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ARE GEOGRAPHICAL MOVEMENTS OF INVENTORS AND THE FORMATION OF RESEARCH NETWORKS A PHENOMENON BOUNDED IN THE SPACE?

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OBJECTIVE

The aim of this paper is to analyse the existence of regional variations in the returns to labour mobility and research networking. In such a case, we could conclude that development policies based on stimulating these mechanisms of knowledge diffusion could differ in their effectiveness according to local conditions.

SCIENTIFIC METHODS

In order to meet the goal identified above, a KPF is estimated for 287 NUTS2 European regions of 31 countries (EU-27 plus Iceland, Liechtenstein, Norway and Switzerland). Thanks to data availability, we are in position to estimate a panel fixed-effects model of 6 periods (2001 to 2006). Again, the use of longitudinal data and the inclusion of fixed effects in our regressions allow us to improve previous estimates in a KPF framework, to the extent that these fixed effects account for a number of time-invariant unobservable characteristics of the regions that might bias our results if not included.

In order to obtain regional variations in the returns to labour mobility and networking, we have introduced a cross-effect of the corresponding focal variable, both labour

mobility and the different proxies for research networks, with a dummy for each region. This way we are able to compute a specific elasticity for each regional economy in Europe. However, with the idea of providing more general patterns of heterogeneity in the returns to labour mobility and networks, we give a step forward and obtain different elasticities according to a set of typologies of the European regions.

POLICY VALUE-ADDED

With respect to the elasticity of knowledge with respect to labour mobility, it is clear that the highest values are obtained for most of the regions in West Germany, Austria, Denmark and Switzerland, as well as some regions in the Netherlands, North France, North-East Italy, Finland and Sweden. On the contrary, the non-significant or lowest values of the labour mobility elasticity are depicted in almost the whole of the Eastern countries as well as the Mediterranean ones (Spain, Portugal, Greece and the South of Italy). It is worth highlighting some exceptions to this general pattern, since in the group of regions with the highest returns we find Cyprus, two Bulgarian regions, one from the Slovak Republic and another from Spain. On the contrary, some regions hosting capital cities, such as Îlle de France, London or Berlin are among the lowest ranges of the return. A plausible explanation of this a priori contra-intuitive result is the potential existence of non-disclosure agreements between knowledge employers and employees in regions with large levels of internal competition, that prevent the later ones to reveal their secrets to other local competing firms.

In relation with the outside collaborations in the development of patents and their impact on the patenting activity of a region, we obtain a positive and significant impact and the geographical distribution of the elasticities resemble very much that of the elasticity of labour mobility just described above. However, when the co-patenting variable is broken down according to the geographical scope of the linkages (with other European regions, with the US, with singular East-Asian countries and with remaining OECD countries), only co-patents with the US and the remaining OECD countries turn out to be significant. The underlying logic of this exercise would state that when the external knowledge is the same to existing competences in the region, it can be absorbed locally, but the new knowledge will not add much to the existing

local one. This way, one possible interpretation would be that the collaborations maintained between inventors in Europe and other OECD countries or the US provide with less redundant pieces of knowledge, which would allow enhancing creativity.

When taking into account the kind of accession to the European Union, it seems clear that the regions belonging to the EU15 countries are the only ones with significant returns to labour mobility and with the highest positive returns to the scope and scale of the research networks. Additionally, they are also the ones that suffer more strongly from the redundancy in the information in dense networks, as shown by the highest negative and significant return of network density.

With respect to the level of development, the regions belonging to the competitive group show the highest positive return of knowledge to mobility, followed by the EFTA, the transition and lastly the convergence regions, being all of them significant.

Additionally, labour mobility is more efficiently used (i.e. shows a greater elasticity) in those regions that are more knowledge and innovation intensive, such as those in the European science-based area and in the Applied science area

We can conclude, therefore, that the regions benefiting from knowledge coming from other regions –both in the form of mobile skilled workers and research networks- are not so concentrated in the core of Europe. Put differently, some peripheral regions might get larger advantages –in terms of returns on knowledge - in building knowledge linkages with distant knowledge hotspots, compared to the core regions, which most likely source their knowledge from their local pools of ideas or the ones from their immediate vicinity.

As labour mobility and research networks have been obtained to be a fundamental factor in the creation of knowledge, the unequal distribution of such features in the territory could explain regional differences in innovation performance and economic development. In this sense, policies aimed at encouraging the mobility of high skilled workers or enhancing the participation in research networks (as promoted by the European Commission through Marie Curie programs or the Framework Program

Projects), specially in less innovative regions, may play a critical role in the creation of knowledge, and subsequent economic growth. Clearly, though, the effectiveness of such policies, as shown by the results of this research, crucially depends on each region's capacity to give returns to such labour mobility and the participation in research networks. To this respect, we have provided evidence that those regions that are more knowledge and innovation intensive obtain higher returns since they are able to translate internal and external knowledge into new specific commercial applications more efficiently than the less innovative regions. Therefore, the idea that R&D spending and knowledge production in general spill-over to neighbouring regions is not so evident in the absence of a certain level of receptivity to exploit external knowledge. Recall, however, that certain threshold effects seem to arise as evidenced by the negative influence of the networks' strength and the null impact of mobility in certain high performance regions.

The motivation of the present inquiry is also strongly based on latest policy developments at the European level. That is to say, our study perfectly fits the rationale around the Smart Specialisation strategy, recently launched by the European Commission. In order to work out how the Smart Specialisation concept could be applied to regional policy, the concepts of *embeddedness* of the local networks and the local labour force, as well as the idea of *connectedness* to global knowledge hotspots, by means of learning-linkages in the form of cross-regional alliances and spatial mobility of human capital, are pivotal.