-30	2020	DEU
6	23494432900	Emilio_Zagheni	Bocconi University	ITA	milan	2000-09-01	2004-12-30	2020	DEU
23494432900	Zagheni, E., Laboratory of Digital and Computational Demography, Max Planck Institute for Demographic Research, Rostock, Germany							2020	DEU
23494432900	Zagheni, E., Laboratory of Digital and Computational Demography, Max Planck Institute for Demographic Research, Rostock, Germany							2020	DEU
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23494432900	Zagheni, E., Max Planck Institute for Demographic Research, Rostock, Germany							2019	DEU
23494432900	Zagheni, E., Max Planck Institute for Demographic Research, Konrad-Zuse-Straße 1, Rostock, 18057, Germany							2019	DEU
23494432900	Zagheni, E.							2019	DEU
23494432900	Zagheni, E., Department of Sociology, University of Washington, Seattle, United States, Max Planck Institute for Demographic Research, Rostock, Germany							2019	DEU
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23494432900	Zagheni, E., Max Planck Institute for Demographic Research, Germany							2019	DEU
23494432900	Zagheni, E., Max Planck Institute for Demographic Research, Konrad-Zuse-Str. 1, Rostock, 18057, Germany							2019	DEU
23494432900	Zagheni, E., Qatar Computing Research Institute, Doha, Qatar							2019	QAT
23494432900	Zagheni, E., Max Planck Institute for Demographic Research							2019	DEU
23494432900	Zagheni, E., Max Planck Institute for Demographic Research, Rostock, Germany							2018	DEU
23494432900	Zagheni, E., Max Planck Institute for Demographic Research, Rostock, Germany							2018	DEU
23494432900	Zagheni, E., University of Washington, Max Planck Institute for Demographic Research, United States							2018	USA
23494432900	Zagheni, E., University of Washington and Max Planck Institute for Demographic Research, United States							2018	USA
23494432900	Zagheni, E.							2017	DEU
23494432900	Zagheni, E., Department of Sociology, University of Washington, Seattle, 211 Savery Hall, Box 353340, Seattle, WA 98195-3340, United States							2017	USA
23494432900	Zagheni, E., University of Washington, Seattle, United States							2017	USA
23494432900	Zagheni, E., University of Washington, United States							2017	USA
23494432900	Zagheni, E., University of Washington, Seattle, United States							2016	USA
23494432900	Zagheni, E., Department of Sociology, University of Washington at Seattle, 211 Savery Hall Box 353340, Seattle, WA 98195-3340, United States							2016	USA
23494432900	Zagheni, E., University of Washington, Seattle, WA, United States							2015	USA
23494432900	Zagheni, E., Department of Sociology, University of Washington, United States							2015	USA
23494432900	Zagheni, E., University of Washington, Seattle, United States							2015	USA
23494432900	Zagheni, E., Department of Sociology, University of Washington, Seattle, United States							2015	USA
23494432900	Zagheni, E., Department of Sociology, University of Washington, Seattle, WA, United States							2015	USA

A publication on publisher's website (left) and Scopus (right)



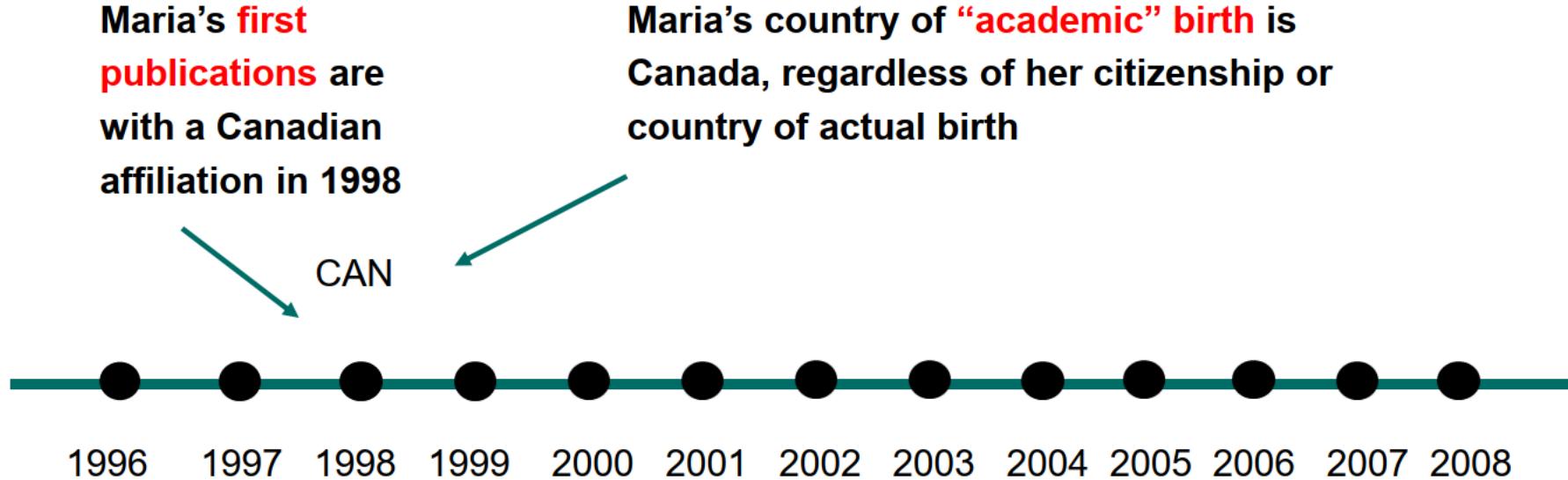
The screenshot shows the SAGE journals website for the journal *Environment and Planning A: Economy and Space*. The article title is "Leaving Home and Entering the Housing Market" by William A V Clark and Clara H Mulder. It includes a brief abstract, references, and links to Google Scholar and Crossref.



The screenshot shows the Scopus document details page for the same article. It displays the author profile of Clara H. Mulder, her affiliation at the University of California, Los Angeles, Department of Geography, and a list of recent documents she has published. Metrics shown include 126 documents, 42 h-index, and 4,345 citations.

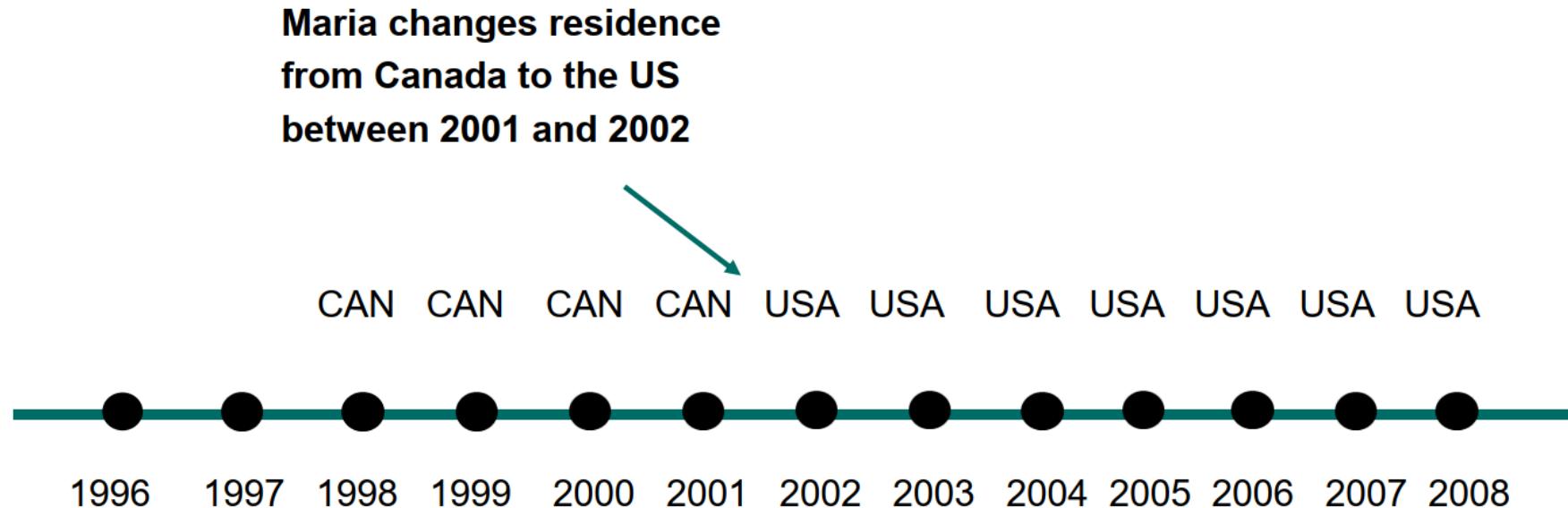
- We tried other set-up like all affiliations instead of mode country/region
- Macro trends doesn't change
- We are extending this further (e.g., our prototype in next slides)

Identifying mobility events: an example (1/4)



The country of residence is inferred as the **modal country of publications** in a given year

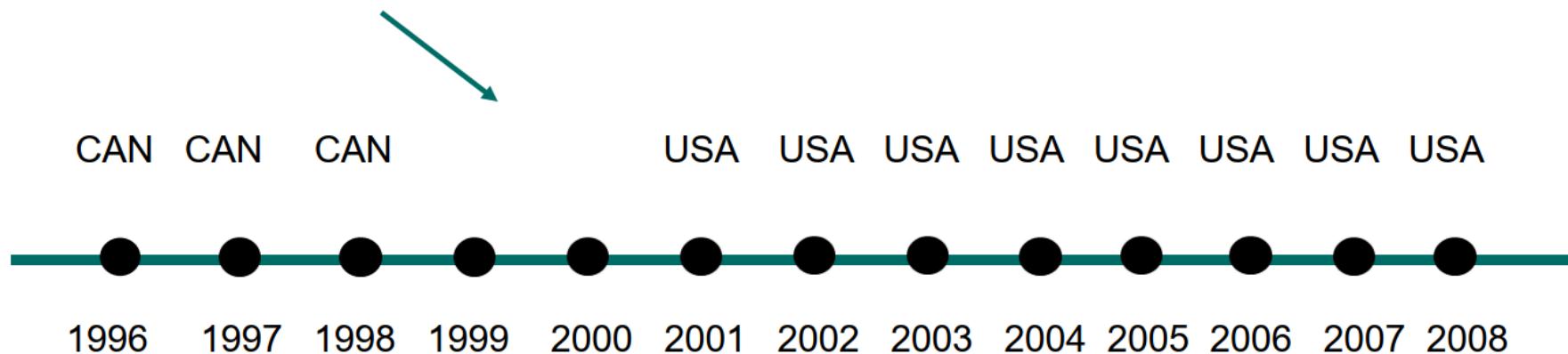
Identifying mobility events: an example (2/4)



**Maria's modal countries
of publications over time**

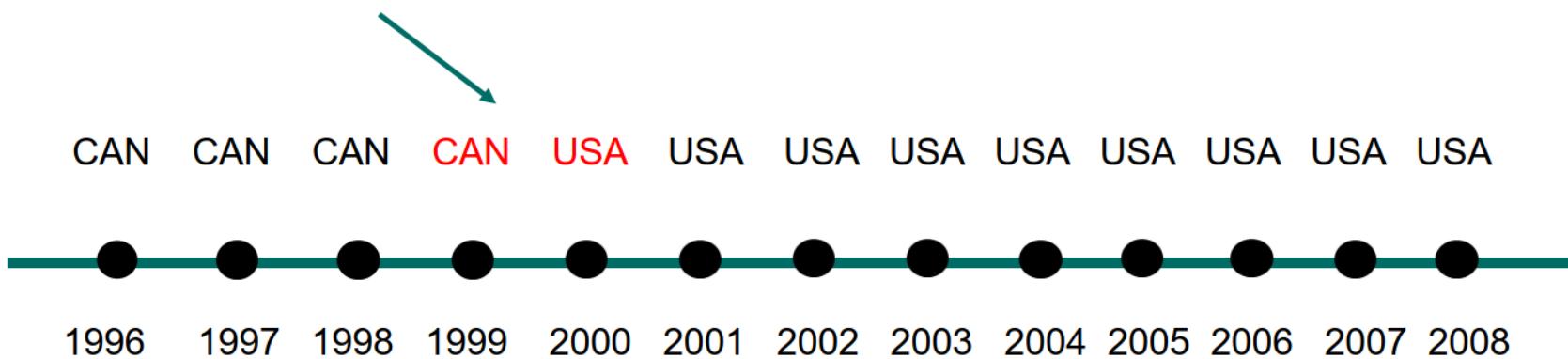
Identifying mobility events: an example (3/4)

Joe has no publications in our database for 1999 and 2000

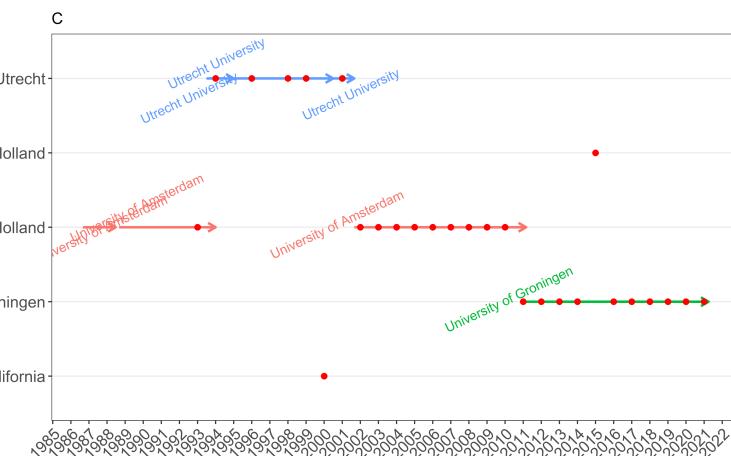
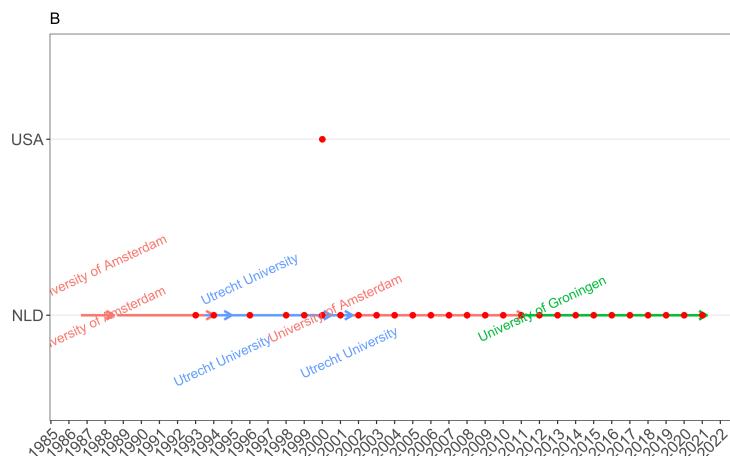
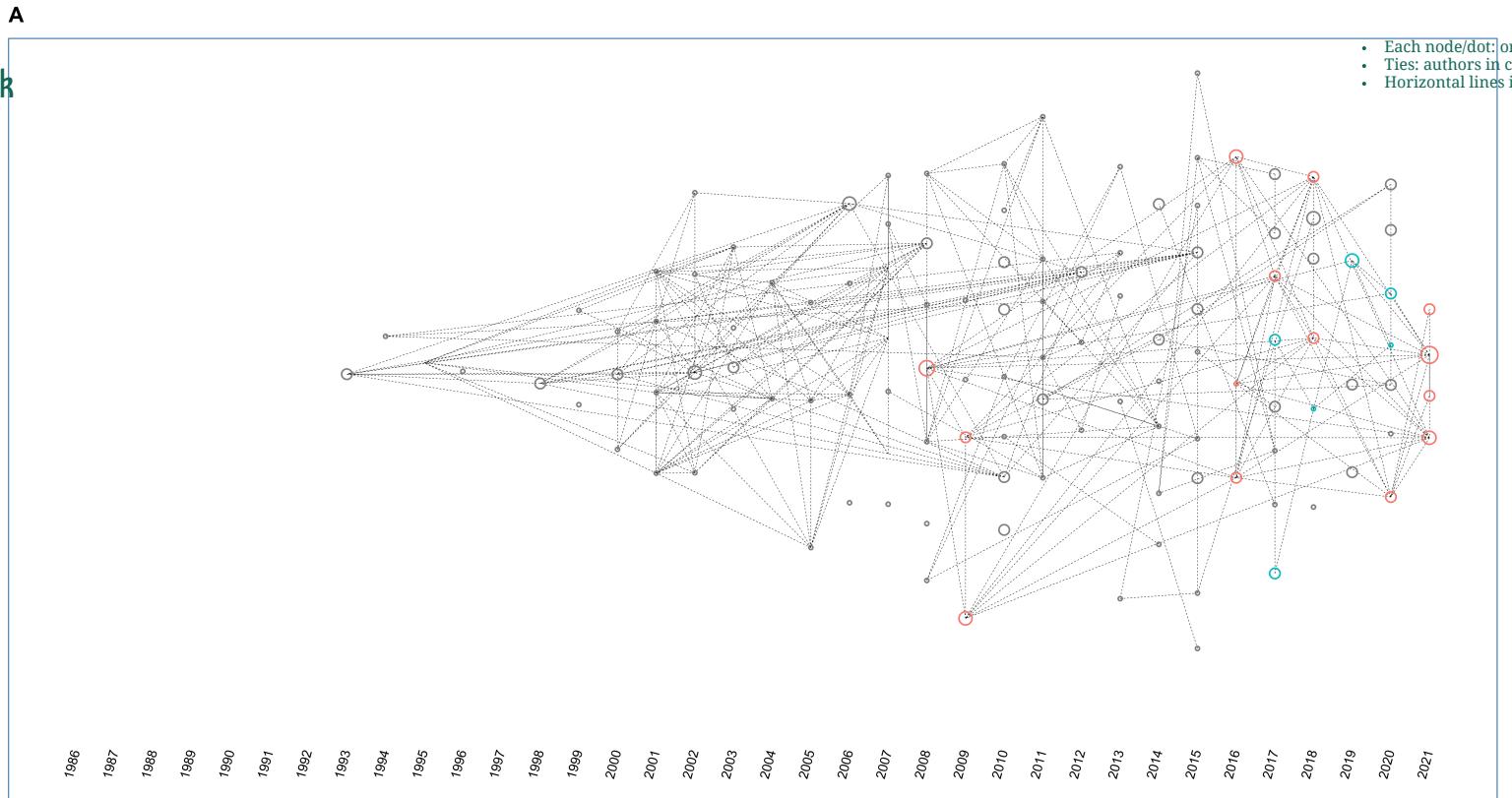


Identifying mobility events: an example (4/4)

We impute the country values
for up to 2 years from the
closest observation with
backward or forward filling



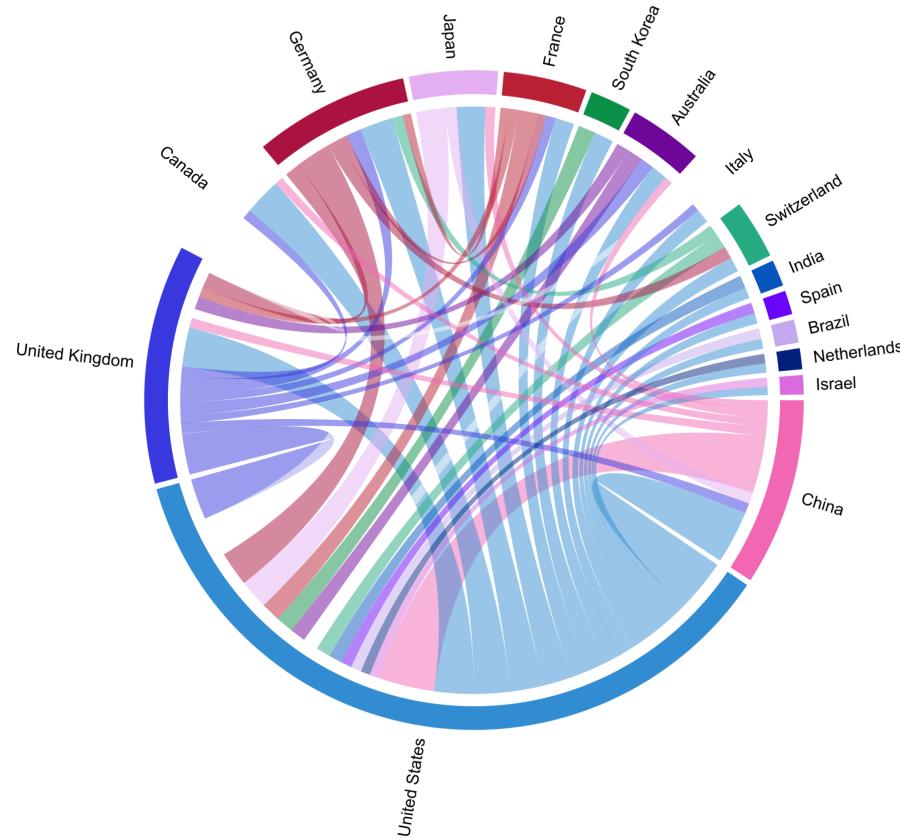
Proposed framework



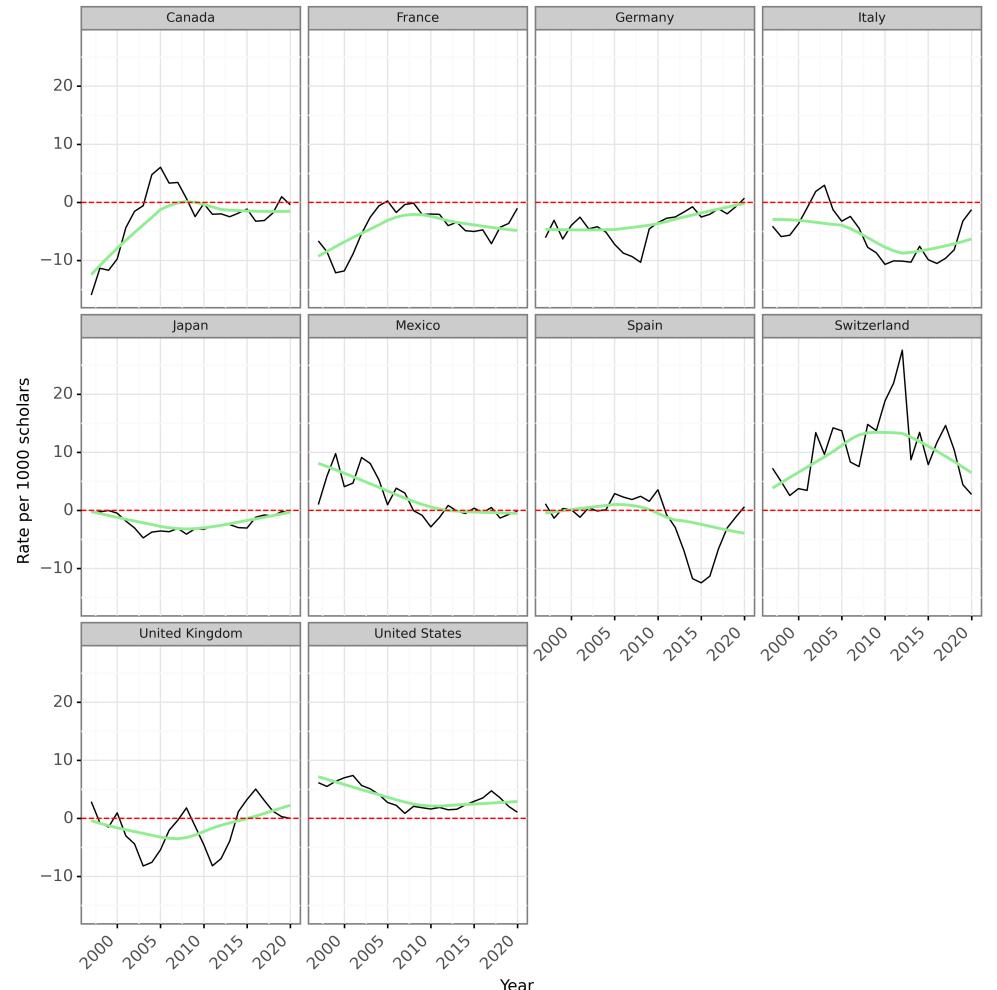
Global mobility based on Scopus 1996-2020

Top 50 pairs, Country level, international: Scopus (left), NMR (right)

- USA dominates the country level flows
- in NMR, it shows a positive trend of receiving scholars (similar to Switzerland)
- France, Germany, Italy, Japan are **sending** countries (internationally)

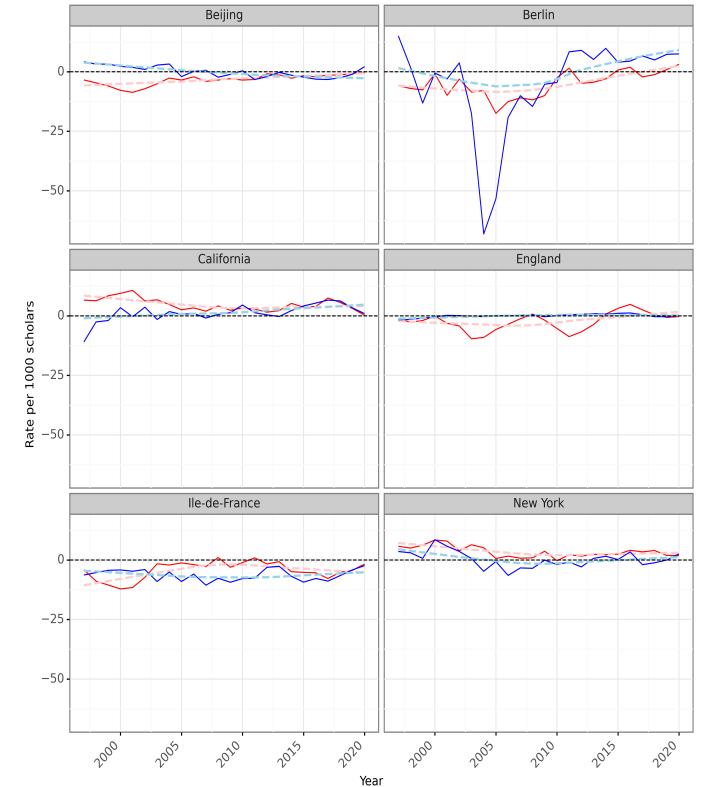
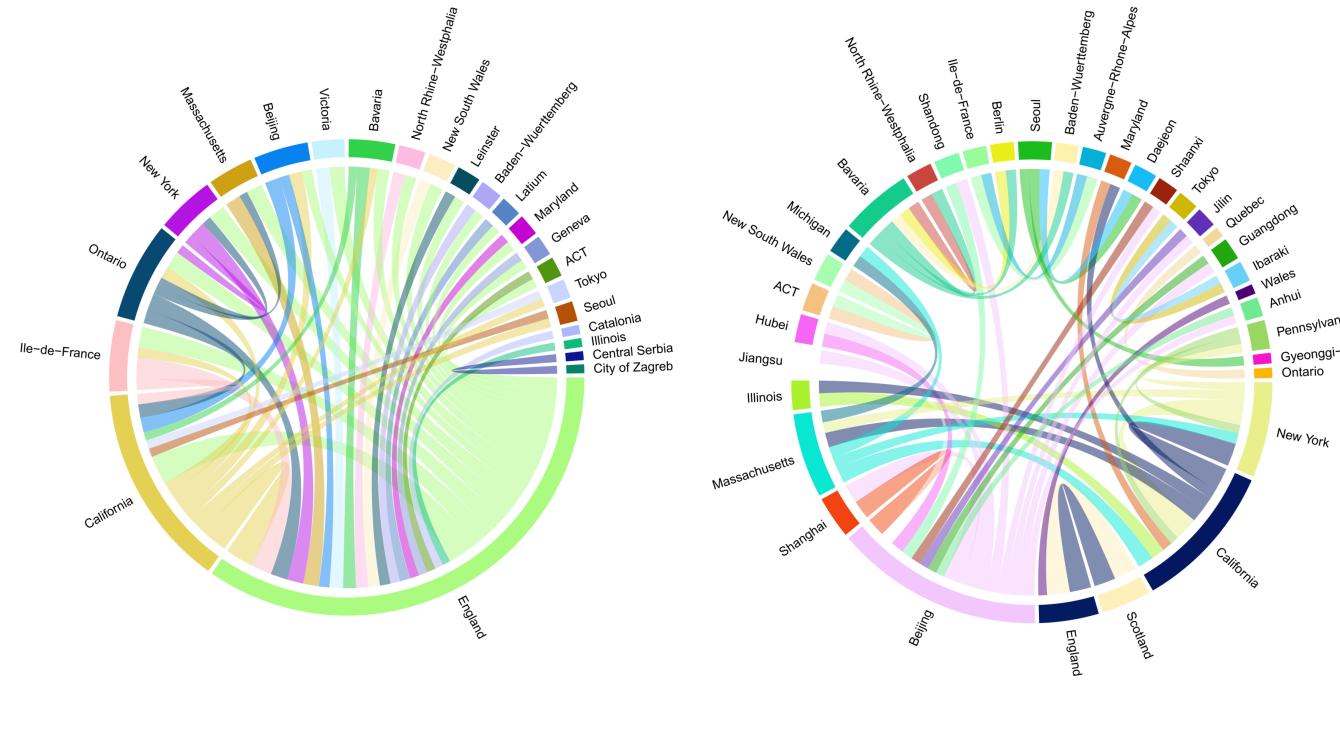


- In NMR plots:
- Negative → Sending
- Positive → Receiving
- Zero → there is a brain balance, instead of gain/drain



Region level, international (left), internal (middle), NMR (right)

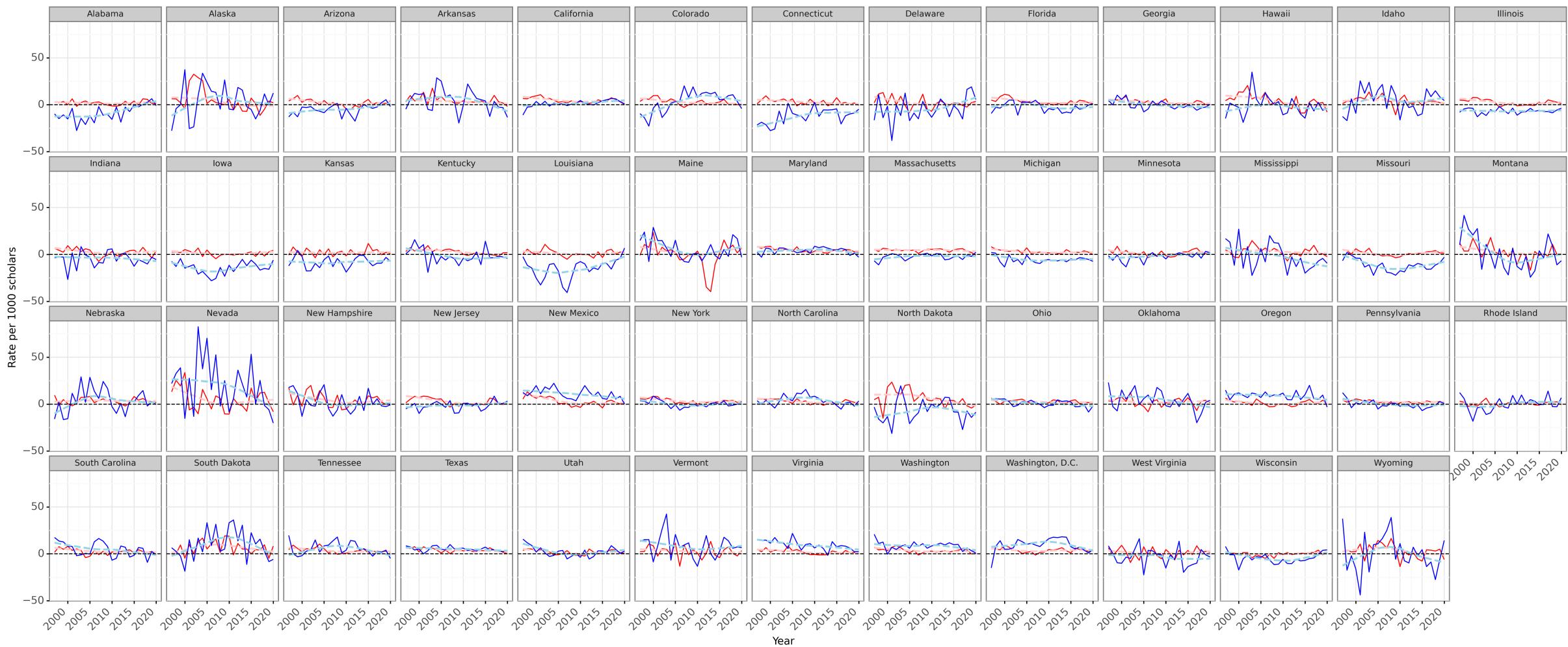
- England region in the UK has the highest count of sending/receiving scholars
- Internal trend is dominated by Beijing and California
- NMR: California and New York are receiving international scholars



- NMR (right): international (red), internal (blue)

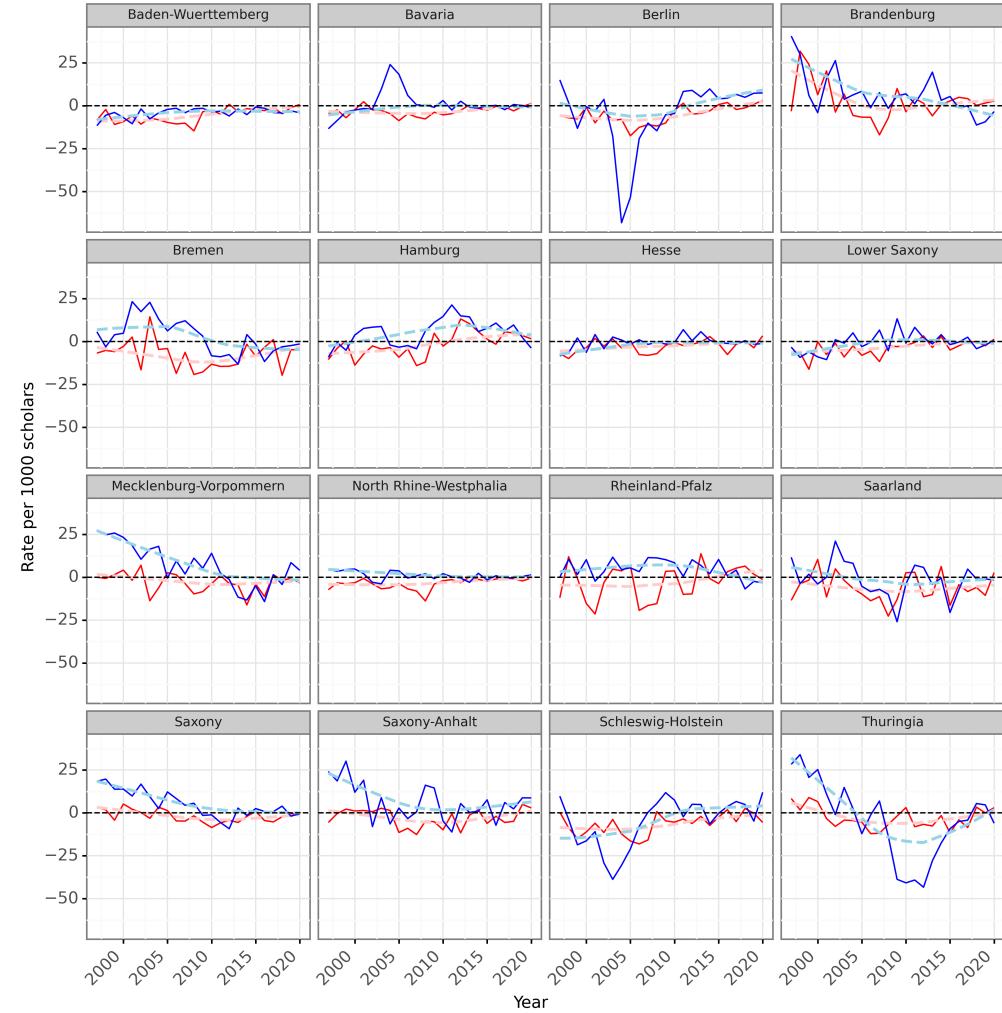
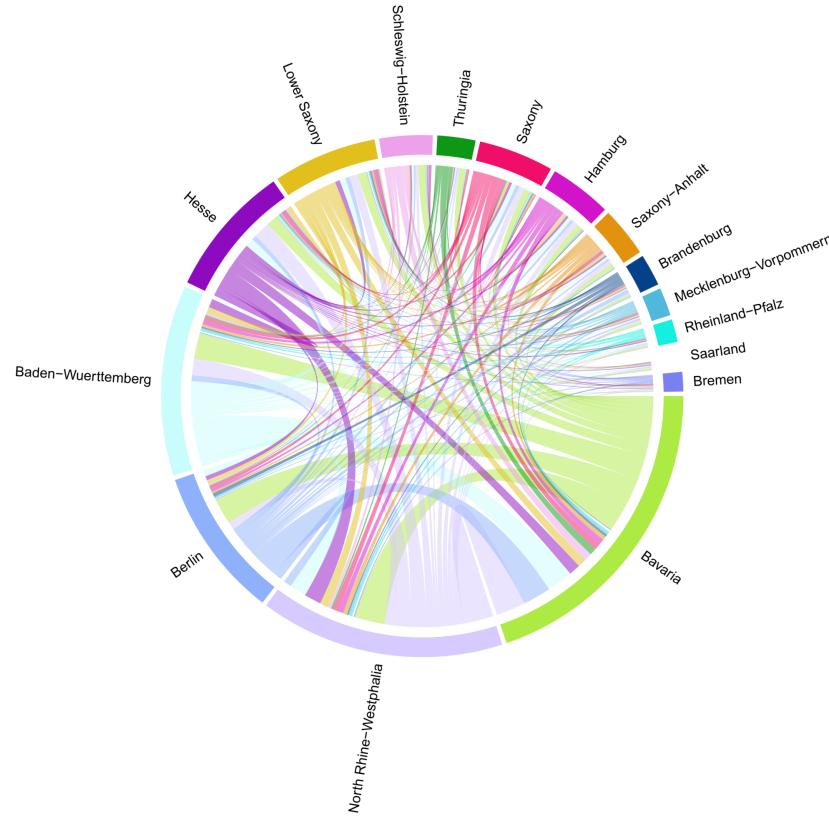
USA, Region level NMR, international (red), internal (blue)

- Larger range of internal mobility
- Sending states, internally: Alabama, Connecticut, Delaware, Iowa, Kansas, Louisiana and Missouri
- Receiving states, internally: Colorado, Nevada, New Mexico, Oregon, South Dakota, Virginia, Washington and Washington, D.C.
- Receiving states, internationally: Alaska, North Dakota and South Dakota
- High variation in attractiveness: Nevada



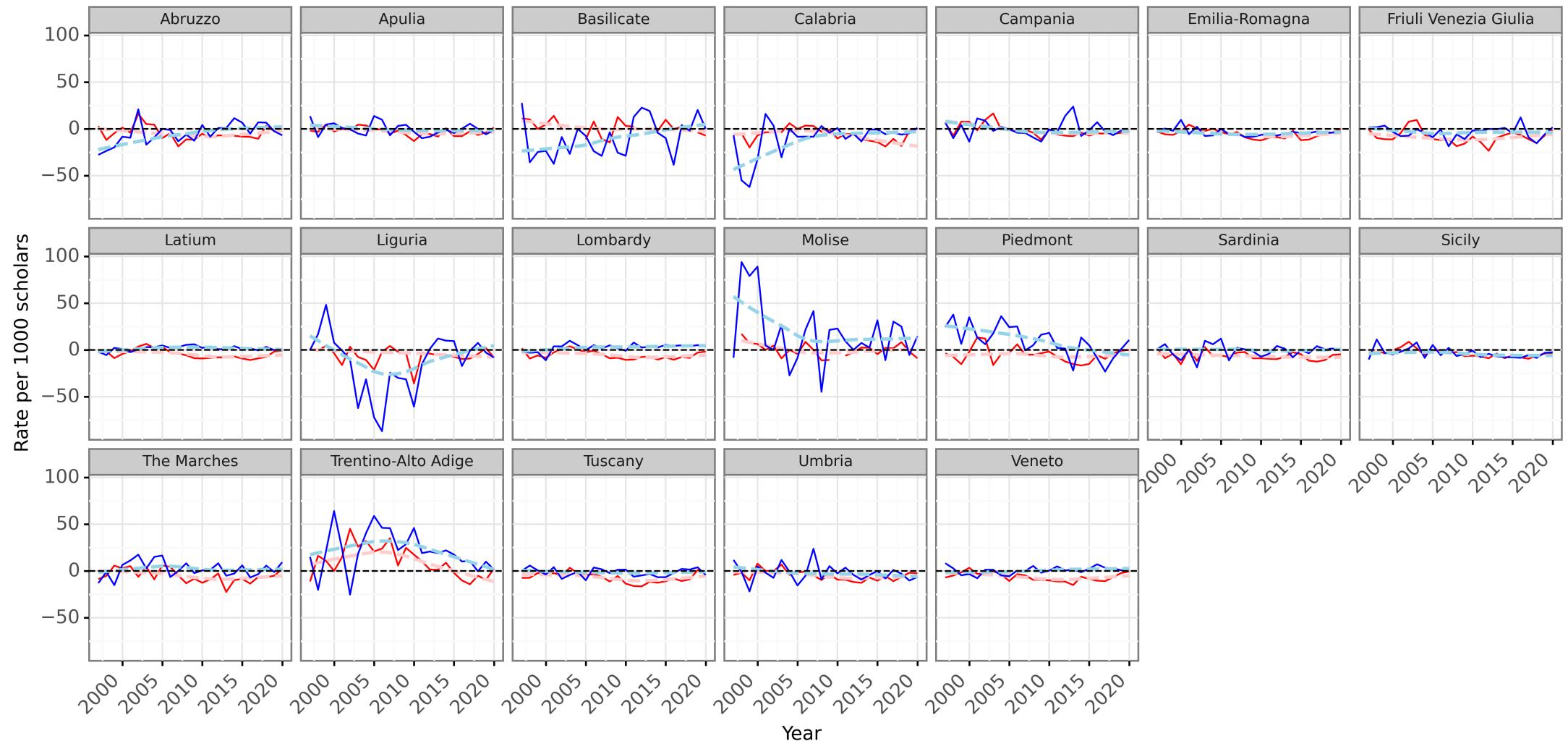
Germany, Region internal (left), NMR (right), international (red), internal (blue)

- Most of the scholars are located in the former West German states (i.e., Bavaria, North Rhine-Westphalia, Baden-Württemberg, Hesse, Lower Saxony, Schleswig-Holstein, Hamburg, Rheinland-Pfalz, Saarland, and Bremen)
- Receiving states, internally: Brandenburg, Bremen, Hamburg, Mecklenburg-Vorpommern, Rheinland-Pfalz, Saxony, Saxony-Anhalt and Thuringia
- Sending states, both internally and internationally: Baden-Württemberg, Berlin, Saarland and Schleswig-Holstein



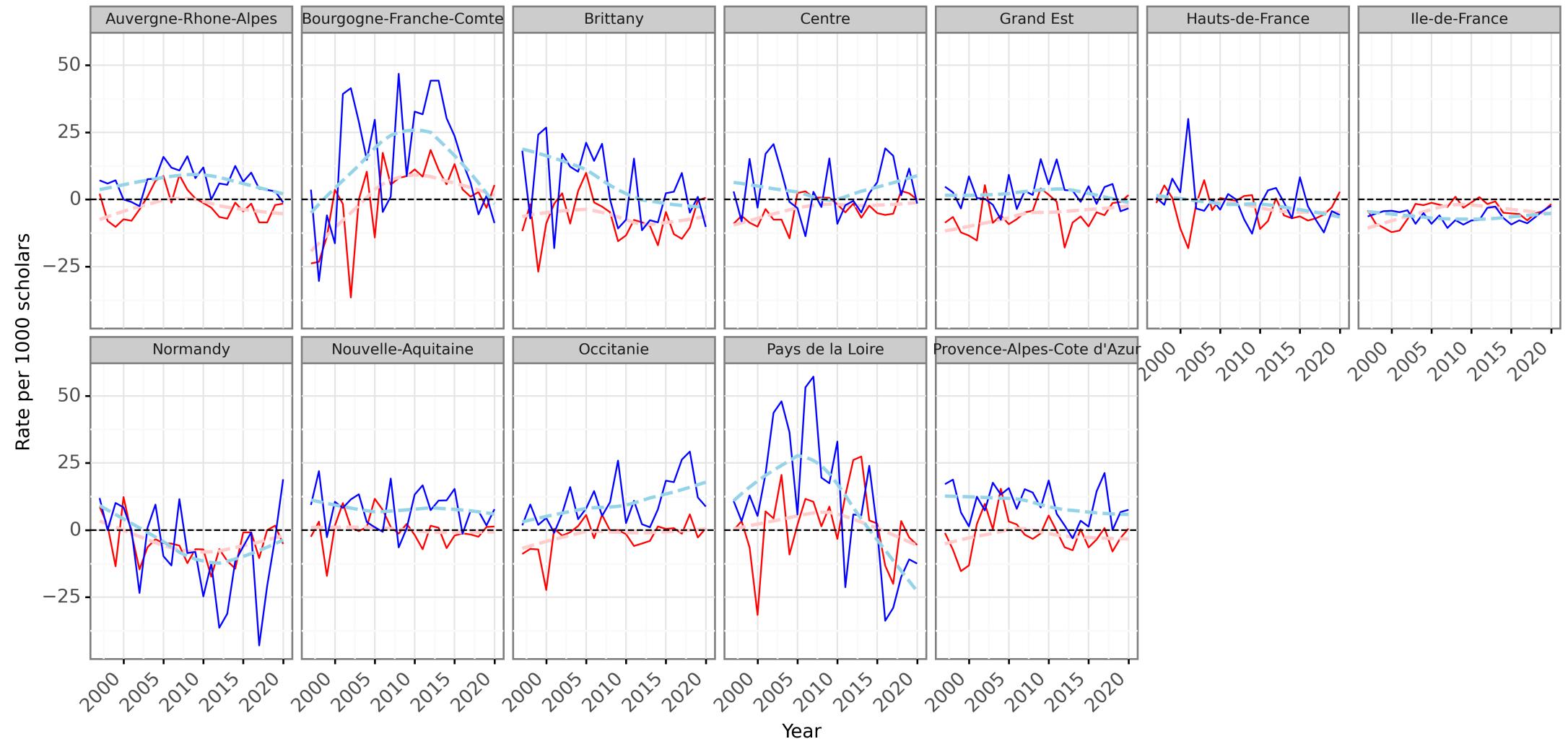
Italy, Region level NMR, international (red), internal (blue)

- Sending states, internally: Abruzzo, Basilicate, Calabria and Liguria
- Receiving states, internally: Latium, Lombardy, Molise, Piedmont and Trentino-Alto Adige
- Receiving states, internationally: only Trentino-Alto Adige pre-2015
- Note that we excluded Valle d'Aosta due to extremely outlier trends



France, Region level NMR, international (red), internal (blue)

- Receiving states, internally: Auvergne-Rhone-Alpes, Bourgogne-Franche-Comte, Brittany, Centre, Nouvelle-Aquitaine, Occitanie, Pays de la Loire and Provence-Alpes-Cote d'Azur
- Sending states, internationally: Brittany, Grand Est, Ile-de-France and Normandy
- Note that we excluded island of Corsica due to extremely outlier trends



To summarize (and next steps):

- A **macro** and **micro** global database of scholarly mobility
- **Internal** and/or/**versus international** scholarly mobility
- **Disambiguation** of authors and organization names (and addresses)
- **Collaboration** and **internationalization**
- **Gender** and **Disciplinary** differences
- Individual level comparison of CV profiles using ORCID vs. Scopus
- Use of more comparable migration indicators and considering their limitations¹
 - Crude Migration Intensity
 - Migration Effectiveness Index
 - Aggregate Net Migration Rate
- Answering substantive questions e.g., what drives observed trends?

• [1] Bell, M., Blake, M., Boyle, P., Duke-Williams, O., Rees, P., Stillwell, J., & Hugo, G. (2002). Cross-national comparison of internal migration: Issues and measures. *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, 165(3), 435–464.
<https://doi.org/10.1111/1467-985X.t01-1-00247>

Thank you for your attention

[akbaritabar; zhao; zagheni]@demogr.mpg.de

(@akbaritabar; @XinyiZhao16; @ezagheni on Twitter)