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Foreign Tourism in Andalusia: A Dynamic Panel Data Analysis*

Adrián Mendieta-Aragón

National University of Distance Education (UNED)
Madrid, Spain

Teresa Garín-Muñoz**

National University of Distance Education (UNED)
Madrid, Spain

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* The authors gratefully acknowledge the helpful comments and suggestions of a reviewer.

**Correspondence: mgarin@cee.uned.es

Abstract

This paper studies the main determinants of the inbound international tourism in Andalusia and quantify its incidence. Based on the classical theoretical framework for tourism demand, we incorporate dynamics into the model by adding the lagged dependent variable as an explanatory variable, along with the per capita income of the tourist's country of origin, the relative prices between the origin and destination countries and the cost of travel. The empirical model is applied to a panel data set consisting of 21 countries of origin of the tourists for the period 2008–2018. Data were collected from the Hotel Occupancy Survey (HOS), published by the National Statistics Institute of Spain (INE). The results have been obtained using the GMM-DIFF estimator of Arellano and Bond. The parameters estimated reflect a high level of consumer loyalty and the importance of the word-of-mouth effect. Moreover, the income elasticity indicates that the demand for tourism in Andalusia may be considered as a luxury good. Prices have a negative relationship with tourism demand. The cost of travel, which has a negative effect, is statistically significant to explain the number of tourists' arrivals and, however, it is not significant for the overnight stays model.

Keywords: Dynamic model; Panel data; Tourism demand elasticities; Consumer loyalty; Habit persistence.

JEL: L83, C01, C23, C51.

1. Introduction

Spain is one of the main destinations for international tourists in the world. In fact, during 2018, it ranked second both by the number of visitors and by volume of earnings (World Tourism Organization, 2019). Being Spain a top tourism destination, Andalusia accounted for 14% of foreign tourist arrivals in 2018. To underline the importance of the study, we can say that Andalusia, with 11.6 million international tourist arrivals, is very close to the volume of tourists received by countries such as Croatia or Denmark.

In addition, the Andalusian economy depends heavily on tourism in general and specifically on foreign tourism. According to data from the Tourism Satellite Account of Andalusia (SAETA, 2018), the contribution of tourism to GDP and employment in the region was 12.6 and 13.2 percent, respectively.

Despite the importance of Andalusia as a tourist destination, as far as we know, there is no research studies dealing with its inbound international tourism demand. Previous studies have modelled the tourism demand either for Spain as a whole (Garín-Muñoz & Pérez-Amaral, 2000) or for some other Spanish regions: Balearic Islands (Álvarez Díaz et al., 2009; Garín-Muñoz & Montero-Martín, 2007; Rodríguez, 2017), Canary Islands (Garín-Muñoz, 2006; Gil-Alana, 2010; Ledesma-Rodríguez et al., 2001), Catalonia (Claveria & Torra, 2014; Turrion-Prats & Duro, 2017), Galicia (Garín-Muñoz, 2009; Otero-Giraldez et al., 2012) and the Mediterranean coast (Albaladejo & González-Martínez, 2018).

The aim of this work is precisely to fill that gap and develop a model for explaining the inbound international tourism to Andalusia to define its main determinants and quantify their impacts. The results obtained can be of great help in designing business strategies and making tourism policy decisions.

In the last decades, a large number of studies have analyzed the characteristics and determinants of the international tourism demand in different destinations using several theoretical and methodological approaches (Song et al., 2019). This study applies the difference Generalized Method of Moments estimator (GMM-DIFF) to a panel dataset composed of 21 countries during the period 2008-2018. This technique allows us to estimate a dynamic model, which analyses the influence of past consumption on current demand for international tourism in Andalusia. The model also incorporates the income

of the country of origin, the relative price, the cost of the travel, and a set of dummy variables to control the impact of special factors.

The rest of the paper is organized as follows. Section 2 begins by highlighting the most important attractions of Andalusia as a tourism destination. Then it continues with an exhaustive description of the volume and recent evolution of inbound tourism by countries of origin. This section ends with an analysis of the seasonality of tourism. Section 3 exposes a review of the literature on tourism demand explaining the theoretical and empirical framework. Section 4 contains the empirical models along with a detailed presentation of the explanatory variables. It also includes the estimation results and the interpretations. Conclusions and policy implications are summarized in Section 6.

2. Market Analysis

This section begins by presenting the main factors that act as forces of attraction of tourism from abroad. Later, we examine the evolution of international tourism and the composition by the market of origin during the period 2008–2018. Finally, we analyze the tourism seasonality in Andalusia.

We use data from the Hotel Occupancy Survey (HOS), which is published monthly by the National Statistics Institute of Spain (INE) since 1996. This survey provides information on travelers, overnight stays, and the average length of stay disaggregated by country of residence of foreign visitors and autonomous communities of destination¹.

There are other alternative data sources for inbound international tourism to Spain, such as the Tourist Movement on Borders Survey (Frontur) and the Survey of Tourist Expenditure (Egatur). These surveys collect the total number of tourists, regardless of the type of accommodation in which they stay. However, they are only homogeneous since 2016². Thus, we have preferred to limit ourselves to the study of tourists staying in hotels in order to have a more extended time sample. When making this decision, we have

¹ It also provides the number of open establishments, occupation and employment rates in the sector.

² The Spanish Institute of Tourism conducted the Frontur and Egatur surveys until the third quarter of 2015. Since the last quarter of 2015, the INE is in charge of carrying out them.

considered that tourists staying in hotels, although they represent approximately 65% of the total, are those who make the highest average daily expenditure.

a. Tourist attractions

This region offers a wide range of tourism resources (artistic, cultural, and natural). The Alhambra (Granada's Moorish fortress) and the Mosque of Cordoba are some of the most visited tourist attractions in Spain. However, as a Mediterranean destination, most of the tourism activity is concentrated along its coastline. The Costa del Sol registered 36% of total foreign travelers (3.2 million people) and around 50% of all international overnight stays (14 million overnight stays) in 2018.

Located in the south of Spain, Andalusia is well connected with the main Spanish and world cities, thanks to the international airports of Malaga³ and Seville (see

Figure 1). The high-speed train is also a valuable asset to connect Andalusia with Madrid and Barcelona.

[Figure 1]

The supply of accommodations is another of the strengths of Andalusia as a tourist destination. In 2018, Andalusia had an average of 2,463 open hotel establishments with a capacity for 256,937⁴ people. Most of these places were of high or very high quality (60% of all hotels were four and five stars).

b. Volume and evolution of inbound international tourism

This paper uses two alternative measures of the international tourism demand during the period 2008 to 2018. One of them is the number of foreign visitors that stay in hotel establishments. The other is the total number of overnight stays they generated.

By comparing both measures, we can observe that, during the 11 years considered period, the total number of overnight stays grew less than the number of tourists. While the

³ The airport of Malaga, which is the fourth in Spain by the number of travellers, is the most important in Andalusia. The ranking of busiest airports by passenger traffic is Madrid, Barcelona and Palma de Mallorca (AENA, 2019).

⁴ Andalusia leads the national ranking of hotel places with a participation rate of 17.1%. They are followed in order of importance by Catalonia and the Canary Islands with shares of 16.5% and 16.3%, respectively.

number of tourists grew by 51%, the number of overnight stays only increased by 43%. In other words, the average overnight stay decreased from 3.41 to 3.24 nights per capita from 2008 to 2018.

The decrease in the average stay of tourists is a generally observed fact and is not specific to the case of Andalusia. The international tourist today takes a higher volume of trips but reduces the duration of stay.

There is already abundant literature on the subject (Aguilar & Díaz, 2019; Alegre & Pou, 2006; Alén et al., 2014; Barros & Machado, 2010; Fleischer et al., 2011; Losada et al., 2016; Montaña et al., 2019). Some researchers attribute the shortening of the stay to a change in preferences of tourists (more trips but shorter) (Fleischer et al., 2011), expansion of low-cost trips (Martínez-García & Raya, 2008), nationality of origin (Barros & Machado, 2010) or the increase of business travel (Aguilar & Díaz, 2019).

Figure 2 shows the volume and evolution of international tourism during the period considered. The progress of both measures is very similar. First, we find a decline in tourism demand in 2009, probably due to the beginning of the global financial crisis. After this year commences a rise period, in which occur the most significant increases⁵. The economic recovery of European countries and the political instability of competitive countries (Arab spring) may explain this growth. Finally, the recuperation of alternative Mediterranean destinations, such as Turkey, Egypt, or Tunisia, may have caused the slowdown in tourism demand during 2017 and 2018⁶.

[Figure 2]

Despite the diversity of countries of origin, there is a significant concentration of international tourism demand. The results show a strong dependence on the British market, which accumulates 17 percent of total foreign tourists and 25 percent of overnight

⁵ The highest year-over-year growth rates occur in 2016 (12% for the number of visitors and 13% for the overnight stays) and during 2011 (11% for the number of visitors and 13% for the overnight stays).

⁶ 2018 was the ninth consecutive record-breaking year by the number of international travellers, but the year-over-year growth rate is the lowest since 2009. On the other hand, the total of overnight stays decreased after seven years of continuous increase.

stays. Moreover, the five most important source markets⁷ (the UK, France, Germany, the USA, and Italy) represent 49 percent of foreign tourists staying in hotels, and they generate 55 percent of overnight stays.

Figure 3 reveals the composition of demand by countries of origin either by the number of tourists (left-hand side graph) or overnight stays (right-hand side graph) in 2018.

[Figure 3]

The evolution of tourism differs significantly depending on the analyzed country of origin. Figure 4 shows the volume and development of the five main tourist markets. The United States and French markets experienced the highest rates of growth by the number of tourists (66% and 56%, respectively) and by overnight stays (73% and 83%, respectively). On the other hand, the German demands were the only one that registered a decrease in the overall period.

As a consequence, France surpassed Germany by the number of visitors in 2015, ranking second, behind the United Kingdom. Likewise, the United States surpassed Italy in the volume of tourists in 2012. Since then, the evolution of both markets has been analogous. The United Kingdom continues to be the most important market of origin. It has increased the difference concerning the second country of origin (France for the number of travelers and Germany for the total overnight stays), even though in recent years it has suffered a decrease in tourism demand.

[Figure 4]

c. Seasonality

Seasonality is a very important issue when analyzing the demand for tourism. As is evident, the same number of visitors will be more or less profitable depending on how those visitors are distributed throughout the year. Given the relevance of this topic, many researchers have paid attention to it, and there are a good number of studies on the subject (Fernández-Morales et al., 2016; Lapa Barros & Sousa, 2019; Qiang, 2020; Rosselló & Sansó, 2017). The results of the works are very valuable to policymakers and professionals in the sector in order to mitigate seasonality.

⁷ The United Kingdom (17%), France (10%), Germany (10%), the USA (6%) and Italy (6%).

The international tourism demand in Andalusia is distributed relatively evenly throughout the year, because of the variety of supply and the climatological characteristics. Nonetheless, the strong influence of *sun, sand, and sea* tourism increases the flow of visitors during the central months of the year, especially in the coastal provinces.

Most of the existing literature finds that climatic and institutional factors determine the tourism seasonality. The Andalusian government has implemented a General Plan for Sustainable Tourism. One of its aims is to reduce the seasonality of tourism, through specific measures to develop cultural, business, or gastronomic tourism during the off-season. However, the data shows that the degree of seasonality has remained stable during the period considered.

presents the monthly distribution of international tourism in 2018. According to the data, 42 percent of all overseas tourists lodged in hotels arrived during the summer season (June-September), and they generated 46 percent of overnight stays. This fact confirms that seasonality in this autonomous community is not very pronounced to be mainly a sun and sand destination⁸. Possibly the tourism industry has known how to combine this type of tourism with cultural and nature tourism.

[Figure 5]

The results suggest that the highest density of tourists occurs in the months with more moderate average temperatures (May, June, September, and October). However, in summer, the average length of stay is longer.

When we examine the monthly distribution of tourism by country of origin, we observed that tourists from Nordic countries, Germany, and Greece are concentrated during the spring season. The rest of the countries are accumulated in the summer season. In this way, the diversification of tourism by countries of origin allows smoothing seasonality.

As a summary of the analysis of the inbound international tourism in Andalusia, we extract that:

- The foreign visitor stays mostly in hotels or similar establishments.
- Andalusia is a vacation destination, the climate, the beaches, the accessibility, and the quality of accommodations are its main pull factors.
- The demand for international tourism in Andalusia has increased sharply during the period 2008–2018 (even though in recent years the trend is slowing down).
- Most travelers arrive in Andalusia from the United Kingdom, France, and Germany.
- The distribution of tourists lodged in hotels is relatively homogeneous from April to October.

⁸ In the same period, the Balearic Islands concentrated 67% of total international tourists and 69% of overnight stays.

3. Theoretical Model

Based on the general principles of economic theory and the specialized literature on tourism demand, the objective of this section is to construct a model, which may explain the demand for inbound international tourism in Andalusia.

The classical economic theory supports that foreign tourism demand depends mainly on income in country of origin, relative tourism prices at the destination, and cost of travel. However, in the consumer decision-making process, several other factors must be taken into account. Psychological, cultural, and political factors may also affect the demand for international tourism.

In this sense, there are a large number of empirical studies that also analyze non-economic determinants, such as consumer preferences (Dogru & Sirakaya-Turk, 2018; Gallego et al., 2019; Ghaderi et al., 2017), climate change (Moore, 2010), political stability (Saha & Yap, 2014), terrorist attacks (Bonham et al., 2006) and cultural diffusion (Qiang et al., 2019). All this literature will be considered to develop a model to explain the demand for inbound international tourism in Andalusia. However, obviously the choice of the model will also be conditioned by the available information.

Then the next step in the model building process is to know exactly the type of information available. First, it is important to know how our dependent variable, tourism, is measured. Previous empirical research has alternatively used the number of tourists, the number of overnight stays, or the volume of spending they generate. None of these measures is better or worse than another, it depends on the purpose of the study. Examples where the international tourism demand is measured by the number of tourist arrivals are: Dogru et al. (2017); Harasarn and Chancharat (2018); Kumar et al. (2020); Li et al. (2017). Some other studies also use the volume of expenditure generated by visitors as the measure of tourism (Marrocu et al., 2015; Muryani et al., 2020; Song et al., 2010).

The database provides us with two alternative measures of tourism: the number of visitors and overnight stays they cause (in both cases, referring to tourists in hotel accommodation). Data have been collected from the HOS published by the INE. The estimation of both measures allows us to obtain a complete study of the international tourist demand.

Similarly, the availability of data will determine the methodology used. In our case, we have data from countries over time, which allows us to use panel data techniques, and to introduce dynamic into the model. These are, precisely, some of the strengths of this work.

Most recent tourism studies introduce the dynamic structure with the inclusion of the lagged dependent variable. This practice is because it is assumed that past consumption affects current consumption by the loyalty of tourists to the destination as well as the effect of word-of-mouth (Dogru et al., 2019). This variable must be interpreted as a word-of-mouth effect, habit persistence, and consumer preferences. Consumer behavior studies have proved that a satisfied tourist tends to return to a holiday destination, because there is less uncertainty associated with that destination compared with traveling to a previously unvisited foreign country (Hui et al., 2007; Žabkar et al., 2010).

Moreover, travelers often share their vacation experiences with friends and family, which may attract potential visitors through word-of-mouth recommendations. Other authors also utilize the lagged dependent variable to measure consumer preferences (Dogru & Sirakaya-Turk, 2018; Gallego et al., 2019; Garín-Muñoz & Montero-Martín, 2007; Ghaderi et al., 2017; Qiang et al., 2019; Seetaram, 2010). We expect this variable to have a positive effect on tourism demand.

4. Empirical Model

Based on all the aforementioned, we will try to model both the number of international tourist arrivals (TOUR) and their overnight stays (NIGHTS). So, our dependent variables will be, alternatively:

- $TOUR_{i,t}$: tourist arrivals from country i during the period t .
- $NIGHTS_{i,t}$: overnight stays generated by tourists from country i during the period t .

The selected explanatory variables are the following:

- *Lagged dependent variable*: Depending on the model, these could be: $TOUR_{i,t-1}$ or $NIGHTS_{i,t-1}$. It is expected to find a positive sign for either of the two variables.

- $GDP_{i,t}$: Gross Domestic Product of the country of origin of tourists in per capita terms. Data have been obtained from the OECD and are expressed in U.S. dollars in purchasing power parity and at constant prices based in 2015. This factor is expected to show a positive effect on international tourism demand.
- $PR_{i,t}$: Relative cost of living in Andalusia of tourists from country i during the year t . The estimated sign for this variable should be negative, according to economic theory. The index has been constructed through the following expression:

$$PR_{i,t} = \frac{CPI_{Andalusia,t}}{CPI_{Origin\ i,t} \times \frac{ER_{Andalusia,t}}{ER_{Origin\ i,t}}} \quad (1)$$

where $CPI_{Andalusia,t}$ is the Consumer Price Index of Andalusia during period t ; $CPI_{Origin\ i,t}$ is the Consumer Price Index of the origin market i , in period t ; $ER_{Andalusia,t} / ER_{Origin\ i,t}$ is the exchange rate defined by the number of monetary units of the destination for each monetary unit of the country of origin i during period t . Data on the exchange rate (ER) and Consumer Price Index (CPI) of the countries of origin have been collected from OECD, and data on the CPI of Andalusia were obtained from INE.

- $PT_{i,t}$: Price of travel from country i during the year t . As a proxy for the cost of travel, we construct an index based on the distance traveled and the price of crude oil. The index has been calculated by the following formula:

$$PT_{i,t} = GD_i \times PCO_t \quad (2)$$

where GD_i is the geographical distance measured in air flight kilometers from the airport with the highest air traffic to Andalusia in the country i to Malaga airport, and PCO_t is the average price of crude oil during period t , in real terms with base year 2015. We expect a negative sign for this coefficient.

- *Dummy variables*: In addition to the economic determinants previously exposed, the demand for tourism can be affected by factors that occur at a specific moment

in time. By including dummy variables, we take care of the effects of such particular events.

In this empirical analysis, we use annual data for 21 countries of origin of tourists during the period 2008-2018. Thus, we have a balanced panel dataset with 231 observations. Using a panel dataset, we get some advantages, such as (i) more accurate inference of model parameters; (ii) greater capacity for capturing the complexity of human behavior than a single cross-section or time-series data (iii) controlling the impact of omitted variables (iv) uncovering dynamic relationships; (v) simplifying computation and statistical inference (Hsiao, 2003).

In order to select the estimation method of our empirical model, we must consider the characteristics of our database and the chosen explanatory variables. The model to be estimated here is a dynamic model where one of the variables used as explanatory is the lagged endogenous variable. For the estimation, we employ the difference generalized method of moments estimator (GMM-DIFF) proposed by Arellano and Bond (1991). Eq. (3) presents the dynamic model that will be estimated:

$$\begin{aligned} \Delta \ln Q_{i,t} = & \beta_1 \Delta \ln Q_{i,t-1} + \beta_2 \Delta \ln GDP_{i,t} + \beta_3 \Delta \ln PR_{i,t} \\ & + \beta_4 \Delta \ln PT_{i,t} + \beta_5 \Delta d_{2009} + \beta_6 \Delta d_{2012} + \Delta \varepsilon_{i,t} \end{aligned} \quad (3)$$

where $Q_{i,t}$ is the dependent variable (TOUR or NIGHTS depending on the model), $Q_{i,t-1}$ is the lagged dependent variable, \ln is the logarithmic transformation, $i = 1, \dots, 21$ countries, $t = 2008, \dots, 2018$ and all the variables are expressed in first differences, that is $\Delta \ln Q_{i,t} = \ln Q_{i,t} - \ln Q_{i,t-1}$, and equivalently for the rest of the variables.

Although our initial sample contains 231 observations, given the specification of the model (including the lagged dependent variable as an explanatory variable) and the fact that the estimation method we employ (GMM-DIFF) requires the use of variables in first differences, we lose some observations. Finally, we employ 189 observations to estimate the model.

After the model and variables have been defined, we verify that there is cross-sectional independence and slope homogeneity in our panel data. Then, we estimate the results using STATA v.15.1⁹. Table 1 presents the empirical results for the two models.

[Table 1]

The signs and values of the estimated coefficients are coherent with the theory of tourism demand in both models. Besides, the p-value of the F-statistic evidence the joint significance of the coefficients. The p-value of the Sargan test is higher than 0.05, which means that the instrumental variables used are valid at the 95% level of significance. The Arellano and Bond test shows that there is no second-order autocorrelation in any of the two models, so there is no serial correlation problem in the residuals. Therefore, the estimation method is robust and appropriate.

Due to the double-logarithmic form of the model, the coefficients obtained can be directly interpreted as elasticities. This dynamic model provides short-run elasticity, but long-run elasticity can also be calculated, dividing each of the parameters by $(1 - \beta_1)$, where β_1 is the estimated coefficient for the lagged dependent variable (0.52 and 0.46, respectively). Table 2 shows the estimated short-run and long-run elasticity values.

[Table 2]

According to the results, the lagged dependent variable is highly significant in both models. Consequently, the non-inclusion of these variables in the models will induce to the overestimation of the rest of the variables. Given the high estimated values for the lagged dependent variable, it is necessary to maintain and improve quality standards in order to preserve the loyalty to the destination of tourists as well as their effect of diffusion among their family and friends.

As expected, the income elasticities are positive. Furthermore, this is the most important factor in explaining the demand for international tourism to Andalusia. The results demonstrate that tourism in Andalusia is considered a luxury good by foreign tourists, since the income elasticities are greater than unity. However, it is important to highlight that the income elasticity is higher for the number of overnight stays than for the number

⁹ GMM-DIFF estimates are obtained using 'xtabond2' command (Roodman, 2009).

of arrivals. This result means that an increase in the income of the countries of origin will produce a greater number of travelers, as well as the average duration of their trips.

The estimated parameters suggest that the flow of tourists and the overnight stays in hotels establishment are also sensitive to the change in prices. Price elasticities are negative either in the short-run (-0.79 and -0.80, respectively) or in the long-run (-1.65 and -1.48, respectively). The values of the coefficients indicate that in the short-run, the demand is inelastic. Therefore, the tourism industry could raise prices to increase their revenues, as demand would decrease less than the increase in prices. However, in the long run, any price increase would lead to a decrease in revenues. Then, tourism companies and policymakers in Andalusia must maintain the competitiveness of their products against substitute markets.

Regarding the cost of travel, our results show that for the model of the number of tourists, this cost is statistically significant. However, this cost is not statistically significant to explain the number of overnight stays. Nevertheless, the signs of the coefficients are consistent with economic theory. Therefore, the expansion of low-cost airlines will increase the number of visitors, but not the number of overnight stays per capita.

This study also incorporates dummy variables to capture possible external factors, which can also affect the demand for tourism. We have included a set of dummy variables for each year of the considered period and sequentially eliminated the non-significant variables. Finally, we obtain as significant variables D2009 and D2012. These variables could represent the beginning of the world financial crisis (D2009) or the introduction of the P2P platform Airbnb in Spain in the case of D2012. The estimated sign for both variables is negative as expected.

Table 3 compares the results of the present study and previous empirical models. The table shows the income and price elasticities (short and long run values) and the coefficient of adjustment (estimated coefficient of the lagged dependent variable). In order to compare the results of our study, we have included papers that use similar estimation methods. Although the results are different depending on the destination studied, the elasticities estimated in this paper are in line with the studies compared. Note the comparison with the Canary Islands study (Garín-Muñoz, 2006), the estimated values of elasticities are very similar. These results are not surprising if we are aware that both regions are sun and sea destinations with similar characteristics.

[Table 3]

5. Conclusion and Policy Implications

This paper is an in-depth study of the inbound international tourism in Andalusia. In the first part of the work, an exhaustive analysis of the data reveals the main characteristics of tourism from abroad. Next, we proceed to model tourism demand in order to identify its main determinant factors and quantify their incidence.

By using data from the Hotel Occupancy Survey (2008–2018) developed by the National Statistics Institute of Spain, two models of tourist demand are elaborated. One of them is for the number of tourist arrivals and the other for the volume of overnight stays they generate. In both cases, the available data allow the formulation of dynamic models with their consequent advantages.

One of the main conclusions of this work is the importance of tourist destination loyalty as a determining factor in demand. The significant value of the lagged dependent variable (0.52 and 0.46, depending on the model) indicate the high consumer loyalty to the destination and the importance of the word-of-mouth effect. In order to attract new and repeat tourists, the Andalusian tourism industry should maintain high tourist satisfaction through quality service.

The estimated parameters for income elasticity are consistent with economic theory. This study confirms the strong dependence of international tourism in Andalusia on the income of the origin's countries. Tourism demand presents a positive income elasticity above unity, which indicates that tourism in Andalusia is considered a luxury good by international tourists. For this reason, the demand for tourism was affected at the time of the economic crisis, especially the number of overnight stays. The overnight stays are more sensitive to economic conditions, which means that a change in income will cause a variation in the number of tourists, as well as the average length of stay.

The demand for tourism in Andalusia is also sensitive to relative prices. It is inelastic in the short-run, indicating that a 1% increase in tourism price decreases tourism demand by 0.8%. However, in the long run, the price rise would lead to a loss of competitiveness against alternative destinations with lower relative prices. Currently, there are similar destinations with lower costs, such as Turkey, Croatia, Greece or Tunisia, among others.

Nevertheless, some circumstances limit tourism in these countries (i.e., political instability in the Arab countries, low quality of the tourist supply, or underdeveloped system of traffic). In the case of Andalusia, as a European tourist destination, it enjoys a high level of safety at an affordable price, which makes it an attractive tourist place for the rest of European countries.

The cost of travel is only statistically significant to explain the number of visitors, and it has a low negative impact. A decrease in airfares would produce an increase in the number of visitors, although not in the number of overnight stays. In this sense, promoting the establishment of flows of low-cost airlines will be promoting an increase in the number of visitors.

The study also reveals that the global financial crisis and the popularization of online tourism platforms have a negative effect on the demand for tourism in hotel establishments. Regarding the online tourism platforms, it must be carefully studied, since the new opportunities offered by the collaborative economy may have an important impact on traditional forms of accommodation.

The empirical models have been subjected to several tests, which shows that the methodology used to estimate the demand for tourism is appropriate. On the other hand, to improve the results, the variable prices of substitute markets could be incorporated into the model to contrast its significance.

Another point to note is that the United Kingdom, France, and Germany represent more than a third of hotel tourism. Therefore, economic, social, or political factors that affect these countries will decisively influence the demand for Andalusian tourism (for example, the Brexit in the case of the United Kingdom). In this sense, it would be interesting to be able to quantify the consequences of the departure of the United Kingdom from the European Union for tourism in Andalusia, which may be the object of study in the coming years, once enough data be available.

By the time this paper is written, we are in the biggest tourism crisis in the world. Then, we cannot finish without mentioning the possible effects of the COVID-19 crisis on foreign tourism in Andalusia. Some of them are direct effects caused by the mobility restrictions imposed to prevent the spread of the pandemic. These effects disappear, to some extent, when the borders are reopened. However, it is quite possible that even when open, some tourists avoid traveling for fear of contagion.

In order to avoid this fear of contagion, it is not only necessary to establish protocols that protect the health of the tourist, but also make them perceive the destination as safe. In this regard, in the case of Andalusia, it helps that tourists are very loyal to the destination. And it is proven that, other things being equal, knowing a destination makes the tourist feel safer.

But, in addition to the effects caused by strictly sanitary aspects, there are other effects derived from the economic crisis produced by the pandemic and which affects (to a lesser or greater extent) to all the countries of origin of tourists. In the case of Andalusia, what happens in the economies of the main source markets (most of them strongly affected by the pandemic) will be decisive in the speed of recovery of tourism.

In any case, according to the UNWTO, it is already a fact that the 2020 results will be by far the worst results since 1950, the year in which the historical series of international tourism began to be measured. And this is extended to the case of Andalusia.

To end on a positive note, let us think that tourism has always recovered very quickly from the different shocks it has faced. Meanwhile, what proceeds is to guarantee the survival of companies to cater to visitors when they do come.

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Figure 1

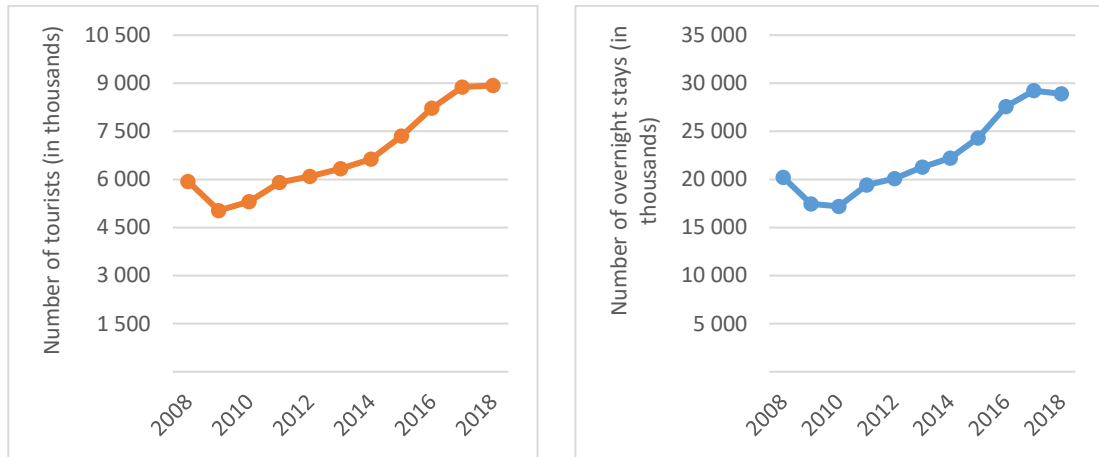
Flight time from Andalusia to several European destinations



Source: Self-elaborated. Flight time from Malaga Airport (AGP).

Figure 2

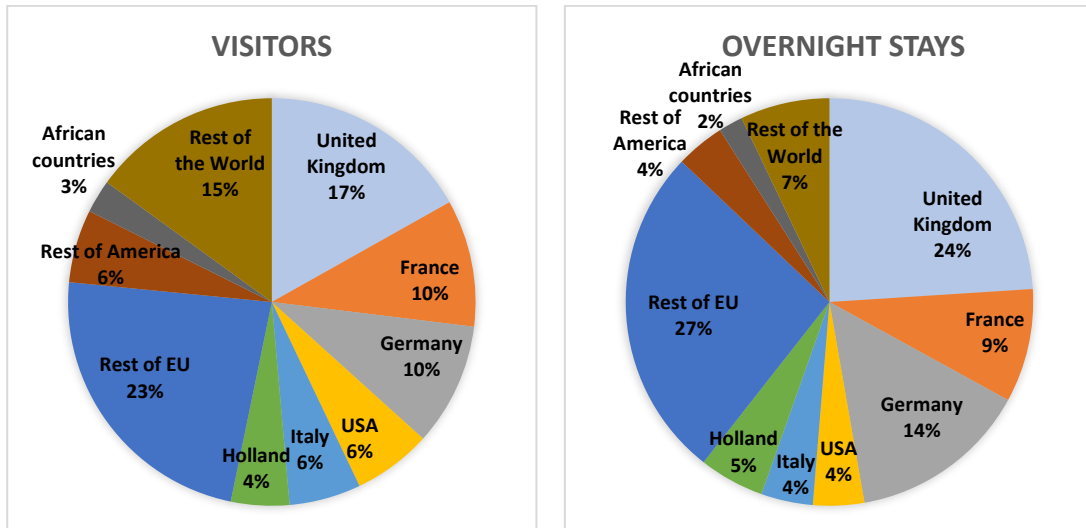
Volume and evolution of tourism in Andalusia (2008–2018)



Source: Self-elaborated. Data: HOS (INE).

Figure 3

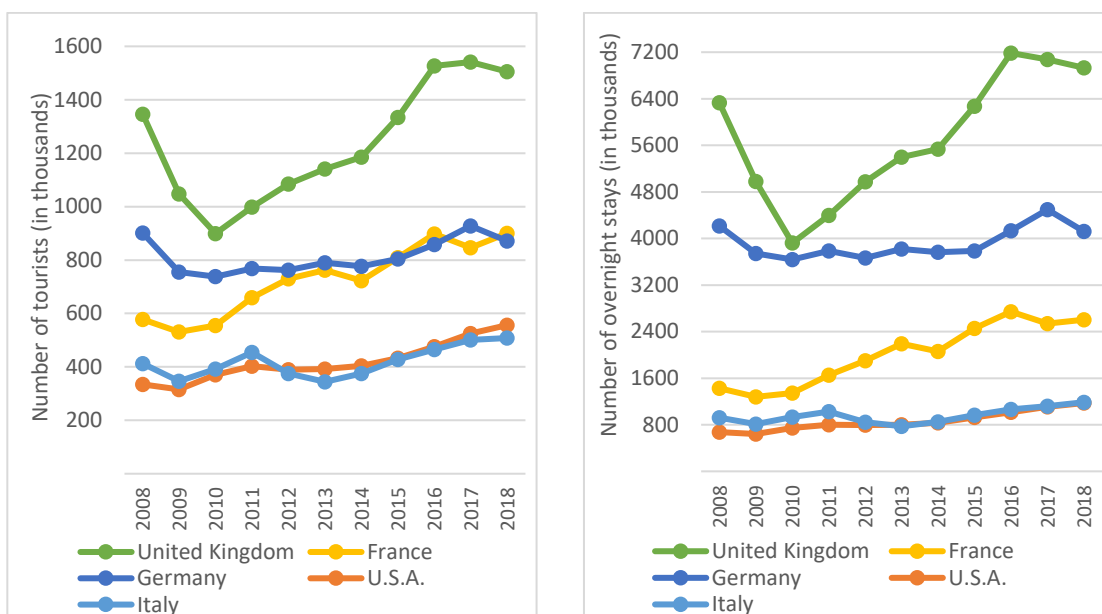
Tourism demand by countries of origin (2018)



Source: Self-elaborated. Data: HOS (INE).

Figure 4

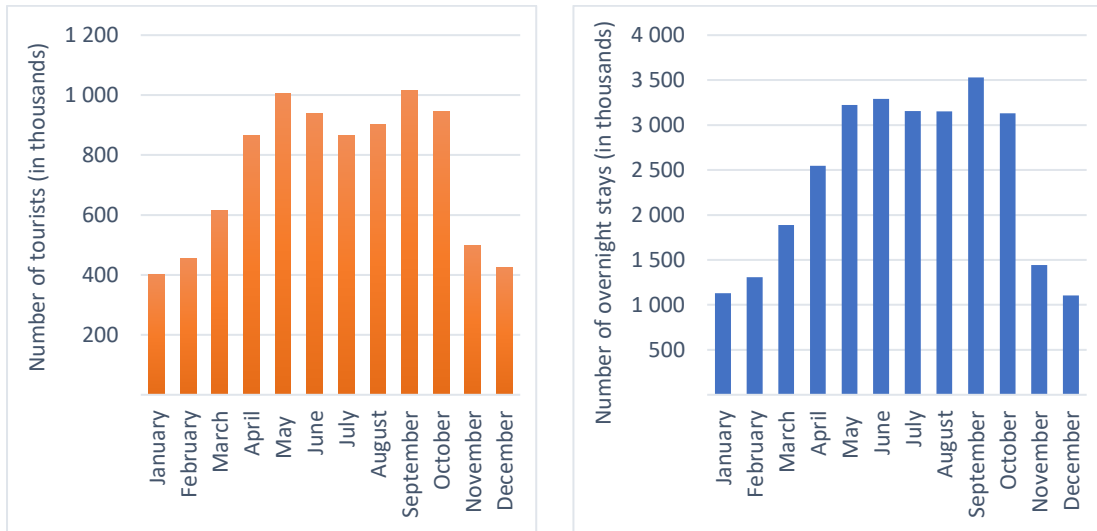
Volume and evolution of tourism from the main markets (2008–2018)



Source: Self-elaborated. Data: HOS (INE).

Figure 5

Monthly distribution of international tourism in hotels (2018)



Source: Self-elaborated. Data: HOS (INE).

Table 1
Estimation results for dynamic models (2008–2018)

Variables	ln TOUR _{i,t}		ln NIGHTS _{i,t}	
	Coefficient	t-Statistic	Coefficient	t-Statistic
ln TOUR _{i,t-1}	0.52 ***	5.91	---	---
ln NIGHTS _{i,t-1}	---	---	0.46 ***	4.51
ln GDP _{i,t}	1.22 ***	3.54	1.46 ***	3.30
ln PR _{i,t}	-0.83 ***	-3.46	-0.86 ***	-2.73
ln PT _{i,t}	-0.05 *	-1.92	-0.04	-1.22
D2009	-0.19 ***	-5.24	-0.21 ***	-3.61
D2012	-0.07 **	-2.45	-0.10 ***	-2.63
F-Statistic	87.41 (6)		54.54 (6)	
	[0.000]		[0.000]	
Sargan	[0.465]		[0.489]	
AR (2)	[0.753]		[0.760]	
N. countries	21		21	
N. Observations	189		189	

Method of estimation: GMM-DIFF of Arellano and Bond (1991).

Countries: Germany, Austria, Belgium, Denmark, Finland, France, Greece, Ireland, Italy, Luxembourg, Holland, Poland, Portugal, United Kingdom, Czech Republic, Sweden, Norway, Russia, Switzerland, Japan and the USA.

Notes: AR (2) is a test for autocorrelation of Arellano and Bond. The p-values of the tests are presented in brackets.

Table 2
Comparison of short-run and long-run elasticities

Variables	ln TOUR_{i,t}		ln NIGHTS_{i,t}	
	Short-run	Long-run	Short-run	Long-run
ln GDP_{i,t}	1.19	2.48	1.47	2.72
ln PR_{i,t}	-0.79	-1.65	-0.80	-1.48
ln PT_{i,t}	-0.05	-0.10	-0.04	-0.07

Source: Self-elaborated. The long-run elasticities obtained by dividing each of the estimated coefficients by $(1 - \beta_i)$.

Table 3
Comparison of results to previous studies

Study	Data Origin-Destination	Study Period	Income elasticity		Price elasticity		Coefficient of adjustment
			Short run	Long run	Short run	Long run	
Habibi (2017)	Malaysia – Rest of the World (33 countries)	2000-2012	0.46	--	0.12	--	0.24
Zhang (2015)	Australia – Rest of the World (40 countries)	Jan. 2009- Dec. 2013	0.12	0.28	0.04	0.09	0.44
Chasapopoulos et al. (2014)	Greece – Rest of the World (31 countries)	2001-2010	0.21	0.95	-0.008	-0.04	0.22
Serra et al. (2014)	Portugal – Rest of the World (6 countries)	2000-2011	0.37	0.88	--	--	0.42
Garín-Muñoz and Pérez-Amaral, (2000)	Spain – Rest of the World (17 countries)	1985-1995	0.91	2.07	-0.10	-0.23	0.44
Garín-Muñoz (2006)	Canary Islands – Rest of the World (15 countries)	1992-2002	1.17	2.92	-0.66	-1.85	0.40
Garín-Muñoz and Montero-Martín (2007)	Balearic Islands - Rest of the World (14 countries)	1991-2003	0.92	2.02	-0.76	-1.65	0.46
Mendieta-Aragón and Garín-Muñoz (Present Study)	Andalusia (TOUR)- Rest of the World (21 countries)	2008-2018	1.19	2.48	-0.79	-1.65	0.48
	Andalusia (NIGHT)- Rest of the World (21 countries)	2008-2018	1.47	2.72	-0.80	-1.48	0.54

Source: Self-elaborated. The coefficient or elasticity of adjustment determines the relation between the short and long run elasticities. It can be obtained by subtracting the estimated coefficient for the lagged dependent variable from 1.