

Spatial-temporal agglomeration processes in tourism – results of exploratory spatial data analysis of tourism supply in Poland in the period 2000-2015¹

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Abstract

The goal of the paper is to measure and identify the spatial-temporal agglomeration processes in tourism - on the example of Polish districts. In particular we consider spatial dynamics of “inter-regional” agglomerations and focus on how to determine the changes of spillover effects which accompany the phenomena of spatial concentration when economic activities and tourism demand spill over beyond the borders of territorial units. We would like to estimate, among others, the immediate and time-lagged results of spillover of tourism firms and tourists’ flows originating from changes in numbers of tourism establishments in the region or in the neighbourhood (agglomeration processes).

There are two main challenges in measuring agglomeration processes in tourism. First, agglomeration phenomenon spreads beyond the borders of the territorial units (eg. districts) forming – often disregarded in research – spatial dependency in neighbouring regions, while statistical data are collected within administrative boundaries (intra-regional) what may produce biased results. Thus, we previously proposed to use the spatial statistics of autocorrelation (local Moran’s I_i statistic) within the modified cluster-mapping procedure in order to identify and measure geographic spillovers in tourism [Majewska 2015]. Moreover, in doing this, we proposed to use geostatistical information (GPS coordinates) instead of traditionally collected data in order to increase the accuracy of the results in measuring the neighbourhood (distances between centres of tourism agglomerations) [Majewska 2016].

The second challenge is to consider time and dynamic in agglomeration processes modelling according to a growing interest in spatial dynamics as a framework for analysis [Rey et al. 2011; Tita & Cohen 2004; Quillian 2002]. It can be accomplished in several ways, eg.: 1) defining/identifying alterations of neighborhood based on changes of localization of central points of agglomerations, eg. central tendencies of GPS coordinates of enterprises located in a given area (in a district); 2) determining compositional changes within territorial units (evolution of characteristics within territorial units and the neighbourhood at different points in time for fixed neighborhood boundaries), 3) combining spatial and temporal lags by determining changes in spatial autocorrelation between neighbouring districts (for this study

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– in 5-year lags within 2000-2015 time period), considering changes of neighbourhood as well as of territorial units' attributes.

In the paper we identified and verified the aforementioned methods to capture the agglomeration dynamics in various types of inter-regional clusters in tourism. We employ the explorative spatial data analysis (ESDA) along with several visualization techniques. We used data collected by Polish Central Statistical Office at NUTS-4 level (tourists staying overnight, the number of tourists establishments) and individual entities being tourism firms registered in section I according to Polish Classification of Activity – accommodation and food services in 379 Polish districts in 2015, with dates of registration and terminating their activities. On this basis we gain the spatial-temporal panel database consisting of 131 338 GPS coordinates of enterprises registered in section I according to Polish Classification of Activity for the period 2000-2015.

As a result of the study the persistence and directions of agglomeration processes spilling over were determined in urbanization- as well as in localization-driven clusters. We observed both the changes that indicate strengthening spillover effects (in the vicinity of some of the most urbanized regions), diminishing spillover (centripetal effects of agglomeration centers) as well as certain dispersion effects in tourist regions (e.g. at the seashore). The effects are dependant on various regional features. A deeper understanding of dynamics of spatial agglomeration phenomena in tourism may prove to be beneficial in optimalization of localization decisions and geomarketing of enterprises as well as planning and management of tourism destinations.

Keywords: spatial dynamics, agglomeration processes in tourism, neighbourhood changes, local Moran statistic, spillover effects, Polish districts.