

Summary

The project intends to explore the mechanisms of generation and exploitation of technological knowledge, as well as its effects of economic performances of firms, regions and sectors. In doing so, we will propose an innovative approach to the conceptualization that go beyond the traditional way economists have investigated these phenomena. Instead of looking at knowledge as an homogeneous good without any internal articulation, we introduce a view of knowledge able to accommodate two important established facts. First, the production of knowledge is the outcome of a collective process, in which innovating agents interact with other institutional actors in local contexts so as to access external sources and enact mutual exchange of knowledge. Second, from a cognitive viewpoint, the creation of new knowledge may be assimilated to a recombination of different pieces of technological knowledge fragmented and dispersed not only across the geographical but also across the technology space.

This opens up the way to new operational translations of technological knowledge to be used in empirical settings aimed at analyzing its economic impact. Rather than as a uniform and undifferentiated stock, we will characterize a knowledge base as a heterogeneous asset, having an internal structure shaped by the combinatorial dynamics of smaller bits of knowledge. A knowledge base will be therefore represented as a sort of network, the nodes of which are the smaller bits of knowledge, while the links are the actual combinations of those bits one another.

This turns out to be a flexible representation of technological knowledge, susceptible of different methodological implementations. We will implement indicators the matrixes of co-occurrence of technological classes (classification codes) within patent documents (publications); measures which are used in social network analysis to characterize the structure of the network and the relative weight of each of its nodes; content analysis performed by means of linguistic engineering software.

Besides the theoretical and methodological innovativeness, the results of the activity carried out within this project have clear and relevant policy implications. Indeed, such new approach is likely to provide policymakers with a broader and less simplistic view on the dynamics of knowledge-driven economic competitiveness. We will analyze the relationships of knowledge structure and the economics performances at different levels of aggregation, i.e. the firm, the region, the sector. Our implementations of technological knowledge allows for interpretations of the relationships between knowledge dynamics and economic performances, as well as their evolution over time, in the light of complexity theory. The systemic nature of technological knowledge and of the agents involved in its creation calls for an accurate evaluation of the incentives schemes to be put in place. The stimuli to cooperative research or to the development of specific leading sectors should take into account the variety of knowledge sources and properly assess their degree of complementarity and similarity, as well as the changing weight of knowledge inputs within the architecture of knowledge structure.