

Productive Places

The influence of technological change and relatedness on agglomeration externalities

Frank Neffke

An old debate in economic geography discusses whether firms are better off in specialised cities or in diversified cities. In other words, are agglomeration externalities, which can be defined roughly as advantages and disadvantages local firms experience when locating close to other firms, stronger if these firms are operating in the same industry, or if they are operating in a large number of different industries? So far, empirical evidence on this issue has been contradictory.

One explanation for why evidence has been inconclusive is that agglomeration externalities are different in different situations. The thesis builds on industry life cycle theorizing to hypothesize that agglomeration externalities change as industries mature. The statistical analyses in this thesis show that agglomeration externalities indeed change as industries and plants mature. In particular, local diversity has a beneficial effect in early development stages, whereas localisation effects are strongest in more mature phases.

A second explanation for why the diversity-versus-specialisation debate has not reached a conclusion is that the distinction between diversity and specialization constitutes a false dichotomy. Some industries are related to one another in terms of their technologies, whereas others are not. If spillovers are most likely to occur between related industries, then agglomeration externalities should only arise in regions that host specific combinations of industries and not simply in any diversified regions.

To investigate the second explanation, an index was developed that quantifies technological relatedness of pairs of manufacturing industries by using information on the co-occurrence of industries in production portfolios of manufacturing plants. The presence of a large number of firms in related industries indeed leads to persistently better survival chances. Moreover, in line with evolutionary economic notions of economic development as a path dependent process, the relatedness structure of the economy is seen to affect which industries enter and which exit a region over time. This shows that inter-industry relatedness plays an important role in the structural transformation of regional economies.