Moving beyond the crisis—Finding the right innovation policy for SMEs in Europe

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The dominant policy

The dominant policy

- **Successive innovation strategies in Europe —both national and EU level— have mainly relied on the linear model of innovation**

  - Lisbon Strategy

  - Europe 2020

    - One of five EU headline targets: "3% of the EU's GDP should be invested in R&D"

    - The other four being: employment, environment, education, poverty

- **Spending 3% of GDP in R&D as the main goal**

  - Other, more targeted policies exist

  - But 3% has remained the overarching objective until 2020

What does this represent for SMEs?

SMEs

o **SMEs (less than 250 employees) represent 99% of firms**

o **Employ two-thirds of workers**

o **Contribute 56 % of the total turnover in the EU**

o **And often follow a non-R&D innovation process**

    o Managerial and process innovation (DUI)

    o Complemented with external sources of innovation

    o Non-R&D-based innovation particularly strong in low- to medium-tech intensive industries

o **Many European SMEs were struggling, even before the pandemic**

The dominant policy and SMEs

o Hence, there may be a mismatch between the primary innovation strategy that has prevailed and the needs of SMEs for innovation

o Especially taking into account that SMEs operate in widely different contexts

o And that the 3% target is 'place-blind'

Have we had the right objective for SMEs?

o **Headline target has closely reproduced the linear model of innovation and neglected a whole body of innovation research in recent decades**

  o Many national policies have reproduced the same objective

o **Approaches that combine the regional innovation systems approach** (Lundvall) **with modes of innovation (STI-DUI)** (Jensen, Johnson, Lorenz & Lundvall)

  o Territorially based learning: Learning within regions

  o Sensitive to context and innovation system trajectories

  o And institutional and technological characteristics
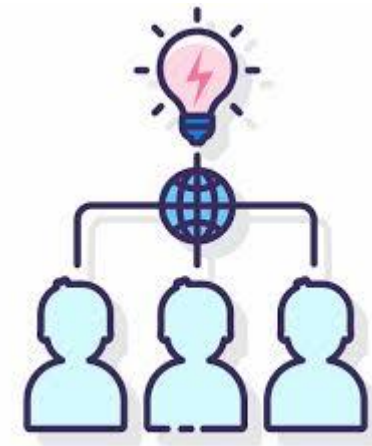
Headline target and recent theories of innovation

Target and changes in innovation theory

o **The dominant (at least in policy) 'linear model of innovation' has remained dominant**

o **There have been steps towards inserting the 'learning within regions and cities' dynamic into innovation policy, but they have mostly remained a sideshow**

   o Modes of innovation approach that combines the regional innovation systems approach with the debate around business innovation modes (STI-DUI) making slow inroads into policy

   o Policies sensitive to context more dominant in development (*smart specialisation*) than in innovation policies

   o And the institutional dimension of innovation mostly ignored

o **If the learning by Doing-Using-Interacting is to feature more prominently in headline objectives there is:**

- o A greater need to decipher the drivers of SME innovation across different European regions (cities/rural areas; more developed/less developed)

- o Showing the alternative ways in which SMEs innovate

- o Finding to what extent SME innovation performance is explained by R&D investments vis-a-vis other non-R&D type of activities related to:

    - o Collaboration

    - o Context

Innovation in European SMEs

Understanding the drivers of SME innovation

o **Hypotheses:**

- o SME innovation output depends both on internal and external drivers, including SME collaborations and scientific contributions, R&D, and non-R&D factors.

- o SME innovation output is less significantly correlated to public R&D, especially in cities and regions far away from the technological frontier.

- o In relation to context, the most innovative cities and regions in Europe rely mostly on private R&D, non-R&D activities, and SME collaborations with both scientific and supply chain-based agents.

- o Less innovative cities and regions rely, by contrast, on SME collaborations and, to a lower extent, on non-R&D activities and scientific contributions.

Study

o **Regional innovation scoreboard (RIS), assessing the innovation performance of European regions based on a limited number of indicators (2017 edition)**

  o Covering 220 regions across 22 EU countries, Norway, Serbia, and Switzerland

  o The RIS has a strong focus on the performance of small and medium-sized enterprises (SMEs)

Data

Dependent variable	Description	Scale
Regional SME innovation	SMEs introducing product or process innovations as percentage of SMEs in a given region (relative number of SMEs that introduced a new product or a new process to one of their markets)	0-1
Independent variables	*At the regional level*	
Public_R&D	R&D expenditures in the public sector as percentage of GDP: All R&D expenditures in the government sector and the higher education sector (STI)	0-1
Private_R&D	R&D expenditures in the business sector as percentage of GDP (STI)	0-1
Non_R&D	Non-R&D innovation expenditures in SMEs as percentage of total turnover: Sum of total innovation expenditure of SMEs, excluding intramural and extramural R&D expenditures (DUI)	0-1
SME_collaboration	Innovative SMEs collaborating with others as percentage of SMEs: Number of SMEs with innovation co-operation activities. Firms with co-operation activities are those that have had any co-operation agreements on innovation activities with other enterprises or institutions. (DUI and STI simultaneously)	0-1
Pub-private co-publication	Public-private co-publications per million population: Number of public-private co-authored research publications. The definition of the "private sector" excludes the private medical and health sector. (STI)	0-1

General results

VARIABLES	MODEL 1	MODEL 2
Public_R&D	0.0406	-0.142***
	(0.0669)	(0.0448)
Private_R&D	0.184***	0.168***
	(0.0576)	(0.0398)
Non_R&D	0.268***	0.154
	(0.0904)	(0.0958)
SME Collaboration	0.296***	0.479***
	(0.0538)	(0.0734)
Pub-private co-publication	0.265***	0.287***
	(0.091)	(0.0717)
Country fixed-effects	NO	YES
Prob > Chi2	0.000	0.000
F	33.29	112.26
Log likelihood	138.38	264.27
Observations	213	213

Public R&D, by contrast, connected to lower innovation, signalling a mismatch between the research conducted in public research centres and the innovation needs of SMEs

Private R&D in the region makes a difference for SME innovation

As do the two key factors behind external collaboration

SME collaboration has the strongest association with innovation

Results across the regional innovation spectrucm

Variables	FULL LOGISTIC PERCENTILE REGRESSION										
	0.05	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95
Public_R&D	-0.298	-0.495	-0.601	-0.615	-0.441	-0.532	-0.682*	-0.326	-0.198	-0.617	-0.112
	0.472	0.370	0.382	0.381	0.440	0.428	0.365	0.398	0.411	0.459	0.553
Private_R&D	1.102**	0.835**	0.659*	0.429	0.416	0.616	0.697*	0.896**	1.032**	0.951**	0.431
	0.457	0.400	0.335	0.393	0.345	0.396	0.360	0.435	0.437	0.438	0.423
Non_R&D	0.503	0.469	0.573	1.054	0.438	0.225	0.484	0.34	0.305	1.468*	1.523
	0.810	0.648	0.622	0.742	0.653	0.671	0.826	0.682	0.840	0.835	0.964
SME Collaboration	1.606***	1.702***	1.953***	2.254***	2.766***	3.271***	3.368***	3.797***	3.639***	3.771***	4.155***
	0.475	0.547	0.520	0.732	0.714	0.780	0.734	0.729	0.660	0.679	0.757
Pub-private copublication	0.89	0.772	1.314***(+)	1.614***	1.306**	1.260**	1.235**	0.634	0.287	0.731	0.493
	0.690	0.672	0.491	0.569	0.596	0.545	0.565	0.581	0.560	0.630	0.579
Country fixed-effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Intercept	-1.751***	-1.521**	-1.739**	-2.045***	-2.127***	-2.403***	-2.482***	-2.429***	-2.263***	-2.706***	-3.015***
	0.58	0.69	0.709	0.769	0.815	0.847	0.881	0.766	0.661	0.712	0.816
Observations	213	213	213	213	213	213	213	213	213	213	213
f (5,187)	4.79	4.27	5.23	3.42	5.69	6.83	7.81	8.46	9.75	11.13	11.89
Prob > chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

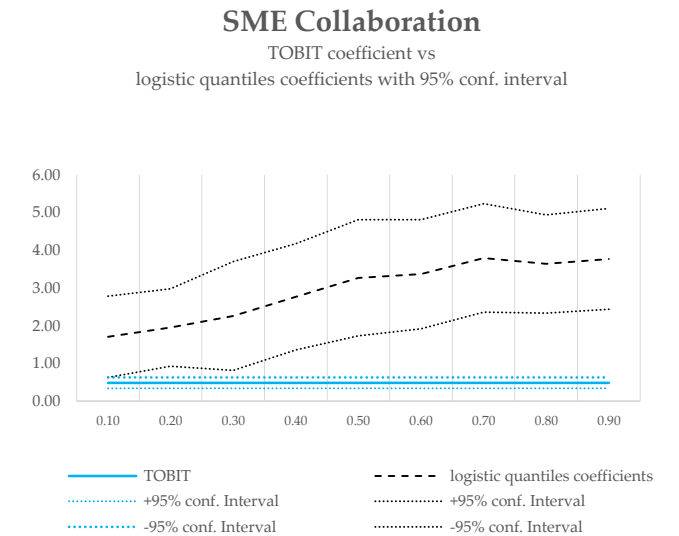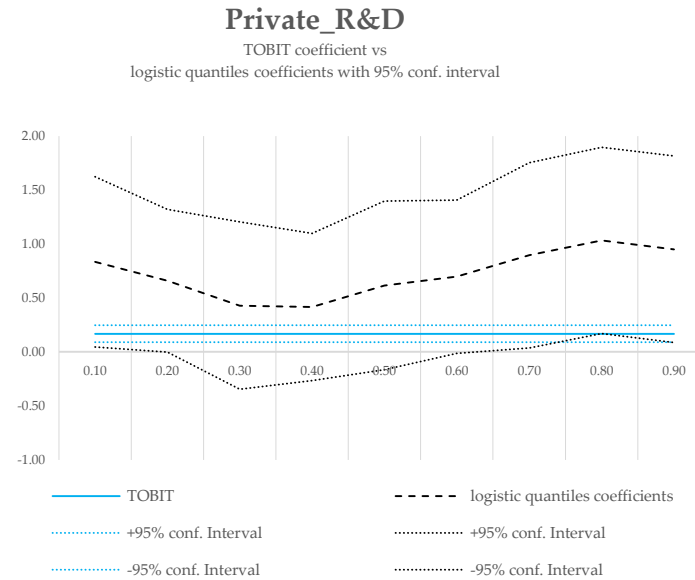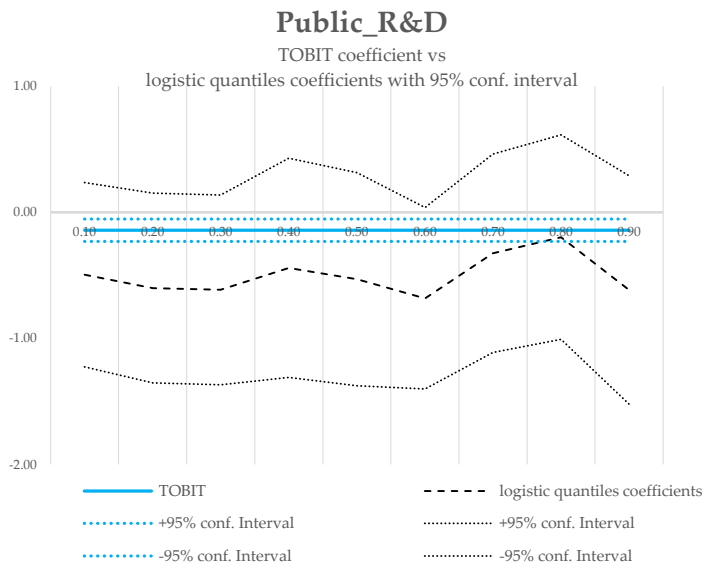All specifications significant at ***$p<0.01$;**$p<0.05$; Bootstrap Standard errors in parentheses.

R&D both at the high and low end of the innovation scale

SME collaboration a driver of innovation across the whole spectrum
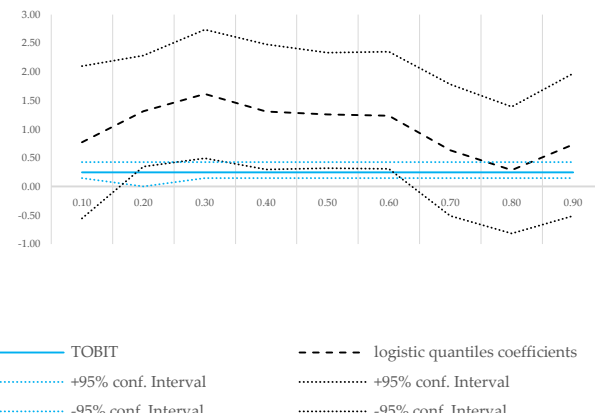
Results across the regional innovation spectrucm

Public_R&D
TOBIT coefficient vs
logistic quantiles coefficients with 95% conf. interval

Private_R&D
TOBIT coefficient vs
logistic quantiles coefficients with 95% conf. interval

SME Collaboration
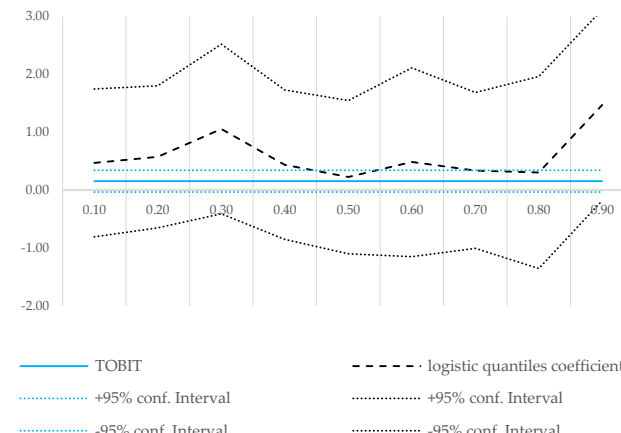TOBIT coefficient vs
logistic quantiles coefficients with 95% conf. interval

Pub-private copublication
TOBIT coefficient vs
logistic quantiles coefficients with 95% conf. interval

Non_R&D
TOBIT coefficient vs
logistic quantiles coefficients with 95% conf. interval

Takeaway messages

Conclusions

o **The EU and European countries have implemented —and, to a large extent, still implement— a research-led innovation policy, based on R&D investment**

o **This research-based innovation policy, however, overlooks the European innovation landscape:**

   o The role of SMEs for the economy

   o Urban and regional context specificities

o **We find:**

   o Private R&D activities drive SME innovation to a far greater extent than public R&D

   o SME collaboration works across all regions

   o Scientific cooperation drives innovation especially in the middle of the innovation spectrum

Twittable messages

In Europe SME innovation in more innovative cities and regions is driven by an effective exploitation of both STI and DUI innovation drivers.

In less innovative regions SME innovation is more the result of collaborations and public/private co-publication.

The 3% R&D-based innovation policy, dominant over the last 20 years, may not be the most adequate to harness SME innovation.

SME innovation in lagging areas depends on processes of learning-by-doing, by-using and by-interacting, and on inter-firm collaboration.

The main drivers of SME innovation vary considerably across the innovation spectrum. Implementing the same policy across the board does not work.

Innovation policies, both at the national and European level, need to become more place-sensitive to be more effective at delivering innovation for SMEs.

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