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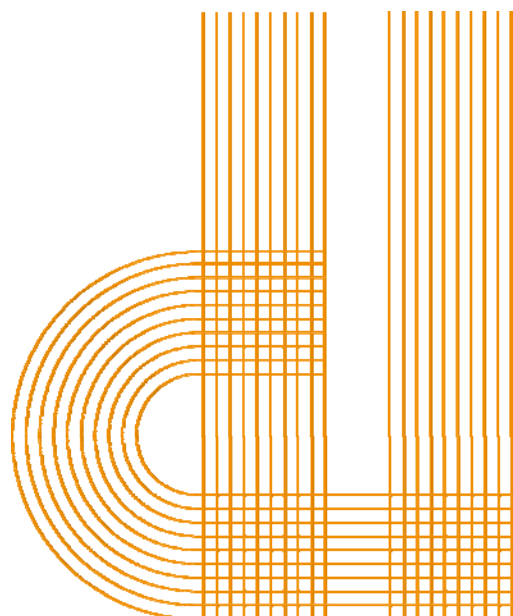
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ESTIMATING INTERNATIONAL TOURISM DEMAND TO SPAIN SEPARATELY BY THE MAJOR SOURCE MARKETS[1]

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ABSTRACT

The objective of this paper is to estimate international tourism demand to Spain separately by major source markets (Germany, United Kingdom, France, Italy and The Netherlands) that represent 67% of the international tourism to Spain. In order to investigate how the tourism demand reacts to price and income changes, we apply the bounds testing approach to cointegration and construct confidence intervals using the bootstrap technique. The results show differences in tourism behavior depending on the countries of origin and corroborate the necessity of analyzing the source markets separately instead of focus on the estimation of a unique tourism demand from a number of countries to Spain.The number of overnight stays is more sensitive to income level in the source markets than to changes in the price levels. Income is the critical determinant of demand. International tourism behaves as a luxury good for visitors from each country of origin. The negative sign of price also corroborates the economic theory. Tourists from Germany and the Netherlands are more sensitive to income changes than citizens from Italy and the United Kingdom. Citizens from the last country react inelastic to price changes and the result is in line with previous studies that have analysed the outbound tourism demand in the United Kingdom.

KEYWORDS: ARDL approach; Bootstrapping; Income demand elasticity; Price demand elasticity, Source markets.

INTRODUCTION

The fast growing tourism streams in the world have caused high growth rates in the tourism industry. Spain is one of the countries with an importatnt increase in the tourism industry over the last half century. The industry is an important sector in the Spanish economy. According to data of the Spanish National Statistic Institute (INE) more than 13 percent of the working population is employed in the tourism sector. According to the same source the contribution of Tourism to Gross Domestic Product (GDP) varies between 10 and 11.6 percent during the last ten years. In addition, it is an important export sector. Nearly two-thirds of nights spent by tourists in Spain correspond to tourists coming from abroad. Moreover, the balance of payment of the Spanish economy shows that the tourism industry is the economic activity with the highest cover rate and consequently with the highest level of competitiveness.

The current economic crisis has risen sharply the unemployment rate in Spain to over 20%. Exceptionally in the Spanish Economy the tourism industry has reported positive results in recent years. In addition, the number of tourists in the world shows a positive development, i.e., the tourism demand increases. In these circumstances the tourism industry is considered a strategic economic sector for the economic growth in Spain: If more visitors come to Spain the tourism and travel activities will grow but also other sector will take advantage from it. Consequently, specific policies measures try to increase the competitiveness of the industry and attract more tourists. A better knowledge of the determinants of tourism demand can help policy makers and managers to take the right decisions. There are some papers that estimate the determinants of the international tourism demand for Spain, such as Gonzalez and Moral (1995); Garin and Perez (2000); Garin (2007) Alvarez et al (2010). This paper analyzes the factors that explain the demand

separately by major source markets. We include Germany, United Kingdom, France, Italy and The Netherlands that represent 67% of the international tourism to Spain

The first contribution is that a tourism demand function is estimated for each country of origin. Garín (2007) is the closest work to ours. In fact, she explicitly recognized that there were several empirical works where the modelization of the tourism demand to Spain had been studied (González and Moral, 1995; Garín and Pérez, 2000). Most of these previous studies had focused on international tourism demand from all origin countries to Spain. Consequently, the elasticities to the main determinants had been estimated assuming that all the origin countries had the same pattern of demand behavior. She estimated the German demand for tourism and found that income and price were very important factors in determining the tourism demand to Spain. There are two key differences between the study from Garin (2007) and our. On the one hand she employs annual panel data from 1991 to 2002 for the 17 Spanish regions and we use monthly data from 1999 to 2011. On the other hand she has estimated the inbound tourism demand from a single country (Germany) whereas we estimate the inbound international tourism demand from five countries to Spain.

The Second contribution is the construction of confidence intervals that overcome the limited information provided in previous studies (Song et al. 2010). Point estimation only quantifies the long-run effect, but it does not give information about the level of variability associated with it. Consequently, the information contents are of limited usefulness if their statistical significance is not properly evaluated. Following Song et al. (2010) and Otero at al. (2012) the confidence intervals are calculated using Bootstraping methodology.

We examine the long-run relationship between the demand for stays spent in Hotels and similar establishments by non residents of each country and its most relevant determinants, i.e. price level and income. The final objective of this work is to increase the effectiveness and accuracy of tourism policy strategies and promotional activities. For example, detecting countries where the income growth does not generates more tourism growth to Spain or those countries where tourism demand is more sensitive to price changes.

The analysis is based on a three-step procedure. First, we use the bounds testing approach proposed by Pesaran *et al.* (2001). That is, we make use of an autoregressive distributed lag (ARDL) model in order to investigate whether a long-run equilibrium relationship exists between the tourism demand and income and price. If the long-run relationship is verified, in the second step we calculate the point estimates of the long-run effects of the price and income elasticity on tourism demand. Finally, in the third step we construct confidence interval estimation of the long run effects.

The remainder of this paper is structured as follows. Section 2 contains the main results and discussion, and Section 3 concludes.

EMPIRICAL RESULTS

The ARDL approach to cointegration implies estimating the unrestricted error correction model (ECM):

$$\Delta Stays_t = \alpha_0 + \sum_{i=1}^{p-1} \alpha_i \cdot \Delta Stays_{t-i} + \sum_{j=0}^{p-1} \mu_1 \cdot \Delta Income_{t-j} + \sum_{j=0}^{p-1} \mu_2 \cdot \Delta \Pr ice_{t-j} + \phi \cdot Stays_{t-1} + \vartheta_1 \cdot Income_{t-1} + \vartheta_2 \cdot \Pr ice_{t-1} + \varepsilon_t \quad (1)$$

where the symbol Δ represents the first-difference operator, the parameters ϕ and ϑ are the long-run coefficients, α_i and μ_j the short-run coefficients and ε_t represent the residuals. *Stays* is the dependent variable and measures the number of overnight stays by Spanish no resident in hotels and other accommodation establishments located in Spain. This variable was seasonally adjusted using Census X12. *Income* and $\Pr ice$ are the independent variables. The variable proxy of *Income* is the Industry production index for France, Italy and Nederland (Eurostat). The IFO Business Climate Index (IFO Institut für Wirtschaftsforschung) for Germany and the services Index (Office for National Statistics) for United Kingdom. Both variables are adjusted seasonally. The proxy variable for $\Pr ice$ is the Consumer Price Index CPI Spain Package holidays, seasonally adjusted using Census X12 and corrected by the nominal exchange rate for United Kingdom. All variables are taken in logarithms. The simple period object of analysis covers the period from January 1999 to December 2011, therefore, the simple size has 156 observations. Except for Nederland, with 144 observations (January 2000 to December 2011).

The ARDL bounds testing approach allows us to analyze the existence of a long-run relationship in levels between international tourism demand for Spain and both explanatory variables. If the variables are *I(d),* with $d \geq 2$, the bounds testing approach to cointegration is not valid. For this reason, we apply ADF test (Dickey and Fuller (1981)) to identify the order of integration of the variables[2]. All variables for the different countries are I(1). Consequently, we verify that the ARDL approach can be applied to study the existence of a cointegration relationship between variables.

Another technical issue is how to determine an appropriate lag length *p* in the ARDL-Model. The value of *p* must be sufficiently large to reduce the possible residual

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[2] The results are not reported in this study, but they can be sent upon request.

serial correlation problem, but sufficiently small to avoid over-parametrization problems. Since we are working with monthly data and following the recommendation given in Pesaran and Pesaran (1997), we assume a maximum number of lags $p = 12$. In our case, the optimal number of lags (p) of the ECM is chosen using jontly the Akaike information criterion or the Schwarz criterion and uncorrelated residuals.

Table 1 shows that the estimation passes all the diagnosis tests commonly used to detect problems of serial correlation of the residuals (Bresuch-Godfrey LM test), White test for heteroskedasticity and Ramsey regression equation specification error of model misspecification at 1% level of significance (Song *et al.*, 2010).

Table 1. ARDL models

Countries	Lag	White	Breush-Godfrey	Reset
United-Kingdom	(1)	0.27	0.57	0.02
Germany	(8)	0.07	0.88	0.91
Nederland	(3)	0.01	0.22	0.96
France	(4)	0.02	0.47	0.02
Italy	(1)	0.69	0.75	0.67

Note: All entries for the test are the p-values. ***Indicates significance at the 1% level.

Table 2 reports the values of the bounds tests for Cointegration (Pesaran *et al.*, 2001). As we can observe, the computed F-statistic and t-statistic are in all cases above their respective upper critical bounds, except for France. Therefore, the null hypotheses of no cointegration are rejected and we get conclusive evidence of a long-run relationship between international tourism demand for Spain and the income and price for all countries. For France, there is no evidence for the relationship of cointegration between the variables.

Table 2. Bound Test for Cointegration.

United-Kingdom	Germany	Nederland	Italy	France
$F_{II}=6.09$***	$F_{IV}=5.14$**	$F_{IV}=6.71$***	$F_{IV}=22.6$***	$F_{IV}=2.21$
$F_{III}=8.12$***	$F_{V}=6.58$**	$F_{V}=8.90$***	$F_{V}=30.14$***	$F_{V}=2.72$
$t_{III}=-4.88$***	$t_{V}=-4.06$**	$t_{V}=-4.71$***	$t_{V}=-9.4$***	$t_{V}=-2.43$

Note: **significance at 5%; ***significance at 1%.

As we can see in table 3, the income variable has a positive effect on demand while the price has a negative effect on it and both results are consistent with the law of demand. Table 3 also displays the 90% confidence intervals for long-run elasticities constructed using the bootstrap technique ((Efron and Tibshirani,1998). The income and price elasticities of demand are statistically significant for the four source markets (confidence intervals do not cover zero).

Table 3. Point and Bootstrap Interval Estimation of Long-run elasticities

Country	Point estimates		Bootstrap Interval Estimation	
	Income	Price	Income	Price
United-kingdom	1.02	-0.50	(0.57,1.47)	(-0.69,-0.33)
Germany	1.24	-0.88	(0.89,1.77)	(-1.43,-0.41)
Nederland	1.61	-1.57	(0.85,2.80)	(-2.57,-0.93)
Italy	1.07	-1.05	(0.84,1.27)	(-1.43,-0.74)
Note: The bootstrap confidence interval is constructed using the accelerated bias-corrected method considering 10,000 replications				

In all the studied countries the inbound international tourism demand to Spain is a luxury good (confidence intervals do cover one). However,the number of nights spent by German and Dutch tourists in Spain, with 90% confidence intervals (0.89, 1.77) and (0.85, 2.80) respectively, is more sensitive to income fluctuations than in the United Kingdom and Italy (90% confidence intervals (0.57,1.47) and (0.84,1.27) respectively).

According to the results a price decrease in the vacation packages would lead to a higher increase in the nights spent in Spain by Italian (-1.43,-0.74) and Dutch (-2.57,-0.93) tourists than by citizens from Germany (-1.43,-0.41). The demand is inelastic to price changes for the United Kingdom (-0.69,-0.31). The result is in line with previous studies in the literature (Song et al., 2000; Song and Witt, 2003; Song, Witt and Li 2003, Song, Wong and Chon., 2003; Ouerfelli,2008; Song et al. 2010) that also have observed inelastic reaction of demand to price changes for Tourists from the United Kingdom. One possible additional explanation for the observed low price elasticity of demand could be the

depreciation of the British Pound in relation to the Euro during the period of analysis. The increase in the amount of British Pounds necessary to get a unit of Euro raises the price of overnight stays in Spain but also in many substitute tourism markets (Greek, Italy, Portugal, France, Malta, Cyprus).

The confidence intervals calculated in this study for Germany and the United Kingdom are compared in table 4 with long-run tourism demand elasticities from previous studies for both countries. Specifically, we compare the point estimate for long-run price and income elasticities of demand for outbound tourism from the United Kingdom to Spain (Song, Romilly and Liu, 2000; Kuledran and Witt, 2001; Li, Wong, Song and Witt 2006) and the same elasticities for inbound tourism from Germany (Garin, 2007) to Spain with our results. Although all the studies estimate long-run elasticities for the same countries of origin there are significant differences between them. First, they use different data sources, period and frequency of analysis (annual, quarterly and monthly). Second, they also use different methodology (Error Correction Model (ECM), Panel data model or Time Varying Parameter-Error Correction Model (TVP-ECM)). Moreover, whereas some studies take the number of holidays visitors as the measure for the demand, other authors measure it by the number of total visitors (holiday and business) or the expenditure generated by the visitors or the night stays spent.

There are very few similitude between the compared studies. Practically the coincidences are reduced to considering the same countries. In spite of the very few similitude the point estimation of the long-run elasticities of demand with respect to income obtained by Kulendran and Witt (2001) and the the point estimation of the long-run elasticities of demand with respect to price obtained by Song, Romilly and Liu (2000) are contained in the 90% confidence intervals constructed in our empirical work using the

bootstrap technique. The existence of confidence intervals for the previous empirical works would enrich our comparison possibilities by analyzing if confidence intervals overlap.

Table 4. Income and price Long-run elatisticites of demand for source market

Data and methodology	Source Market	Dependent variable	Income long-run elasticity*	Price long-run elasticity*
Song, Romilly and Liu (2000)				
Annual 1965-1994 ECM	UK	Number of holyday visits	Real personal disposable income per capita (2.199)	CPI both countries adjusted by exchange rate (-0.496)
Kuledran and Witt (2001)				
Quarterly 1978-1995 ECM	UK	Holiday visits per capita	Real personal disposable income per capita (0.928)	CPI both countries adjusted by exchange rate (-2. 98)
Li, Wong, Song and Witt (2006)				
Annual 1972-2004 TVP-ECM	UK	Real tourism spending per capita	Real household disposable income per capita (2.22)	CPI both countries adjusted by exchange rate (-1. 23)
Garin (2007)				
Annual 1991-2002 Panel data	Germany	Nights spent	GDP per capita (5.4)	CPI both countries adjusted by exchange rate (-2. 23)
Present Paper				
Montly 1999-2011 ECM	UK	Nights spent	Services Index (0.57,1.47)	CPI Spain package holidays adjusted by exchange rate (-0.69,-0.33)
	Germany		IFO Business Climate Index (0.89,1.77)	CPI Spain package holidays (-1.43,-0.41)

*Elasticities and 90 % bootstrap confidence intervals in parenthesis

CONCLUSION

This paper studies the main economic influencing factors (income and price level) of the international tourism demand for Spain separately by source markets. Moreover, the use of the bootstrap technique provides more accurate results to policy makers and

professionals. In other words, we overcome the shortcomings of both the limited information provided by point estimation and the assumption that all origin countries have the same pattern of demand behaviour. For this purpose, we followed a three-step procedure. In the first step, we applied the ARDL bounds testing approach to verify the existence of a long-run relationship between the number of nights spent by tourist in Spain and the level of income and price. Once the existence of a long-run connection between the variables was verified, the next step used the ARDL model to quantify the long-run impact of these factors on the international tourism demand. In the third step, we estimate the confidence intervals associated with each impact.

Our empirical findings provide information of interest and represent important contributions to the existing literature. The main results and contributions can be summarized in the following points:

(1) The results reveal that the null hypotheses of no cointegration are rejected for all countries except France. Therefore, we have conclusive evidence that the income and price are relevant to explain the long-run dynamic of the international tourism demand to Spain for each origin country (Germany, Italy, Netherlands and United Kingdom).

(2) The sign of estimated coefficients in the ARDL model are in line with our a priori expectations. Moreover, these estimates allow us to quantify the long-run impacts of the explanatory variables on tourism demand. That is, we can calculate the point estimate of the long-run effects. Nevertheless, the point estimate provides only incomplete information concerning the long-run effects. Policy makers and entrepreneurs also need to know the statistical significance and the variability of these effects. For this reason and given the limitations of the classical statistics, we

use a non-parametric and computational method known as bootstrapping to construct confidence intervals for each long-run effect. In our opinion, the inclusion of bootstrap intervals provides more relevant information and gives more consistency to our results.

(3) The number of overnight stays is more sensitive to income level in the source markets than to changes in the price levels. Income is the critical determinant of demand. International tourism behaves as a luxury good for visitors from each country of origin. The negative sign of price also corroborates the economic theory.

(4) The results show differences in tourism behavior depending on the countries of origin and corroborate the necessity of analyzing the source markets separately instead of focus on the estimation of a unique tourism demand from a number of countries to Spain.

(5) The price and income demand elasticities for Spain by origin could be useful to design and implement tourism policies and marketing strategies for each source market. Specifically tourists from Germany and the Netherlands are more sensitive to income changes than citizens from Italy and the United Kingdom. Citizens from the last country react inelastic to price changes and the result is in line with previous studies that have analysed the outbound tourism demand in the United Kingdom.

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