Mapping the mechanisms of knowledge spillovers in science

Universiteit Utrecht

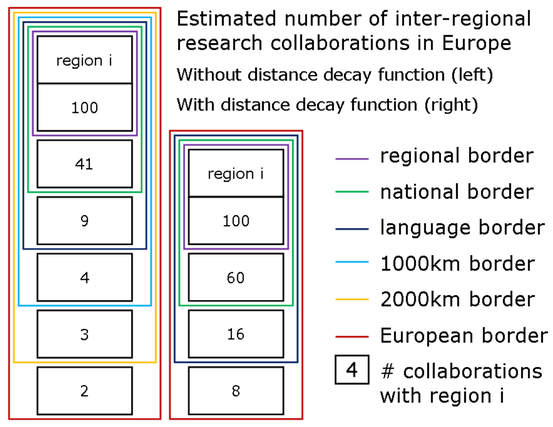
Jarno Hoekman

Supervisors: Koen Frenken, Ron Boschma

j.Hoekman@geo.uu.nl

Introduction

Economic geographers have always stressed that the localized nature of knowledge spillovers partially explains persistent disparities in regional economic development. Yet, a few recent studies have also drawn attention to global mechanisms of knowledge spillovers which are facilitated by ongoing advancements in information and communication technology and the emergence of cheap air travel. In this study we try to specify the role of these global mechanisms by focusing on collaboration and labour mobility in the scientific world. More specifically, the research goal of this study is to provide insight into the determinants of research collaboration networks and labour mobility in science and their effects on innovation and scientific productivity, respectively.



Part I Collaboration

Research goal:

To provide insight into the determinants of interregional research collaboration networks and their effect on innovation for European regions.

Data:

- All scientific publication that were published in journals indexed by the Web of Science in the period 2000-2005 *(n = 2779325).*
- Classification into 318 NUTS2-regions in 34 countries using the addresses of institutions.
- The number of times addresses from a pair of regions *(n = 100806)* co-occur on a single publication is counted as the collaboration intensity.

Results:

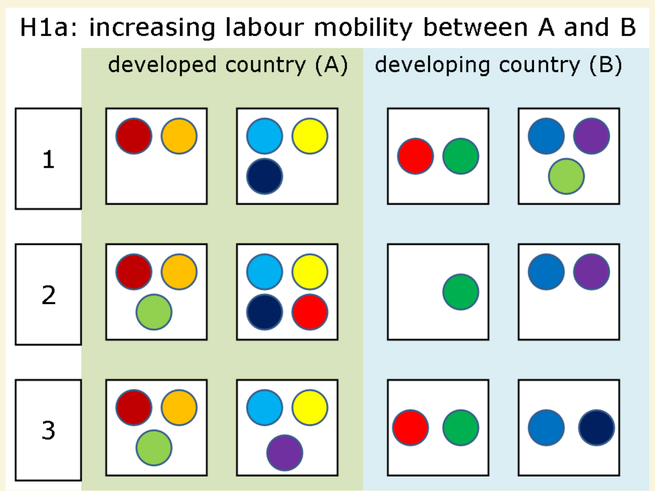
- Collaboration in science decreases with geographical distance.
- Collaboration in science is hampered by institutional barriers even when controlled for geographical distance.
- Regions that host the same quality of research are more inclined to collaborate with each other.

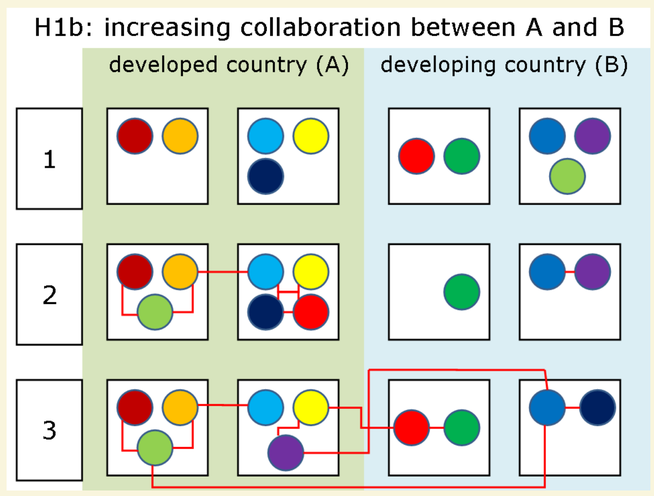
Part II Brain circulation

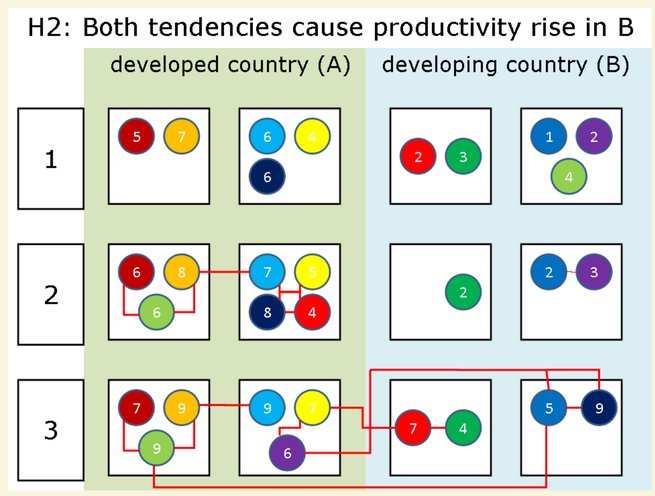
'Communities of technically skilled immigrants with work experience and connections to American technology centres... are undermining the old pattern of one-way flows of technology and capital from core to the periphery creating far more complex and decentralized two-way flows of skill, capital and technology...and transforming a brain drain into a brain circulation' (Saxenian, 2006)

Research goal:

To provide insight into labour mobility patterns of scientists between developed and developing countries and their effect on research collaboration and research productivity.

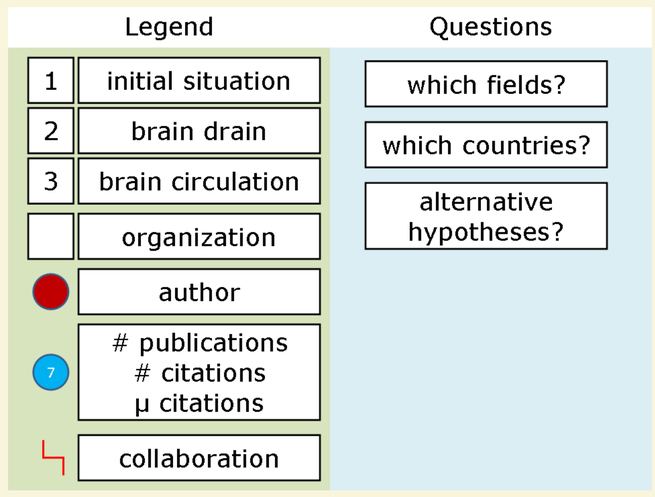






Data:

- All scientific publications of authors who have worked for an organization in 'developing' countries between 1996 and 2007.
- Unique authors are identified by an algorithm for name, scientific field, collaboration partner and self-citations.
- Labour mobility is indicated by the occurrence of the same author in different organization through time.
- Collaboration is indicated by the co-occurrence of authors on a publication.



Expected results:

- The direction of labour mobility flows and collaboration networks between countries depend primarily on previous flows and collaborations (path dependence).
- The probability of re-migration of scientists is dependent on the collaboration intensity with the home country and their social embeddedness.

Geosciences

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