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Les défis de développement pour les villes et les régions dans une Europe en mutation

RELATEDNESS, EXTERNAL LINKAGES AND REGIONAL INNOVATION IN EUROPE

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Résumé / Summary

Following a well-settled tradition in evolutionary economic geography, this paper argues that not all types of formerly existing knowledge are equally and successfully combined, and the results of such processes depend on the kinds of knowledge that are put into contact, both in terms of their technological content and their geographical breadth. The paper estimates a knowledge production function (KPF) for the case of the European regions, trying to ascertain what type of knowledge recombination is more conducive to regional innovation. Following Frenken et al. (2007), we argue that Jacob's concept of diversification needs to be more thoroughly elaborated by differentiating between the diversification of related industries and the diversification of unrelated industries – or related versus unrelated variety. Regions hosting related industries, with different but connected knowledge bases, can engage in recombinant innovation. On the contrary, the combination of unrelated technologies is less likely to lead to the production of new ideas.

Two questions have been generally under-investigated by this particular literature, and they constitute the main contributions of this paper. First is the role played by knowledge linkages across the space in introducing variety into regions. While most of the related literature has been silent on the role of linkages across regions, thus implicitly assuming that innovation production draws mainly from geographically localised knowledge sources (Audretsch and Feldman, 2004), some scholars have recently posited that, at some point, co-located agents may start to combine and recombine local knowledge, which eventually becomes redundant and less valuable. As a result, processes of negative lock-in may begin to occur (Boschma, 2005; David, 1993). Conversely, firms looking for external sources of knowledge may find that the

knowledge they require is available beyond the boundaries of the region where the firm is located (Bergman and Maier, 2009; Bathelt et al., 2004). In this scenario, this paper argues that not only does being connected to the outside world matter, the degree of diversity between the external knowledge that is brought into the region and the existing knowledge base is also important (Boschma et al., 2014). The paper's theoretical rationale lies therefore on the belief that highly specialised regions could also perform well if they use diverse knowledge inputs from external sources. However, while adding the external dimension is crucial, this concern has been generally neglected by the related variety literature, and contributions introducing a "more geographical wisdom in the study of regional diversification" are still scarce (Boschma, 2016; Content and Frenken, 2016). Indeed, very few empirical studies have tried to quantify this issue. Boschma and Iammarino (2009), for Italian regional growth, and Tavassoli and Carbonara (2014), for Swedish regional innovation, concluded that it is not enough to be connected to the outside world; rather, different, yet related, connections provide real learning opportunities and boost economic outcomes. Yet neither study looked at knowledge flows across regions directly, as the present paper does, but instead proxied them using trade data flows.

Second, this study incorporates the idea that the combination of related technologies is not always a necessary condition for regional diversification. Thus, as case-study works and a few systematic empirical analyses seem to point out, unrelated diversification may also occur and influence regional economic outcomes. This paper therefore evaluates the role played by relatedness and unrelatedness in heterogeneous regional economic outcomes. In particular, the paper uses regional innovation as an outcome variable, which allows us to regress not only innovation quantity, but also innovation quality (i.e., breakthrough innovations) on related variety, unrelated variety and connectedness with other regions. This allows us to test whether breakthrough innovations draw more on unrelated and distant pieces of knowledge, as ideas with high impact tend to stem from knowledge cross-fertilization and the combination of unrelated technologies (Fleming, 2001; Saviotti and Frenken, 2008). Again, very little systematic evidence exists in this respect, with Tavassoli and Carbonara (2014) and Castaldi et al. (2015) as the exceptions, for the cases of, respectively, the Swedish regions and the US states.

This paper makes use of a large sample of European regions (255 NUTS2 regions) belonging to 25 countries, which, to our knowledge, corresponds to the largest coverage in Europe of studies of this kind. Moreover, the study utilises data for several years, allowing us to introduce time and region fixed-effects (FE) to control for a large number of unobservables.

We show that, while related variety is conducive to regional innovation, unrelated variety plays a role with respect to radical innovation in the case of the European regions. We also provide results on the role of related, non-local capabilities in the capacity of these regions to innovate. Interestingly, the results indicate that external knowledge flows have a higher impact, the higher the similarity between these flows and the extant local knowledge base.

Key words: related variety, unrelated variety, patents, patent citations, knowledge production function

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