Authors	Benjamin Heldt, Kay Gade, Dirk Heinrichs
Title	Agents in land use models - Identifying parameters explaining their location choice decisions under limited data conditions
Track	General Papers
Director	Mark Wardman

Abstract

Daily mobility consists of recurring trips to perform specific activities like shopping or working. Such activities are connected to purpose-related locations or land-use both as the origin and the destination of these trips, e.g. residential, industrial or commercial locations. Location choice of a person or household, also referred to as household or long-term mobility, has an important influence on daily mobility. For example, a household may choose to locate close to the workplace or where good accessibility to destinations with public transport is available. Land use and transport models provide instruments to understand and forecast such interactions. These models depend first and foremost on a firm understanding of the factors / variables that explain household or individual location decisions. There is, however, no ubiquitous applicable set of variables available as they might differ for separate analysed regions. To represent the region-specific reality in the best way and to be as simple as possible, aggregate models need to cluster individual behaviour and decisions into homogeneous groups. As location choice is a complex process, building these groups is based on multiple variables. According to Marradi (1990) they can be called “types”. “A type is a concept whose intension is the intersection […] of the n classes which are combined to form it.” (Marradi 1990, p. 134), whereas a typology is the result of a classification process. While there is an extensive literature on the variables that explain location choice, less attention has so far been given on the development of methodologies and procedures to define typologies for the ‘choice sets’ of different homogenous groups.

This paper addresses this methodological gap, presenting work to set up an aggregate model for the agglomeration of Berlin in Germany. It covers three related topics: selecting variables that explain location choice, creating the typology of households and discussing outcomes of the process.

With respect to the first topic, the paper explains the methodology that was implemented to examine the relevant variables for the study region. An extensive literature review was performed to scrutinize relevant push and pull factors for household location choice. Discussions with experts from the modeller’s and the empiric’s perspectives further consolidated the findings by ranking these variables and adding region-specific variables. Thereby we could assure that we did not miss any empirically relevant attributes. Further attributes were given by the interaction between location choice and transport models. The location choice model receives accessibilities from the transport model and returns new locations of households and firms. Consequently, for connecting the models, they

need to be compatible (i.e., transformable and free of intersections) regarding these variables, their categories, and the spatial level of detail.

With regard to the second topic, the paper explains the methodologies and procedures to disaggregate and classify variables for different homogenous household types. The preliminary defined set of variables is constrained by the available empirical data as well as the computational performance of the model. An extensive review of data shows that neither all required data at the desired spatial level of detail, nor the necessary combination of variables are contained in a single data source. Therefore different data sets have to be combined. As a consequence of combining diverse data sources, the typology process has to consider the different levels of data aggregation. To create the requested typology, the variables need to be grouped and classified according to the dimensions found in the literature. In order to identify the variable classes, statistical analyses have been used to determine regionally and empirically relevant categories. Using a similarity analysis, the typology was further aggregated. The analysis takes into account data confidentiality constraints as well as restrictions of the modelling software.

Coming to the third topic, the paper will explain the similarity analysis in more detail and outline results. Moreover, we will discuss the conflict between the ideal typology regarding model validity and model environment and the restrictions due to data availability and model capabilities.

BIBLIOGRAPHY

Marradi, A. (1990). Classification, typology, taxonomy. Quality & Quantity, 24(2), 129-157.