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Case study

Assessing the tourism attractiveness of World Heritage Sites: The case of Spain

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ABSTRACT

No consensus has been reached on the effectiveness of World Heritage Sites (WHSs) in attracting tourism. This paper analyzes the impact of WHSs on tourist demand in Spain at a disaggregated level for all Spanish provinces (NUTS-3 regions), based on original panel data for 50 Spanish provinces for the 2000–2019 period. The results show a positive impact of WHSs on domestic and foreign tourism demand when considering all the provinces together and that the first WHSs (designated in the 1980s) have a greater tourism-enhancing effect ("first generation effect"). However, there are differences between Spanish inland and coastal provinces: only cultural WHSs have an impact on tourism in inland provinces, whereas, in coastal provinces, only natural WHSs have the power of tourism attraction.

1. Introduction

Tourism is one of the most important sectors in the world economy and the main source of income for many countries [1]. Tourism's relevance justifies the ample treatment that the academic literature has given to the determinants of tourism demand [2], which takes other factors into account in addition to the typical economic variables, including security, infrastructure, climate, and culture [3].

This last determinant, culture, has a positive impact on local economy in terms of employment and income [4], and has been approached from multiple perspectives including that analyzed in the present paper: The Declaration of World Heritage Site (WHS). This status has been granted since 1978 by the United Nations Educational, Scientific and Cultural Organization (UNESCO) to certain natural or cultural sites that meet certain criteria of historical or cultural significance, with the aim of their preservation and conservation [5]. In this sense, some authors suggest that being declared a WHS is also regarded as a strategy to boost tourism and the local economy [6], although it has led to some issues such as a conflict of interests with local communities [7].

Evidence of the increasing validation of this award is the growing number of sites throughout the world that UNESCO has listed as WHSs. The WHS list has expanded from 12 sites in 1978 to 1,121 in 2019. This increase has also gone hand-in-hand with a growth in the number of tourists who visit the sites [8], which justifies research in this field [9].

However, the effectiveness of WHSs as a developer of tourism and economic growth is an open and controversial question [10]. Some authors such as Arezki et al. [11] consider that WHSs have a positive effect on tourism and economic growth since they are an example of tourism specialization, while Caust and Vecco [12] go even further by stating that WHS status could be seen as a marketing tool rather than a protection approach. As an example of this, evidence has been found of the positive impact of WHS on tourism in countries such as China [13], Germany [14], Israel [15], or even worldwide [9,11]. On the other hand, other authors such as Cellini [16] and Cuccia et al. [17], for the case of Italy, do not find any evidence that WHSs are effective in fostering tourism. Finally, Groizard and Santana-Gallego [18] show that the disappearance of a WHS in Arab countries would result in a minimum 12% loss of tourism.

Among all the countries that have been analyzed by previous literature, Spain is specially an interesting and relevant case of study for three reasons. First, because of the dependence of the Spanish economy on the tourism sector in terms of GDP, employment and

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balance of payments [19]. Second, because Spain is considered a leading tourist destination and the second most visited country in the world in 2019. And third, Spain is the third country in the world with more WHSs, with 48 listed assets, only behind China and Italy [5].

Despite this relevance, however, at present, only partial studies can be found on the impact of WHS on tourist arrivals for the case of Spain and they analyze specific locations, like [20] for Cordoba, who determined a positive impact of the WHSs on tourism and on the economic development of the region. Other studies have analyzed specific Spanish WHSs but have focused on aspects other than tourist arrivals or the tourism-enhancing effect, for example, the impact of WHS building and employee displayed emotions on tourist emotions, satisfaction, and behavioral intentions to revisit a WHS such as the Sagrada Familia Cathedral in Barcelona [21] and the "Camino de Santiago" (St. James Way) [22]; the willingness to (not) pay more for sustainable tourism in Caceres [23]; tourism expenditure in Baeza and Ubeda [24]; conservation of WHSs such as the Garajonay Natural Park [25] and the Altamira Cave [26], and the links between natural areas and WHSs in Caceres and Merida [27].

2. Research aims

This paper aims to test the capacity of UNESCO WHSs to attract tourists to Spain given the controversy that exists around their impact on tourism and to contribute to current literature with new evidence. There are three main gaps that the current paper intends to cover.

The first gap is that, to date, there is no previous literature that addresses the significance of WHSs as a tourist attraction for all Spanish provinces (with an all-province approach).

Second, another relevant and pioneering aspect of this study is data analysis at the disaggregated provincial level (NUTS-3 regions according to the Eurostat statistical classification). Data analysis at this level has been carried out by other authors for other countries, for example, De Simone et al. [28] for Italy, but never for Spain. This enables any differences to be distinguished in the interdependence between WHSs and the dichotomy that exists in Spain in terms of the implemented tourism model: the coast and the interior.

And third, this paper covers the need to include a temporal dimension in the analysis. In this sense, we try to assess whether WHS status has been diminished in Spain by the loss of exclusivity (according to WHC [5], the number of WHSs in Spain has increased from 6 in 1984 to 48 in 2020), with WHS listings disaggregated into three groups: WHSs designated in the 1980s, the 1990s, and the 21st century.

To achieve these aims, an econometric analysis of panel data has been carried out based on a sample of 50 Spanish provinces. Besides, it covers the longest research period of all the extensive literature reviews on WHSs and tourism demand that have been conducted (2000–2019), covers times of economic crisis and economic boom, and thus avoids the problem of time-invariant variables in the panel data model [9].

3. Data and methodology

An annual data panel has been collected for all Spanish provinces (excluding Ceuta and Melilla, as that their small size and low volumes of tourists could distort the analysis) for the 2000–2019 period. According to Huang et al. [13], the most suitable research method for this study is to use panel data, as this will allow a reasonable exploration of the effects of WHSs by examining changes in tourist arrivals along with changes in the number and status of WHSs.

Following previous research [8,9], the unit of observation is the province-year binomial and a model is used that follows expression (1), where i represents the provinces (which will be divided into two sub-samples, inland provinces and coastal provinces), and t the years:

$$Y_{it} = \alpha + \beta_k X_{it} + \gamma_k Z_{it} + \delta_k W_{it} + \varphi_k Year + \varepsilon_{it} \quad (1)$$

The dependent variable Y_{it} is the logarithm of the number of tourists (distinguishing between foreign and domestic). Expression (1) also considers different types of explanatory variables whose use is justified by the previous academic literature [8,16,17,9]: X_{it} encompasses a set of variables related to the importance of cultural heritage, which is the main objective of this study; W_{it} captures a series of attributes related to tourism supply and infrastructures such as prices, hotel supply, provinces' connectivity and accessibility levels, both by air transport and High-Speed Train (HST), and number of restaurants with 3 Michelin Stars; and Z_{it} refers to the provinces' climatic and geographic variables. *A priori*, these last two attributes must have a significant influence, given that the main Spanish tourist segment is "sun and sand". They will also help to capture province fixed effects. *Year* indicates the fixed effects of the years.

In total, we collected 1000 observations for each variable with officially-sourced panel data for 50 provinces over 20 years (2000–2019). Table 1 summarizes the variables and gives their definitions, sources and descriptive statistics.

As shown in Table 1, the following categories of explanatory variables are used in relation to different determinants of tourism demand:

a) **Cultural Heritage.** As previously mentioned, the prior literature [8,16,17,9] is inconclusive about the relationship that can be expected between the WHS variable and tourist demand. Despite there being no previous literature to support this assumption given the novelty of the variable, first-generation WHSs from the 1980s and even the 1990s, are expected to have a stronger effect on attracting tourists to the most emblematic cultural assets, such as the Alhambra in Granada, Barcelona's Gaudi buildings such as the Sagrada Familia Cathedral, the Cordoba Mosque and some of the main Spanish cathedrals. Table 2 shows WHSs in Spain organized by year of inscription.
b) **Tourism supply and Infrastructure**. First, the destination's price level (Consumer Price Index) is a basic variable that every tourism demand model should include [3]. Normally, it will have a negative relationship with tourist arrivals. Hotel supply is a good indicator of the capacity of a destination to attend to its demand, so a positive relationship is expected [34]. According to Rey et al. [35], a positive relationship can be expected between the level of transport infrastructure and tourism demand, especially with airlines (Air). The effect of the HST on tourism could be positive although with less impact than air transport, as shown in Albalate and Fageda [36]. Regarding the number of museums variable, as museums are considered to attract tourists a positive relationship is expected [37]. Finally, the number of restaurants with 3 Michelin Stars is a proxy of gastronomic quality, so a positive relationship is expected [38].
c) **Climate and geography.** It is important to remember that the sample is divided into two sub-samples—inland and coastal provinces—due to the dichotomy in the Spanish tourism model, where the coastal provinces account for greater tourist demand according to INE data (2020). In addition, it can be observed that even within each sub-sample there is no pattern or uniformity, since, for example, the north coast has lower tourist density than the Mediterranean and South Atlantic coasts and the islands. All this justifies the inclusion of geographic and climatic variables such as latitude (Lat.), longitude (Long.), altitude (Alt.) and tem-

Table 1
Variables and descriptive statistics.

Variable (abbreviations)	Description	Obs.	Mean	Std. Dev.	Min.	Max.	Source
Endogenous variable							
Foreign tourists (Ftou)	Number of non-residents staying one night or more at the same hotel by province (Log)	1000	12.28	1.55	9.26	16.08	INE - Spanish National Institute [19]
Domestic tourists (Dtou)	Number of Spanish residents staying one night or more at the same hotel by province (Log)	1000	13.38	0.75	11.28	15.70	
Exogenous variable by category							
Cultural heritage							
WHS, cultural (WHScul)	Number of cultural WHSs by province	1000	1.81	1.28	0.00	4.00	
WHS, natural (WHSnat)	Number of natural WHSs by province	1000	0.14	0.38	0.00	2.00	WHC - World Heritage Council [5]
First WHS in the 1980s (WHS80)	1 if the first WHS was designated in the 1980s, 0 otherwise (by province)	1000	0.32	0.47	0.00	1.00	
First WHS in the 1990s (WHS90)	1 if the first WHS was designated in the 1990s, 0 otherwise (by province)	1000	0.14	0.35	0.00	1.00	
First WHS in the 21st cent. (WHS21st)	1 if the first WHS was designated in the 21st century, 0 otherwise (by province)	1000	0.14	0.35	0.00	1.00	
Tourism supply and infrastructure							
Consumer Price Index (CPI)	Consumer Price Index interannual variation by province	1000	0.02	0.02	−0.02	0.05	INE - Spanish National Institute [19]
Number of hotels (Hotels)	Number of hotel establishments by province (Log)	1000	5.46	0.61	4.18	7.10	
Airlines (Air)	Number of scheduled airlines by province (Log)	1000	1.42	1.51	0.00	5.20	AENA - Spanish Airport operator [29]
HST connections (HST)	Number of other provinces that can be reached by HST	1000	0.34	0.67	0.00	3.00	ADIF - Spanish Railway Infrastructure Administrator [30]
Museums (Mus)	Number of museums and museum collections recorded in the census by province (Log)	1000	3.19	0.63	1.61	4.91	MECD - Ministry of Education, Culture and Sports [31]
Number of Michelin Star Restaurants (Mich)	Number of Michelin Star Restaurants (1,2 or 3 stars) by province (Log)	1000	0.62	0.86	0.00	3.46	MICHELIN [32]
Climate and geography							
Maximum temperature (Temp)	Average maximum temperature (°C) by province (Log)	1000	3.03	0.13	2.58	3.38	AEMET - State Meteorology Agency [33]
Coast	1 if coastal province, 0 otherwise	1000	0.44	0.50	0.00	1.00	
Latitude (Lat)	Province's angular distance north or south of the earth's equator (Degrees)	1000	40.09	3.14	28.12	43.55	
Longitude (Long)	Province's angular distance east or west of the Greenwich meridian (Degrees)	1000	−3.84	3.69	−16.25	2.82	
Altitude (Alt)	Province's height above sea level or ground level (Meters)	1000	365.06	358.61	4.10	1129.84	

Source: Authors.

perature (Temp.), to capture the fixed effect of the provinces in each subgroup.

4. Results and discussion

Panel-Corrected Standard Errors (PCSE) have been estimated with standard errors robust to heteroscedasticity (see tests for heteroscedasticity in Table 4) and assuming an AR (1) correlation in the error term (see Wooldridge test in Table 4). According to the previous literature [39], this provides more accurate estimators than an estimate by Feasible Generalized Least Squares (FGLS). This methodological approach has also been used by González et al. [40] for a Spanish tourist demand modeling. In addition, time fixed effects have been included, while the province fixed effects have been captured with the geographic and climatic variables and another 5 explanatory variables which, as seen in Table 3, have no "within" variability. The fixed-effects model is based on the "within" variation of each province with respect to its average during the considered period. In this case, as Table 3 shows, province "between" variation is much higher than the "within" variation for

Table 2
WHSs in Spain by province, year of inscription, and generation.

Cultural WHSs			
Name of the Site	Province	Year	Generation
Alhambra	Granada	1984	
Generalife	Granada	1984	
Albayzín	Granada	1984	
Historic Center of Cordoba	Cordoba	1984	
Monastery and Site of the Escorial	Madrid	1984	
Works of Antoni Gaudí	Barcelona	1984	
Cave of Altamira and Paleolithic Cave Art of Northern Spain	Cantabria	1985	
Monuments of Oviedo and the Kingdom of the Asturias	Asturias	1985	
Old Town of Ávila with its Extra-Muros Churches	Avila	1985	
Old Town of Segovia	Segovia	1985	1st Generation
Aqueduct of Segovia	Segovia	1985	
Santiago de Compostela (Old Town)	A Coruña	1985	
Historic City of Toledo	Toledo	1986	
Mudejar Architecture of Aragon	Teruel and Zaragoza	1986	
Old Town of Cáceres	Caceres	1986	
Sevilla Cathedral	Sevilla	1987	
Alcázar	Sevilla	1987	
Archivo de Indias	Sevilla	1987	
Old City of Salamanca	Salamanca	1988	
Poblet Monastery	Tarragona	1991	
Archaeological Ensemble of Mérida	Badajoz	1993	
Routes of Santiago de Compostela	A Coruña	1993	
Royal Monastery of Santa María de Guadalupe	Caceres	1993	
Historic Walled Town of Cuenca	Cuenca	1996	
La Lonja de la Seda de Valencia	Valencia	1996	
Las Médulas	Leon	1997	2nd Generation
Palau de la Música Catalana	Barcelona	1997	
Hospital de Sant Pau	Barcelona	1997	
San Millán Yuso and Suso Monasteries	La Rioja	1997	
Rock Art of the Mediterranean Basin on the Iberian Peninsula	Multiple	1998	
University and Historic Precinct of Alcalá de Henares	Madrid	1998	
San Cristóbal de La Laguna	Tenerife	1999	
Archaeological Ensemble of Tárraco	Tarragona	2000	
Archaeological Site of Atapuerca	Burgos	2000	
Burgos Cathedral	Burgos	2000	
Catalan Romanesque Churches of the Vall de Boí	Lleida	2000	
Palmeral of Elche	Alicante	2000	
Roman Walls of Lugo	Lugo	2000	
Aranjuez Cultural Landscape	Madrid	2001	
Renaissance Monumental Ensembles of Úbeda	Jaen	2003	
Renaissance Monumental Ensembles of Baeza	Jaen	2003	3rd Generation
Vizcaya Bridge	Vizcaya	2006	
Tower of Hercules	A Coruña	2009	
Prehistoric Rock Art Sites in Siega Verde	Salamanca	2010	
Cultural Landscape of the Serra de Tramuntana	Islas Baleares	2011	
Heritage of Mercury in Almadén	Ciudad Real	2012	
Antequera Dolmen Site	Malaga	2016	
Caliphate City of Medina Azahara	Cordoba	2018	
Risco Caido and the Sacred Mountains of Gran Canaria Cultural Landscape	Las Palmas	2019	

Natural and mixed WHSs			
Name of the site	Province	Year	
Garajonay National Park	S.C. Tenerife	1986	1st Generation
Doñana National Park	Multiple	1994	
Pyrénées - Mont Perdu	Huesca	1997	2nd Generation
Ibiza, Biodiversity and Culture	Baleares	1999	
Teide National Park	S.C. Tenerife	2007	3rd Generation
Primeval Beech Forests	Multiple	2017	

Source: Authors from WHC [5].

all variables without exception, which clearly justifies the methodological approach used.

Estimation by PCSE exploits both "between" and "within" variation giving greater or lesser weight to one source of variation or another based on its contribution to the reduction in the standard deviation of the estimate. In fact, following Hsiao and Pesaran [41], the low variability of any of the variables of interest during the analyzed period—such as WHSs in this case—would prevent the fixed-effects model from obtaining a consistent estimator. Previous work on the impact of WHSs [9,42] came to the same conclusion regarding the lack of significance of fixed-effect models.

The variables do not present any significant correlation problems with each other. In addition, all the explanatory variables in the different estimates present variance inflation factors (VIFs) below 10, and the mean of the VIFs is 3. Finally, in all estimates, the unit root test (Levin–Lin–Chu test) indicates that the dependent variable does not present any non-stationarity problems (see Table 4).

Table 3
"Between" and "within" standard deviation.

Variable	Between	Within
Ftou	1.546	0.264
Dtou	0.735	0.179
WHScul	1.277	0.220
WHSnat	0.372	0.108
WHS80	0.471	0.000
WHS90	0.351	0.000
WHS21st	0.351	0.000
CPI	0.001	0.015
Hotels	0.612	0.099
Air	1.487	0.351
HST	0.595	0.315
Mus	0.593	0.217
Mich	0.823	0.289
Temp	0.125	0.040
Coast	0.501	0.000
Lat	3.174	0.000
Long	3.727	0.000
Alt	362.065	0.000

Source: Authors.

Table 5 shows that the results are robust for all 4 estimated models according to the considered dependent variable (Ftou or Dtou) and the variable-WHS relationship (WHScul and WHSnat or WHS80, WHS90 and WHS21st).

Likewise, as explained above, and in a novel way, the sample has been separated into inland and coastal provinces. These results are given in Table 6.

According to Table 5, the price level presents a negative but not significant coefficient, the hotel supply is a clear determinant of the tourism demand [34] and the number of museums has a positive and significant relationship with the number of foreign tourists, as suggested by Del Barrio et al. [37]. Regarding the transport infrastructure-related variables, HST seems to be a determinant of tourism, especially for domestic tourists [43]. The result for air transport (Air) shows that the number of companies with scheduled flights operating in each of the provinces is a significant factor for both domestic and international tourism demand, as in Rey et al. [35]. Finally, the gastronomic variable positively affects only international tourism demand [38], although the level of significance is relatively low.

Regarding climatic variables, the temperature does not seem to have a significant effect on tourist arrivals, possibly because tourists visiting Spain might be less weather-sensitive since they already perceive Spain to be a good weather country [44]. The significance of the geographic variables of altitude, longitude, and latitude shows that the east coast has the greatest power of tourist attraction, i.e., the Mediterranean and the islands compared to all others.

Table 4
Results of the tests.

	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
Breusch-Pagan/Cook-Weisberg test for heteroscedasticity (Ho: Constant variance)	9.02***	2.67**	56.63***	90.11***	3.38***	0.5**	6.16***	0.77**
Modified Wald test for groupwise heteroskedasticity (Ho: constant variance)	2520.18***	3335.18***	5496.55***	5710.96***	886.09***	1106.83***	340.38***	452.56***
Wooldridge test (Ho: no first order autocorrelation)	249.966***	246.656***	385.991***	387.766***	386.790***	419.962***	156.678***	106.771***
LLC test (Ho: panels contain unit roots)	−5.7257***	−5.7257***	−5.9097***	−5.9097***	−3.8136***	−3.8136***	−4.2711***	−4.2711***
VIF (max | mean)	5.04 |2.77	4.84 |2.72	5.04 |2.77	4.84 |2.72	7.44 |2.91	8.01 | 2.99	6.12 |2.61	6.41 |2.69

Note: Statistical significance at 1% (***), 5% (**), 10% (*).

Table 5
Results of all-province model (NUTS-3 regions).

	Ftou		Dtou	
Exogenous variables	(I)	(II)	(III)	(IV)
WHScul	0.093 (0.019)***	–	0.051 (0.018)***	–
WHSnat	0.101 (0.046)**	–	−0.024 (0.032)	–
WHS80	–	0.601 (0.068)***	–	0.239 (0.053)***
WHS90	–	0.352 (0.08)***	–	0.178 (0.039)***
WHS21st	–	0.250 (0.082)***	–	−0.018 (0.04)
CPI	−0.001 (1.327)	−0.033 (1.345)	−0.401 (0.880)	−0.429 (0.875)
Hotels	0.982 (0.055)***	0.901 (0.054)***	0.629 (0.034)***	0.603 (0.035)***
Air	0.094 (0.013)***	0.098 (0.013)***	0.041 (0.008)***	0.0401 (0.008)***
HST	0.040 (0.029)	0.043 (0.028)	0.034 (0.018)*	0.038 (0.017)**
Mus	0.080 (0.027)**	0.062 (0.028)**	0.037 (0.02)*	0.029 (0.020)
Mich	0.081 (0.020)***	0.092 (0.02)***	0.023 (0.019)	0.025 (0.019)
Temp	−0.038 (0.111)	−0.098 (0.118)	0.099 (0.066)	0.084 (0.066)
Coast	0.396 (0.081)***	0.437 (0.077)***	0.076 (0.045)*	0.128 (0.049)***
Lat	−0.173 (0.012)***	−0.184 (0.012)***	−0.051 (0.012)**	−0.053 (0.012)***
Long	0.058 (0.009)***	0.069 (0.009)***	0.026 (0.009)***	0.033 (0.008)***
Alt	−0.001 (0.000)***	−0.001 (0.000)***	0.000 (0.000)***	0.000 (0.000)***
Intercept	12.83 (0.776)***	13.914 (0.784)***	11.273 (0.683)***	11.53 (0.660)***
Time-fixed effect	Yes	Yes	Yes	Yes
AR(1)	Yes	Yes	Yes	Yes
Wald test (joint significance)	3139.31***	3390.91***	2270.25***	2460.3***
No. observations	1000	1000	1000	1000
No. provinces	50	50	50	50

Note: Standard errors in parentheses. Statistical significance at 1% (***), 5% (**), 10% (*).

Table 6
Results for the two sub-samples: inland and coastal provinces (Ftou as a dependent variable).

	COASTAL		INLAND	
Exogenous variables	(V)	(VI)	(VII)	(VIII)
WHScul	0.035 (0.027)	–	0.277 (0.022)***	–
WHSnat	0.107 (0.062)*	–	0.012 (0.062)	–
WHS80	–	0.272 (0.118)**	–	1.053 (0.072)***
WHS90	–	0.455 (0.095)***	–	0.363 (0.072)***
WHS21st	–	0.585 (0.094)***	–	0.342 (0.111)***
CPI	−0.380 (2.063)	−0.977 (1.802)	0.756 (2.168)	0.909 (2.424)
Hotels	1.076 (0.073)***	1.062 (0.07)***	0.811 (0.077)***	0.7 (0.074)***
Air	0.086 (0.017)***	0.051 (0.016)***	0.161 (0.021)***	0.182 (0.021)***
HST	0.097 (0.037)***	0.092 (0.038)**	0.095 (0.037)**	0.099 (0.037)***
Mus	−0.012 (0.043)	−0.034 (0.038)	0.268 (0.040)***	0.228 (0.041)***
Mich	0.158 (0.028)***	0.11 (0.024)***	0.064 (0.033)*	0.164 (0.035)***
Temp	−0.032 (0.146)	−0.043 (0.112)	−0.393 (0.199)**	−0.84 (0.290)***
Lat	−0.227 (0.013)***	−0.235 (0.013)***	0.053 (0.027)**	0.053 (0.029)*
Long	0.097 (0.009)***	0.098 (0.009)***	−0.082 (0.018)***	−0.016 (0.018)
Alt	0.000 (0.000)	−0.001 (0.000)***	−0.001 (0.000)***	−0.001 (0.000)***
Intercept	15.431 (1.069)***	15.862 (0.863)***	4.223 (1.468)***	5.24 (1.728)***
Time-fixed effect	Yes	Yes	Yes	Yes
AR(1)	Yes	Yes	Yes	Yes
Wald test (joint significance)	1706.08***	1752.82***	1934.31	1950.27
No. observations	440	440	560	560
No. provinces	22	22	28	28

Note: Standard errors in parentheses. Statistical significance at 1% (***), 5% (**), 10% (*).

Finally, different results are obtained in relation to the main objective of this paper. First, UNESCO's granting of WHS status to an asset is significant when considering all the provinces together, as is the case in China [8,13], Germany [14], Israel [15], and even the group of countries analyzed by Su and Lin [9]. Second, cultural sites (WHScul) have a more generalized impact than natural sites (WHSnat), as shown by the positive and significant coefficient of the variable in the two types of tourism, foreign and domestic. This coincides with Yang et al. [8] and Cuccia et al. [17] but not with Su and Lin [9]. It also makes sense from a logistical perspective, since natural WHSs tend to be located in more remote areas, which may limit their positive effect on tourism demand [10]. This is exactly the case in Spain where there are only a small number of natural WHSs (6 natural and mixed WHSs compared to 42 cultural WHSs). Third, first-generation WHSs have a greater impact on tourism than the most recently designated WHSs. Although all WHSs positively affect tourism demand, the power of attraction of the original WHSs seems to be stronger, so a sort of "first-generation effect" can be confirmed. This would mean that the increasing number of WHS properties over time might cause the WHS brand to lose exclusivity, which is what leads to the first and longest-standing WHSs having the greatest power of attraction.

Focusing on Table 6, with respect to coastal provinces, cultural WHSs cannot be considered a tourism-fostering tool, but natural WHSs and other tourism infrastructure-related variables can. Cultural assets are less important for "sun and sand" tourists, who seek other types of leisure. This idea is reinforced by the fact that the museum variable is not significant either. In this case, however, the most recent WHSs might have a greater impact on tourism demand, which may be a reflection of the fact that in the 1980s, a greater number of cultural sites were declared WHSs (only one natural WHS was declared). With respect to inland provinces, the opposite occurs. Cultural WHSs present a positive and significant coefficient, whereas natural WHSs do not. The idea that the demand for cultural assets is more related to inland than coastal provinces is again reinforced since the number of museums does have a positive relationship with the arrival of tourists in this case. Also, first-generation WHSs (WHS80) have a much greater positive impact than those in subsequent decades (WHS90 and WHS21st), and this can be referred to as the "first-generation effect". This further supports the above idea that a greater number of cultural sites were declared WHSs in the 1980s.

5. Concluding remarks

The main objective of this paper was to assess the tourist impact of UNESCO WHSs on tourism demand for the case of Spain. In addition, compared to other similar studies of a variety of countries, a set of additional elements has been included (the compatibility of WHSs with "sun and sand" tourism, the length of time since the declaration of WHS status and the different categories of WHS, cultural versus natural) that enable the present results to complement the conclusions of the previous literature on this subject.

The relationships between the arrival of foreign and domestic travelers and a wide range of factors are explored through the econometric methodology of panel data. The results highlight that prices, hotel supply, air transport and HST infrastructure, gastronomic quality, and climatic and geographical factors operate as economic theory, as the previous literature states.

The results for cultural tourism show a positive and significant relationship between the cultural offer (cultural assets with WHS status and the number of museums) and tourist demand when considering all the provinces. In addition, this relationship is stronger for international tourism than domestic tourism. It also seems that the first WHSs granted by UNESCO in the 1980s have a greater impact, revealing the importance of the "first- generation effect". Therefore, although UNESCO's WHS brand is not primarily designed for promoting tourism, it does play a role as a driver of tourist attraction. It is, therefore, advisable for regional Destination Management Organizations (DMOs) to include WHSs as a component of the tourist brand when coordinating tourist stakeholders and defining tourism policies [45]. Also, favoring the international projection and exposure of WHS, especially the most recent sites, would contribute to local tourism development while helping to ensure their preservation.

Regarding the limited effect of natural WHS on tourism demand, which is partially explained by their location and accessibility, policymakers should consider the possibility of their inclusion in tour packages and of improving their accessibility by both private and public transport (i.e., direct buses from cities).

The results for the two sub-samples, inland and coastal provinces (Table 6), show different patterns that should be considered by policymakers. On the one hand, the WHS tourism-enhancing effect in coastal provinces is generated by natural WHSs

rather than cultural and recently-designated WHSs. On the other hand, the main assets of inland provinces are cultural WHSs, especially those that are "first-generation". This does not mean that both tourism models are mutually exclusive, as shown by the abundance of mixed tour packages (cultural + sun and sand) all over the world, from Egypt to Thailand, in which for instance, the trip generally begins with several days of an eminently cultural tour but ends with a rest at a beach resort for the last few days.

In this sense, based on these results, it would be advisable for DMOs to analyze these synergies, case by case, to increase the attractiveness of both types of tourism. For example, facilitating tourist excursions from the beach resort to a nearby cultural WHS. By the same token, this would serve as a catalyst for other complementary tourist products such as the quality gastronomic offer.

Finally, and also based on the different results obtained for coastal and inland provinces, it can be stated that no global measures or tourism policies should be applied to all Spanish territory but, on the contrary, it is preferable to tailor individual tourism policies to each destination to increase competitiveness. Nevertheless, it would be advisable in all cases for cities to have a UNESCO WHS listed site in the area to be able to actively participate in national and international networks such as the Organization of World Heritage Cities (https://www.ovpm.org/), share best practices and marketing strategies, and join forces in tourism promotion. As an example, multi-day tours through nearby WHSs could be offered as a tourist product.

Despite the robustness of our results, we consider the main limitation of our study to be the analysis. Due to the statistical data available from official sources, our analysis has been conducted at the provincial level (NUTS-3) and not at the municipality level, which would have allowed us to better control the dependent variables (Ftou and Dtou) in municipalities where WHSs are located. This would be an interesting future line of research, since a significant part of the responsibility for being on the WHS list and for managing and preserving a WHS falls to the municipality/municipalities in which it is located.

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