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Nonconstant reputation effect in a dynamic tourism demand model for Spain☆

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HIGHLIGHTS

- A dynamic econometric model for tourism demand with nonconstant reputation effect.
- Our model allows the reputation effect to vary with tourism congestion.
- The model is testing with panel data from Spanish regions during 2000–2013.
- Two different estimations for domestic and international tourists are performed.
- A positive but decreasing with congestion reputation effect is found in both cases.

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ABSTRACT

Following the ideas of the Tourism Area Life Cycle (TALC) theory, we propose a dynamic econometric model for tourism demand where the reputation effect (the effect of the lagged demand on the current tourism demand) is not constant, but dependent on congestion. We test the model using panel data from Spanish regions during the period 2000–2013. Two estimations are performed depending on whether the tourists' origin is domestic or international. The results show that the reputation effect is not constant in both estimates, supporting the idea that tourism congestion influences tourist arrivals in Spain.

1. Introduction

Research in tourism economics has been dominated by demand analysis (Sinclair, Blake, & Sugiyarto, 2003). See, for example, Li, Song, and Witt (2005), Song and Li (2008) and Song, Dwyer, Li, and Cao (2012) for reviews of the methods used to analyze tourism demand. Since the 1990s, demand modeling studies have shifted from static regression models to more sophisticated dynamic specifications. Dynamic models aim to avoid potential problems such as spurious regression, poor predictions and structural instability (Witt & Song, 2000; Song & Turner, 2006), and take into account important factors like repeat visits, habit persistence, and word-of-mouth recommendations or reputation (Morley, 2009). These models support the idea that previous visitors have an impact on the current tourism demand. In this paper we call this intertemporal link the Persistence or Reputation effect, and it can be caused by a wide branch of different factors.

The most common way to incorporate dynamics into demand models is to include the lagged demand in a linear fashion as an

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explanatory variable. However, this may not be sufficient to account for the dynamics of tourism demand (Morley, 1998, 2009). This simple inclusion of the lagged demand assumes a constant persistence or reputation effect.

Nevertheless, the Tourism Area Life Cycle (TALC) theory (Butler, 1980), the most popular one on tourism evolution, suggests that the effect of lagged demand on current demand is not constant, but changes as the level of occupation approaches the destination carrying capacity. According to the TALC theory, during the first stages, the number of visitors increases at an increasing speed. However, as it approaches the carrying capacity the process slows down. Lundtorp and Wanhill (2001, 2006) consider the ratio of visitors over the carrying capacity as the source of this slowing down. This ratio is called tourism congestion along this paper. Following this idea, we propose an econometric demand model where the reputation effect is not constant but varies with congestion.

Our research improves the literature in two ways. First, by specifying a non linear relationship between current and lagged demand we allow for a nonconstant reputation effect. Second, the tourism congestion is considered as the key to this nonlinearity. There may be other factors involved in this non linearity, however. We focus on congestion inspired by the TALC theory. We test the model with panel data from Spanish regions during the period 2000–2013. We perform two different estimates depending on whether the origin of the tourists is domestic or international. The results show a satisfactory performance. The reputation effect is not constant in both estimates, supporting the idea that congestion influences tourist arrivals in Spain.

Panel data have been used in recent studies on tourism demand. However, they simply include the lagged demand in a linear fashion in order to take into account habit persistence or reputation. As examples, we have the work by Maloney and Montes Rojas (2005) for tourist demand at Caribbean destinations, Naudé and Saayman (2005) for tourist demand in 43 African states, Garín-Muñoz (2006, 2007 and 2009) for tourism demand at different Spanish destinations, Garín-Muñoz and Montero-Martín (2007) for tourism demand in the Balearic Islands (Spain), Massidda and Etzo (2012) for domestic tourism in Italy, and Rodríguez, Martínez-Roget, and Pawlowska (2012) for academic tourism demand in Galicia (Spain). All these studies assume a constant persistence or reputation effect. Our econometric specification is more flexible as it allows the reputation effect to vary with congestion. Furthermore, it allows us to analyze the effect of tourism congestion on a destination's appeal. To the best of the authors' knowledge, there are few empirical studies analyzing this supply-side factor.

The paper is organized as follows. Section 2 provides the theoretical foundations of the model. Section 3 assesses the congestion in Spain, as a tourist destination. Section 4 presents the data and variables used in our estimates. Section 5 provides the empirical model and describes the econometric methods used for estimation. Section 6 contains the results of our estimations and their interpretations. Finally, Section 7 offers some conclusions.

2. A nonlinear dynamic demand model

Econometric models studying tourism demand are based on the classical economic theory which postulates that income and price-type factors are likely to play a central role in determining the demand. Moreover, theoretical and empirical studies suggest that the behavior of tourism demand may also be affected by dynamic elements (Morley, 2009). Accordingly, most tourism demand modelers have included the lagged demand as an explanatory variable (Croes & Vanegas, 2005; Garín-Muñoz, 2006; Garín-Muñoz & Montero-Martín, 2007; Salman, 2003; Song & Witt, 2003, among others). These models assume a habit persistence or reputation effect that boosts current demand. This intertemporal effect between current demand, T_t, and lagged demand, T_{t-1}, is mathematically measured by the partial derivative $\partial T_t/\partial T_{t-1}$.

The standard dynamic econometric model formally obeys the specification

$$T_t = \beta_0 + \beta_1 T_{t-1} + \gamma' \cdot X_t + \varepsilon_t \tag{1}$$

where the lagged dependent variable T_{t-1} is an explanatory variable and $X_t' = (x_t^1, x_t^2, \ldots x_t^k)$ is the vector of the remaining k explanatory variables (price, income, etc.), which can also include lagged explanatory variables and dummy variables. β_0, β_1 and $\gamma' = (\gamma_1, \gamma_2, \ldots, \gamma_k)$ are parameters. The regression error term is ε_t. The proper procedure of estimation and properties of the resulting estimators will depend mainly on the statistical properties of ε_t and of the variables. The demand for tourism, T_t, is measured as the number of nights, number of visitors or tourists' expenditures. See Song, Li, Witt, and Fei (2010) for a recent review of tourism demand measures. The dependent and explanatory variables can be either in levels or log transformed.

Equation (1) assumes an exponential trend for tourism demand, modified by the evolution of the explanatory variables X_t. The reason for this is that

$$\frac{\partial T_t}{\partial T_{t-1}} = \beta_1 \text{ is constant.} \tag{2}$$

That is, this model assumes that the persistence or reputation effect is constant (lagged demand has a constant effect on the current demand). If variable T_t measures the logarithm of tourism demand, Equation (2) means that the elasticity of current tourism demand with respect the lagged demand is constant.

However, the theoretical literature argues that this effect may not be constant (Butler, 1980, 2009, 2011; Morley, 1998, 2000, 2009). Morley suggest a diffusion model, which shares some properties with Butler (1980) tourism area life cycle (TALC) model. The TALC theory is one of the most widely accepted descriptions of the temporal evolution of tourism areas. The theory argues that resorts evolve over an S-shape curve. Lundtorp and Wanhill (2001) show that this evolution might be satisfactorily approximated by the logistic growth model[1]

$$T_t - T_{t-1} = \sigma T_{t-1}\left(1 - \frac{T_{t-1}}{CC}\right) \tag{3}$$

where parameter σ is the intrinsic rate of tourism growth, assumed as positive, and CC refers to the carrying capacity.

The S-shape pattern is due to the interaction of two opposite effects. First, the less uncertainty associated with holidaying at a known destination and the spreading of the knowledge about destinations as people talk about their holidays lead to a positive autocorrelation of past visitors and current tourists. Secondly, the subsequent congestion has a negative effect on arrivals.

Rearranging the terms in Equation (3) gives

$$T_t = \beta_1 T_{t-1} + \beta_2 \frac{T_{t-1}^2}{CC}, \tag{4}$$

with $\beta_1>0$, $\beta_2<0$. Mathematically, Equation (4) is a Riccati equation with constant coefficients which has been used to describe diffusion processes. Note that from Equation (4)

[1] Although Lundtorp and Wanhill (2001) formulated the model in continuous time, here we present its discrete version to fit the econometric analysis better.