The drivers of innovative collaborations and the role of public policies

Riccardo Crescenzi
London School of Economics
This talk

Regional Innovation and R&D Investments

The missing link: collaboration

Public investments in innovation: can they foster collaboration?

Some reflections
Regional Innovation and R&D Investment
How Regional Innovation works (1)

Figure 2. The effect of R&D (RD) and Human Capital (HK) on regional patent intensity ($K$).

Source: Charlot, Crescenzi and Musolesi, JEG, 2016
How Regional Innovation works (2)

Figure 3. The joint effect of R&D and HK on regional patent intensity $K$, $f(RD_{r,t}, HK_{r,t})$. A 3D surface plot.

Source: Charlot, Crescenzi and Musolesi, JEG, 2016
The missing link: Collaboration
...Innovation is increasingly collaborative


Source: Crescenzi et al. 2013
... and team-work is the norm for inventors

Source: Crescenzi et al. 2013
Questions (1)

Do we need **geographical proximity** for innovative collaborations to happen?
What **forms of proximity** influence the incidence of collaborative knowledge creation?
Does innovation need geographical proximity? (1)

• In order to answer these questions Crescenzi, Nathan and Rodriguez-Pose 2016 analysed patents microdata from the PATSTAT database, running from 1978-2010, comprising 116,351 patents with at least one UK-resident inventor.

• We look at how physical, organisational, institutional, cognitive, social, and ethnic proximities between inventors shape their collaboration decisions.

• We explore the net effects of all these ‘proximities’ on the choice of collaborator and on the underlying decision to collaborate.
Does innovation need geographical proximity? (2)

Research highlights

– Physical proximity has become more important over time but it is mediated by organisational and cultural/ethnic closeness;
– For multiple inventors (highly innovative individuals) geographic proximity is much less important than organisational and social factors;

In a follow-up paper Crescenzi, Filippetti and Iammarino (2014) look at the role of geographical and institutional proximity in shaping University-Industry collaborations:
– Quality of university (academic stars) crucially important
Public investments in innovation: can they foster collaboration?
Innovation Policies to leverage collaborations (1)

Crescenzi, De Blasio & Giua (2018) evaluate the impact of a scheme (Collaborative Industrial Research - CIR) supporting innovative activities of firms located in less developed regions in Italy (1 billion euros)

Co-financed by the EU Cohesion Policy in 2007-2013 it anticipates some key features of Smart Specialisation Strategy Programmes

Makes it possible to draw insights on:

– What features of Innovation Programmes (such as S-3 in the European Union) work best?

– What is the impact and 'value added' when innovation programmes that try and leverage links with public research centres?
Innovation Policies to leverage collaborations (2)

Unique collection of detailed programme-level and firm-level data

Information on applicants, selection scores and beneficiaries with actual payments and firm characteristics and performance (5 different datasets)

RDD approach using the evaluation score of the applications as the forcing variable (some projects are eligible but not funded due to limited resources)

Focus on project-level heterogeneity
The CIR Programme in a nutshell

- Beneficiaries: firms, universities, research centres.
- Promotes partnerships among firms, and collaboration with Universities and Public Research Centres
- Concentration of support in specific pre-selected sectors
- The territorial coverage: ‘Mezzogiorno’ Regions
CIR’s features for empirical assessment

Each project submitted to CIR is assigned a score by an independent evaluation committee appointed for this purpose.

Only projects with scores higher than a certain value (\( \geq 96 \)) have been declared eligible for CIR incentives.

HOWEVER Only projects with scores higher than 104.4 have been IN FACT funded due to budget availability.

Therefore we have a number of projects in principle eligible for funding but NOT funded due to available resources and their absorption by higher ranked project.
Research questions on CIR impacts

What is the impact of CIR on the economic performance of the beneficiary firms?

How does the impact of CIR depend on specific aspects of the program?

Does the impact of CIR incentives change if the beneficiary project/firm:

- collaborates with public research centres?
- collaborates with other partners?
- targets specific - innovative - activities?
- operates in low tech industrial sectors?
- has a consolidated innovative capacity?
- is a multinational?
## Heterogeneous Impact (H-ATE) Results

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Interaction</th>
<th>Investments</th>
<th>Value Added</th>
<th>Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z1: Public research</td>
<td>Treatment*Z1</td>
<td>-1.1480</td>
<td>0.4142</td>
<td>1.0767*</td>
</tr>
<tr>
<td>(presence of a University in the project partnership)</td>
<td></td>
<td>(0.8926)</td>
<td>(0.7503)</td>
<td>(0.4205)</td>
</tr>
<tr>
<td>Z2: Collaboration</td>
<td>Treatment*Z2</td>
<td>-0.5514</td>
<td>-1.9874***</td>
<td>-1.9942***</td>
</tr>
<tr>
<td>(project partnership involving large number of firms)</td>
<td></td>
<td>(0.5438)</td>
<td>(0.5263)</td>
<td>(0.4992)</td>
</tr>
<tr>
<td>Z3: Advanced Activities</td>
<td>Treatment*Z3</td>
<td>-0.4083</td>
<td>-0.2672</td>
<td>-1.4622*</td>
</tr>
<tr>
<td>(activity of the project classified as advanced)</td>
<td></td>
<td>(0.4439)</td>
<td>(0.4907)</td>
<td>(0.5910)</td>
</tr>
<tr>
<td>Z4: Low tech</td>
<td>Treatment*Z4</td>
<td>1.2951**</td>
<td>0.1203</td>
<td>1.3514**</td>
</tr>
<tr>
<td>(firms operating in low tech sectors)</td>
<td></td>
<td>(0.4333)</td>
<td>(0.4162)</td>
<td>(0.4749)</td>
</tr>
<tr>
<td>Z5: Patenting</td>
<td>Treatment*Z5</td>
<td>-0.1697***</td>
<td>0.2223***</td>
<td>0.1248</td>
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<tr>
<td>(firms with a high capacity of patenting)</td>
<td></td>
<td>(0.0477)</td>
<td>(0.0596)</td>
<td>(0.0876)</td>
</tr>
<tr>
<td>Z6: Internationalisation</td>
<td>Treatment*Z6</td>
<td>-0.7148</td>
<td>-0.9529*</td>
<td>-1.7699*</td>
</tr>
<tr>
<td>(multinational corporations)</td>
<td></td>
<td>(0.6535)</td>
<td>(0.3698)</td>
<td>(0.7928)</td>
</tr>
</tbody>
</table>

Source: Crescenzi, De Blasio & Giua (2018)
Heterogeneous impacts (what works?)

Z1 - **Collaboration** with public research centres or Universities does not increase impact

Z2 - **Large partnerships** have a negative impact value added and employment

Z3 - **Most innovative activities** (e.g. ICT or Health and biotechnologies) do not show any additional benefits vs. **more 'traditional' activities** (e.g. Agro-industrial system, Cultural heritage).

Z4 - Firms operating in **low tech economic sectors** benefit the most

Z5 - Firms with more **consolidated innovative capabilities** reduce investments (crowding-out) and focus on value added

Z6 - No benefit for large **internationalized firms**
Conclusions

The generation of local impacts from public investments in research remains a challenge for current and future regional innovation policies.

Large research infrastructure are difficult to embed in regional innovation eco-systems and local strategies.

Even targeted incentives for collaborative activities might not reach the intended targets.

Overall this is a complex challenge for regional innovation strategies:

- The development of ‘new proximities’ can be facilitated and supported.
- Dedicated processes are needed to identify areas with the highest potential for collaboration.

More research is needed on tools that work in practice.
Foreign Direct Investment and the world regions. Where? Why? And for Whom?

Economists have long seen innovation and technological progress as central to the most powerful drivers of economic growth and wealth. Thereina, in order to assess the impact of multinational enterprises how economies and how local economies are affected by innovation in cities across the globe. One relatively recent approach to this problem is to ask: how much does a city's FDI outflow and inflow impact the number of patents granted to their residents/investors.

Based on this rationale, local economies are extremely unequal in their innovation potential. The tables on the pages represent regional patent activity of the United States and China. These aggregates are broken down to the level of cities and the average and median FDI flows per capita.

Click on the image above to visualise global economic flows and their impacts on regions (opens a new tab).

Recent Posts

Recent trends in the internationalisation of Business R&D
What do we know about FDI?
Connect or Perish! FDI and the resilience of EU regions

September 29th, 2017
September 29th, 2017
September 29th, 2017
Key References


• Crescenzi R., De Blasio G. and Giua M. “Cohesion Policy Incentives for Collaborative Industrial Research. The Evaluation of a Smart Specialisation Forerunner Programme” LSE SERC/CEP (Centre for Economic Performance) Urban and Spatial Programme Discussion Paper No' SERCDP0231, 02-2018

→ Read VoxEU Column: https://voxeu.org/article/smart-specialisation-strategies-italy-s-mezzogiorno