Abstract

This thesis consists of three chapters.

The first chapter proposes a novel multi-layer clustering algorithm aimed to identify technology clusters from the network of collaboration ties among innovators with geo-coded locations. Using this novel algorithm, I identify innovation clusters in the U.S. Patent Inventor Database by simultaneously exploring two dimensions: the spatial distribution of inventors and the patterns of interconnections among them. Based on the clusters identified, I show that a combination of proximity and interconnectedness of inventors within the cluster boundaries is related to higher quality of innovations than those produced outside the clusters.

In the second chapter, I exploit the introduction of the USPTO's Prioritized Examination (Track One) Program to capture the impact of shortened pendency on the likelihood that a pending or granted patent will be commercialized via the transfer of property rights. I find that the Track One program significantly increased the probability of commercial reassignment of applications that were more likely to be prioritized.

In the third chapter, joint with Christian Fons-Rosen and Patrick Gaulé, we investigate causes of the ageing of the U.S. scientific workforce. Using novel data on the population of U.S. chemistry faculty members between 1960 and 2010, we find that the secular increase in the age of the academic workforce has mainly been driven by changes in the numbers of new faculty hires over time.