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Climate in the region of origin and destination choice in outbound tourism demand

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ABSTRACT

This paper describes the relationship between regional climate in the home area and the choice of taking holidays in the region of origin or abroad. This decision is simultaneously estimated with a bivariate probit model. The study combines the socioeconomic characteristics of European households with information on the region of residence, such as climate, which is defined according to a new annualized climate index. The estimated probabilities are analysed using GIS and nonparametric techniques. The results of modelling support the hypothesis that the climate in the region of residence is a strong determinant of holiday destination choice. They show that residents in regions with better climate indices have a higher probability of travelling domestically and a lower probability of travelling abroad.

1. Introduction

The domestic market represents a large proportion of tourism demand in many regions around the world. However, the literature indicates that modelling domestic tourism demand has been overlooked in favour of analysing the international market. Climate is a key variable to take into account when investigating the capacity of domestic markets to retain tourists. The present paper particularly focuses on the role climate plays in outbound tourism demand. For example, colder regions may be attractive to foreigners as a destination for a short period in the winter months. Although the residents may also enjoy the area during their daily life, it may not be sufficiently attractive to retain them, and so they may prefer to experience a different climate elsewhere. Thus, this study investigates the home climate as a determinant of travelling domestically or abroad.

This paper represents an initial attempt to quantify the relationship between the home climate and destination choice in outbound tourism demand, and tries to address some of the challenges outlined in the literature (De Freitas, 2003; Gössling & Hall, 2006). One major drawback of current methods is that the empirical analysis is usually conducted at the national level, while ignoring the remarkable variations that may exist within a country. Another drawback is the use of average annual temperatures while disregarding seasonal variability (Amelung, Nicholls, & Viner, 2007). In particular, this paper considers the holiday decisions taken by households rather than employing the usual aggregated approach by country. It takes into account regional differences and their socioeconomic characteristics as determinants of destination choice, either for travelling domestically or abroad. Regarding modelling, the way that climate is defined within an econometric model is challenging. This paper proposes a new regional climate index for tourism purposes which may be used for analyses that require taking seasonality into account, despite the dataset being based on yearly data. The index is based on a double-hurdle model of temperature and rainfall, such that it captures the number of months per year during which a good climate is expected for tourism purposes. The aim was to test the hypothesis that residents in regions which have more months with a good climate are more reluctant to travel abroad than residents in regions which are less well-favoured climatically. Since decisions regarding domestic and international tourism demand are not independent, a bivariate probit model was estimated demonstrating the relevance of

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climate in the home region as a determinant of destination choice decisions.

2. Regional climate and destination choice

Only a few quantitative studies have considered the role of climate in outbound tourism demand and destination choice (Bigano, Hamilton, & Tol, 2006; Lise & Tol, 2002; Maddison, 2001; Meyer & Dear, 1999; Syriopoulos & Sinclair, 1993). Amelung et al. (2007) argue that this is due to a lack of variation in climate over the years. As a consequence, tourism marketers take climate as a given, thereby limiting the number of possible policies addressing the issue. Recent interest in studying climate change and its impact on tourism has led to studies investigating this relationship (Amelung et al., 2007; Bigano, Hamilton, & Tol, 2007; Gómez, 2005). These studies attempt to identify the role played by climatic conditions in a destination as a tourism attractor (Maddison, 2001). Moreover, to understand the sensitivity of tourism demand to climate change scenarios, Lise and Tol (2002) highlight the need for estimating the optimal temperature of a destination for tourism purposes. Due to climate change, those destinations where there is a shift of temperature towards or away from optimal temperature will experience an impact on tourism demand. As stated by the United Nations Intergovernmental Panel on Climate Change "Recreational preferences are likely to change with higher temperatures. Outdoor activities will be stimulated in Northern Europe, but heat waves are likely to reduce the traditional peak summer demand at Mediterranean holiday destinations, and less reliable snow conditions could impact adversely on winter tourism" (Hall & Higham, 2005).

Questions arise regarding the way in which climate is defined and incorporated into a tourism demand function. This definition needs to be in line with the endogenous variable used in the function. Most studies are constrained by data availability and use single variables as a proxy for climate (Hamilton & Tol, 2007). For example, Bigano et al. (2006) employ temperature as an exogenous variable and Teye (1988) uses rainfall. The problem of using either temperature or rainfall alone, is that their combined effect remains unexamined. Lise and Tol (2002) consider temperature and rainfall simultaneously. Such studies face an additional shortcoming related to the temporal and spatial dimension of climatic variables. Due to the lack of data, studies at the national level consider the average values of single variables. Climatic variations during the year and in different regions in the same country may lead to inaccurate results in subsequent analyses.

An additional challenge is related to the choice of variables used to define climate. Mieczkowski's (1985) seminal paper presented an index, known as the Tourism Climatic Index (*TCI*), composed of five subindices: daytime thermal comfort, daily thermal comfort, precipitation, hours of sunshine, and wind speed. These subindices have values ranging from 0 to 5 depending on how appropriate they are in relation to tourism well-being. These assessments are based on previous studies on thermal comfort and have been adapted to tourism. The final *TCI* is obtained by arbitrarily weighting the subindices.

Mieczkowski's index has three major drawbacks. First, it should be noted that the index is designed in relation to the "average tourist". Hence, it may be useful for tourism analysis where there is no need to distinguish between tourist activities. However, if the analysis focuses on a particular tourist activity, the index should be adapted because different tourism destinations vary according to their dependency on climatic conditions (Capó, Riera, & Roselló, 2007). For example, De Freitas, Scott, and McBoyle (2008) have adapted the index to sun, sea and sand destinations. Second, the assessment of each subindex is based on an adaptation of previous studies on thermal comfort. Further research on this issue is required. Third, the weights used to create the aggregate index are subjective. Attempts have been made to address the last two problems using stated preferences to indicate the relative importance of each subindex. For example, Morgan et al. (2000) employed an in situ survey and De Freitas et al. (2008) estimated preferences using a sample of students. Neither case is ideal, since the first is subject to sample selection bias, and the second does not consider the decisions of actual tourists or the decisions of tourists from different places. Bigano et al. (2006) draw attention to the possible existence of asymmetries in climate preferences between different origin countries depending on the climatic conditions in the residents' home area. Thus, individuals who are used to colder climates may be less demanding regarding temperature than those used to warmer climates. These asymmetries suggest that multiple regions could be included in the analysis.

All of these studies have focused on the role of climate as a determinant of destination choice, but without taking into account the characteristics of the place of residence. Our paper is an initial attempt to estimate the significance of climate in the region of origin as a determinant of travelling domestically or abroad. The methodology used is an adaptation of Mieczkowski's index. An alternative approach to aggregation is suggested, such that the arbitrariness involved in determining specific weights can be avoided.

3. Case study

A survey conducted at the household level incorporating socioeconomic characteristics was obtained from a stratified weighted survey of 16 183 households conducted in 1997 in the European Union, namely: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxemburg, the Netherlands, Portugal, Spain, Sweden, and the United Kingdom. This survey was used to create the Eurobarometer 48 (European Commission, 1998). The survey collected information on holidays taken, as well as socioeconomic variables such as income, gender, age, education, the number of children, the number of adults, marital status and employment, among others.

Europeans who travel more often are from Scandinavian and north-European countries. According to the survey, 76.16% of the Danish population travel at least once per year. Denmark has the highest participation rate, followed by the Netherlands (72.52%), Sweden (70.13%) and Finland (67.09%). Portugal has the lowest participation rate (34.66%). However, it may be that the main determinant of tourism is the financial aspect. This is plausible, given that the average frequency of travel per year by residents from different countries indicates wide differences between the first case, Finland (1.43), and the last, Portugal (0.40). In fact, Finns travel 3 times more often than Portuguese in any year. Despite the differences in GDP between Finland and Portugal, it is likely that there are other reasons for these differences.

The interviewees were asked for their reasons for non-participation in tourism demand in the previous year. The main causes of differences were financial (19.23% of the sample), although labour conditions (6.52%) and family matters (8.90%) also led to differences between some countries. However, these reasons leave aside variations in conditions between places of origin. The argument that a household does not travel due to financial reasons is subjective and depends on their preferences and this affects how they allocate their budget. In other words, Danish residents may be more willing to pay for tourism than Portuguese residents, because they may have different needs. These needs are related to other aspects, such as climatic conditions and the attractiveness of the place of residence.