Zooming into Regional Innovation Traps in Europe

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We investigate regional innovation output in terms of patenting per population over the period 2000-2020 in the European NUTS2 regions.[1] While innovation activities in European regions exhibit in general a pronounced tendency of convergence, some of the lagging regions show at best only little improvement and fall further behind. One might say that these regions are captured in an innovation trap, a trajectory that constitutes a certain type of development trap (Diemer et al., 2022; Balland and Boschma, 2024; Fuest et al., 2024; World Bank, 2024). Development traps may indicate a dynamic 'market failure' that suggests a case for policy intervention.

In a first step, we discuss several approaches to identify regions that may be considered to be in an innovation trap. The general idea is that regions in an

[1] The information for patenting is from the OECD RegPat data base; see Maraut et al. (2008). We merge those NUTS2 regions that represent only a large city with their surrounding region in order to analyze functional regions.

innovation trap are those with a relatively low number of patent applications per population in the year 2000 and a low growth or even decline of this figure in the 2000-2020 period. Although such a definition may be quite appropriate for identifying problem regions within countries, it is problematic when applied to the European level. The reason is the considerable differences in the level of innovation activities across countries, for example, between countries in the north and in the South of Europe. As a consequence of such differences, some regions in the north that have severe problems in their innovation activities (such as East Germany) may not be classified as lagging because patents per population there are close to the European average. It may also be the case that, based on average values for whole Europe, whole countries may be classified as lagging, which in this case is more a problem at the national level and not at the regional level.

For this reason, we apply two alternative country-specific definitions in which we measure the regional level of innovation activity in relation to the national average. Accordingly, those regions may be regarded in an innovation trap where the level of innovation activity in the base year is in the lower quartile of the national distribution and stagnant. An alternative country-specific definition uses national rankings of regions according to their innovation output (patents per population). Based on these rankings, we classify those regions as problematic that are in the lower part of the ranking and stagnate or decline in the 2000-2020 period.

We analyze the characteristics of the regions that are considered problematic according to the different definitions. Comparing them to regions with low levels of innovation activity in the base year but significant improvements over time, aim at identifying reasons for stagnation versus drivers of growth. In the analysis, we also regard different measures for the types and quality of patents such as ‘radicalness’ and ‘originality’. Overall, regions that may be considered to be in an innovation trap are a rather heterogeneous group. This implies that there is no one size fits all approach when it comes to policies aimed at improving innovation performance but rather specific regional characteristics should be taken into account.

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