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Evaluation of Linear Spatial and Non-linear Models in Explaining the Spatial Dispersion of Travel Agencies in Mashhad, Iran

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Extended Abstract

1. Introduction

Travel agencies are an indispensable part of the tourism industry and act as the distribution canal of this industry. These offices (travel agencies) are, in fact, a medium through which consumers and producers are connected and they are considered as one of five major sections of tourism, as well as influential elements in the evolution of this industry. The activities of travel agencies regarding destinations, attractions, transportation, residency, and recreation could affect the extent of tourists' satisfaction toward travel and the level of demand. In truth, travel agencies play the role of retailers within the industry of tourism. In this regard, they are considered as the final linking point throughout the process of consuming the industry's products, receiving several services. Effective factors in the success and functionality of these agencies include their location pattern and spatial distribution throughout the geographical area of various cities and regions. It seems that travel agencies, as a facilitating factor for traveling, should have an appropriate distribution pattern across a city. As a result of this even distribution, all residents would have access to travel facilities and services. However, in reality, many factors have negatively influenced such equal distribution, and different patterns of spatial distribution and dispersion can be observed. The current study focuses on Mashhad, in which travel agencies are often seen only in certain parts of the city. This study aims to find the factors, which have led to such unbalanced establishment. Also, in addressing this question, the study would aim to see which explanation method presents more realistic results in this matter. More specifically, the current study would focus on two well-known effective models, namely geographical regression as a linear model, and neural network as a non-linear model.

2. Methodology

Due to the nature of the research question, this study is based on descriptive-analytical methods. Hence, in addition to referring to the existing documents and resources, initial information was obtained from various sources. Then, by referring to the website of the Cultural Heritage, Handicrafts and Tourism Organization of Iran, the latest statistics regarding travel agencies in Mashhad were collected and registered at the geographical information database. Also, some data regarding the variables of the study were gathered from this database (21 variables). Subsequently, using several models, the dispersion pattern of travel agencies in Mashhad was described.

3. Results

In geographical regression, variables such as distance to the holy shrine, movie theaters, shopping malls, parks, religious and academic centers, and literacy level were considered as effectless variables. However,

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these variables were effective from the viewpoint of the neural network model. In fact, some of these variables have an important role in explaining the scope of influence of travel agencies. Instances include distance from centers of higher education and the holy shrine of Imam Reza. As for the neural network model, the most effective factor was the distance from main squares and intersections, while spatial regression selected 'distance from hotels' as the main effective factor. A look at the nature of these urban spaces shows that squares and intersections are public spaces, while hotels specifically belong to tourists. Therefore, based on the outlook provided by the neural network model, travel agencies tend to get established at public urban spaces. On the contrary, according to the spatial regression model, such a tendency is based on variables related to pilgrims and tourists.

4. Conclusion

As compared to the geographical regression model, the estimations of the neural network model provide more reasonable explanations regarding the establishment of travel agencies. White-colored areas are more widely and steadily observed in this model. Also, uniform cluster estimations have better distribution in the neural network model. On the other hand, the deviation of estimated values for the scope of influence of travel agencies show more variety in the geographical regression model.

Due to the linear nature of the spatial regression model, some variables, which seem to have a role in the dispersion and scope of influence of travel agencies have been eliminated. However, no variables have been excluded from the neural network model. This may be one of the reasons for the high flexibility of the neural network model in adapting with different variables of the study. On the other hand, it has to be kept in mind that some variables have a qualitative nature and they may not be expressed quantitatively. Such variables are practically excluded from geographical regression. They are, however, easily used in the neural network model. Based on the findings of this study, it seems necessary and inevitable to smoothly pass on from linear towards non-linear patterns for studying geographical phenomena and their dispersion in urban spaces.

Keywords: Travel agencies, Geographical regression, Neural network, Mashhad

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