

Regional cooperation: evidence from European cooperative innovation networks

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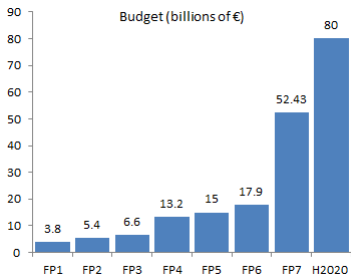
Regional innovation networks stimulate economic growth

- Innovation relies on global knowledge flows of formal codified knowledge
- Territorial aspect of innovation and learning capacity has become a key resource in regional competitive advantage
- Precompetitive R&D collaboration → key instrument of STI policy
- European Framework Programmes (FPs) priorities changed over time: from high-tech → scientific excellence → European scientific integration

Background and aim of the study

- Effects of cohesion policies on inter-regional income convergence (López-Bazo et al. 1999, Ramajo et al. 2008)
- Contribution of FPs to the integration of a ERA
 - network analysis (Breschi&Cusmano 2004, Roediger-Schluga&Barber)
 - [spatial interaction models](#) (Scherngell&Lata 2013)

→ Effects of spatial, social and knowledge proximity on the intensity of inter-regional R&D collaboration across heterogeneous participating regions



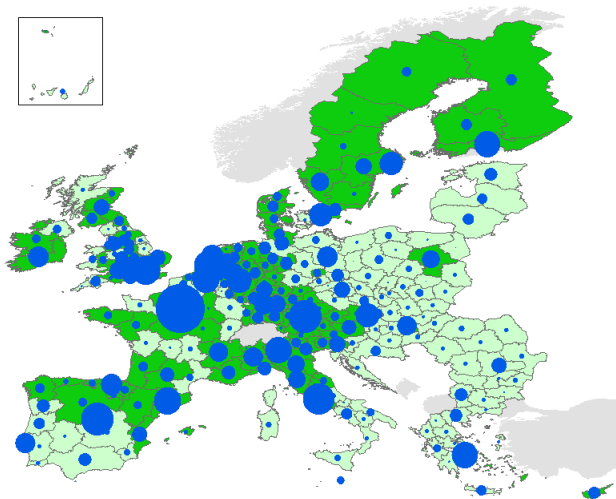
- EC medium-term planning instruments for R&I to support and foster research in the European Research Area (ERA)
- Medium/large collaborative projects for 3-5 years with a minimum of 3-6 participants from different Member S/Associated S
- from FP6 new instruments: networks of Excellence (NoE) and integrated projects (IP, basic research)

- Participant-level information on: geographical location, type (firm, university, public organization), project id, project thematic area, project cost (tot. and participant's) and duration
- Formal research collaborations - no small-scale collaborations
- 12055 projects (excluded all projects with one participant)
- More than 29000 participating organizations (2007-2013)
- 282 participating EU regions (NUTS2, v. 2010)

n -by- n collaboration matrix by aggregating the n. of individual collaborations at regional level

→ Y_{ij} number of R&D collaborations between region i and j

More and less developed regions



R&D collaborations among European regions

<i>All regional links</i>	Sum	Mean	SD	Min	Max
More/More	1099964 (77%)	41.15	114.15	0	3310
More/Less	301648 (21%)	7.66	19.06	0	536
Less/Less	27148 (2%)	1.90	4.89	0	93
All regions	1428760 (100%)	17.78	69.23	0	3310

Spatial interaction model

$$Y_{ij2007-2013} = O_i^{\alpha_1} D_j^{\alpha_2} \exp \left[\sum_k \beta_k S_{ij2000-2006}^k \right]$$

where S_{ij}^k are distance measure between region i and j

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Geographical effects

- geographical distance (in 1000 km)
- shared border: dummy=1 if i and j share a border
- periphery: dummy=1 if i or j are located outside the capital city of a country

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Institutional and economic effects

- GDP distance: difference in the GDP per capita
- international: dummy=1 if i and j are located in different country

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Knowledge and social proximity

- human capital distance: difference in the % of population in S&T
- technological proximity: correlation between the shares of patents in 35 IPC sub-classes of region's i and j
- social proximity: n. of collaborations in the past FP6

Results of negative binomial specification

	All	More/More	More/Less	Less/Less
<i>Spatial effects</i>				
geo dist	-0.147*** (0.008)	-0.156*** (0.012)	-0.039*** (0.011)	-0.125*** (0.020)
shared border	0.401*** (0.040)	0.408*** (0.051)	0.361*** (0.073)	0.688*** (0.076)
periphery	-0.909*** (0.045)	-0.429*** (0.051)	-0.361*** (0.073)	-0.073 (0.204)
<i>Institutional and economic effects</i>				
international	-0.308*** (0.021)	-0.139*** (0.027)	-0.346*** (0.032)	-0.688*** (0.056)
GDP dist	-0.024*** (0.001)	-0.007*** (0.001)	-0.016*** (0.001)	-0.012*** (0.004)
<i>Social and knowledge proximity</i>				
tech prox	0.147*** (0.022)	-0.008 (0.030)	0.098*** (0.030)	0.174*** (0.063)
HC dist	-0.009*** (0.001)	-0.012*** (0.002)	-0.003** (0.001)	-0.003 (0.003)
social prox	0.004*** (0.000)	0.002*** (0.000)	0.051*** (0.001)	0.071*** (0.004)
intercepts	✓	✓	✓	✓
ln dispersion	0.326*** (0.007)	0.005 (0.059)	0.189*** (0.011)	0.057** (0.214)
Obs	64,317	21,904	31,367	11,046

- Heterogeneity in the determinants on FP7 collaborations across different sub-groups of regions
- Geographical distance has a negative effect of the expected R&D collaboration intensity
 - but weaker effect between more-less developed regions
- Peripheral regions collaborate less
 - the propensity for innovative activities to cluster spatially may favour core regions rather than integrating peripheral ones
- Regional human capital disparities hinder R&D collaboration, as well as institutional/cultural barriers
- Technological proximity can be essential for the absorption of transferred knowledge and has a positive impact on the frequency of cooperation

- FP7 may have helped contributed to geographically integrate European research systems by connecting more and less developed regions,
 - **however** distance still matters! strong core-region effect, leaving out peripheral regions
 - there are still important institutional barriers
- Most relevant function of FP7 is the creation of dynamic networks, reducing the duplication of research efforts
- Looking at the structure of the European research networks to design appropriate policies