Measuring the role of Blue Flags in attracting sustainable "sun-and-sand" tourism.

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Abstract

Eco-labels such as Blue Flags can be effective for enhancing both sustainability and tourism. Given the ongoing political debate on the effectiveness of Blue Flags for promoting tourism, we analyze the impact of the number of Blue Flag beaches on tourist arrivals (international and domestic, respectively) for Spanish coastal provinces. Panel data techniques are used to evaluate Blue Flags econometrically for the longest and most recent time period in the literature (2000-2019). Findings suggest that Blue Flags are effective at promoting international tourism but not domestic tourism. Different patterns for international and domestic tourists mean that differentiated policies should be applied.

Keywords

Blue Flags, Sustainable Tourism, sun-and-sand, tourism demand, Spain, NUTS-3, panel data.

1. Introduction.

Evidence shows that the negative effects of tourism on the environment (Kaján and Saarinen, 2013; Gao and Zhang, 2019) are even greater at coastal resorts (Davenport and Davenport, 2006). Tourism has dominated coastal activity since the mid-20th century (Zielinski and Botero, 2019) and intensive beach use has had negative environmental effects such as physical and ecological degradation (Jimenez et al., 2007; Phillips and House, 2009). Mass tourism at resorts, where tourists are normally concentrated in small areas, produces greater quantities of pollution and waste and degrade water conditions (Onofri and Nunes, 2013). In addition, climate change is aggravating these problems, with issues such as a rise in the sea-level, a change in rainfall, and higher water temperatures that disrupt the marine ecosystem (Hall et al, 2018).

Sustainable tourism at coastal destinations is firmly positioned on the 2030 Agenda (UNWTO, 2020b), but strong political efforts are needed to balance power relations between economic interests and beach and coastal ecosystem management (Gössling et al., 2018). In response to this concern for the environment and the quality of the beaches, quality accreditation strategies such as eco-labels have emerged to simultaneously enhance both the tourist industry's sustainability and its competitiveness (Zielinski and Botero, 2019). One type of eco-label is the Beach Certification Scheme (BCS), which evaluates the characteristics of a specific beach according to standard criteria to find the right balance between recreation and conservation (Nelson and Boterill, 2002). Since BCS's are usually applied in the form of awards (Botero et al., 2015), they are considered to be not only an environmental management tool but also a means of promoting and improving a coastal tourist destination's competitiveness and tourism quality indicator (Mir-Gual et al., 2015; Klein and Dodds, 2018). In other words, and according to Pencarelli et al. (2016), if managed correctly, environmental certifications and, specifically, BCS's can help to simultaneously achieve two aims: effective environmental protection and tourism promotion, and the economic growth of coastal tourism destinations.

One of these BCS's is the Foundation for Environmental Education's (FEE) well-known Blue Flag (BF), awarded to beaches, marinas, and sustainable boating tourism operators that meet and maintain a series of conditions and accessibility, health, environmental education, cleanliness, and safety requirements (Blue Flag, 2020) that conform to the United Nations Sustainable Development Goals for 2015-2030. BFs have become a social phenomenon that attracts both media coverage (Aliraja and Rughooputh, 2005) and motivates public authorities to make efforts to obtain them (Fraguell et al., 2016), as they are perceived as a sign of quality by tourists and tour operators (McKenna et al., 2011). BF is probably one of the world's most recognized and widespread voluntary eco-labels that combine recreation and environmental conservation while, at the same time, having high economic significance, contributing to ending poverty, creating job opportunities and supporting innovation programs and resource-use efficiency technologies (FEE, 2019).

However, in the opinion of authors as Bernini and Cerqua (2020), there seems to be no clear consensus in the academic literature on how effective BFs are at promoting tourism demand. So, the purpose of this paper is to contribute new evidence to the current literature and test how effective having a BF award is for attracting tourists.

The case of Spain is especially interesting as it is a leading tourist destination (UNWTO, 2020a), especially in the "sun-and-sand" segment, and also the country with the highest number of BF awards (566 in 2019). This justifies the growth in the number of studies in Spain that address the issue of sustainable tourism, eco-labels and, specifically, BF certification (Blancas et al., 2010; Roig-Munar, 2018). However, few studies address the impact of accreditation on tourism demand (i.e., tourism inflows) and those that do, only use BFs as a control variable (Bujosa and Roselló, 2013; Álvarez-Diaz et al., 2020).

To the best of our knowledge, to date no study has simultaneously analyzed both foreign and domestic tourists, respectively, for Spain and looked for any possible differences in their decision-making patterns. Also, none of the previous BF-related studies have used panel data methodology, which has been recognized as effective in tourism demand models (Song and Li, 2008; Dogru et al., 2017), especially when there is high variability across countries/provinces, as there is in the case of the highly heterogeneous Spanish provinces (Garín-Muñoz and Montero-Martín, 2007).

Therefore, this paper intends to cover these gaps with a comparison of the impact of BFs on foreign and domestic tourism demand and, as an additional innovation, for the longest and most recent period in the academic literature, 2000-2019.

For this, an econometric analysis of panel data has been carried out on a sample of 22 Spanish coastal provinces for the period 2000-2019. The analysis considers a series of climatic, geographic, infrastructure and cultural variables and a set of different specifications to explore the tourism impact of the variable of BF awards by province, which is the main goal of the current paper.

The paper is structured as follows: Following this introduction, Section 2 establishes the current impact of BFs on sustainable tourism. Data and the methodology framework are included in Section 3. Section 4 discusses the results and, lastly, Section 5 offers some conclusions.

2. The impact of Blue Flags on sustainable tourism

2.1. Worldwide literature review

The importance of sustainable tourism, especially for coastal resorts, has caused eco-labels to catch the attention of the academic literature in recent years. Eco-labels can be applied to almost any type of tourist product that meets certain environmental criteria, including restaurants, hotels, and beaches (Bernini and Cerqua, 2020). Many authors consider an eco-label, and specifically, a BCS, a useful tool not only for improving environmental quality (Pencarelli et al., 2015), but also for promoting the development of tourist products, improving a resort's eco-friendly image and making it more competitive (Klein and Dodds, 2018), although there are discrepancies in this regard (Mir-Gual et al., 2015).

The most recognizable BCS, since it was the first to emerge, is the BF certificate (Zielinski and Botero, 2019). This is a rating scheme implemented by FEE in 1987 in France that evaluates a beach's performance and determines whether certain quality criteria are met. To be precise, it is an international award that offers indicators of the quality of environmental education and accessibility, water quality, environmental management, and safety services (Blue Flag, 2020). According to FEE Website information (see https://www.blueflag.global/criteria), the BF award criteria are developed in a partnership between an expert committee and relevant national, regional, and local sectors and are subject to change (updated yearly) to guarantee the symbol of excellence and provide a powerful incentive that encourages owners and candidates to continuously improve. Consequently, it might be said that the constant updating of these criteria, together with the recognized quality of the award, require a significant effort to be made in areas that rely heavily on tourism and where sun and sand tourism plays an important role.

In 2020, a total of 4,573 beaches, marinas, and tourism boats were accredited in 47 different countries (Blue Flag, 2020). BFs have mostly been awarded in Europe, although the scheme is being expanded to other areas such as the Americas, the Caribbean, Africa and the Pacific region. Other national BCS's have been created since the beginning of the 1990s apart from BFs. These include the Bandera Azul Ecológica in Costa Rica, Blue Wave in the USA, the Green Coast Award and the Seaside Awards in the UK and Ireland, IRAM 42100 in Argentina, Marca Q in Spain, Playa Ambiental in Cuba, and Playa Natural in Uruguay. However, most have not been successfully implemented and, in any case, the BF scheme has the highest number of certified beaches and the greatest international recognition, and is considered to be the global leader of all the BCS's (Zielinski et al, 2019), which justifies the greater attention that BFs have received in the academic literature.

BFs were initially designed to create environmental awareness and promote good practice among all tourism stakeholders (Blue Flag, 2020) but, although they were created to protect the maritime ecosystem, they also act as a tourism marketing tool (Schianetz et al., 2007). BFs have proven to be a powerful tool to raise political will toward beach management actions (Botero and Zielinski, 2020).

Some authors argue that BFs have failed to meet their primary objective (environmental protection), as they do not address all the relevant aspects of beach ecosystem protection and management (Lucrezi et al., 2016) and not all BF beaches present ecological and scenic scenarios (Mir-Gual et al., 2015). However, Bernini and Cerqua (2020) argue that these criticisms are more a call to redesign beach certifications, as they are effective sustainability tools for the specific areas for which they are designed. Nonetheless, many authors consider that, despite their usefulness for effective environmental protection, BFs have largely been used as a communication tool for attracting tourism (Klein and Dodds, 2017; Ulme et al., 2018).

A large number of studies address the economic impact of BFs (e.g. McKenna et al, 2011; Capacci et al, 2015; Bernini and Cerqua, 2020; Chamorro-Mera et al., 2020; Merino and Prats, 2020) but there is no clear consensus in the literature on their effect in the tourism industry. Some authors focus on whether visitor satisfaction is improved by a beach having a BF. Dodds and Holmes (2019), for example, do not find that BFs have a positive impact on overall satisfaction with Canadian beaches but, rather, with the beach locations. These results are consistent with Lucrezi and Saayman (2015), who find no evidence that the award increases satisfaction with beaches, even though the characteristics of an “ideal beach” coincide with BF criteria for visitors.

Other authors focus on the award’s impact on tourist destinations’ competitiveness. For Italian small and medium destinations, Goffi and Cucculelli (2019) observe a general pattern of hotels at resorts with BFs performing better than hotels at similar resorts without BFs. Also for Italy, Lorenzini et al. (2011) observe a significant impact of heritage signaling (such as UNESCO or BF) on the number of overnight stays and consider that the territorial brand should be included in destination management processes. For Canada, Dodds, and Holmes (2020) suggest that BFs are a signal of indirect competitiveness.

Some authors think that BFs have positive spillover effects on other areas of the tourism economy, so the economic incentives mean it is worth the effort to obtain BF certification. Sipic (2017) observes a positive impact of BFs on marina slip rental prices, sailboat charters, and hotel services, with price premiums in Croatia ranging between 18% and 72% due to BFs offering product differentiation and, therefore, making it easier to raise prices. This advantage in product differentiation can also be seen in Blackman (2012), who, in a study of beaches in Costa Rica, finds evidence that BFs attract investment in new and, especially, luxury hotels. Saayman and Saayman (2017) also recognize the economic incentives afforded by BFs and find evidence that the BF beach-goer profile is one of higher income and higher expenditure.

Lastly, there is a large group of authors who directly or indirectly analyze the impact of BFs on tourism inflows, i.e., they use tourism demand models to analyze whether BFs are a determinant of tourism demand or not. This group includes Quintinialli (2009), who analyzes the determinants of tourism demand for Italy, Spain, Greece, Croatia, and Cyprus and uses the number of BFs as a control variable but observes no significant impact on tourist arrivals. Marrocu (2013) also uses BFs as a control variable in an analysis of the determinants of tourist demand for Italy and, in this case, beach quality, measured by the number of BFs, is found to be significant. The reasoning is that destinations with BFs are full of natural, cultural, and recreational amenities and that these attract greater tourism flows. These results coincide with Capacci et al. (2015), whose study of Italian coastal provinces finds evidence that the number of BFs has a positive impact on foreign tourist arrivals. However, in a similar study, also for Italy, Cerqua (2017) finds no effect on the flow of international tourists, only on domestic tourism. This coincides with Saayman and Saayman (2017) for the case of South Africa, who state that BF destinations are more frequented by local people than by foreign visitors, so there may be a need for greater international promotion.

2.2. Blue Flags in Spain

Spain is a relevant case study. It is a leading tourism country (the second most-visited country in 2019 (UNWTO, 2020a) and the Spanish economy is also highly dependent on the tourism sector (Benito, 2016).

Coastal zones are vitally important for Spanish tourism activity, especially during the high season, when there are large concentrations of population and human activity in these areas (Albaladejo and González-Martínez, 2019a). The term “sustainable tourism” has, therefore, been coined as a strategy to address this challenge (Cervelló-Royo and Peiró-Signes, 2015).

As a result of growing environmental awareness and in an attempt to make its tourism more competitive, Spain is now the country with most beaches with BF awards in the world (Blue Flag, 2020). The following table shows the number of BF beaches in the 24 Spanish coastal provinces.

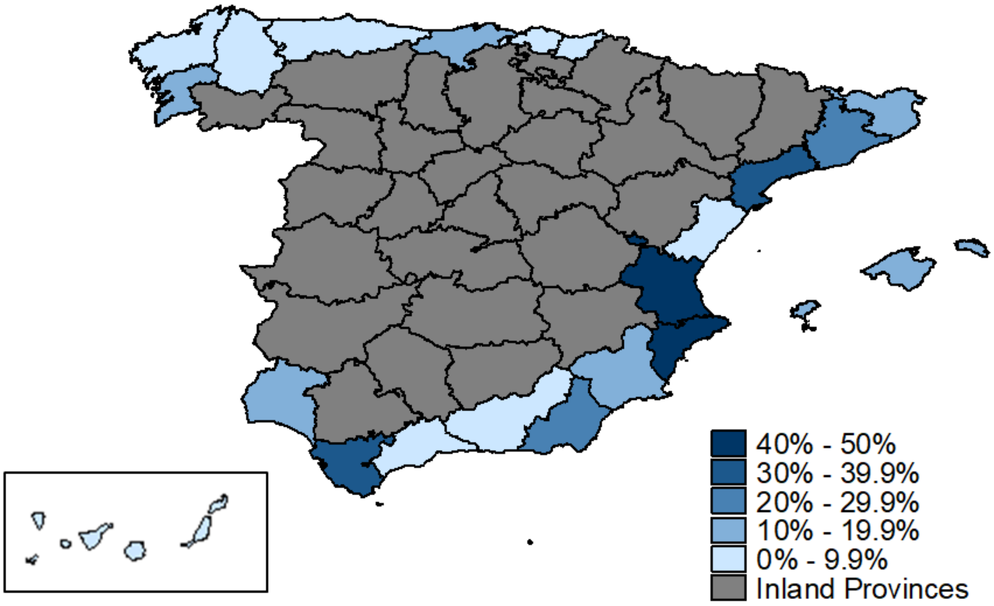
Table 1. Spanish coastal provinces and BFs (2019)

Spanish Region/Sea	Spanish Province (Eurostat NUTS-3 region)	Size (in Km^2)	Coastline (in Km)	Number of BFs	Number of Beaches	% BFs/ Beaches	Domestic tourists*	Foreign tourists*
North Atlantic and Cantabrian	**A Coruña**	7,950	910	38	410	9.27	1,284,969	652,504
	Gipuzkoa	1,909	84	0	36	0.00	639,533	557,555
	Lugo	9,856	120	14	81	17.28	478,802	169,678
	Asturias	10,603	334	12	205	5.85	1,461,717	319,918
	Pontevedra	4,495	289	55	370	14.86	1,118,524	389,581
	Cantabria	5,325	211	11	80	13.75	1,037,767	283,953
	Vizcaya	2,217	108	2	31	6.45	936,627	654,550
Mediterranean and South Atlantic	**Alicante**	5,816	212	71	173	41.04	2,578,721	2,003,803
	Almeria	8,774	217	27	111	24.32	1,151,028	341,883
	Islas Baleares	4,992	910	44	348	12.64	1,396,579	9,185,485
	Barcelona	7,733	101	26	112	23.21	3,161,272	9,650,212
	Cadiz	7,436	252	29	84	34.52	1,796,854	995,131
	Castellon	6,632	116	33	96	34.38	1,057,987	210,239
	Girona	5,910	198	28	183	15.30	1,717,387	2,306,352
	Granada	12,531	71	3	48	6.25	1,708,416	1,561,962
	Huelva	10,148	111	3	28	10.71	826,436	252,511
	Malaga	7,308	161	17	131	12.98	2,227,277	3,594,081
	Murcia	11,313	208	25	199	12.56	1,052,776	304,166
	Las Palmas	4,066	608	25	322	7.76	1,124,387	4,500,298
	S.C.Tenerife	3,381	518	18	258	6.98	1,143,950	3,005,943
	Tarragona	6,303	216	43	122	35.25	1,657,566	1,307,266
	Valencia	10,763	109	31	62	50.00	1,901,813	1,572,156
	Ceuta	19	20	2	16	12.50	46,267	30,072
	Melilla	13	9	3	8	37.50	44,806	22,504

*With a minimum of one overnight hotel stay
Source: Authors from Blue Flag (2019) and INE (2020)

BFs have not been evenly distributed throughout the provinces, with an overall higher ratio of beaches awarded BFs per total beaches on the Mediterranean and South Atlantic coasts. This uneven distribution can be observed in Figure 1.

Figure 1. Map of the share of BF beaches in Spain (2019).



Source: Authors from Blue Flag (2019)

All this has sparked the academic literature's interest in sustainable tourism and eco-labels at coastal destinations in Spain, especially BCS's (Botero et al., 2018). According to Cervelló-Royo and Peiró-Signes (2015), it is vital to improve the environmental, economic, and social conditions of the coastal zone in line with the principle of sustainable development. The coastal destinations that best implement sustainable management include those that have been awarded BFs (Blancas et al., 2010), although for some authors such as Mir-Gual et al., (2015), this accreditation needs a deeper ecological vision, which is probably linked to the fact that most BF beaches are in urban and semi-urban environments with less relevant environmental values (Roig-Munar et al., 2018).

The academic literature not only analyzes the award's effectiveness for the environment, but also its economic effectiveness in terms of promoting tourism in Spain, which is another reason why beaches want to obtain BFs (Palazón et al., 2019). However, there does not seem to be a clear consensus on the issue.

Cabezas-Rabadán et al. (2019) examine a selection of six award-winning beaches in Valencia province (Spanish Mediterranean coast) to search for common patterns but determine that there is a lack of knowledge of BF certification's impact and that the award has little influence on tourists' choices of beach destinations. In a survey of Spanish and Portuguese tourists, Chamorro-Mera et al. (2019) suggest that a high percentage of tourists prefer BF beaches, although they are not willing to pay more for them. Other studies measure other aspects of BFs or the spillover effects that they might have on the tourism sector. For example, Rigall-I-Torrent et al. (2011) measure the effect of Catalonian beaches' characteristics on hotel prices and determine that BFs raise prices by approx. 11.5%, enough to justify any efforts to obtain a BF award. Fuentes et al. (2012) measure the technical efficiency of 22 coastal destinations in Spain and Portugal and suggest that, as a quality measure and an effort to display a good image abroad, BF is the variable that most differentiates between efficient and inefficient destinations.

Others authors like Álvarez-Diaz et al. (2020), model domestic tourist demand in Spain and suggest that income level, relative prices, the climate, and infrastructure are not the only factors that affect domestic tourism flows, but others also do, including natural amenities, measured by the variables such as Natural Parks and BFs. Bujosa and Rosselló (2013) also seek to identify the determinants of domestic tourism demand, although focusing on climatic variables. They find temperature as a major factor but also state that the size of the share of BF-rated beaches (included as a control variable) increases the likelihood of a destination being chosen.

3. Data and methodology

Panel data methodology is used for the 22 Spanish coastal provinces[1] (NUTS-3 regions, according to Eurostat territorial statistical classification) and the 2000-2019 period. The following model is applied, with *i* = provinces and *t* = years:

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

Both the dependent and independent variables are based on the previous academic literature, where they have been used in similar generic tourist demand models (i.e., Seetaram, 2012; Khoshnevis and Khanalizadeh, 2017). In the present case, as in Garín-Muñoz (2009), two dependent variables, Y_{it} (log of tourist numbers) are used to differentiate between resident and non-resident tourists since Gil-Alana et al. (2019) suggest that domestic and foreign tourists generally follow different patterns.

X_{it} represents the variable related to BF awards and is this study's main object. In particular, we use the number of beaches awarded BFs in the previous year per total beaches by province (%), as in Bujosa and Roselló (2013). Due to the lack of a homogeneous coastline in Spain, with many provinces with long coastlines but few beaches (i.e., some northern provinces with a high number of cliffs) and some provinces with very long beaches, which ultimately means fewer beaches per km (see Table 1), we believe that this variable (share of beaches with BF awards in the province) gives a more accurate

1 Ceuta and Melilla are excluded to prevent any deviations due to their small size and tourist volumes.

representation of the quality of the province's beach landscape than other BF-related variables used in previous studies such as the number of beaches awarded BFs per length (km) of coastline, in Alvarez-Díaz et al. (2020), or simply the number of beaches awarded BFs by province, as in Cappacci et al. (2015), which might underestimate the quality of these provinces' beach resources.

We have, nonetheless, tested our model with these other BF-related variables used in previous studies (i.e., number of beaches awarded BFs and number of beaches awarded BFs by km of coastline) and the results are highly robust. This is explained by the fact that we use a *log-log* model, so within-data variability is the same, since the "original" variable (number of beaches awarded BFs) is divided by a constant.

In addition, in line with Cappacci et al. (2015) we identify the number of beaches awarded BFs the previous year as the number of BF beaches for each individual year does not seem to be entirely relevant for planning vacations. This is logical, as BF awards are announced around the month of May, when many families have already planned their vacation trips (Cappacci et al., 2015).

W_{it} is a series of attributes related to tourism supply and infrastructure such as prices, hotel supply, connectivity and accessibility by air transport and High Speed Train (HST), number of museums, and number of restaurants with 3 Michelin Stars. In line with the previous literature, we expect all these variables to have some effect on the number of tourist arrivals. In particular, we expect the destination's price level (Consumer's Price Index, CPI), which is essential in a tourism demand function (Drogu et al., 2017), to have a negative relationship with the number of visitors (Albaladejo and González-Martinez, 2019a). Hotel supply, measured by the number of hotel establishments by province, is also a clear determinant of tourism demand (Roget and González, 2006). We also expect air transport infrastructure, considered a main determinant of tourism destination competitiveness (Fernández et al, 2020) and measured by the number of regular airlines operating in the province, to have a greater impact than HST, measured by the number of other provinces that can be reached by HST, in line with Castillo-Manzano et al. (2018) and Albalate and Fagueda (2016). For recreational activities, we include the number of museums by province (Campaniello and Richiardi, 2017; Del Barrio et al., 2009) as a proxy of the cultural offer, and the number of restaurants with 3 Michelin stars by province as a proxy of the provinces' gastronomic quality (Castillo-Manzano et al., 2020).

Z_{it} refers to the provinces' climatic and geographic variables. Specifically, we include the mean maximum temperature by province, as considerable differences exist (Bujosa and Roselló, 2013) and might affect seasonality (Duro and Turrión-Prats, 2019), and a dummy called "Island", as both the

Balearic Island and Canary Island archipelagos are considered to be tourist hubs where tourism is a major economic driver (Roig-Munar et al., 2018). These two variables will, therefore, also help to capture province fixed effects.

Year indicates the time trend. This can help to capture the reputational effect, which is also important for coastal tourism demand (Albaladejo and González-Martínez, 2019b).

Table 2 summarizes the variables, their definitions, sources, and descriptive statistics and Table 3 gives the correlation matrix of the dependent variables. The line graphs of the variables for all the Spanish coastal provinces are given in Appendix I.

Table 2. Variables and descriptive statistics

Variable (abbreviation)	Description	No. of obs.	Mean	Std. Dev.	Min.	Max.	Source
Endogenous Variables							
Foreign tourists (Ftou)	Number of non-residents with a minimum of one overnight hotel stay by province (Log)	440	13.34	1.26	10.48	16.08	Spanish Statistical Institute (INE)
Domestic tourists (Dtou)	Number of Spanish residents with a minimum of one overnight hotel stay by province (Log)	440	13.88	0.47	12.66	15.03	
Exogenous variables							
Blue Flags (BFs)	Share (%) of beaches awarded BFs the previous year out of total beaches by province (log)	440	1.140	1.369	0	3.912	Blue Flag
Consumer's Price Index (CPI)	Consumer Price Index inter-annual variation by province	440	0.217	0.015	-0.011	0.051	Spanish Statistical Institute (INE)
Hotels (Hotels)	Number of hotel establishments by province (Log)	440	5.814	0.536	4.388	7.07	
Number of airlines (Air)	Number of scheduled airlines by province (Log)	440	2.421	1.345	0	5.198	Spanish Airport operator (AENA)
Number of provinces connected by High-Speed Train (HST)	Number of other provinces that can be reached by HST from each province	440	0.167	0.458	0	1.792	Spanish Railway Infrastructure Administrator (ADIF)
Museums (Mus)	Number of museums and museum collections recorded in the census by province (Log)	440	3.298	0.667	1.791	4.701	Ministry of Education, Culture and Sports (MECD)
Number of 3 Michelin Star Restaurants (Mich)	Number of 3 Michelin Star restaurants by province (Log)	440	0.053	0.217	0	1.098	State Meteorology Agency (AEMET)
Maximum temperature (Temp)	Mean maximum temperature (in ºC) by province (Log)	440	3.056	0.131	2.58	3.266	
Island	1 if island province; 0 otherwise	440	0.091	0.287	0	1	

Source: Authors

Table 3. Correlation matrix.

	BF	CPI	Hotels	AIR	HST	Mus	Mich	Temp	Island
BFs	1.000								
CPI	-0.052	1.000							
Hotels	0.004	0.001	1.000						
AIR	-0.011	-0.001	0.495	1.000					
HST	0.163	-0.103	0.470	0.268	1.000				
Mus	0.046	-0.020	0.453	0.465	0.277	1.000			
Mich	-0.041	-0.020	-0.011	-0.116	0.140	0.113	1.000		
Temp	0.307	-0.039	-0.164	0.306	0.016	0.128	-0.332	1.000	
Island	-0.315	-0.085	-0.179	0.296	-0.115	-0.005	-0.077	0.342	1.000
Time	0.095	-0.631	0.049	0.005	0.233	0.053	0.092	0.026	0.000

Source: Authors

4. Results and discussion.

Panel-Corrected Standard Errors (PCSE) have been estimated with standard errors robust to heteroscedasticity and assuming an AR (1) correlation in the error term, as is usual in analyses of Spanish provinces (González et al., 2018). Both the low values of the correlation coefficients (see correlation matrix in Table 3) and the low values of the VIFs (maximum 2.84 and average 1.57 depending on the model variable) indicate that there are no significant correlation problems. The VIF values are much lower than the rule-of-thumb recommendations (10) in econometrics textbooks especially (Hair et al., 2013). Neither of the two dependent variables presents any stationarity problems.

Province fixed effects are also included as there might be unobserved, individual-specific (and time-invariant) factors that impact the outcome and that are correlated with our variables of interest, and also considering the substantial differences that exist between coastal provinces in Spain (Cervelló-Royo and Peiró-Signes, 2015). Since this is a public policy evaluation paper (i.e., the efforts made to gain the BF award) rather than a study designed to forecast tourism demand, it is appropriate to use the static model with fixed effects.

This approach is becoming increasingly relevant in policy evaluation papers, where the within effects are the target of greatest interest (Fairbrother and Jones, 2019). There are many academic papers on the evaluation of public policies in different fields that use the static model with fixed effects, not only in tourism, such as Albalate and Fagueda (2016), but also in public transport (Anna and Angelo, 2014), road safety (Castillo-Manzano et al., 2015) and even renewable energy (Liu et al, 2019), among others. Also, although the nature of our data (a relatively large T=20 that is of a similar size to the N=22) prevents the use of a dynamic specification (a specification that is only applicable to a large N and a small T (Arellano, 2003; Roodman, 2009), as can be seen in the Gallego et al. (2019) literature review of dynamic panel data models in tourism), nonetheless a dynamic model is included in Appendix II with a modification made to the period (using biannual data) to show the robustness of our results.

Three models have been estimated, each with two different dependent variables (see Table 4). The reason for this is the different treatment given to the time variable. First, we include a time trend, as the 20-year period of observation (2000-2019) means that it is plausible that tourism demand in Spain, as in the rest of the world, has followed a deterministic path over time, as suggested by Martins et al. (2017). The time trend would, therefore, allow to control for the exogenous increase in the dependent variable not explained by other variables.

We also understand that a fixed time effect might be preferable from an econometric point of view. However, in samples covering so many years—20 in this particular case—this can lead to overparameterization and cause problems as we also include province fixed effects and the AR(1) component per province. In this sense, we believe that an optimal solution would be to include a dummy for the years when a shock occurs such as the international tourism crisis in 2002 in the wake of the 9/11 terrorist attack (Khoshnevis and Khanalizadeh, 2017) and the first years of the financial crisis (2008, 2009, and 2010), when Spain received a greatly reduced number of international (mainly European) tourists. We also estimate the model with a pure fixed time effect and an independent correlation structure.

In short, we run the three following models:

1. Province fixed effect (PFE) with time trend
2. Province fixed effect (PFE) with time trend and dummies for years of crisis (2002, 2008, 2009, 2010)
3. Province fixed effect (PFE) with time fixed effect (FE).

Table 4. Results of PCSE model estimation (coastal NUTS-3 regions)

Exogenous Variables	PFE + time trend (1)		PFE + time trend + dummies crisis years (2)		PFE+ time FE (3)	
	Ftou	Dtou	Ftou	Dtou	Ftou	Dtou
BFs	0.036 (0.010)***	0.004 (0.010)	0.011 (0.010)*	0.013 (0.011)	0.045 (0.015)***	0.001 (0.010)
CPI	-0.985 (0.324)***	-0.785 (0.533)***	-0.351 (0.420)	0.296 (0.461)	1.543 (2.226)	-2.224 (1.742)
Hotels	0.451 (0.052)***	0.326 (0.069) ***	0.440 (0.050)***	0.338 (0.061) ***	0.631 (0.049)***	0.491 (0.039) ***
Air	0.036 (0.008)***	0.010 (0.013)	0.032 (0.012)***	-0.001 (0.014)	0.001 (0.0)***	-0.013 (0.014)
HST	0.020 (0.022)	-0.021 (0.021)	0.016 (0.022)	-0.006 (0.019)	0.034 (0.024)	0.019 (0.014)
Mus	0.062 (0.029)**	0.009 (0.027)	0.068 (0.027)**	-0.009 -(0.027)	0.111 (0.034)***	-0.024 (0.023)**
Mich	0.063 (0.026)**	0.019 (0.032)	0.064 (0.024)***	0.014 (0.040)	0.124 (0.043)***	-0.108 (0.034)*
Temp	0.230 (0.133)*	0.235 (0.126)*	0.119 (0.131)	0.268 (0.154)*	0.296 (0.226)	0.108 (0.034)**
Island	0.780 (0.071)***	-0.647 (0.119)***	1.062 (0.072)***	-0.576 (0.108)***	0.981 (0.058)***	-0.517 (0.046)***
Time	0.039 (0.001)***	0.023 (0.001)***	0.039 (0.001)***	0.023 (0.001)***	-	
Intercept	-68.587 (2.885)***	-36.354 (3.398)*	-68.342 (2.802)***	-34.743 (2.942)***	10.238 (0.851)***	10.368 (0.623)***
Province fixed effect	YES	YES	YES	YES	YES	YES
Time fixed effect	NO		2002, 2008, 2009, 2010		YES	
Autocorrelation structure	AR(1)	AR(1)	AR(1)	AR(1)	-	-
Wald test (joint significance)	37,449.25***	1538.44***	55,117.75***	7,063.02***	79,835.07***	17,638.30***
R^2	0.9994	0.9983	0.9996	0.9981	0.991	0.902
Modified Wald test - heteroscedasticity	961.55***	220.49***	1,551.54***	124.37***	606.39***	199.04***
Wooldridge test – autocorrelation	199.588***	270.578***	199.588***	270.578***	199.588***	270.578***
LLC (Levin-Lin-Chu) test – non-stationarity	-3.832***	-5.229***	-3.832***	-5.229***	-3.832***	-5.229***
VIF (max|mean)	2.25| 1.75		2.25| 1.75		2.25| 1.75	
No. observations	440					
No. provinces	22					

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

Results in Table 4 are consistent with the previous academic literature. CPI has a significant negative relationship with both foreign and domestic tourist inflows, indicating that tourist arrivals at coastal resorts are sensitive to price changes (Albaladejo and González-Martinez, 2019b). The Hotels variable, considered one of the main determinants of tourism demand presents a positive influence for both foreign and domestic tourists (Roget and González, 2006).

The air connectivity variable (Air) is positive and significant only for foreign tourists corroborating to earlier scholars such as Castillo-Manzano et al. (2018) and Rey et al. (2011); and the HST connectivity variable is positive but not significant for either of the two tourist groups, as demonstrated Albalate and Fageda (2016). In this case, both these results can be easily interpreted as follows: while foreign tourists prefer to arrive by air or may have no alternative, the fact that these variables (Air and HST) are not significant for domestic tourism indicates that domestic tourists normally travel to coastal destinations by road, either by private car or bus, as Perles-Ribes et al. (2020) explain.

The museum variable (MUS) presents low levels of significance for both groups of tourists. Despite being an important factor in general tourist demand, it seems to be less significant for sun-and-sand destinations, where tourists seek mainly other types of leisure (Alegre et al., 2011). On the other hand, there is a positive relationship between gastronomic quality, measured by the number of Michelin Star restaurants (Mich), and tourist demand in coastal provinces. The impact of gastronomic quality is slightly higher for foreign than for domestic tourists, as suggested by Castillo-Manzano et al. (2020), who showed that this variable was significant due to the inclusion of inland provinces, where gastronomic assets are an even more important determinant of tourism demand.

The temperature variable (Temp) is positive for both foreign and domestic tourists, indicating a preference for warmer provinces, i.e., those on the Mediterranean and South Atlantic coasts rather than the Cantabrian and North Atlantic provinces (Bujosa and Roselló, 2013). The low significance of the variables indicates that tourists in Spain are less weather-sensitive as they already perceive Spain to be a good weather country (Beerli and Marti, 2004). However, this variable is not significant for domestic tourists. Meanwhile, the variable Island is positive and significant for foreign tourists and negative and significant for domestic tourists. This is a reflection of the tourism model of the Canary Islands and the Balearic Islands, which receive mainly foreign tourists (Roig-Munar et al., 2018) and where the "distance effect" has an impact, since domestic travelers tend to travel to provinces in their own regions (Álvarez-Diaz et al., 2019).

A very interesting pattern emerges from these results. Their joint analysis shows that the variables air transport, temperature, and island indicate contrasting results for foreign and domestic tourists; it would appear that, in the case of coastal and sun-and-sand destinations, domestic tourists travel to the closest destinations and by road, and are not bothered about the temperature or any other determinants such as the number of museums, whose coefficients have been found not to be significant.

Last but not least, this idea is reinforced by the results for our variable of interest, the number of beaches awarded BF accreditation. According to results shown by Table 4, it seems that, while this award may be a good indicator of quality and, therefore, of attraction of foreign tourists, it has no impact on domestic tourists. While this finding is contrary to earlier research by Bujosa and Roselló (2013) and Álvarez-Diaz et al. (2020), it is in line with other international studies such as Capacci et al. (2015) and with the fact that BFs are a signaling instrument that helps to reduce any asymmetric information for international tourists (Cerqua, 2017). It also seems to indicate that domestic tourists travel to sun-and-sand destinations that are closer to them in terms of culture, proximity, tradition and idiosyncrasy, with no regard for any of the quality indicators (Nicolau and Mas, 2006) such as BFs. BFs are, however, a determinant of foreign tourist demand for sun-and-sand destinations, which makes sense, since they fulfill their function as a signaling instrument and cover any information gap that exists between foreign tourists and coastal destinations (Cerqua, 2017).

5. Concluding remarks

The main objective of this paper was to evaluate the impact of BF awards on tourism demand for the case of the Spanish coastal provinces. This is an interesting topic given the current political and academic debate surrounding the effectiveness and usefulness of BF certification, which is considered the most important of all the BCS's. Unlike other similar studies for Spain, the present study compares the direct impact of BF awards and some other determinants on foreign and domestic demand and covers the longest and most recent period of time in the academic literature. Different patterns have been seen to emerge and the present results complement the conclusions of the previous literature on this topic.

The relationships between the arrival of both foreign and domestic travelers and a wide range of factors have been explored through the econometric methodology of panel data. Results highlight that Consumer's Price Index, hotel supply, and gastronomic assets affect both foreign and domestic tourists, as previous literature suggests. However, the impact of the remaining variables on foreign and domestic tourists indicate that they are two very different user groups and that differentiated policies can be applied.

First, it is suggested that domestic tourists prefer to travel to beaches, not by plane or HST, but by road, either by bus or, presumably, private car. However, foreign tourists are significantly attracted by air connections.

Second, in line with previous results, although the BF award is not a determinant of domestic tourism demand, it is an important factor for foreign tourists. Here, it is crucial to consider the political debate around the attraction power of BFs in Spain, especially for the North Atlantic and Cantabrian beaches, where some municipalities are refusing to apply for BF accreditation (El Diario, 2019) as they consider that no increase in their tourist appeal would compensate for the cost of the policies and investments needed to obtain an award. Note that there is a difference between these beaches in the north of the country and those on the Mediterranean and South Atlantic coasts: as Table 1 shows, the latter receive many more international tourists, whereas in the former, other tourist assets such as ruralism and the Way of Saint James are more important in places such as Galicia (Santos and Trillo-Santamaría, 2017).

This finding, along with the previously commented result regarding the dominance of road transport, reveals a profile of domestic tourists who are much less sensitive to an indicator of environmental quality such as BFs as they give greater importance to criteria of proximity, possibly strengthened by the traditional links of planned visits to a family member or friend who owns a second home. In fact, according to a study published by CaixaBank Research (Montoriol-Garriga, 2020) based on data from the European Household Finance and Consumption Survey, there are 3.7 million second homes in Spain, which equates to 14.6% of all Spanish housing. This makes Spain the second highest country in Europe (behind only Malta) in terms of second homes, with most located on the Mediterranean coast. This finding may also be in line with the hypothesis of Golob and Kronegger (2019) that Spanish consumers' environmental awareness is below the European mean. This would justify an education policy to inform the public that BFs offer other benefits apart from an increase to beaches' tourism appeal, i.e., environmental.

However, potential international tourists might see the BF award as an opportunity to reduce any asymmetric information about a destination and so may feel more attracted to coastal destinations with a greater number of BF beaches. It would appear that boarding an airplane makes tourist consumers more demanding of a destination. This would justify destinations that want to attract foreign tourists making economic efforts to obtain and retain awards, while at the same time they also help to make tourism more sustainable. BF accreditation can be considered a tool that simultaneously achieves two aims: it can be effective at both protecting the environment and at promoting international tourism. It is a win-win policy.

These results may also be capturing less evident indirect effects, specifically, the role in sun-and-sand tourism of large international tour operators, who are currently losing ground in the market (Aguiar-Quintana et al., 2016; Almeida-Santana and Moreno-Gil, 2017) due to low-cost carriers driving the rise of do-it-yourself tourists over package holidays. However, in countries such as Spain, there are still large numbers of international sun-and-sand tourists who make reservations through tour operators. So it is the latter who decide which specific resorts are offered to their potential customers and they keep well informed about destinations' quality parameters (see Picazo and Moreno-Gil, 2018), including BFs, which would play a major role.

Finally, our results might suggest that the positive impact of BF certification—or of similar BCS's, provided that they are the most widely-implemented in the region—on international tourism could be extrapolated to other countries such as the Mediterranean countries, especially if they have high levels of sun-and-sand tourism and receive foreign tourists through international tour operators.

6. Limitations and future research

First, due to a lack of statistical data, we have used the number of tourists that stay overnight in hotels as the dependent variable rather than the total number of tourists with the inclusion of other types of accommodation such as campsites and private apartments. Although this dependent variable is a good proxy of overall tourism and is also related to tourists with greater purchasing power, it would be interesting, if disaggregated data were available, to analyze whether different outcomes are achieved with other types of tourist (in terms of type of accommodation) as the dependent variable. As a future line of research, it might, therefore, be interesting to change the dependent variable from the number of tourists to tourist spending to determine whether BFs not only attract more tourists, but also whether these tourists are of higher quality (in terms of purchasing power).

Second, the use of panel data at the provincial and non-municipal level (or by beach) limits the possibility of studying the impact of award longevity on tourism. Every province has multiple beaches and many of these hold the BF award, but the beaches do not necessarily retain the award year-on-year, due to BF award criteria by FFE are yearly updated. Also, since the award was first given in 1987, when 67 Spanish beaches received BFs, most of the provinces have had at least one BF beach, which would make it difficult for provinces to stand out simply on the basis of the BF award longevity of their beaches. Panel data for beaches or at least at the municipal level would be required for this.

Finally, as has already been stated, our results can only be extrapolated to countries / regions with a similar tourism model to Spain's; therefore, it would be appropriate to carry out this type of analysis for different countries and/or tourism models.

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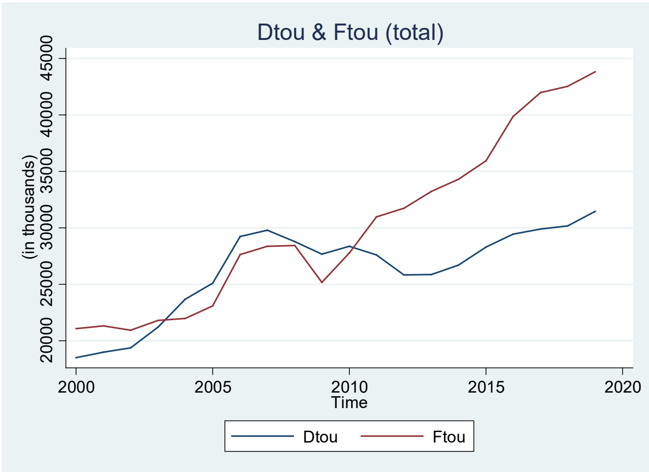
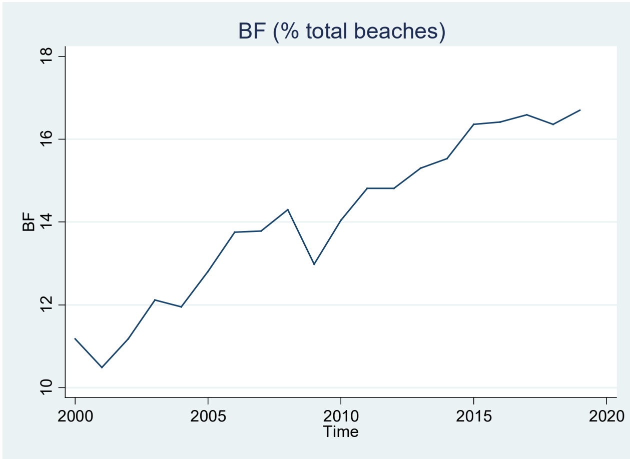
Appendix I. Line graphs of variables (total of coastal provinces).



Source: Authors from statistical database



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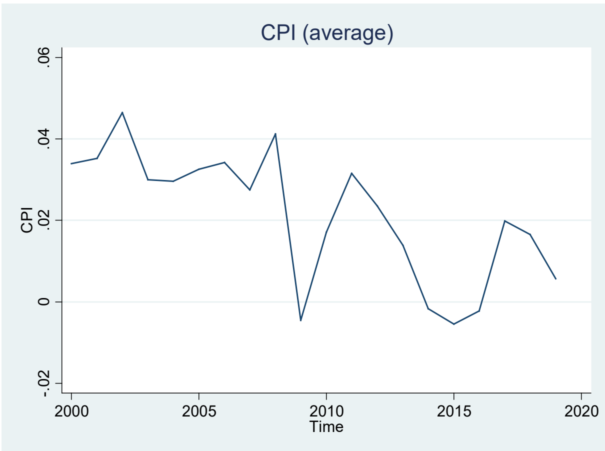

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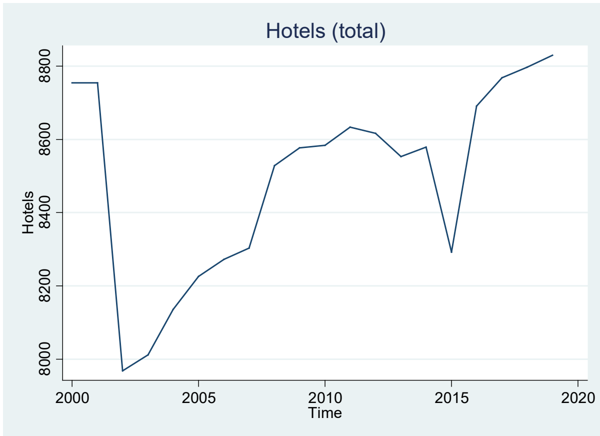

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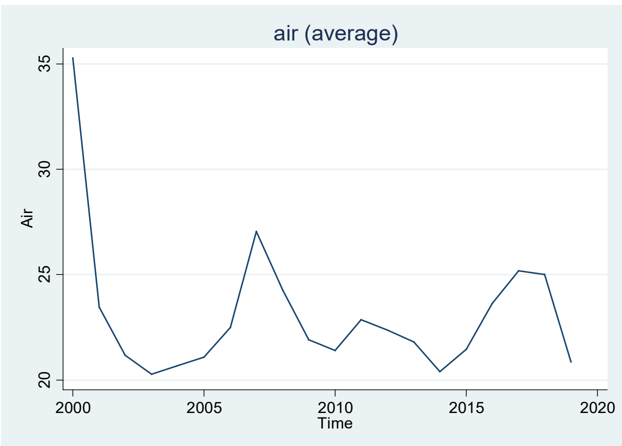

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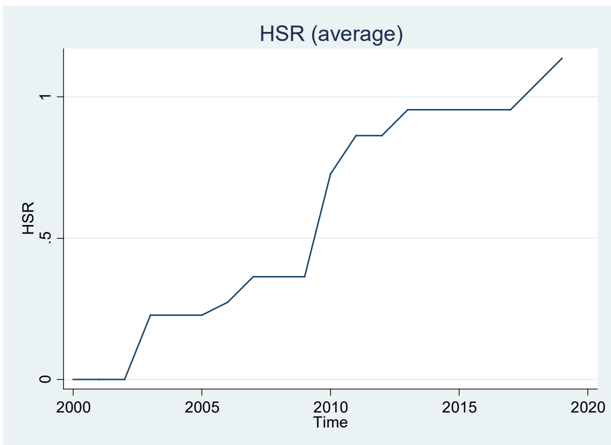

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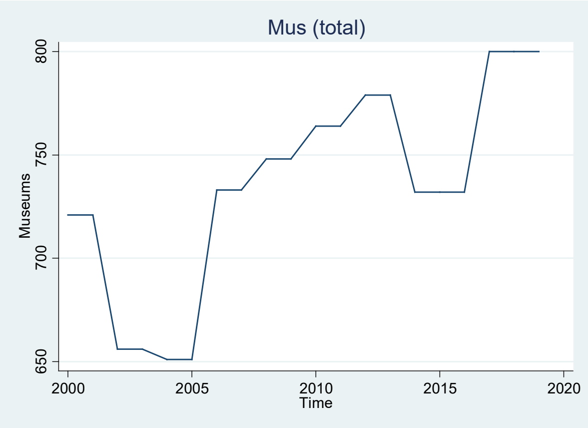

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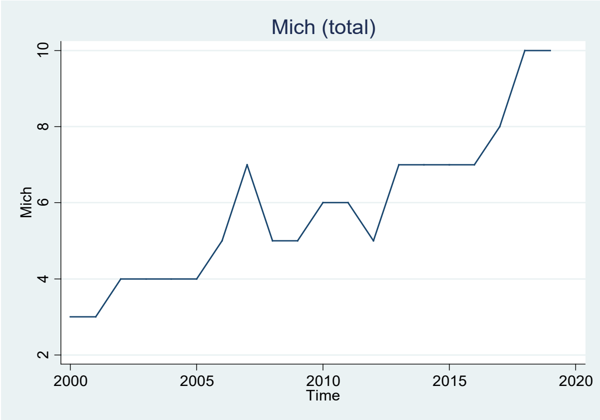

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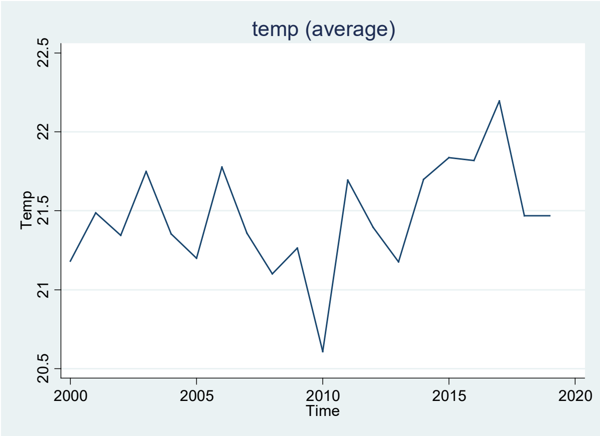

Source: Authors from statistical database

Appendix II

Dynamic model results. System GMM

Regressors	Ftou	Dtou
(F/D)Tou (-1)	0.715 (0.161)***	1.041 (0.499)**
BFs	0.154 (0.065)**	0.005 (0.111)
CPI	-23.744 (11.913)**	-5.955 (17.314)
Hotels	0.396 (0.155)**	-0.019 (0.247)
Air	0.042 (0.014)***	0.010 (0.021)
HST	-0.031 (0.015)**	0.023 (0.046)
Mus	0.035 (0.026)	0.046 (0.154)
Mich	-0.023 (0.034)	0.046 (0.047)
Temp	0.407 (0.209)*	0.123 (0.548)
Intercept	-0.119 (0.184)	0
Time fixed effect	YES	
Observation	170	170
Provinces (groups)	22	22
Number of instruments	26	26
Abond (AR1)	Prob>*z= 0.014*	Prob>*z= 0.294*
Abond (AR2)	Prob>*z = 0.204*	Prob>*z = 0.361*
Sargan	Prob > chi2 = 0.051	Prob > chi2 = 0.866
Hansen	Prob > chi2 = 0.960	Prob > chi2 = 0.807

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