

FCC Week 2019 – Economics of Science  
Tuesday, 25 June 2019, Brussels, BE

# The drivers of innovative collaborations and the role of public policies

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# This talk

Regional Innovation and R&D Investments

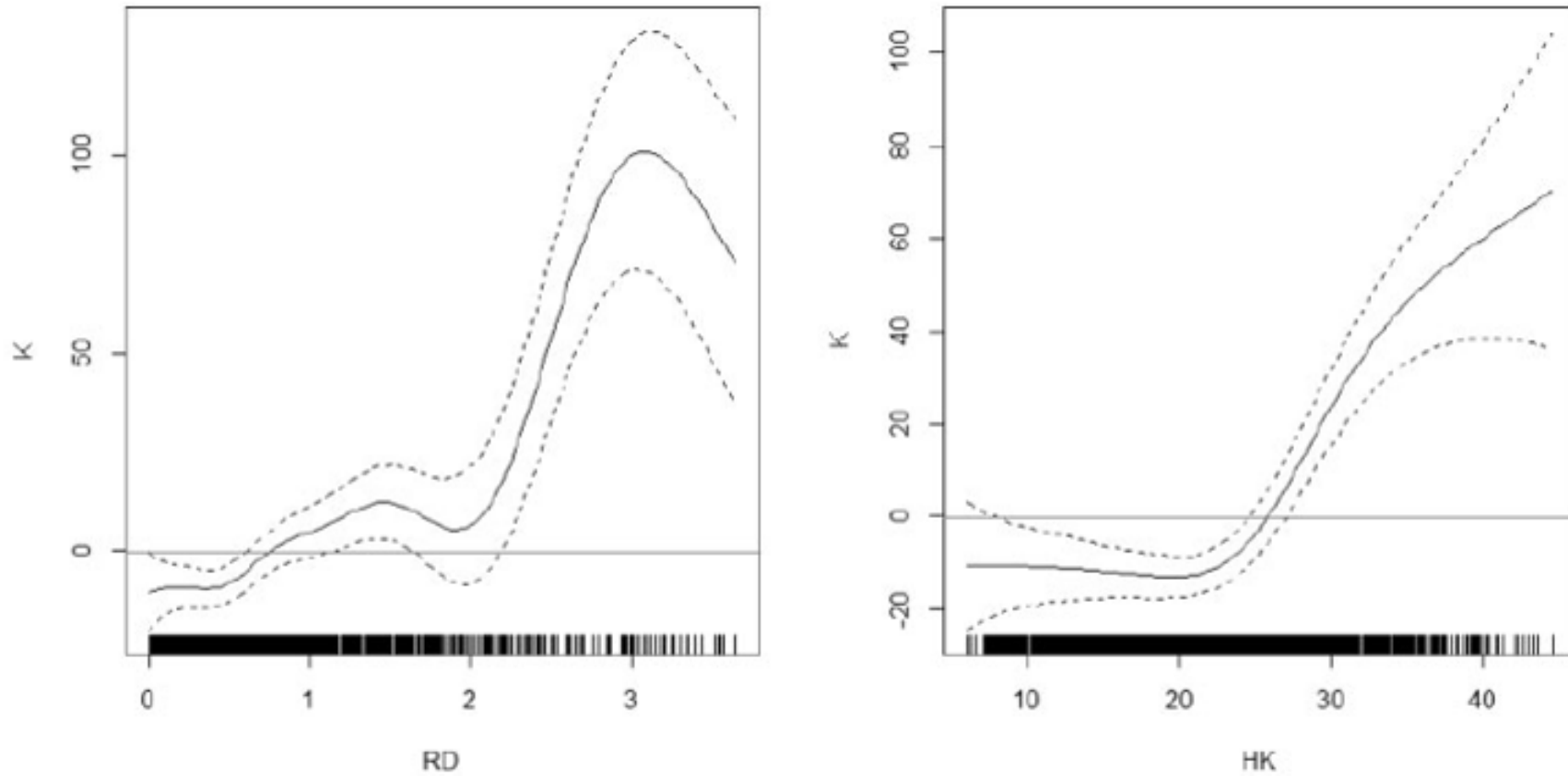
The missing link: collaboration

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 ( $K$ ).

# How Regional Innovation works (2)

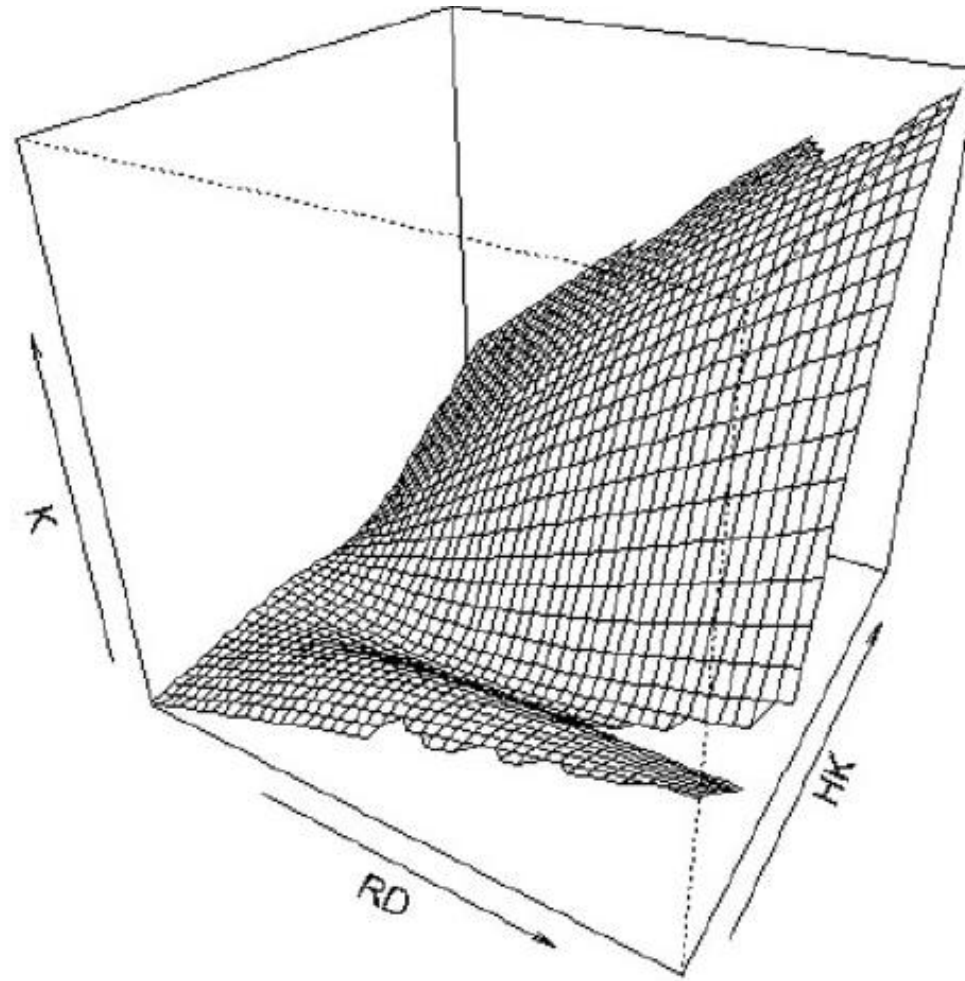
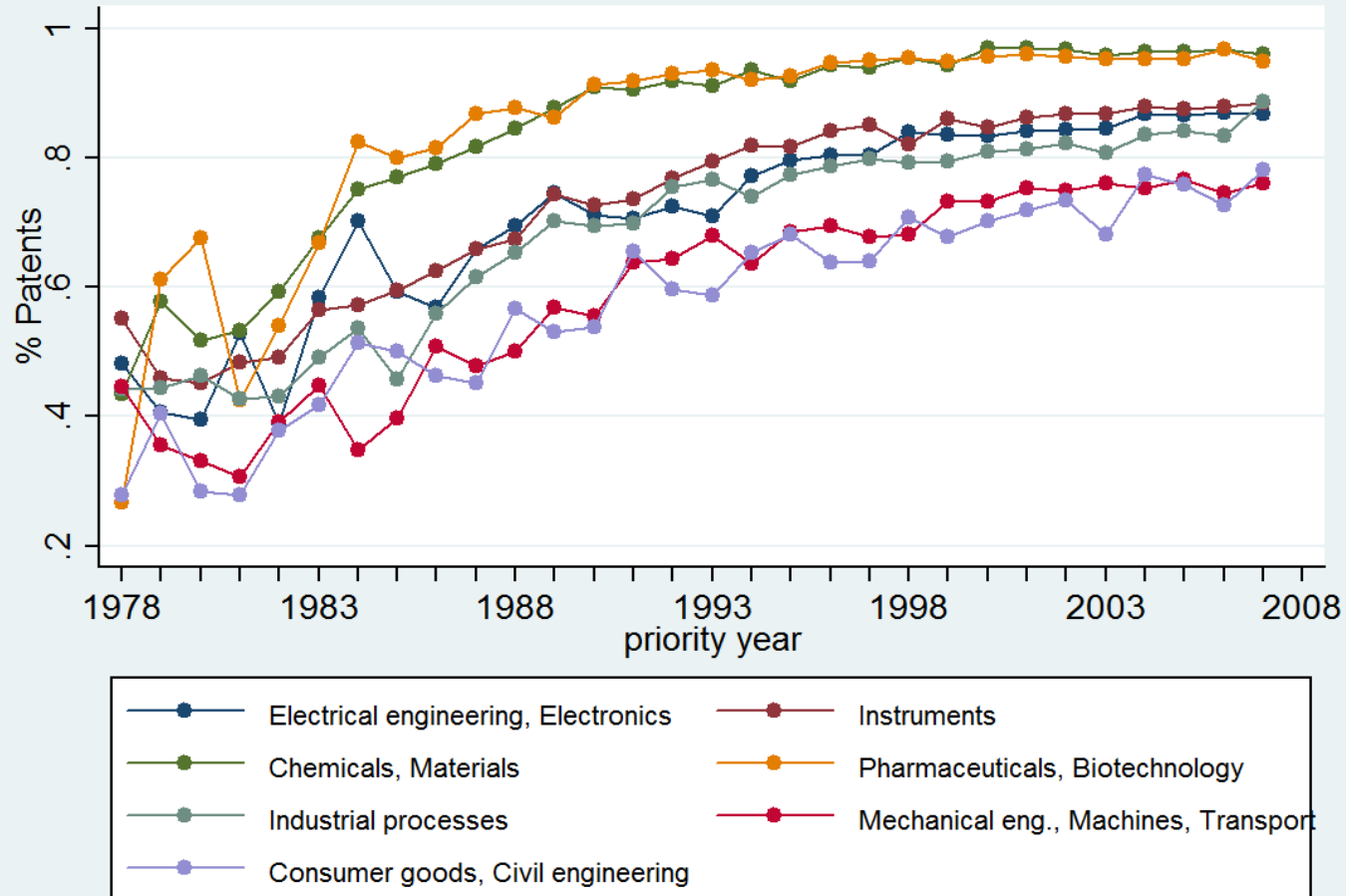


Figure 3. The joint effect of R&D and HK on regional patent intensity  $K$ ,  $f(RD_{r,t}, HK_{r,t})$ .  
A 3D surface plot.

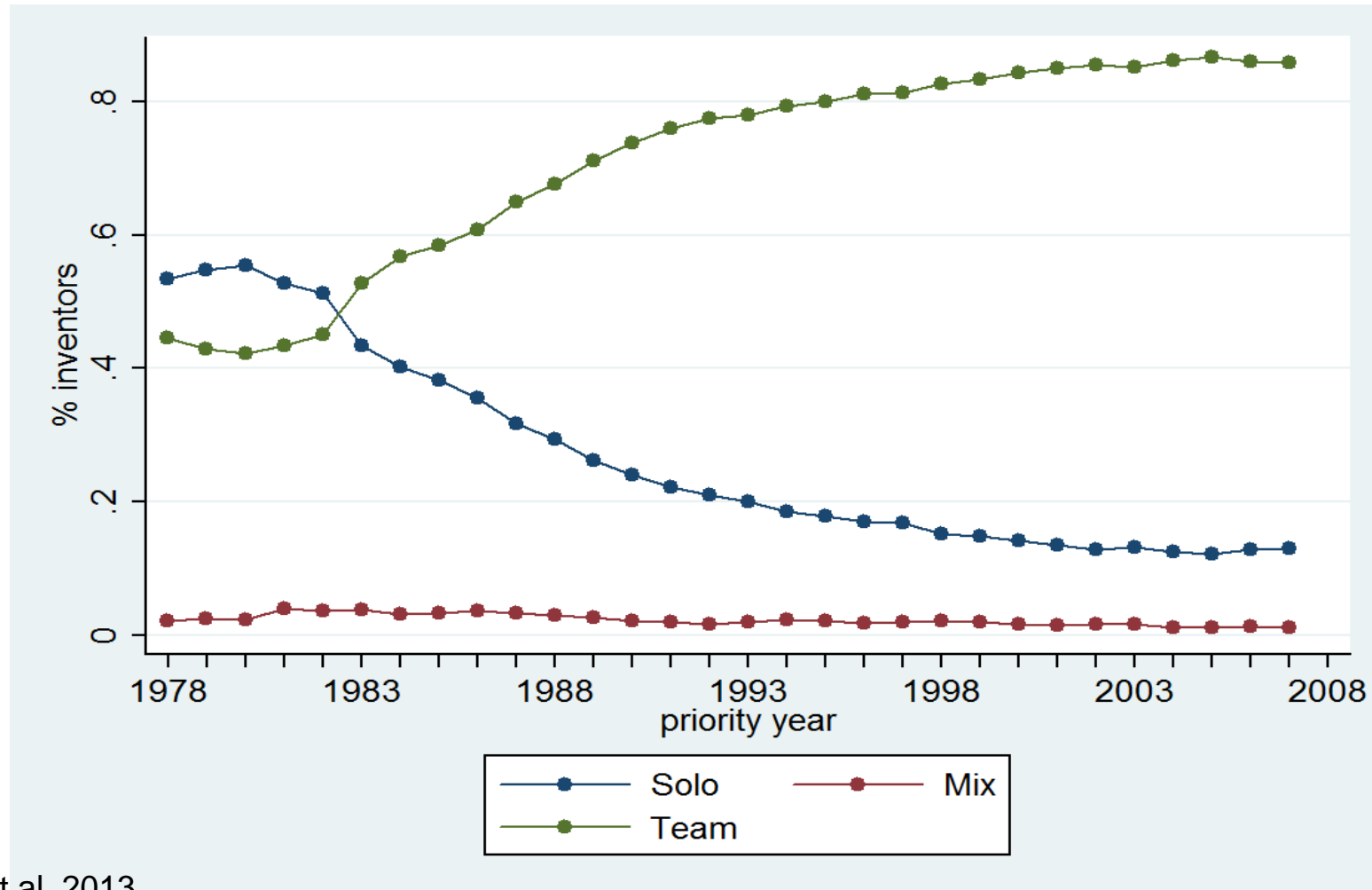
The missing link: Collaboration

# ...Innovation is increasingly collaborative

Co-invented patents by technology field, 1978-2007.



# ... and team-work is the norm for inventors





# Questions (1)



Do we need **geographical proximity**  
for innovative collaborations to happen?

# Questions (2)



"Oh, man!! When I invited my Facebook friends to visit,  
I didn't think they would all show up."

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

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

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 bio-technologies) 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.**

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# Key References

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- 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>