

# Regional patterns of innovation clustering and economic performance

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## Scientific and social impact

The results of this thesis indicate that in today's complex and evolving economy, the study of innovation can benefit from moving past artificial boundaries regarding the nature and structure of innovation systems. Specifically, the findings presented point towards patterns of co-located patenting and manufacturing activity that emerge organically and cut across traditional categorisations. In future research, the fundamental principle on which this methodology has been based can be extended and applied to many types of data linked to the innovation process. Given the rapidly growing availability of data and pattern recognition techniques, there is no reason to limit ourselves to static assumptions. It is easy to understand why studying the automotive industry without taking into account electronics would not make sense, yet this is exactly what one would do if one depended on previously applied taxonomies. The nature of production is constantly transforming, and our tools of analysis must be able to capture this incessant transformation.

This point has direct policy implications, since it is imperative for policy-makers to have a real-time view of the geography of innovative activity. Much can be lost in translation if policy is designed based on models that fail to illustrate emerging and evolving innovation ecosystems.

Another important policy implication arises from the results regarding the links between cluster presence and economic performance. As expected, technology-intensive clusters appeared connected to more positive results. Yet it is important to note that we did not

observe an absolute dichotomy between high performing 'high-tech' clusters and underperforming 'low-tech' clusters, since, for instance, the more traditional clusters were linked to comparatively lower unemployment. This observation is particularly relevant in the context of an often-held view of certain types of activities as having strictly positive effects on economy. However, in the age of automation it is worth keeping in mind that certain industries may be connected to higher wages (and / or GDP growth) but fewer jobs and vice versa.

Another often encountered assumption that was not confirmed by the findings presented concerns the role of urbanisation. In public discourse, large cities are usually viewed as synonymous to economic growth, yet our results do not point towards that direction. Europe, therefore, with its polycentric structure, appears to be the host of different dynamics when compared to the US, the country where the high performance of metropolitan areas has mainly been observed in literature.

Therefore, an overarching theme concerning the scientific and societal impact of this thesis, is that fixations on certain themes and patterns should be avoided. The nature of innovation constantly changes, and we should be open to new ways of mapping it and studying its effects. Additionally, while certain high-tech industries may be appealing in many ways, policy-makers should not treat their promotion as a solution to all economic and social problems. The same applies to the focus on large cities, especially in the European context.

The evolution of an economy is a complex process whose effects have many dimensions. Adapting to it in a way that benefits society the most requires constantly recalibrating our assumptions in accordance with the transformations taking place around us. This can translate in tailor made policy initiatives that will help build on regional advantages and generate the potential for diverse evolutionary trajectories.