

GRAVITATION AND DISPERSION - A DISAGGREGATE VIEW ON URBAN AGGLOMERATION AND SPRAWL IN GERMANY

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Abstract

In the study of urbanisation, a specific strand of the literature focuses on the size ranking of cities within countries or regions. In particular, an empirical regularity known as Zipf's law implies that once an urban hierarchy has emerged, small cities will grow at the same pace as large ones. Recent research has interpreted deviation from Zipf's law in the upper tail of the city size distribution in support of agglomeration economies among large cities. So far, issues of measuring the population of cities accurately have been out of the main focus in this literature. Assuming a disaggregate view, this paper examines whether the validity of Zipf's law with respect to Germany is robust to variation in the urban areas taken into consideration. Urban agglomerations are defined by a clustering algorithm referring to population density across small spatial grids (1 km) in Germany. Data on the residential population of grids was compiled by a market research firm, according to the guidelines of the INSPIRE Directive of the European Union.

We find that deviation from Zipf's law increases in line with greater expansion of the urbanised regions assigned to a fix set of urban cores. Among larger urban zones, size increases more than proportionally by rank, which indicates increasing returns to scale. In order to assess the relevance of our agglomeration definitions for current territorial planning, we compare the size ranking resulting from our solutions to rankings deriving from agglomeration concepts commonly referred to in regional and urban policy. From our grid-based solution it follows that concentration of the German population on the largest urban agglomeration (i.e. Rhine-Ruhr in North Rhine-Westphalia) is more distinct than the concept

of conurbations for purposes of spatial planning ("European Metropolitan Regions") would imply. In the planning-oriented definition, a comparatively smaller and much more densely populated urban area is associated with the Rhine-Ruhr conurbation than with the other large urban agglomerations in Germany. If spatial clustering methods are applied to define all agglomerations in Germany, a greater dominance of Rhine-Ruhr among urban settlements is revealed. The analysis therefore suggests that economic forces tend to favour continuing agglomeration in very large cities. Concerning intra-urban differentials the analysis implies that congestion diseconomies inhibit growth of very densely populated urban core zones beyond a certain size.