2014 BARCELONA WORKSHOP ON REGIONAL AND URBAN ECONOMICS
Cultural Tourism and Sustainable Urban Development
Barcelona, November 28th-29th, 2014

CULTURAL RESOURCES AS A FACTOR IN CULTURAL TOURISM ATTRACTIVENESS: PERFORMANCE ANALYSIS OF REGIONAL DESTINATIONS IN SPAIN

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ABSTRACT

The paper involves a study along the line of performance analysis of tourist destinations, yet taking the regions as territorial units and cultural tourism as a tourist flow to be explored. The aims of this study are, first, to ascertain whether or not regions with more abundant cultural resources attract greater flows of cultural tourism, and second, to evaluate efforts in the 'management' of regional cultural resources in the medium term in attracting cultural tourism. The analysis will be carried out at a regional disaggregation level in Spain, and one hypothetical production function will be designed to link cultural resources and demand. We adopt a two-stage procedure to evaluate regional efficiency as cultural destinations, first measuring performance by non-parametric methods, and secondly, analysing how other external variables might determine these efficiency ratios. In this case, we consider indicators representing notoriety, accessibility, the omnivorous nature of cultural tourism as well as the scope to the regional cultural sector. The findings of this research have implications for economic development and regional disparity analysis, and interesting extensions for economic policy may also be deduced.

KEY WORDS: Cultural tourism, regional analysis, performance of cultural tourist destinations, Data Envelopment Analysis, conditional efficiency models

JEL: Z10, L83, R38, O18, D24

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1. Introduction

The main idea underlying the present work is the relation between cultural tourism flows arriving at various regions, and the combined cultural resources available in said destinations. Indeed, if we take a fairly broad definition of cultural tourism, such as the movement of people from their usual place of residence to other destinations for the purpose of gathering information and enjoying new experiences with which to satisfy their cultural needs (Richards, 1996; Bonet, 2003), the cultural resources and events found in a given area emerge as the main attractions that compete with one another to draw visitors for the aforementioned aims. Cultural tourism is thus able to embrace a wide array of activities ranging from visiting museums, monuments, archaeological sites and so on, to attending performing and musical arts festivals and shows, or offering guided tours of historical cities and cultural sites, as well as attending celebrations and events which are representative of intangible cultural heritage (Benhamou, 2012; Bonn et al., 2007).

The link between cultural resources and their specific tourism demands seems clear. Yet, in terms of cultural economics analysis it has been approached from a number of different perspectives. On the demand side, efforts have been made to specify the idiosyncratic nature of cultural tourists (Kim et al., 2007), their particular motivations (McKercher, 2002; Guzmán et al., 2006), or the impact of tourism on cultural consumption (Borowiecki and Castiglione, 2014). On the supply side, many works have explored participation in various tourist experiences (Richards, 2001) or estimated the value allocated to certain manifestations of culture (Bedate et al., 2004; Herrero et al., 2011). Other studies have sought to measure the contribution of cultural tourism to economic growth (Stoddard et al., 2006; Murillo et al., 2008) or estimate the economic impact of certain events (Herrero et al, 2006; Devesa et al, 2012). Finally, another group of contributions address the issue from the standpoint of public intervention by evaluating public spending on tourism (Cellini and Torrisi, 2009) or related tourist policies (Wöber and Fesenmaier, 2008)

Our work explores an issue which has thus far received less attention in the field, namely evaluating the efficiency of cultural tourism destinations. More specifically, our main objective is to measure how efficient regions might be when attempting to manage their own cultural resources in order to attract the highest possible number of cultural tourists. Obviously, to maintain this argument we need to involve specific work hypotheses. First, we assume that we are able to design a regional production function which takes account of cultural (material and human) resources as inputs, and cultural tourism as final output. We therefore take the territory as a firm and hypothesize that cultural resources in a given region constitute the input of a virtual production process, the output of which is cultural tourism flow (Cracolici et al., 2008). Secondly, and stemming from the previous issue, we think that regions are capable of managing and accumulating cultural resources for tourist purposes, or at least with the aim of improving their ability to attract tourism (Richards, 2001). It is true that managing many cultural resources and institutions has a strictly cultural goal, such as conservation, restoration, encouraging creativity, and promoting cultural participation, etc. However, it is no less true that many also seek to enhance the image of the urban area and to attract greater spending in cities and regions;

in other words, to be a factor in local and regional economic development (Bille and Shulze, 2006; Herrero, 2011)

The third hypothesis of our research involves defining a cultural tourist as someone who makes a trip entailing a stay of at least one night and whose motivation is essentially cultural, that is to say, cultural participation or cultural consumption during their trip. This by no means rules out those who merge their cultural visits with other leisure activities, the so-called “omnivorous tourism” phenomenon which is acquiring such importance in the field (Barbieri and Mahoney, 2010). Yet, what needs clarifying is that classification of a cultural tourist should come exclusively from the individual’s own declaration concerning the main reasons for their trip and the cultural affinity involved, which poses certain problems when constructing reliable and significant data. Finally, a fourth hypothesis in this relation between cultural tourism flow and cultural resources suggests the existence of other variables which might determine the degree of efficiency, and which are possibly related to the conditions of accessibility, the notoriety of the place, the cultural sector scope, etc. That is why we propose a two-stage procedure to evaluate the performance of cultural destinations, firstly measuring regional efficiency by non-parametric methods, and secondly, analysing how other external variables may determine these efficiency ratios. For this purpose, we follow so-called conditional efficiency models (Simar and Wilson, 2007)

The empirical application is conducted on all the regions in Spain, an exceptional case study, due both to the importance of its cultural resources and the scope of related cultural tourism, as well as the existence of a highly decentralised political system, endowing the regions with enormous power to intervene, particularly vis-à-vis managing and promoting cultural resources. Considering these premises, the paper is organised as follows. In the next section, a brief literature review is provided. In the third section, the methodological approach and database used are presented. The fourth section provides the empirical application, measuring regional performance, and analysing conditional efficiency. We finish with a section of discussion and main conclusions.

2. A literature review

This research is framed in the area of the efficiency analysis of cultural and tourist prototypes. In this field, abundant case study literature addressing the evaluation of cultural institutions already exists (Fernandez Blanco et al, 2013) although the cultural sector may not have as yet received the same amount of attention as given to other areas in the provision of public goods, such as health or education. Certain studies focus on estimating stochastic production frontiers using parametric methods such as the works of Bishop and Brand (2003), addressing a selection of museums in the United Kingdom, or Zieba (2013) and Last and Wetzel (2010) on efficiency of several samples of theatres in central Europe. Yet, a greater number of efficiency studies have been conducted based on non-parametric mathematical programming techniques, particularly Data Envelopment Analysis (DEA) and derivatives thereof. Based on the flexibility this technique affords, there have been numerous applications since the 1990s, above all in the field of museums. Mairesse, and Vanden Eeckaut (2002) evaluated samples of Belgian museums, and the work by Taalas (1998) is one of the few approaches to evaluating allocative efficiency using a set of Finnish museums. In Italy, Pignataro (2002) explored efficiency and technical change in museums in Sicily, while Basso and Funari, (2004) offer a detailed appraisal of productivity gains for a set of museums located in large tourist cities. In Spain, Del Barrio, *et al*. (2009) evaluate the efficiency of a wide network of museums based on a prior classification thereof using multivariate statistical techniques, and also considering a complex production function with several sets of inputs and outputs (Del Barrio and Herrero, 2014). Studies of a similar nature have also emerged for orchestras (Luksetich and Nold Hughes, 1997) and theatres (Marco Serrano, 2006). It is only recently, however, that conditioned efficiency models have been applied to evaluating cultural institutions such as libraries (Vitaliano, 1998; De Witte and Geys, 2011) or historical heritage restoration agencies and policies in Italy (Finocciaro Castro, et al., 2011; Guccio et al., 2014)

By contrast, there are an abundant and ever-increasing number of efficiency literature studies in the specific field of tourism and hospitality sectors. In addition to providing an extensive literature review in this area in recent years, Fuentes (2011) examines the efficiency of travel agencies in a Spanish case study using DEA and smoothed bootstrap techniques. Köksal and Aksu (2007) also evaluate travel agencies in Turkey using a simple DEA model with one output and three inputs, while Wöber (2006) considers non-controllable inputs in the efficiency analysis of branch offices of a tour operator in Austria. Giménez-García et al. (2007) and Reynolds and Thompson (2007) examine the efficiency of restaurant establishments in Spain and the USA respectively, from a DEA perspective of a model in stages. However, most studies in the tourist industry basically deal with efficiency analysis of hotels and hotel chains under different perspectives. Some studies estimate stochastic production frontiers, such as the applications of Barros (2004 and 2006) for several Portuguese hotel samples. Yet, most works on efficiency studies adopt an approach using non-parametric, and basically DEA techniques, in different versions. Such is the case of the studies by Sigala (2004) on three-star hotels in the UK, Perrigot et al (2009) on hotel chains in France, or Barros (2005) who explores the efficiency of the Portuguese *Pousadas,* a publicly-owned chain of national hotels. Pulina et al. (2010) merge tourist efficiency studies in Italian regions with a detailed analysis of the efficiency of hotels on the island of Sardinia, using window DEA approach. Adopting the same approach, Keh et al. (2006) examine the productivity of marketing expenses in the units of an Asian Pacific hotel chain. Finally, Wang et al. (2006) and Shang et al. (2010) progress through efficiency conditional models in two stages, complementing the DEA approach by means of a Tobit regression to analyse the efficiency of international tourist hotels in Taiwan

Nevertheless, what is more closely related to the approach in our research is the area analysing the efficiency of tourist destinations, which has come to the fore in recent years. The argument for this type of study revolves around the concept of territorial competitiveness in the field of tourism (Crouch and Ritchie, 1999), or how tourist destinations are able to deploy the inputs at their disposal in an efficient manner in order to attract a maximum share of tourist demand and to remain competitive against key rivals. Most of these studies adopt a two-stage approach to evaluate efficiency. Firstly, they consider an extremely simple regional production function by basically relating the number of nights slept as a function of accommodation capacity and tourist arrivals. For this first analysis, non-parametric techniques such as DEA are usually employed. At the second stage, a regression is made between the efficiency scores and other environmental variables, such as cultural and natural resources, safety, accessibility conditions, and so on. With regard to this approach, we may mention the works of Barros et al. (2011) and Botti et al. (2009) for the efficiency evaluation of French destinations, and Cuccia et al. (2013) who focus particularly on ascertaining whether or not UNESCO nominations determine tourist flows travelling to Italian regions. There are also other contributions which focus on constructing and evaluating a more sophisticated production function using DEA, including as input some of the variables previously considered as external. Such is the case of the evaluation studies of Italian tourist regions conducted by Cracolici et al. (2008) and Suzuki et al. (2010), which include cultural resources, total beach length, educational attainment levels and tourist sector employment amongst the inputs. Finally, other studies such as Pulina et al (2010), who use revenue from tourism and labour costs to evaluate Italian regions, include a financial support perspective when analysing tourist destination efficiency, or Wöber and Fesenmaier (2004) who propose benchmarking tourism destinations by assessing state tourism advertising programs in the USA.

3. Methodological approach and data base

All of the previous approaches are fairly rational since most consider an extremely managerial production function and explore the external variables involved in this relation, taking into account the whole of the tourist flow reaching a region, whatever its motivation. Nevertheless, our contribution differs greatly. First, because we expressly consider cultural tourism flow itself, namely those who declare a cultural purpose as the main reason for travelling. Second, because we consider as determinants of this flow, all of the cultural resources available in a region which act as the main magnet of the region's appeal. As a result, we consider a regional production function, which is clearly understood, but which proves more complex to manage and to explain. On the one hand, it consists of cultural tourism as output, and on the other hand, cultural capital and labour as inputs. As regards cultural resources, we include festivals, museums, and historical heritage, and add cultural employment in the region as a labour factor. We feel that by using such resources as these, we cover most of a region's cultural attractions: the area of performing arts, music and cinema by way of cultural festivals; museums, which are the expression of the most emblematic movable cultural heritage and also represent one characteristic institution in this area; and finally immovable historical heritage, that is buildings, historical ensembles, archaeological sites, and so on, which are given special protection by the authorities due to their relevance (*Bienes de Interés Cultural* **-** Goods of Cultural Interest)

As a result, for all the regions in Spain and for even years between 2004 and 2012, we have constructed a database, which is initially 17 units, the number of autonomous regions in Spain, five variables and five time periods such that our data set is a balanced panel data with 85 observations[1]. The variables comprising the production function appear in Table 1. It should be pointed out that the analysis is restricted to national tourist flows, in other words the movement of residents in Spain, and excludes foreign tourists, whatever their reason for being in Spain. In addition, and given the cultural purpose of the trip, also excluded are those who may make cultural visits during their stay but for whom said visits are not the stated objective of their trip[2].

[TABLE 1]

The methodological approach we adopt follows a two-stage conditioned efficiency evaluation model. We first evaluate the level of efficiency of regions as cultural tourism destinations applying non-parametric techniques – DEA–, on the basis of the regional production function explained before. DEA is a mathematical programming technique designed to evaluate the relative efficiency of a group of comparable decision-making units (DMUs), in our case, regions as cultural destinations. The advantages of this method hinge on the fact that it does not require specifications in the behaviour model of the decision units, or explicit functional forms of the production function, as the approach basically consists of a simple definition of a production

[1] Demand data are taken from the FAMILITUR survey of the Institute of Tourist Studies, whereas supply data are taken from the Ministry of Education, Culture and Sport, all the data being obtained by using the CULTURABase. Cf. www.mcu.es/culturabase. The general survey on museums is conducted each two years, hence our consideration of only even years for the analysis.

[2] Specifically, in the case of Spain, Spanish nationals may travel for the following four reasons: recreational leisure and holidays, business trips, study trips, visiting relatives. Amongst the first reason given, which in 2012 accounted for 53% of all trips, possible eligible motivations might be: countryside and seaside, doing sports, cultural tourism, and other kinds of leisure. Single purpose cultural tourism accounted for 10.4% of leisure trips in 2012. For methodological clarifications www.iet.tourspain.es

frontier comprising the best units, prior to quantifying how efficient the rest of the sample is in relation to distance from the frontier[3]. This distance (efficiency score) between observed DMU and the most efficient DMU gives a measure of the radial reduction in inputs that could be achieved for a given measure of output. To describe this point, let us consider *n* DMUs to be evaluated. A DEA input-oriented efficiency score θ_i is calculated for each DMU solving the following program, for $i=1,\ldots, n$, in the case of constant returns to scale:

$$\begin{aligned} &\text{Min}_{\lambda,\theta i} && \theta i \\ &\text{Subject to} && Y\lambda - y_i \geq 0 \\ & && \theta i\, x_i - X\lambda\, y_i \geq 0 \qquad [1] \\ & && \lambda \geq 0 \end{aligned}$$

where x_i and y_i are, respectively, the input and output of *i-th* DMU; *X* is the input matrix and *Y* is the output matrix of the sample, and λ is a $n\times1$ vector of variables. The model [1] can be modified to account for variable returns to scale by adding the convexity constraint: $e\lambda=1$, where *e* is a row unity vector with all elements equal to 1, which allows Technical Efficiency (TE) and Scale Efficiency (SE) to be distinguished.

Following our methodological approach, at the second stage, we attempt to estimate the degree of correlation of the previously obtained efficiency ratios with regard to other environmental variables which could affect regional performance in attracting cultural tourism. We have grouped these external variables into four concepts. First, notoriety, in other words, whether cultural tourists decide their trips based on the importance of certain cultural ensembles or taking into account some well-known cultural brands. To include this notion, we build a variable which considers the World Heritage List (WHL) declared by UNESCO, and each nomination is weighted by the number of years since it was registered. We therefore consider the density and time-relevance of cultural heritage labelling. The second concept merges variables related to accessibility of cultural destinations, such as accommodation capacity and presence of motorways, which allow easier and faster access to destinations. We take accommodation capacity to be the number of hotels and rural houses by region, as well as the number of beds included, with a special distinction for establishments up to three stars. Thirdly, we also take into account indicators which aim to measure the possible omnivorous nature of cultural tourism, in other words, whether visiting cultural attractions is combined with leisure

[3] By contrast, DEA is a deterministic model since it assumes that any distance from the optimal frontier is the result of inefficient performance and is not random. This may be overcome through dynamic efficiency and conditioned efficiency analysis, the methodological approach chosen in the present research. For technical details on this method, its advantages and detractors, see Gambley and Cubbin (1992) and Fernández-Blanco (2013)

activities involving other entertainments such as beaches or natural parks[4]. We therefore bring into our analysis the length of beaches and the surface area of natural parks. Finally, we also aim to test the importance of variables related to the regional scope of cultural activity, for instance cultural expenditure by regional governments, the number of cultural enterprises, or even variables related to levels of safety, basically crimes and thefts. Most of these variables are calculated in relation to regional area and are shown, together with the main descriptive statistics, in Table 1.

We perform the second-stage analysis running OLS regression with the efficiency scores as the dependent variable and the environmental variables as the independent ones. We thus assume that the efficiency scores can be regressed – in a cross-section framework – on a vector of environmental variables in line with the following general specification:

$$\theta_i = f(z_i)+\varepsilon_i \qquad [2]$$

where θ_i represents the efficiency score from the previous stage, z_i is a set of possible non-discretionary inputs, and ε_i is a vector of error terms.

[FIGURE 1]

[MAP 1]

[MAP 2]

In order to introduce a brief preliminary description of data, what is the situation regarding cultural tourism in Spain? Bearing in mind that we are considering domestic cultural tourism, namely, movements of Spanish people for cultural reasons, it should be pointed out that this has experienced a slight drop due to the financial crisis (Figure 1), although curiously, the number of trips abroad has grown except for the last year of the analysis. We therefore have certain stability in national cultural tourism flows in recent years. Which regions enjoy the largest cultural tourism flow? As we can see in Map 1, Andalusia and Catalonia, together with the inland regions of Madrid and Castile and León achieve the best results. These four regions account for over half of all domestic cultural tourism in Spain. Yet, in which regions does cultural tourism have the greatest weight in relation to total arrivals? Prominent here, obviously,

[4] In sum, it aims to ascertain whether, however much we isolate the tourist's cultural character, their participation is actually determined by when they have time, in other words, during the holidays and free time. To examine the significance of omnivorous tourism, see Richards (1996) and Barbieri and Mahoney (2010)

is Madrid, as well as the inland regions of La Rioja and Extremadura, together with Asturias and the Basque Country (Map 2). As regards cultural resources, the inscriptions of goods of cultural interest have continued to grow in an automatic inertia to incorporate new historical heritage that should be protected, also reflecting a desire to expand what is considered cultural heritage. Nevertheless, the trend of opening new museums has come to a halt and the number of festivals has decreased after the financial crisis. The regions with most cultural resources are some from the Mediterranean arc together with Madrid (Map 3), even though some have seen a drop in their number of resources, mainly festivals, while other regions are still increasing their endowment even during the financial crisis.

[FIGURE 2]

[MAP 3]

4. Empirical application

4.1. Performance evaluation of cultural tourist destinations

As regards the results to emerge from the first stage of the empirical application, regional efficiency evaluation in attracting cultural tourism, we first engage the main points involved in the technical formulation of the DEA method. As pointed out earlier, with regard to the regional production function we consider four inputs, cultural employment, together with three elements which are representative of cultural capital, and one output, the flow of domestic cultural tourism. Although the dimensionality space of the production function (numbers of input and output variables employed) is relatively short, we pool the data in order to gain more consistency in the DEA model results. With this procedure, regions in different years are treated as if they were different DMUs. This approach allows us to compare the efficiency of a DMU with its own efficiency in other years, as well as with the other DMUs' efficiency. Consequently, we also have a dynamic evaluation of regional performance as cultural destinations over time.

Efficiency assessment using DEA analysis may be performed by applying various models which are either input or output oriented. In our research, we chose the model we felt best suited to our case study, leading us to specify DEA analysis based on oriented output, namely maximizing outputs given the inputs. Using this approach, the optimal case frontier will comprise those regions which, with the same resources, achieve the maximum output level of cultural tourism, or to put it another way, what is the potential of maximum radial increase of a region's output, given the observed levels of its inputs. We chose this type of approach as we felt that cultural resources are mainly a regional inherited endowment that could be managed either better or worse to achieve the greatest possible flow of cultural tourism. It is also the most frequent approach in other studies of a similar nature (Cracolici et al., 2008; Barros et al., 2011; Cuccia et al. 2013)

As regards technological hypotheses, we consider constant returns to scale (CRS) and variable returns to scale (VRS), Table 2 showing the main results from the DEA application to the panel data. As expected, the mean efficiency under VRS for all observations and the whole time period is slightly greater due to the flexibility of this technological hypothesis. Nevertheless, as of now we will only work with the results from the first hypothesis, since we consider CRS offers a measure of the overall efficiency of each unit, namely aggregating pure technical efficiency and scale efficiency, while the second only provides measures of pure technical efficiency. This assumption has often been challenged since it may not account for differences in the dimensions of tourist destinations. However, our concern is not to investigate scale inefficiencies, but rather to seek out possible determinants of regional efficiency variations. Furthermore, we observe that the CRS approach is quite widespread in two stage analyses in the literature mainly for two reasons: first, CRS scores exhibit more variability than VRS scores and second, CRS scores identify overall technical inefficiency as already mentioned (Cuccia et al., 2013).

[TABLE 2]

Consequently, Table 3 indicates the main results of the efficiency analysis for each region and each year, considering a pooled DEA model and CRS technological hypothesis. The mean efficiency of the regions over the period may be put at 53.6%. This more or less means that, when all sources of inefficiency are included, Spanish regions could improve their output by an average of around 46% given their current input levels. The mean level of efficiency has fallen slightly over the years[5], such that the best practices frontier comprised four regions in 2004 and 2006, yet none in the following years. If we take the mean efficiency ratios for the whole 2004-2012 period, the regions achieving the highest values are the inland regions of Madrid, Extremadura, Aragón, and Rioja, together with the regions of Asturias and Cantabria on the north coast. By contrast, it can be said that the least efficient regions are those covering the whole of the Mediterranean arc, stretching from Catalonia down to Andalusia. These are regions in which beach tourism predominates and, surprisingly, despite monopolising much of the domestic cultural tourism, they do not prove as efficient as expected, taking into account the

[5] This has also been borne out in a study positing a similar approach carried out for Italian regions. See Cuccia et al. 2013.

resources they have available. The same might be said of the remaining Cantabrian regions (Galicia, Basque Country, and Navarre) in which, even though cultural tourism accounts for a major part of their tourist sector, they achieve relatively low and below national average levels of efficiency. The other inland regions (Castilla y León and Castilla La Mancha) remain stable, with efficiency levels around the national average. Figure 3 displays the evolution of the efficiency ranges between 2004 and 2012, with three groups of regions standing out: *improving regions*, whose efficiency has improved, and who occupy the top spots (Madrid, Asturias and La Rioja); *losing momentum regions*, who have witnessed a significant drop from the high levels of efficiency shown at the start of the period (Extremadura, Cantabria and Castilla La Mancha); and finally *delayed regions*, who display a low and stable level of efficiency, these being mainly the regions in the Mediterranean arc together with the Basque regions.

[TABLE 3]

[FIGURE 3]

One interesting result of DEA analysis is that it allows the necessary adjustments, both in inputs and outputs, to be calculated so as to reach an optimum result, in other words the efficiency frontier. The results of this analysis for the case study in hand are shown in Table 4 reflecting the average improvements which regions need to make for the whole period of time. In other words, we have calculated the mean of the fits for each region in each year of reference, since the efficiency analysis was conducted for all the panel data. The results should therefore be taken merely as references of the direction in which improvements towards an optimal situation might be considered. It can thus be seen that the main sources of inefficiency are connected with the excessive number of museums and the need for a greater effort in attracting specific cultural tourism in some regions. More specifically, as regards input, we might point to: the excessive number of festivals in the Basque regions and Catalonia; too many museums in the two Castillas, Aragón, and Murcia; numerous heritage inscriptions in the Balearic Islands; and too many people employed in the cultural industry in the Canary Islands, Catalonia and Galicia. Regarding possible improvements in outputs, it can be said that Mediterranean regions need to attract highly significant flows of cultural tourism in general terms.

[TABLE 4]

4.2. Analysing determinants of regional efficiency

In the second step of our efficiency analysis, we investigate the impact of environmental variables on the regional destinations' technical efficiency. For this purpose, we perform the second-stage analysis running a regression with the efficiency scores as dependent variables and the external variables as the independent ones. Nevertheless, DEA literature recognises that the efficiency scores obtained in the first stage might be correlated with the explanatory variables used in the second term, this often resulting in inconsistent and biased second stage estimates (Simar & Wilson, 2000). A bootstrap procedure might prove suitable to overcome this problem since it offers some improvements in both efficiency of estimation and inference in the second stage. Specifically, the procedure allows consistent estimates with models explaining efficiency scores by estimating the bias corrected estimator of the efficiency score. Consequently, and as regards our research, we have implemented a bootstrap procedure, with 1,000 bootstrap draws, to correct the bias in DEA estimators and to obtain their confidence intervals. Table 5 reports these average values at a regional level for the whole time period.

[TABLE 5]

As far as independent variables are concerned, we identify a set of explanatory variables which is likely to affect the efficiency of regions as cultural destinations. As mentioned in the methodological section, we first consider indicators of cultural heritage labelling, namely WHL inscriptions, weighted by the accumulated year of nomination which might represent the possible influence of notoriety on cultural tourist motivation. Second, we consider variables related with the regional accessibility, such as accommodation facilities in terms of hotels and rural houses, or length of motorways allowing tourists better and faster access. Third, we consider indicators which aim to represent the omnivorous component of tourism, by merging visits to cultural attractions with visits to the beach or natural resources. Finally, we consider variables related with the level of regional cultural activities, measured by regional expenditure on culture, the weight of the private cultural sector through the number of cultural enterprises as well as other variables such as those related to safety through the number of thefts and minor offences. We measure all these variables in terms of km^2 or inhabitants in each region. We have also considered a yearly time trend to take into account possible time effects on regional efficiency.

We adopt OLS regression for a pooled cross-section time-series data on all Spanish regions. We regress the bias corrected efficiency scores under CRS assumption on the previous set of explanatory variables. We estimate two models: the baseline model, with all explanatory variables, and the purified model, dropping some of the variables that appear as non-significant in the analysis and we try to find the best interpretation. Table 6 reports the results from these estimations. We analyzed the changes in the value and signs of the parameters as a result of dropping certain variables, results showing that the signs basically do not change and that the values are almost the same. The homoscedasticity of the data is further confirmed by White's test. The regression with a bootstrap model appears to be the best fit for the data, with positive t-statistics, which are statistically significant individually and jointly for all parameters. It also yields acceptable accumulated information in terms of R^2.

[TABLE 6]

Regarding the interpretation of the results, we may point to the following. Firstly, there would appear to be an inverse relation between variables of accessibility such as motorways and the accommodation supply of luxury hotels (four and five star) and how efficient regions are in attracting domestic cultural tourism vis-à-vis their available resources. This might be due to the Mediterranean regions, the less efficient ones, having a greater density of motorways and obviously having a more abundant offer of four and five star hotels, compared to their usual tourist potential. For the same reasons, the length of the coastline also fails to favour cultural tourists' decisions, as this has a negative impact on the regions' efficiency ratios. By contrast, the presence and size of natural parks does have a positive impact. This might be indicative of inland regions and the specific cultural tourist flows arriving there who, whilst maintaining the cultural purpose of the visit, plan the trip taking into account a complementary interest in the countryside and natural attractions. A further factor which fails to contribute positively, and indeed does quite the opposite, is the presence of official heritage ensembles (WHL), which are likely to have a greater impact among foreign tourists than among domestic tourists. Yet, one factor which does have a positive impact on the level of efficiency is the number of cultural enterprises per km^2, reflecting the importance which should be attached to having a thriving private cultural sector if higher levels of efficiency are to be achieved. Finally, one obvious relation is the negative link between efficiency ratios and the number of criminal offences per km^2.

5. Conclusions

Efficiency of cultural destinations can be measured through the relation between available cultural resources and cultural tourism. An empirical application in Spain was carried out following a two-stage method to evaluate the efficiency of its regions which evidence highly significant independence vis-à-vis managing their own cultural resources. We employ the DEA method to obtain efficiency scores and then estimate the possible influence of a set of environmental variables. Specifically, we take national cultural tourism as the object of our analysis and consider a broad sample of cultural resources which act as a region's main cultural attraction. As external variables which may qualify this relation, we consider indicators representing notoriety, accessibility, omnivorous cultural tourism as well as the scope of the regional cultural sector. As regards efficiency outcomes, we find the most efficient regions to be the inland regions together with the central part of the north coast. By contrast, the least efficient regions are those covering the whole of the Mediterranean arc, stretching from Catalonia down to Andalusia, together with the rest of the Cantabrian regions. Among the former are some regions whose efficiency level improves (Madrid, Asturias, and Rioja), whereas others have experienced a substantial decline (Extremadura, Cantabria, and Castilla La Mancha). As regards environmental determinants of regional efficiency in attracting domestic cultural tourism, it can be said that efficiency is greater in the case of non-congested areas, which differ from the conventional sun and beach tourism, and when offering natural attractions. Nor does heritage labelling notoriety prove necessary, whereas efficiency does prove to be related to the existence of a large private cultural sector. These results can be considered as an important guide for the regional authorities and policy-makers in the area of cultural heritage and cultural policy in order to take advantage as much as possible of the benefits in order to attract cultural tourism as a source of economic development.

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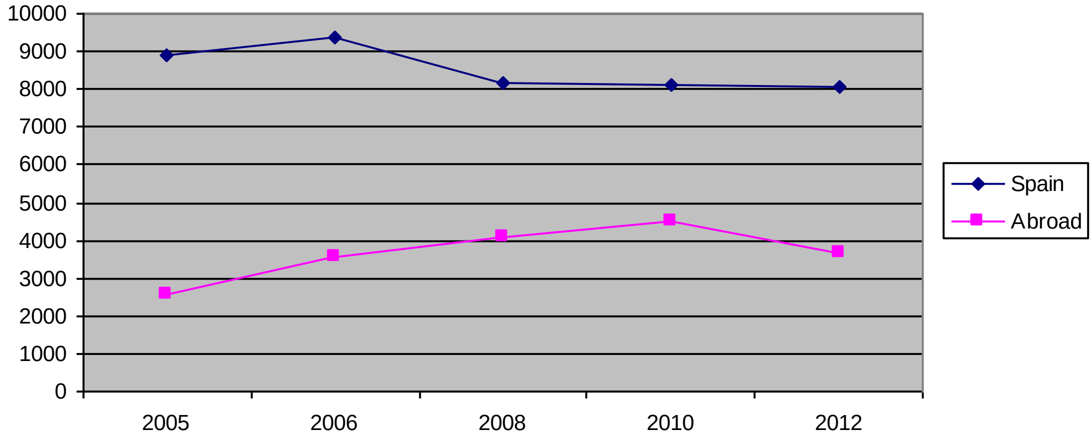
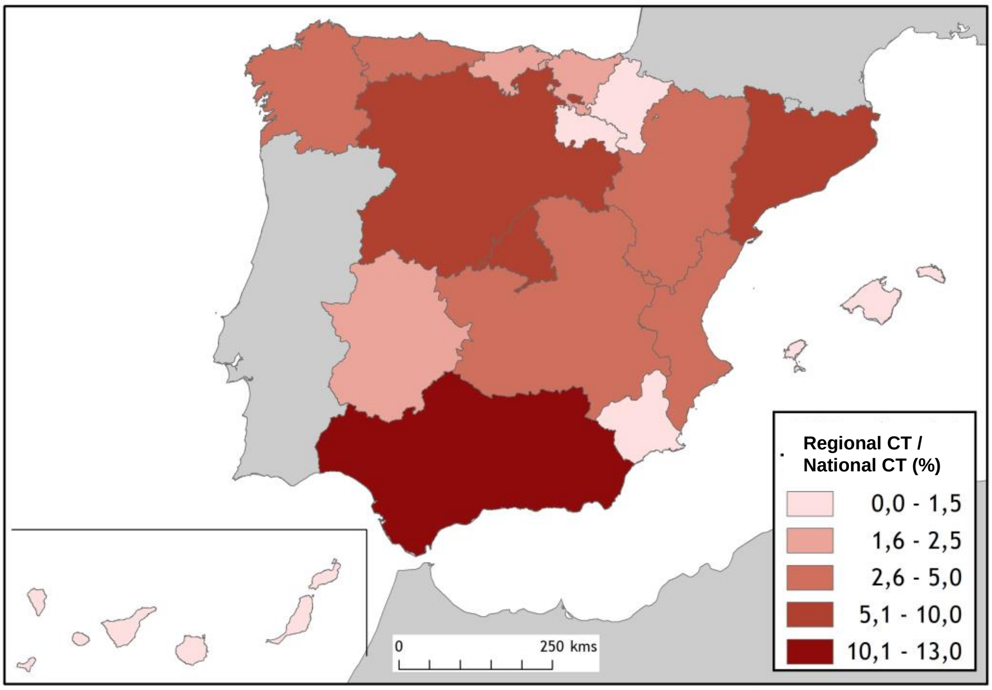
TABLE 1. VARIABLES AND DESCRIPTIVE STATISTICS								
Variables		**Mean**	**Sum**	**Std. Dev.**	**Variance**	**Minimum**	**Maximum**	**Range**
First stage: Regional production function								
Festivals	No. of festivals by region	124.1	10,551.0	109.5	11,992.0	21.0	409.0	388.0
Museums	No. of museums by region	87.4	7,429.0	59.3	3,521.5	8.0	206.0	198.0
Heritage Sites	No. of protected heritage sites by region	798.4	67,864.0	835.3	697,679.7	103.0	2,890.0	2,787.0
Cult-Employment	Cultural employment in 1,000s by region	30.0	2,545.8	36.9	1,364.2	3.8	139.1	135.3
Cult-Tourism	National cultural tourism in 1,000s by region	500.5	42,540.6	381.9	145,815.7	61.5	1,795.0	1,733.5
Second stage: Environmental variables								
WHL-Acc	No. of WHL cultural sites by region weighted by years of inscription	44.7	3,800.0	30.4	923.7	6.0	134.0	128.0
Hotels-Total	No. of hotels by region in 1,000 square kilometres	19.0	1,614.9	14.6	213.6	2.5	60.4	57.9
Hotels-345H Stars	No. of 3, 4, 5 star hotels by region in 1,000 square kilometres	12.1	1,030.7	12.1	146.0	1.1	53.2	52.1
BedsH-Total	No. of beds in hotels per square kilometre by region	3.6	308.1	6.3	39.6	0.2	30.6	30.4
Beds-345H Stars	No. of beds in 3, 4, 5 stars hotels per square kilometre by region	3.3	276.4	6.1	36.6	0.1	29.7	29.5
Rural-H	No. of rural hotels by region in 1,000 square kilometres	35.7	3,033.9	28.2	792.6	4.8	124.2	119.4
Rural-B	No. of rural beds by region in 1,000 square kilometres	33.9	2,880.0	26.0	674.0	1.4	112.3	110.9
Motorways	Kilometres of motorways by region per 100 square kilometres	4.1	345.9	2.5	6.4	1.0	12.3	11.3
Coast	Kilometres of beaches by region per 100 square kilometres	4.4	374.1	7.8	61.5	-	28.6	28.6
Natural Parks	Surface of natural parks by region per 1,000 square kilometres	9.0	761.9	12.6	159.4	-	44.0	44.0
Cult-Enterprises	No. of cultural enterprises by region per 100 square kilometres	32.6	2,770.8	55.7	3,098.8	2.1	288.9	286.8
Safety	No. of crimes and thefts by region per 100 square kilometres	16.6	1,412.1	17.2	296.2	1.2	83.5	82.3
Cult-Expenditure	Cultural expenditure by regional government per 1,000 inhabitants	42.6	3,621.3	21.4	455.7	9.0	126.7	117.7

FIGURE 1. EVOLUTION OF NATIONAL CULTURAL TOURISM IN SPAIN BY DESTINATIONS



MAP 1. NATIONAL CULTURAL TOURISM ALLOCATION BY REGIONAL DESTINATIONS IN 2012



MAP 2. PROPORCION OF CULTURAL TOURISM ON REGIONAL TOURISM SECTOR IN 2012

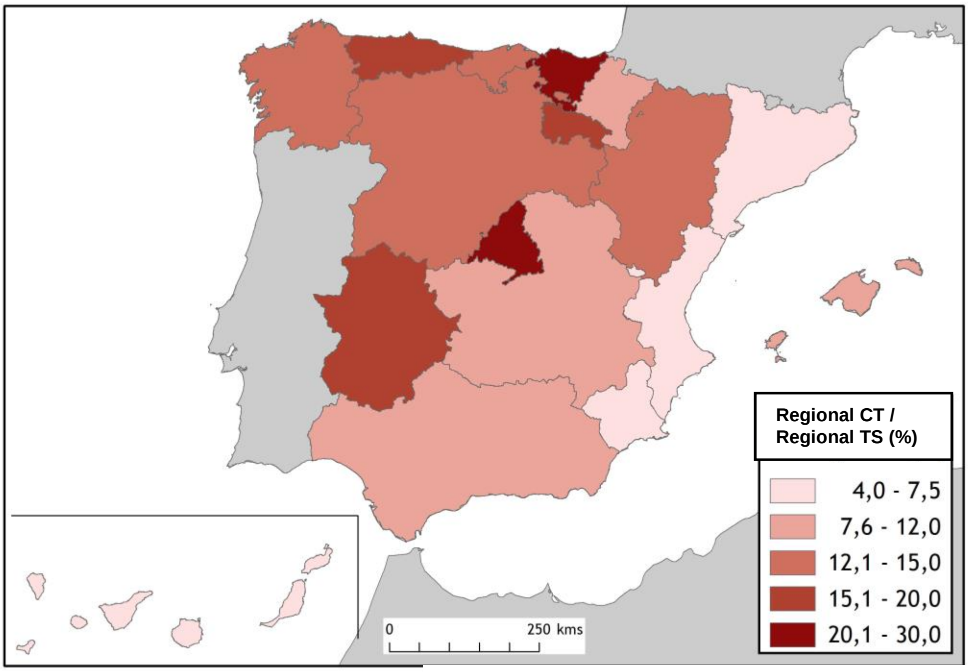
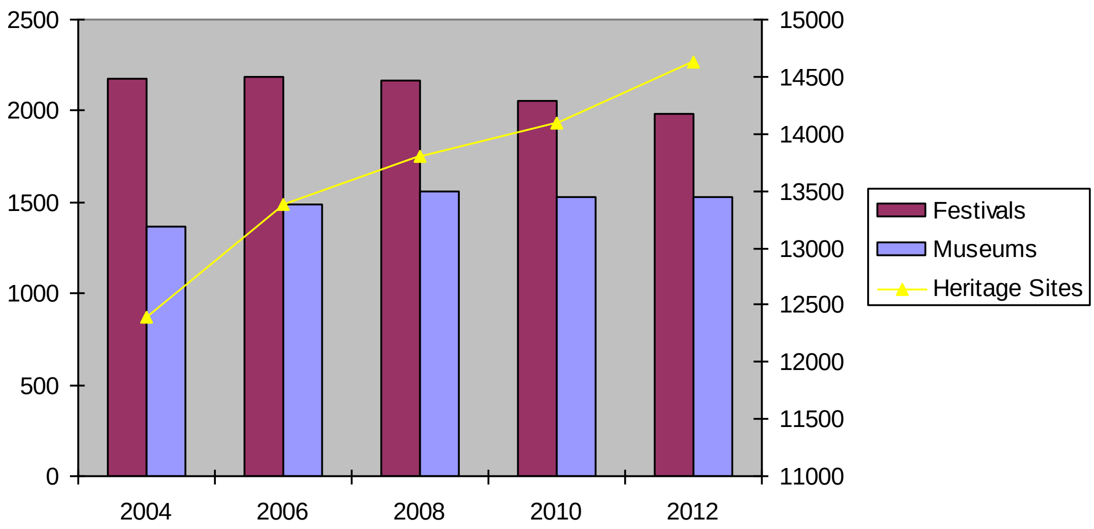


FIGURE 2. EVOLUTION OF CULTURAL RESOURCES IN SPAIN



MAP 3. REGIONAL DISTRIBUTION OF CULTURAL RESOURCES IN SPAIN (2012)

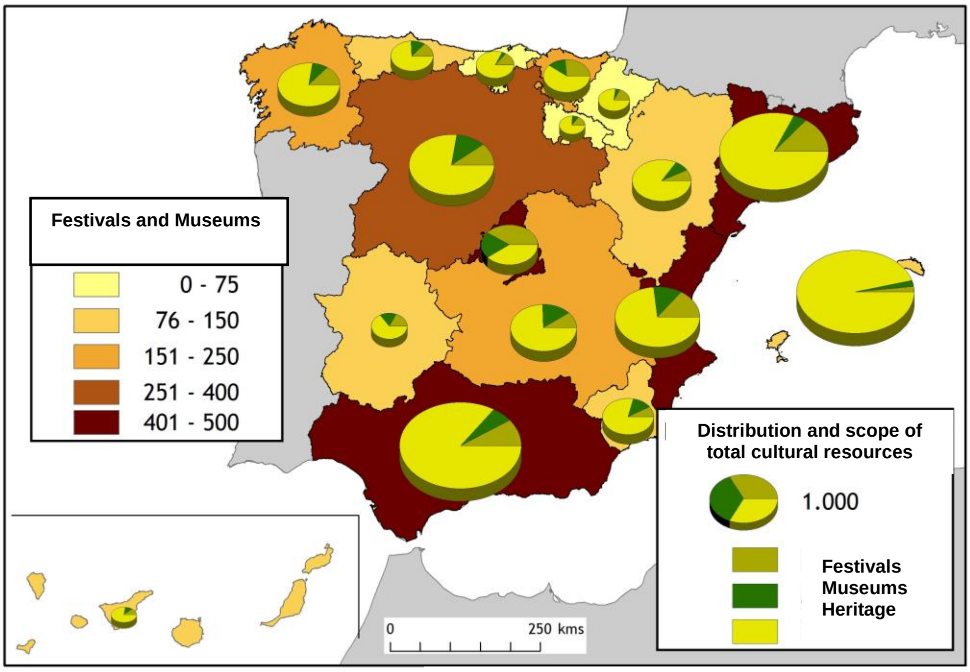


TABLE 2. DESCRIPTIVE STATISTICS OF EFFICIENCY SCORES UNDER CRS AND VRS MODELS

	CRS Model	VRS Model
No. of Efficient Regions	4	17
No. of Inefficient Regions	81	68
Mean all sample	53.6	70.5
Median all sample	50.7	73.8
Mean inefficient regions	51.3	63.1
SD	22.5	24.1
Observations	85	85

TABLE 3. REGIONAL EFFICIENCY SCORES. CRS POOL MODEL						
	CRS 04	**CRS 06**	**CRS 08**	**CRS 10**	**CRS 12**	**Mean CRS**
Andalusia	45.15	47.49	41.56	42.49	51.21	45.58
Aragon	60.67	71.37	62.24	64.91	67.23	65.28
Asturias	65.08	100	76.12	69.57	87.26	79.61
Balearic Islands	28.45	35.59	58.25	42.18	29.75	38.84
Canary Islands	57.23	45.41	74.24	69.92	28.63	55.09
Cantabria	100	71.44	89.34	92.04	62.41	83.05
Castile and Leon	64.03	58.81	40.37	46.77	53.96	52.79
Castile-La Mancha	80.1	46.74	43.64	38.64	51.73	52.17
Catalonia	27.85	31.23	27.52	23.62	24.14	26.87
Valencian Community	42.8	35.87	30.66	29.76	20.51	31.92
Extremadura	100	81.42	66.84	64.32	72.99	77.11
Galicia	50.39	65.99	52.49	50.34	43.15	52.47
Madrid	84.12	100	77.27	91.39	98.23	90.20
Murcia	22.79	28.16	23.82	12.44	15.66	20.57
Navarre	56.23	45.7	26.9	50.72	41.14	44.14
Basque Country	32.66	33.79	20.56	41.16	39.45	33.52
La Rioja	66.06	42.68	57.23	55.62	84.72	61.26
Mean Eff.	57.9	55.4	51.1	52.1	51.3	53.6
No. of Eff. Reg.	1	2	0	0	0	0

FIGURE 3. EVOLUTION OF EFFICIENCY SCORES. CRS POOL MODEL

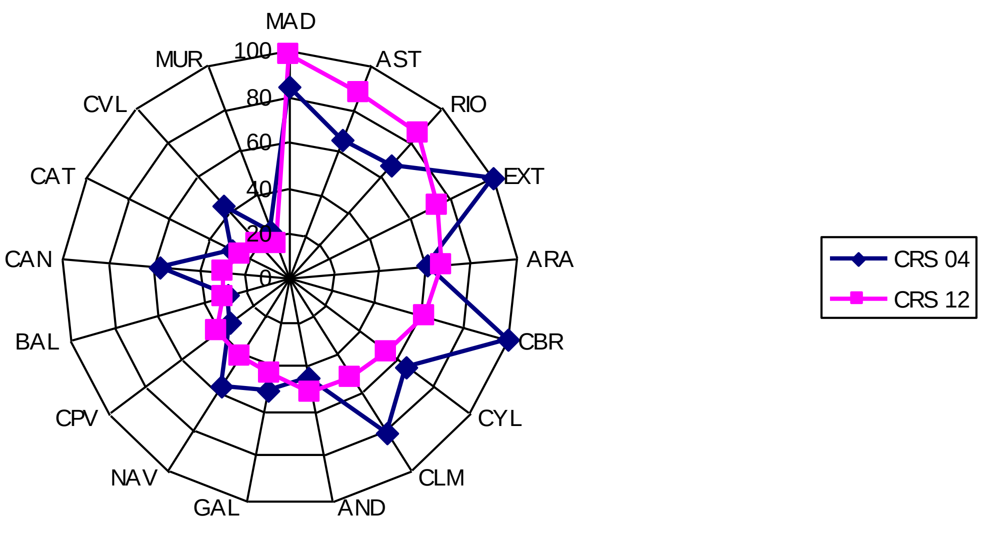


TABLE 4. POSSIBLE IMPROVEMENTS IN ACHIEVEMENT OF INPUTS AND OUTPUTS BY REGION															
	Festivals			**Museums**			**Heritage sites**			**Cultural employment**			**Cultural tourism**		
Regions	**Value**	**Target**	**Gain (%)**	**Value**	**Target**	**Gain (%)**	**Value**	**Target**	**Gain (%)**	**Value**	**Target**	**Gain (%)**	**Value**	**Target**	**Gain (%)**
Andalusia	326.6	326.6	0.0	176.2	104.6	-39.3	2,461.6	1,970.5	-18.5	56.5	33.0	-41.1	1,587.9	3,498.9	120.7
Aragon	59.2	59.2	0.0	69.6	17.1	-75.4	619.2	370.8	-40.0	11.6	5.9	-48.1	424.7	650.4	53.7
Asturias	55.8	55.8	0.0	46.6	32.5	-28.3	266.8	266.8	0.0	8.4	6.3	-24.4	418.4	524.3	28.7
Balearic Islands	58.2	58.2	0.0	60.4	16.8	-72.1	2,861.4	364.5	-87.2	12.1	5.8	-51.5	243.7	639.4	175.5
Canary Islands	56.6	56.6	0.0	53.4	25.2	-49.4	307.2	290.2	-4.7	18.4	6.8	-63.1	299.2	544.3	104.4
Cantabria	40.8	38.3	-5.5	11.4	11.2	-2.1	248.4	238.6	-3.9	4.4	3.9	-10.4	345.4	419.1	24.2
Castile and Leon	153.2	153.2	0.0	193.2	44.3	-77.0	1,125.0	959.5	-14.6	19.6	15.2	-20.7	886.9	1,683.2	94.6
Castile-La Mancha	87.8	87.8	0.0	160.2	25.4	-84.1	682.4	549.9	-19.6	13.5	8.7	-35.6	488.2	964.6	104.0
Catalonia	380.6	350.0	-7.6	106.6	103.1	-3.0	2,034.0	2,032.7	-0.1	119.6	43.4	-63.8	967.6	3,606.0	276.1
Valencian Community	222.6	222.6	0.0	187.8	140.0	-24.2	993.0	993.0	0.0	46.1	24.4	-46.5	636.2	2,010.9	232.4
Extremadura	46.0	46.0	0.0	51.0	33.8	-31.4	175.4	175.4	0.0	4.4	4.3	-2.4	295.5	383.4	33.0
Galicia	99.2	99.2	0.0	76.4	36.0	-53.2	598.8	585.2	-2.3	24.5	10.3	-58.0	548.0	1,051.2	94.2
Madrid	286.8	286.4	-0.1	121.2	101.2	-15.9	276.4	276.4	0.0	123.8	110.5	-9.8	785.5	870.2	11.9
Murcia	44.6	44.6	0.0	70.8	12.9	-81.1	395.2	279.3	-27.9	9.3	4.4	-51.4	101.2	490.0	431.2
Navarre	46.0	39.4	-14.3	19.6	19.6	0.0	149.2	149.2	0.0	7.7	6.5	-15.0	133.5	304.3	141.7
Basque Country	121.8	113.2	-6.8	70.0	66.0	-5.4	274.4	274.4	0.0	24.9	24.2	-2.6	222.0	662.7	217.0
La Rioja	24.4	23.3	-4.1	11.4	10.8	-4.0	104.4	104.4	0.0	4.4	3.3	-22.3	124.0	202.5	71.7

TABLE 5. BOOSTRAP ESTIMATION ON REGIONAL EFFICIENCY SCORES UNDER CRS POOL MODEL				
Regions	**Mean CRS**	**Boostrap Mean**	**Boostrap lower bound**	**Boostrap upper bound**
Andalusia	45.6	38.7	28.4	46.1
Aragon	65.3	61.4	53.7	65.5
Asturias	79.6	73.2	66.5	80.7
Balearic Islands	38.8	36.7	32.5	39.0
Canary Islands	55.1	51.1	44.8	55.6
Cantabria	83.0	71.6	66.1	84.0
Castile and Leon	52.8	44.5	31.6	53.4
Castile-La Mancha	52.2	48.1	40.2	52.4
Catalonia	26.9	22.1	13.1	27.2
Valencian Community	31.9	28.8	24.8	32.4
Extremadura	77.1	66.4	56.9	78.1
Galicia	52.5	47.4	40.5	53.2
Madrid	90.2	82.8	80.4	91.2
Murcia	20.6	19.4	17.0	20.7
Navarre	44.1	38.3	29.1	44.9
Basque Country	33.5	29.1	23.4	34.1
La Rioja	61.3	54.6	44.8	62.4
Mean Eff.	53.6	47.9	40.8	54.2

TABLE 6. ENVIRONMENTAL FACTORS INFLUENCING REGIONAL EFFICIENCY. OLS REGRESSION				
	Baseline Model		**Purified Model**	
Variables	**Coefficient**	**Std. Error**	**Coefficient**	**Std. Error**
Constant	97.76 *	12.07	85.90 *	8.47
WHL-Acc	-0.26 *	0.08	-0.25 *	0.07
BedsH-Total	-6.84	9.91	-	-
Beds-345H Stars	6.27	10.30	-0.85 ***	0.46
Rural-B	0.04	0.14	-	-
Motorways	-7.64 *	1.93	-8.15 *	1.64
Coast	-1.54 *	0.41	-1.49 *	0.38
Natural Parks	1.13 *	0.39	1.22 *	0.22
Cult-Expenditure	-0.14	0.11	-	-
Cult-Enterprises	0.47 *	0.08	0.50 *	0.07
Safety	-1.53 ***	0.87	-1.14 ***	0.68
Trend	-0.11	0.82	-	-
No Observations	85		85	
R-Square	0.54		0.53	
Note: Statistically significant at 1% level; ** statistically significant at 5% level; *** statistically significant at 10% level				