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THE EFFECT OF SPATIO-TEMPORAL KNOWLEDGE FLOWS ON REGIONAL INNOVATION PERFORMANCE: THE CASE OF ICT PATENTING IN EUROPE

PRELIMINARY DRAFT

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OBJECTIVE OF THE RESEARCH CONCERNING POLICY

This study investigates the effects of external knowledge on a region's inventive activity by taking into account two facts. First, knowledge can diffuse in space not only though localized mechanisms but also though networks, which allow long-distance exchanges. Second, the neighborhood that supply a region with external knowledge may evolve in time, and especially for the relational neighborhood the evolution can be quick and significant. We therefore aim to answer the following questions :

Does the intensity of knowledge flows driven by relational proximity significantly differ from those based on spatial proximity?

How long does it take for knowledge to diffuse?

The aim concerning policy is to assess the role played by inter-regional research collaborations and the existence of the dynamic effects.

POLICY VALUE-ADDED

Which policies are results important for?

The results are important for EU policy in the perspective of creating a Knowledge Space and favouring regional convergence.

Novel or expected findings?

The results suggest that both spatial and relational neighborhoods are affecting regional innovation performance, besides expenditure in R&D, specialization in the field, and the level of past inventive activity.

Our results corroborate the literature that external knowledge matters for innovation and additionally it shows that two different types of neighborhoods play an equally

important role as a source of external knowledge. To this regard, our results corroborate past studies on the role played by space in knowledge diffusion. In addition, it shows that the EU policy implemented through the Framework Programme appears as an effective way to diffuse knowledge among European regions. Some regions remain however weakly integrated into these global networks. Peripheral regions (in geographical terms as well as in relational terms) may thus suffer from a difficulty to access external knowledge.

The study also reveals that although the effect of contemporaneous flows from neighbors is small in magnitude, they are in play in time because evidence is found on the effect of past inventive activity on the current inventive activity. This highlights the necessity of considering dynamic effects for a more a proper assessment of the importance of knowledge flows from neighborhoods. This means that the weak cross-sectional dependence may prove to have important impacts on the long run, due to the temporal dependence. This can therefore explain the existence of regional clusters with persistently different levels of innovative activity.

For which countries?

Since regional data are not available for NEC, the study covers EU countries only. Policy implications are therefore relevant for this area only.

Under which conditions are the policies suited for?

The study focuses on ICT industry. This is a deliberate choice. Using aggregated data over all industries would indeed lead to broader results but these latter would be biased. Since industrial specialization of regions may explain both their ability to enter networks and their level of inventive activity, the estimated coefficients would be both biased and inconsistent. This special emphasis on ICT makes it difficult to extend the results to other fields.

In addition, the paper is still preliminary. In particular, our parameter estimates include both direct and indirect effects. In order to properly assess the magnitude of each effect, marginal impacts should be computed. As computation of these impacts in the case of our extended spatial Durbin panel model is not trivial, this will be dealt with in a further step of our research.