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COMPARATIVE ADVANTAGES IN TOURISM: THE CASE OF THE EUROPEAN COUNTRIES

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SOMMARIO

This study investigates the comparative advantages in tourism of the EU-28 countries for the period 2000-2013. Comparative advantages are "revealed" by observed trade patterns and computed according to the methodology initially proposed by Balassa (1965) and based on three traditional Revealed Comparative Advantage indices. Three more comprehensive measures that take into account exports and imports of tourism services are then developed. Finally, a panel data analysis is implemented to explain the drivers of comparative advantages. The results show that Spain and Portugal have more established patterns of trade in tourism services, the specialization patterns of Greece are very dynamic and strong, while Italy and France have lost international competitiveness. New competitors in the EU market are Croatia and Bulgaria, which are attracting an increasing number of international tourists. This study finds empirical evidence that the Heckscher-Ohlin hypothesis has still validity and drives, together with the overall country's efficiency, comparative advantages in tourism.

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1. Introduction

Over the past decades, tourism has experienced continued expansion, becoming one of the largest and fastest-growing economic sectors worldwide. Despite the uncertain global economic outlook, the number of international tourists has shown a virtually uninterrupted growth from 25 million arrivals in 1950 to 278 million in 1980, 528 million in 1995, and a record 1087 million arrivals in 2013 (UNWTO, 2014).

In the ranking by total arrivals at tourist accommodation establishments, Europe leads the growth in absolute terms and the Mediterranean countries as a whole cover the highest share of the European market. Given their significant role as top tourist destinations, this paper provides a comprehensive analysis of comparative advantages in tourism of the EU-28 countries and the Mediterranean group (M-9 group)[4].

A country or region has a comparative advantage in specific products or services when it is able to produce them at a lower opportunity cost than other countries. A comparative advantage gives a country the ability to sell goods and services on international markets at a lower price than its competitors and realize stronger revenues.

Understanding comparative advantages in tourism is of key importance for a country given that tourism is an important sector in both advanced and developing economies. Indeed, a strong tourism sector raises national income, supports job creation and improves the balance of payments.

The assessment of the extent and the nature of comparative advantages in tourism would allow policy makers to have a more comprehensive overview of the performance of the tourism sector, enabling them to design better policies and programs. It would permit to monitor tourism progress over time and identify emerging risks for the tourism sector. It would finally facilitate to track relative performance against key competitors over time.

To gauge comparative advantages in tourism and their evolution over time, we have first calculated three different Balassa indices to appraise the performance of the EU-28 countries according to the classical methodology. We have then developed three extended versions of these indices to account for total trade flows in tourism. This extension, that is a novelty in the literature on tourism analysis, allows us to overcome the drawback of the classical Balassa indices. Finally, we have carried out an econometric analysis based on a panel framework to evaluate the drivers of comparative advantages and investigate their nature. In this regard, we have distinguished between price and non-price factors and we have considered the six measures of revealed comparative advantages as a robustness check. To our knowledge, this is a further novel contribution of our work.

Indeed, the revealed comparative approach has been adopted in other studies on tourism mainly focused on small islands and developing countries (Jackman et al. 2011; Bobirca and Bucaresti, 2007; Seyoum, 2007; Algieri, 2006), whereas a specific attention on the EU-28 countries and its Mediterranean 'sub group' is still missing with the exception of the study by Bento Cerdeira (2014). This author, however, considers only narrow measures of comparative advantages and does not explore the nature of their drivers.

Our study, based on Eurostat and UNCTAD data, indicates that all the Mediterranean countries are specialized in tourism, although to a different extent. Contrariwise, northern and western EU shows comparative disadvantages in tourism. This is mainly the case for the UK, Ireland, Denmark, and Germany. With reference to the drivers of comparative advantages, both the Ricardo and Heckscher-Ohlin theories explain well the factors that foster international exports and imports of tourism services.

The remainder of the study is organized as follows. Section 2 revises the literature on comparative advantages and presents the indicators to compute them. Sections 3 and 4 discuss the empirical results on the battery of the six comparative advantage indices. Sections 5 and 6 show the econometric model of the determinants of comparative advantages and discuss the empirical findings. Section 7 concludes.

[4] Mediterranean countries include: Croatia, Cyprus, France, Greece, Italy, Malta, Portugal, Slovenia and Spain.

2. Literature and Methodology: the Revealed Comparative Advantages

The theory of comparative advantages is one of the most important theories for explaining the patterns of international trade in goods and services and the specialization structure of a given country. Its main conceptualization is due to David Ricardo (1817) in his seminal work 'On the Principles of Political Economy and Taxation'. According to Ricardo, all countries can be better off if each one exports goods and services in which it has a comparative advantage and imports goods and services in which it has a comparative disadvantage. According to Ricardo, comparative advantages and disadvantages stem from international differences in opportunity costs of products. The theory of comparative advantage states that if each country specializes in goods and services with a lower opportunity cost there could be an increase in global economic welfare.

Comparative advantages are present, even if one country is more efficient in the production of all goods than another, as long as international differences in efficiency differ between products.

After Ricardo, two Swedish economists, Eli Heckscher and Bertil Ohlin (H-O), highlighted that comparative advantages are triggered by different relative factor endowments across countries combined with different relative factor intensities across products; therefore, even when countries have the same technology, it is possible for them to benefit from international trade. Explicitly, a nation will export the commodities whose production require a relatively more intensive use of the nation's relatively abundant factor, and import the commodity whose production requires a relatively more intensive use of the nation's relatively scarce factor. In other words, relative factor abundance and relative factor intensities drive comparative advantages and the pattern of trade.

Measuring comparative advantage is not an easy task (Balassa, 1989), since for an open economy relative prices which would prevail in autarky are not observable. Balassa (1965), however, suggested that comparative advantages could be "revealed" by observed trade patterns. Exports could be used to disclose the comparative advantages of a particular country in the absence of data on factor costs, given that the pattern of commodity exports reflects relative costs, as well as differences in non-price factors that can be expected to determine the structure of exports. Balassa suggested an index, also known as revealed comparative advantage index, or Balassa index (B) given by:

$$B_{yi} = \frac{\dfrac{x_{yi}}{\sum_{y=1}^{N} x_{yi}}}{\dfrac{\sum_{i=1}^{M} x_{yi}}{\sum_{y=1}^{N}\sum_{i=1}^{M} x_{yi}}} \qquad (1)$$

where x_{yi} stands for country i's exports of commodity/service y. Note that i= 1…M countries and y=1… N commodities/ services. The Balassa index has a lower bound of zero and no upper bound. Values greater than 1 indicate the presence of a comparative advantage; the greater is the index, the stronger the comparative advantage.

In this paper three different revealed comparative advantage indices have been calculated (B1 B2 and B3) and three extended versions of these indices (EB1, EB2 and EB3).

The first measure (B1) calculates the percentage share of travel services exports in national total exports of goods and services, over the share of world travel services exports in world total exports of goods and

services. This is the standard measure of revealed comparative advantage, where the comparative advantage of the country is revealed within the country's whole export bundle of goods and services.

The second measure (B2) calculates the percentage share of travel services exports in national service exports, over the share of world travel services exports in world service exports. There are ten service sectors included in the dataset: transport, travel, communications, construction, insurance, financial, computer and information, royalties and license fees, other business services, and personal, cultural and recreation services.

The third measure (B3) calculates the percentage share of travel services exports in national services exports and the denominator represents the percentage share of EU28 travel services exports in total EU28 services exports.

The extended three measures of the Balassa index (EB1, EB2 and EB3) consider in addition to export flows also imports flows. Put differently, EB1 is the ratio between B1 index and its counterpart for imports, EB2 is the ratio between B2 index and its equivalent for imports and EB3 is the ratio between B3 index and its counterpart for imports. We have developed these three extended Balassa indices to overcome a possible drawback of the original Balassa index. Indeed the latter could not provide a correct measure of comparative advantages because only exports are considered (Algieri et. al. 2001; Aquino, 1999; Greenaway and Milner, 1993; Aquino, 1978). In some cases, it could give implausible information. It is possible, for instance, that a country shows strong comparative advantage considering exports of tourism services and at the same time that country registers a value of imports of that services higher than its exports. In this circumstance, the Balassa index would show tourism specialization, which is not the case.

Formally, the extended version of Balassa index is given by:

$$EB_{yi} = \frac{\dfrac{x_{yi}}{\sum_{y=1}^{N} x_{yi}}}{\dfrac{\sum_{i=1}^{M} x_{yi}}{\sum_{y=1}^{N}\sum_{i=1}^{M} x_{yi}}} \Bigg/ \frac{\dfrac{m_{yi}}{\sum_{y=1}^{N} m_{yi}}}{\dfrac{\sum_{i=1}^{M} m_{yi}}{\sum_{y=1}^{N}\sum_{i=1}^{M} m_{yi}}} \qquad (2)$$

where m_{yi} stands for country i's imports of commodity y. This index is the ratio between the Balassa index calculated for exports and the Balassa index for imports. The numerator represents the share of commodity y in the exports of country i relative to the share of commodity y in the exports of the world. The denominator represents the same ratio for imports.

3. A descriptive Analysis of the values of the Balassa indices

To carry out the empirical analysis, data have been collected from Eurostat and UNCTAD statistics. The databases allow retrieving statistical information of international trade statistics in merchandise and commercial services. For our analysis we have considered trade flows in tourism services, which correspond to the voice "travel services" in the current account of the balance of payments of each country as described in the V Manual of the International Monetary Fund. Table 1 reports the values of the Balassa index computed according to the first methodology (B1) from 2001 to 2013.

The results show that the northern and central EU countries have a comparative disadvantage in tourism services, while, a comparative advantage in these services is revealed by the B1 Balassa index for most EU, southern countries, and in particular the Mediterranean ones. Specifically, three of the nine Mediterranean countries – i.e., Cyprus, Croatia, and Greece – reveal very high comparative advantages in tourism, Malta,

Portugal, and Spain follow soon after; smaller values are recorded for Italy, France and Slovenia. A strong comparative disadvantage in tourism service is revealed by the B1 index for Germany, Romania, the Netherlands, and Ireland. The UK has neither a comparative advantage, nor a comparative disadvantage in tourism.

Table 1 Revealed Comparative Advantages in Tourism Services with reference to World Total Exports of Goods and Services – Balassa B1 Index

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*
Austria	1.85	1.79	1.81	1.92	1.79	1.82	1.81	1.70	1.83	1.85	1.83	1.79	1.75	1.69
Belgium	0.52	0.52	0.59	0.61	0.59	0.61	0.63	0.58	0.58	0.63	0.65	0.64	0.65	0.61
Bulgaria	2.56	2.24	2.39	2.77	2.78	2.76	2.49	2.81	2.88	2.93	2.66	2.35	2.26	2.15
Croatia	5.31	5.68	5.92	7.28	6.71	7.20	7.29	7.29	7.74	7.18	6.95	7.37	7.35	7.55
Cyprus	6.44	6.19	5.96	5.73	5.31	5.32	5.41	5.17	4.98	4.18	4.48	5.07	5.46	5.93
Czech Rep.	1.38	1.26	1.07	1.08	0.95	1.06	1.15	1.10	1.10	1.07	1.05	1.02	0.93	0.88
Denmark	0.83	0.87	0.95	0.94	0.89	0.77	0.76	0.73	0.69	0.69	0.75	0.80	0.79	0.76
Estonia	1.75	1.67	1.75	1.69	1.78	1.61	1.49	1.31	1.38	1.48	1.32	1.18	1.16	1.24
Finland	0.44	0.45	0.47	0.50	0.48	0.49	0.49	0.50	0.51	0.56	0.63	0.74	0.78	0.76
France	1.35	1.32	1.35	1.36	1.48	1.44	1.48	1.54	1.51	1.33	1.31	1.40	1.41	1.36
Germany	0.49	0.45	0.44	0.46	0.46	0.47	0.48	0.45	0.47	0.45	0.44	0.44	0.44	0.44
Greece	5.23	5.06	5.36	5.00	4.59	4.86	4.98	4.59	4.45	4.47	4.21	4.53	4.33	4.73
Hungary	1.65	1.64	1.29	1.34	1.04	1.01	0.96	0.85	0.98	1.04	0.99	0.94	0.85	0.80
Ireland	0.49	0.45	0.45	0.51	0.50	0.54	0.59	0.58	0.59	0.44	0.39	0.38	0.35	0.37
Italy	1.55	1.41	1.40	1.45	1.42	1.41	1.44	1.38	1.43	1.46	1.42	1.43	1.39	1.37
Latvia	0.67	0.57	0.70	0.82	0.78	0.84	1.06	1.11	1.17	1.17	1.00	0.98	0.89	0.93
Lithuania	1.27	1.04	1.12	1.15	1.16	1.14	1.14	1.08	0.90	0.88	0.78	0.83	0.76	0.72
Luxembourg	…	…	1.31	1.41	1.35	1.20	1.06	0.96	1.03	1.02	1.03	1.12	1.07	1.00
Malta	2.74	2.96	2.84	3.13	3.06	3.04	2.70	2.84	2.75	2.39	2.74	2.99	2.85	3.10
Netherlands	0.46	0.43	0.47	0.47	0.45	0.44	0.45	0.46	0.42	0.42	0.43	0.44	0.42	0.44
Poland	2.05	1.49	1.25	0.97	1.06	1.02	1.02	1.20	1.13	0.95	0.96	0.96	0.98	0.91
Portugal	2.57	2.62	2.55	2.50	2.53	2.63	2.58	2.64	2.69	2.60	2.76	2.76	2.74	2.67
Romania	0.49	0.44	0.34	0.37	0.32	0.59	0.64	0.64	0.66	0.44	0.39	0.41	0.44	0.35
Slovakia	0.56	1.00	0.69	0.59	0.50	0.61	0.63	0.62	0.66	0.69	0.64	0.60	0.54	0.53
Slovenia	1.50	1.44	1.39	1.47	1.46	1.50	1.46	1.36	1.48	1.57	1.63	1.58	1.60	1.50
Spain	2.96	2.91	2.78	2.93	2.91	3.03	3.05	2.91	2.97	2.74	2.74	2.80	2.65	2.55
Sweden	0.61	0.68	0.72	0.68	0.67	0.78	0.85	0.90	0.82	0.78	0.78	0.84	0.86	0.88
UK	0.90	0.79	0.81	0.83	0.90	0.95	0.99	1.05	0.99	0.89	0.95	0.95	0.98	1.04
(World)	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Source: Own Elaborations on UNCTAD data, 2015 *http://unctadstat.unctad.org/EN/Index.html*

According to the classification system proposed by Hinloopen and Marrewijk (2001), there are four classes of relative comparative advantages intensity:

Class a: $0 < B_{yi} \leq 1$ comparative disadvantage;

Class b: $1 < B_{yi} \leq 2$ weak comparative advantage;

Class c: $2 < B_{yi} \leq 4$ medium comparative advantage;

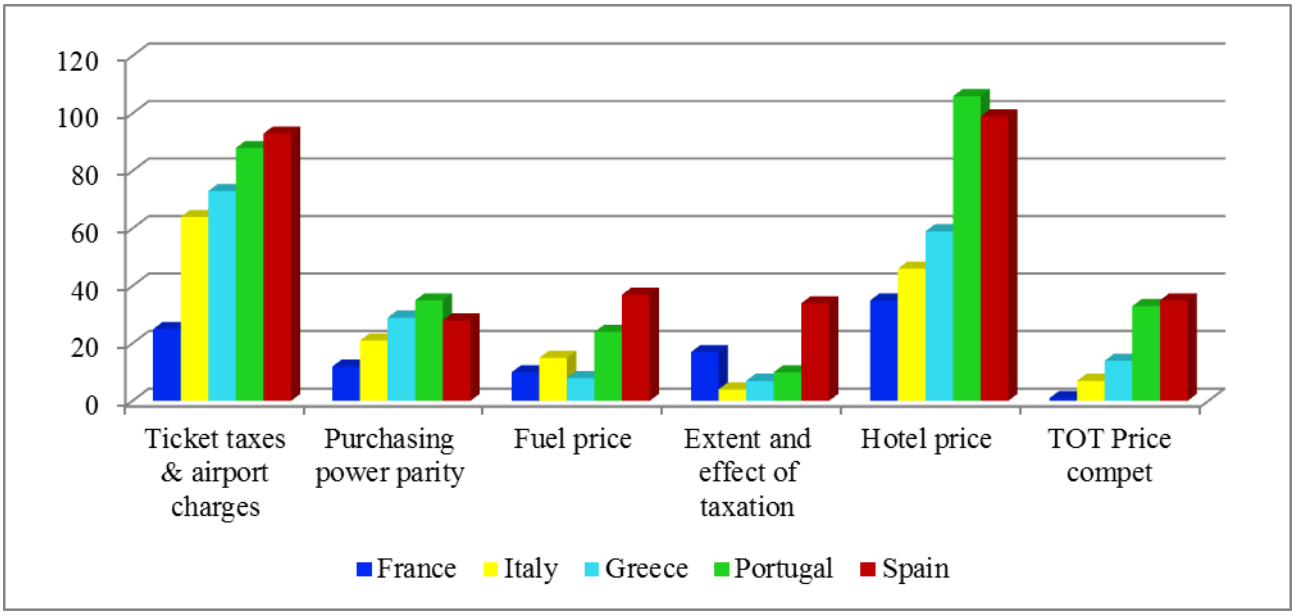
Class d: $B_{yi} > 4$ strong comparative advantage.

Cyprus, Croatia, and Greece have strong comparative advantages, although their degree of specialization has experienced a decreasing pattern over time. This result accords with the international experience of 'sea, sand and sun' in small economies (McElroy, 2006; Giannoni and Maupertuis, 2007). These economies, to a large extent, are dependent on the contribution of tourist earnings to economic development, as indicated by the high scores sketched in Table 1. Malta, Portugal and Spain have a medium comparative advantage in tourism, while France, Italy, and Slovenia have a very weak comparative advantage in tourism. Outside the M-group, Austria, Bulgaria, and Estonia experience a respectable specialization in tourism sector. Conversely, Belgium, the Netherlands, Denmark, Finland, Sweden, Ireland, Germany, Romania, Slovakia, and Latvia lack any tourism specialization, given that the Balassa index is always below 1 between 2000 and 2013.

A possible justification of tourism specialization patterns can be explained in the light of the factors and policies that make each destination more attractive to international tourism. Using the Travel & Tourism Competitiveness Index[5] (TTCI) developed by the World Economic Forum it is possible to provide comparative information regarding some of the EU countries under scrutiny on the basis of their price competitiveness. Specifically, the price competitiveness index (Figure 1) is decomposed into five categories: ticket taxes and airport charges, purchasing power parity, fuel prices, extent and effect of taxation and hotel prices.

For each of the five categories, the index ranges from 1 to 140, where 1 indicates the worse performance (highest costs registered in the country) while 140 indicates the best performances (lowest costs). Graphically, this means that the higher the bars, the higher the degree of price competitiveness.

Figure 1 International Price competitiveness index, 2013



Source: Own Elaborations on World Economic Forum Report, 2013

The ticket taxes and airport charges index measures the relative cost of access to international air transport services based on the level of airport charges, passenger ticket taxes, and value-added taxation. It reflects the costs associated with a narrow-body and a wide-body passenger plane arrival and departure at the major international airports in each country. Charges include landing, terminal navigation, passenger and security charges as listed in the IATA Airport and Air Navigation Charges manual. Ticket taxes applicable to international travel were applied as described in the IATA List of Ticket and Airport Taxes and Fees manual. Per-passenger charges were calculated by applying a 75 percent load factor to a typical seating configuration

[5] The ten pillar of TTCI has been considered.

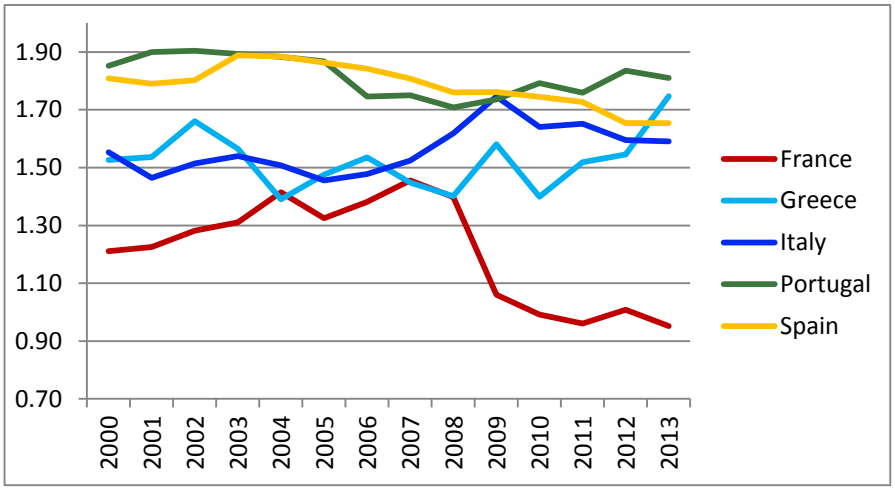
of each type of aircraft. Value-added taxes (VATs) were calculated based on an average ticket price for each country, applied to half of the departing passengers, because the VAT is normally charged only on itineraries originating in the country concerned. A higher score indicates a lower level of charges and taxes. In this category, Spain and Portugal turns out to be more competitive than the other countries.

The purchasing power parity factor is the number of units of U.S. dollar required to buy the same amounts of goods and services in each country's domestic market as U.S. dollar would buy in the United States. According to this factor, Portugal and Greece are the most competitive countries, since in these two countries the purchasing power of the US dollar is higher than in the other countries, while France appears as the less competitive one. Fuel price levels refer to the pump prices of the most widely sold grade diesel fuel. For this factor, Greece records the worse performance. The extent and effect of taxation refer to the level of taxes in each country and its effect on working or investing in the country. For this factor Italy is the most expensive country. Finally, the hotel price index measures the average price, in US dollars, of first-class hotel accommodation in each country. The index is calculated by using the average room rate achieved by first-class hotels in each country over a 12-month period from January through December 2011, to mitigate the impact of any seasonality fluctuations. In this class, Portugal, Spain and Greece appear to be the most low-priced countries.

The total price competitiveness index reflects the average of the five indices; it shows that on average the most competitive country is Spain, following, in decreasing order of competitiveness, Portugal, Greece, Italy and France.

The narrower Balassa index (B2), which measures revealed comparative advantages in tourism inside the service sector, provides interesting results (Table 2). In general when the share of travel exports over the total service exports is computed, the values of B2 drop significantly compared to B1 for the Mediterranean countries with very strong and medium comparative advantages. Instead, for Italy, France, and Slovenia the two indices are almost similar. This result points to the different importance of 'travels' within the total service basket.

Figure 2 Balassa Index World Services, B2 Index



Source: Own Elaborations on Eurostat data, 2015

The evolution over time of the B2 measure for a smaller group of Mediterranean countries is reported in Figure 2. The latter shows that France is the country that has recorded the most significant drops in revealed comparative advantage in tourism within the service sector, while from 2010 onwards, Greece is the only country to have experienced increases in its specialization in tourism within the service sector.

Table 2 Revealed Comparative Advantages in Tourism Services with reference to World Total Exports of Services – Balassa B2 Index

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*
Austria	1.35	1.35	1.41	1.44	1.42	1.38	1.39	1.37	1.38	1.44	1.40	1.33	1.27	1.23
Belgium	0.48	0.49	0.61	0.64	0.62	0.64	0.66	0.58	0.52	0.54	0.54	0.55	0.52	0.50
Bulgaria	1.58	1.50	1.67	1.91	1.94	2.01	1.88	2.17	2.18	2.21	2.24	2.19	2.06	2.13
Croatia	2.16	2.23	2.29	2.56	2.55	2.72	2.86	2.94	3.00	3.06	2.91	2.98	2.98	3.01
Cyprus	1.52	1.50	1.45	1.36	1.28	1.31	1.26	1.22	1.16	1.10	1.09	1.21	1.33	1.51
Czech Rep.	1.39	1.45	1.41	1.59	1.54	1.49	1.59	1.59	1.46	1.46	1.39	1.36	1.29	1.29
Denmark	0.49	0.52	0.60	0.58	0.55	0.44	0.41	0.39	0.35	0.41	0.39	0.42	0.40	0.40
Estonia	1.08	1.01	1.09	1.05	1.11	1.10	1.08	0.91	0.91	0.98	0.96	0.92	0.91	0.93
Finland	0.58	0.51	0.50	0.57	0.48	0.47	0.52	0.49	0.41	0.41	0.46	0.54	0.56	0.55
France	1.21	1.23	1.26	1.29	1.40	1.32	1.38	1.45	1.39	1.05	0.98	0.95	1.00	0.94
Germany	0.72	0.67	0.63	0.65	0.67	0.65	0.67	0.65	0.63	0.59	0.57	0.58	0.57	0.56
Greece	1.53	1.54	1.63	1.54	1.37	1.47	1.53	1.44	1.39	1.56	1.38	1.51	1.54	1.73
Hungary	1.82	1.85	1.58	1.54	1.29	1.17	1.19	1.09	1.20	1.24	1.14	1.04	0.96	0.95
Ireland	0.50	0.37	0.36	0.32	0.30	0.29	0.28	0.26	0.26	0.21	0.17	0.15	0.14	0.14
Italy	1.56	1.47	1.49	1.51	1.49	1.45	1.47	1.51	1.60	1.73	1.62	1.64	1.59	1.58
Latvia	0.36	0.33	0.43	0.51	0.53	0.58	0.69	0.72	0.72	0.76	0.71	0.71	0.67	0.70
Lithuania	1.18	1.08	1.16	1.18	1.13	1.09	1.09	1.14	1.05	1.07	0.97	1.04	0.91	0.82
Luxembourg	…	…	0.39	0.41	0.38	0.33	0.27	0.25	0.27	0.29	0.27	0.28	0.26	0.25
Malta	1.72	1.67	1.71	1.83	1.62	1.38	1.13	1.13	1.01	0.92	1.02	1.08	1.05	1.12
Netherlands	0.44	0.43	0.46	0.45	0.43	0.42	0.45	0.47	0.43	0.44	0.45	0.43	0.42	0.42
Poland	1.75	1.56	1.44	1.27	1.53	1.41	1.34	1.46	1.34	1.26	1.20	1.16	1.17	1.13
Portugal	1.86	1.90	1.87	1.86	1.86	1.86	1.74	1.74	1.69	1.72	1.77	1.75	1.83	1.79
Romania	0.66	0.58	0.48	0.52	0.50	0.76	0.72	0.68	0.63	0.51	0.53	0.58	0.55	0.40
Slovakia	0.67	1.10	0.87	0.91	0.86	1.00	1.07	1.14	1.24	1.56	1.57	1.51	1.30	1.34
Slovenia	1.63	1.66	1.57	1.68	1.67	1.65	1.66	1.60	1.50	1.69	1.72	1.68	1.64	1.55
Spain	1.81	1.79	1.77	1.86	1.86	1.85	1.83	1.80	1.74	1.74	1.72	1.71	1.64	1.64
Sweden	0.60	0.61	0.66	0.60	0.56	0.63	0.68	0.68	0.60	0.59	0.58	0.60	0.59	0.58
UK	0.58	0.52	0.52	0.50	0.51	0.54	0.56	0.53	0.51	0.47	0.50	0.49	0.51	0.55
(World)	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Source: Own Elaborations on UNCTAD data, 2015 http://unctadstat.unctad.org/EN/Index.html

The Balassa B3 measure (Table 3) suggests that tourism also plays a relatively more important role in the economies of the Mediterranean countries, compared to other EU-28 countries. In particular, all the M-9 countries have a comparative advantage greater than the EU average; however, within EU-28, Croatia and Bulgaria have registered an increase in their comparative advantage in tourism.

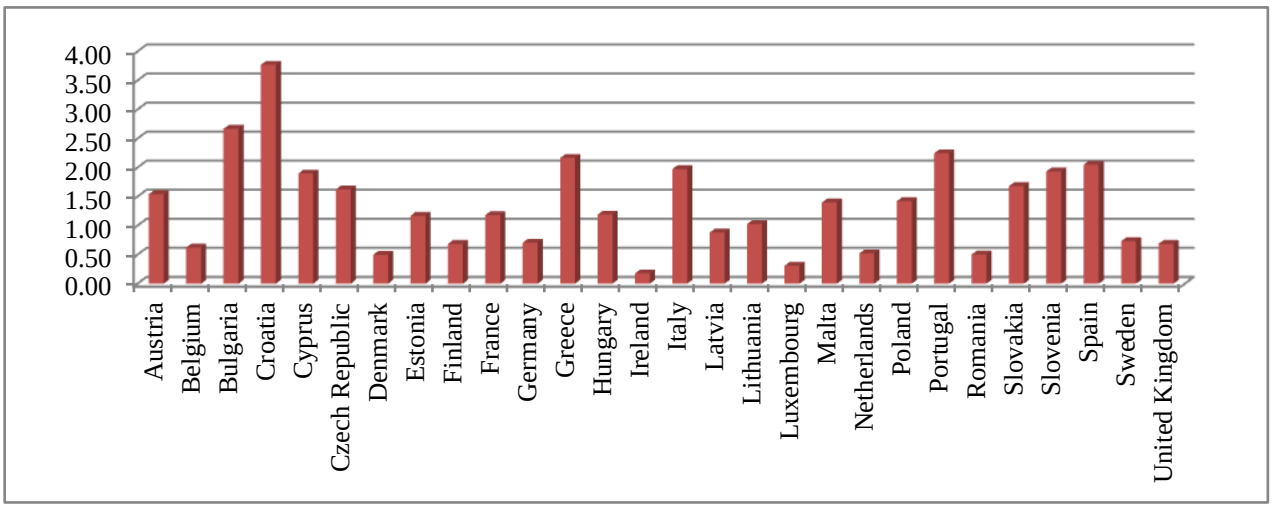
The B3 index for 2013 (Figure 3) clearly indicates that Croatia and Bulgaria have reached a comparative advantage in tourism significantly greater than the other Mediterranean countries. The lowest value is recorded by Ireland, followed by Luxembourg, Denmark, Romania, and the Netherlands.

Table 3 Revealed Comparative Advantages in Tourism Services with reference to EU28 Total Exports of Services – Balassa B3 Index

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*
Austria	1.40	1.44	1.51	1.53	1.52	1.51	1.52	1.51	1.54	1.68	1.70	1.63	1.58	1.55
Belgium	0.49	0.52	0.66	0.68	0.67	0.70	0.72	0.64	0.58	0.64	0.65	0.67	0.65	0.62
Bulgaria	1.63	1.60	1.79	2.02	2.09	2.20	2.05	2.40	2.44	2.59	2.74	2.67	2.57	2.68
Croatia	2.23	2.38	2.45	2.72	2.74	2.98	3.12	3.25	3.36	3.58	3.54	3.64	3.72	3.78
Cyprus	1.57	1.60	1.55	1.45	1.37	1.43	1.38	1.34	1.30	1.28	1.33	1.48	1.66	1.90
Czech Rep.	1.44	1.55	1.51	1.69	1.65	1.63	1.73	1.76	1.63	1.71	1.70	1.66	1.61	1.63
Denmark	0.51	0.56	0.64	0.62	0.59	0.49	0.44	0.43	0.39	0.47	0.48	0.51	0.50	0.50
Estonia	1.11	1.07	1.16	1.12	1.19	1.20	1.17	1.01	1.02	1.15	1.17	1.13	1.13	1.17
Finland	0.60	0.54	0.54	0.60	0.52	0.51	0.57	0.54	0.46	0.47	0.56	0.66	0.70	0.69
France	1.25	1.31	1.35	1.37	1.50	1.44	1.50	1.60	1.55	1.23	1.19	1.16	1.25	1.18
Germany	0.74	0.71	0.67	0.69	0.72	0.71	0.73	0.71	0.71	0.69	0.70	0.71	0.71	0.71
Greece	1.58	1.64	1.75	1.63	1.47	1.60	1.66	1.59	1.55	1.83	1.68	1.84	1.92	2.17
Hungary	1.87	1.97	1.69	1.63	1.39	1.28	1.29	1.21	1.34	1.45	1.39	1.27	1.20	1.19
Ireland	0.52	0.40	0.39	0.34	0.32	0.32	0.31	0.29	0.29	0.25	0.21	0.19	0.17	0.18
Italy	1.61	1.56	1.59	1.61	1.60	1.58	1.60	1.67	1.80	2.02	1.97	2.00	1.98	1.98
Latvia	0.37	0.35	0.46	0.55	0.57	0.63	0.75	0.80	0.81	0.89	0.87	0.87	0.83	0.88
Lithuania	1.22	1.15	1.24	1.25	1.21	1.19	1.19	1.26	1.18	1.26	1.18	1.27	1.13	1.03
Luxembourg	…	…	0.42	0.43	0.41	0.36	0.30	0.27	0.30	0.34	0.32	0.34	0.32	0.31
Malta	1.77	1.78	1.83	1.94	1.74	1.51	1.23	1.24	1.13	1.07	1.24	1.32	1.31	1.40
Netherlands	0.45	0.46	0.49	0.48	0.46	0.46	0.49	0.52	0.48	0.51	0.54	0.52	0.52	0.52
Poland	1.80	1.66	1.54	1.35	1.64	1.55	1.46	1.61	1.50	1.48	1.46	1.42	1.46	1.42
Portugal	1.92	2.03	2.00	1.98	2.00	2.03	1.89	1.92	1.90	2.01	2.16	2.13	2.28	2.25
Romania	0.68	0.62	0.51	0.55	0.53	0.83	0.78	0.75	0.71	0.59	0.65	0.70	0.69	0.50
Slovakia	0.69	1.17	0.93	0.97	0.92	1.10	1.16	1.26	1.39	1.83	1.91	1.84	1.62	1.69
Slovenia	1.68	1.76	1.68	1.78	1.80	1.81	1.81	1.77	1.68	1.98	2.09	2.05	2.04	1.94
Spain	1.87	1.91	1.90	1.97	2.00	2.03	2.00	1.98	1.95	2.04	2.10	2.09	2.05	2.06
Sweden	0.62	0.66	0.70	0.64	0.61	0.69	0.74	0.75	0.67	0.69	0.71	0.74	0.74	0.73
UK	0.60	0.55	0.55	0.53	0.54	0.59	0.61	0.59	0.57	0.55	0.61	0.59	0.63	0.69
(EU28)	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Source: Own Elaborations on UNCTAD data, 2015 http://unctadstat.unctad.org/EN/Index.html

Figure 3 Balassa Index EU28 Services, B3 Index, 2013



Source: Own Elaborations on Eurostat data, 2015

4. A descriptive analysis of the values of the Extended Balassa indices

The extended Balassa Index (EB) captures both the export and the import component of tourism trade flows. The results presented in Table 4 and Table 5 show that, even when tourism imports are considered, all Mediterranean countries have a revealed comparative advantage in tourism. These extended measures compared to their counterparts B1 and B2 reveal stronger comparative advantages for Greece and Spain, but weaker comparative advantages for Portugal for the entire time frame and for Italy after 2007.

In general, the first two measures of comparative advantages and their extensions provide similar specialization rankings.

Table 4 Revealed Comparative Advantages in Tourism Services with reference to World Total Exports and Imports of Goods and Services – Extended Balassa EB1 Index

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*
Austria	1.41	1.34	1.36	1.39	1.43	1.51	1.50	1.53	1.60	1.54	1.57	1.67	1.67	1.71
Belgium	0.63	0.62	0.60	0.60	0.59	0.60	0.60	0.58	0.56	0.59	0.58	0.59	0.60	0.58
Bulgaria	2.02	1.84	1.66	1.79	1.82	2.22	2.10	2.49	2.28	2.32	2.85	2.70	2.77	2.50
Croatia	4.98	5.68	5.63	10.21	8.48	10.62	11.59	10.35	10.68	9.06	9.07	9.47	8.57	9.57
Cyprus	4.45	4.20	3.66	3.28	2.75	2.48	2.47	1.95	1.98	1.77	2.03	1.99	2.00	2.12
Czech Rep.	2.26	2.14	1.81	1.80	1.71	1.80	1.89	1.74	1.49	1.48	1.54	1.46	1.41	1.32
Denmark	0.64	0.65	0.67	0.64	0.65	0.64	0.64	0.60	0.56	0.52	0.53	0.56	0.57	0.58
Estonia	2.40	2.54	2.48	2.21	2.28	2.25	1.84	1.66	1.43	1.55	1.43	1.33	1.39	1.36
Finland	0.55	0.55	0.56	0.59	0.57	0.60	0.58	0.59	0.60	0.56	0.63	0.73	0.75	0.71
France	1.53	1.46	1.46	1.41	1.37	1.33	1.37	1.40	1.37	1.26	1.19	1.20	1.35	1.29
Germany	0.33	0.30	0.30	0.30	0.31	0.32	0.36	0.35	0.35	0.35	0.36	0.37	0.38	0.38
Greece	2.65	2.81	5.22	5.68	5.23	5.44	6.41	6.45	5.98	5.69	5.48	5.32	5.71	6.20
Hungary	2.42	2.44	1.85	1.57	1.58	1.73	2.13	1.73	1.72	1.80	1.92	1.92	2.10	2.25
Ireland	0.80	0.71	0.64	0.63	0.65	0.63	0.63	0.58	0.50	0.49	0.44	0.45	0.47	0.53
Italy	1.57	1.53	1.44	1.40	1.57	1.48	1.58	1.48	1.40	1.37	1.42	1.44	1.39	1.40
Latvia	0.58	0.61	0.82	0.84	0.90	0.73	0.95	1.02	0.86	0.86	0.93	0.99	1.08	1.17
Lithuania	1.64	1.79	1.56	1.42	1.29	1.31	1.25	1.18	0.90	0.83	1.08	1.45	1.30	1.40
Luxembourg	…	…	0.93	0.94	0.93	0.89	0.81	0.79	0.81	0.78	0.79	0.88	0.90	0.89
Malta	3.03	3.06	3.65	3.28	2.96	2.83	2.39	3.90	3.26	2.95	3.22	3.45	3.21	3.19
Netherlands	0.51	0.48	0.52	0.50	0.52	0.53	0.54	0.57	0.50	0.50	0.54	0.57	0.56	0.62
Poland	1.96	1.39	1.41	1.47	1.20	1.08	0.97	1.38	1.24	1.16	1.07	1.19	1.16	1.12
Portugal	3.02	3.25	3.28	3.23	3.34	3.15	2.95	2.97	2.99	2.94	2.92	2.76	2.71	2.65
Romania	0.91	0.91	0.92	1.07	1.09	1.39	1.28	1.45	1.21	0.94	0.75	0.75	0.83	0.68
Slovakia	1.33	1.63	1.69	1.45	1.17	1.42	1.39	1.24	1.13	1.03	1.06	1.01	0.94	0.96
Slovenia	1.84	1.71	1.64	1.69	1.77	1.94	1.86	1.91	1.87	1.77	1.89	2.16	2.46	2.52
Spain	5.13	4.68	4.38	4.47	3.97	3.57	3.52	3.40	3.35	3.12	3.10	3.27	3.28	3.16
Sweden	0.41	0.48	0.52	0.51	0.47	0.55	0.65	0.68	0.60	0.59	0.54	0.56	0.55	0.53
UK	0.56	0.50	0.51	0.49	0.52	0.55	0.57	0.57	0.54	0.59	0.65	0.66	0.71	0.78
(World)	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Source: Own Elaborations on UNCTAD data, 2015 *http://unctadstat.unctad.org/EN/Index.html*

Both EB1 and EB2 computed for the other EU countries highlights that Croatia has the highest comparative advantage, while Germany has the strongest comparative disadvantage.

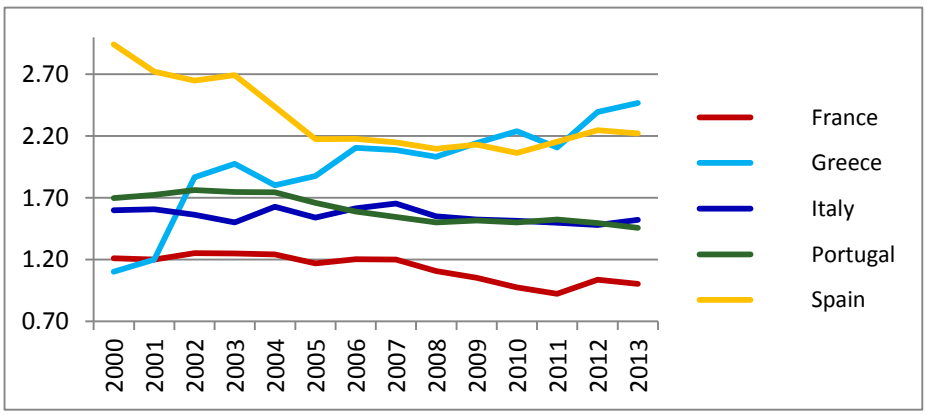
Table 5 Revealed Comparative Advantages in Tourism Services with reference to World Total Exports and Imports of Services – Extended Balassa EB2 Index

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*
Austria	1.04	1.01	1.08	1.08	1.15	1.20	1.22	1.24	1.20	1.14	1.16	1.22	1.24	1.28
Belgium	0.57	0.57	0.61	0.61	0.58	0.58	0.57	0.56	0.52	0.52	0.53	0.54	0.55	0.53
Bulgaria	1.42	1.37	1.15	1.24	1.24	1.38	1.32	1.46	1.30	1.47	1.74	1.57	1.60	1.61
Croatia	2.01	2.02	1.95	3.05	2.88	3.25	3.39	2.86	2.84	2.72	2.82	2.79	2.72	2.86
Cyprus	1.70	1.60	1.39	1.37	1.12	1.00	0.97	0.76	0.73	0.66	0.73	0.79	0.88	0.98
Czech Rep.	1.71	1.61	1.59	1.65	1.63	1.67	1.74	1.57	1.28	1.29	1.34	1.34	1.36	1.32
Denmark	0.64	0.67	0.70	0.67	0.68	0.63	0.62	0.58	0.52	0.54	0.52	0.56	0.57	0.56
Estonia	1.44	1.58	1.49	1.26	1.30	1.46	1.16	1.03	0.88	0.95	0.97	0.96	1.04	1.03
Finland	0.86	0.72	0.70	0.78	0.67	0.72	0.72	0.67	0.65	0.58	0.66	0.72	0.80	0.73
France	1.21	1.20	1.25	1.25	1.24	1.17	1.20	1.20	1.11	1.05	0.98	0.92	1.04	1.00
Germany	0.54	0.51	0.49	0.48	0.50	0.49	0.51	0.50	0.47	0.44	0.45	0.46	0.47	0.48
Greece	1.10	1.20	1.87	1.98	1.80	1.88	2.11	2.09	2.03	2.14	2.24	2.11	2.39	2.47
Hungary	1.88	1.86	1.65	1.48	1.46	1.54	1.88	1.62	1.58	1.65	1.68	1.68	1.81	1.95
Ireland	1.60	1.23	1.15	1.01	1.00	0.91	0.84	0.70	0.64	0.66	0.59	0.59	0.59	0.64
Italy	1.60	1.61	1.56	1.50	1.63	1.54	1.61	1.66	1.55	1.53	1.51	1.50	1.48	1.52
Latvia	0.29	0.28	0.37	0.40	0.45	0.41	0.49	0.51	0.47	0.50	0.55	0.55	0.60	0.63
Lithuania	0.92	0.98	0.89	0.87	0.78	0.79	0.77	0.83	0.67	0.68	0.78	1.05	0.98	1.02
Luxembourg	…	…	0.71	0.72	0.74	0.70	0.66	0.65	0.64	0.62	0.64	0.70	0.70	0.71
Malta	1.88	1.94	2.43	2.01	1.78	1.64	1.58	2.58	2.03	1.89	2.11	2.35	2.18	2.16
Netherlands	0.56	0.54	0.57	0.56	0.56	0.57	0.58	0.60	0.51	0.54	0.56	0.57	0.58	0.62
Poland	1.37	1.12	1.16	1.32	1.15	1.04	0.93	1.11	0.97	0.96	0.94	1.00	0.99	0.98
Portugal	1.70	1.72	1.76	1.75	1.75	1.66	1.59	1.55	1.50	1.52	1.50	1.53	1.50	1.46
Romania	0.89	0.78	0.79	0.87	0.96	1.19	0.96	0.96	0.80	0.82	0.61	0.64	0.65	0.51
Slovakia	1.05	1.22	1.29	1.34	1.07	1.28	1.21	1.19	1.22	1.29	1.26	1.12	0.95	1.01
Slovenia	1.32	1.27	1.26	1.33	1.34	1.41	1.40	1.46	1.33	1.36	1.41	1.56	1.74	1.79
Spain	2.94	2.72	2.65	2.69	2.44	2.18	2.18	2.15	2.10	2.13	2.06	2.15	2.25	2.22
Sweden	0.52	0.59	0.60	0.57	0.49	0.55	0.63	0.61	0.54	0.54	0.48	0.49	0.48	0.47
UK	0.44	0.38	0.38	0.36	0.36	0.39	0.39	0.37	0.35	0.37	0.39	0.39	0.42	0.45
(World)	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Source: Own Elaborations on UNCTAD data, 2015 http://unctadstat.unctad.org/EN/Index.html

The dynamics of EB2 for a restricted group of Mediterranean countries are sketched in Figure 4.

Figure 4 Extended Balassa Index World Services, EB2 Index



Source: Own Elaborations on UNCTAD data, 2015 http://unctadstat.unctad.org/EN/Index.html

The extended index EB3 computed considering the total trade flows in tourism for the 28 European Union countries confirms the previous results. It further highlights that Croatia and Greece reduce significantly their comparative advantage, while Italy and France maintain almost the same values. This is due to the fact that the former countries have a tourism sector well developed and a scanty manufacturing structure, while France and Italy have also an established secondary sector. Lower values of the index are obtained for the northern and western European countries.

Table 6 Revealed Comparative Advantages in Tourism Services with reference to EU28Total Exports and Imports of Services – Extended Balassa EB3 Index

	2000	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*
Austria	1.13	1.12	1.19	1.21	1.28	1.36	1.37	1.39	1.39	1.32	1.36	1.41	1.40	1.42
Belgium	0.62	0.63	0.67	0.68	0.65	0.65	0.64	0.63	0.60	0.60	0.62	0.62	0.62	0.59
Bulgaria	1.54	1.51	1.27	1.38	1.38	1.55	1.48	1.64	1.51	1.70	2.04	1.82	1.82	1.80
Croatia	2.18	2.23	2.15	3.40	3.21	3.66	3.80	3.21	3.28	3.14	3.30	3.23	3.08	3.18
Cyprus	1.84	1.77	1.53	1.53	1.25	1.13	1.09	0.85	0.84	0.76	0.86	0.91	0.99	1.09
Czech Rep.	1.86	1.78	1.76	1.84	1.82	1.88	1.95	1.76	1.48	1.49	1.56	1.56	1.54	1.46
Denmark	0.70	0.74	0.78	0.75	0.75	0.71	0.69	0.65	0.61	0.63	0.61	0.64	0.64	0.63
Estonia	1.56	1.75	1.64	1.41	1.45	1.64	1.30	1.16	1.01	1.10	1.14	1.12	1.17	1.14
Finland	0.93	0.79	0.77	0.87	0.75	0.81	0.80	0.76	0.75	0.67	0.77	0.84	0.90	0.81
France	1.31	1.33	1.38	1.40	1.39	1.31	1.35	1.35	1.28	1.22	1.14	1.07	1.18	1.12
Germany	0.59	0.57	0.54	0.53	0.55	0.55	0.58	0.56	0.55	0.51	0.53	0.53	0.53	0.54
Greece	1.19	1.33	2.06	2.21	2.01	2.11	2.36	2.34	2.35	2.48	2.62	2.44	2.72	2.75
Hungary	2.03	2.06	1.83	1.66	1.63	1.74	2.11	1.82	1.83	1.91	1.96	1.95	2.06	2.17
Ireland	1.74	1.36	1.26	1.13	1.11	1.02	0.94	0.78	0.74	0.76	0.69	0.69	0.67	0.72
Italy	1.73	1.78	1.73	1.68	1.82	1.73	1.81	1.86	1.79	1.76	1.77	1.74	1.68	1.69
Latvia	0.32	0.31	0.41	0.45	0.50	0.46	0.55	0.58	0.54	0.58	0.65	0.64	0.68	0.70
Lithuania	0.99	1.08	0.99	0.97	0.87	0.89	0.86	0.93	0.78	0.78	0.92	1.21	1.11	1.13
Luxembourg	…	…	0.78	0.80	0.82	0.79	0.74	0.73	0.74	0.72	0.75	0.81	0.80	0.79
Malta	2.04	2.15	2.69	2.24	1.99	1.84	1.77	2.89	2.34	2.19	2.47	2.73	2.48	2.41
Netherlands	0.60	0.60	0.63	0.63	0.63	0.65	0.65	0.67	0.59	0.62	0.65	0.66	0.65	0.69
Poland	1.49	1.24	1.28	1.47	1.28	1.17	1.04	1.24	1.12	1.11	1.11	1.16	1.12	1.09
Portugal	1.84	1.91	1.95	1.95	1.95	1.87	1.78	1.73	1.74	1.75	1.76	1.77	1.70	1.62
Romania	0.97	0.87	0.88	0.97	1.07	1.34	1.08	1.07	0.93	0.95	0.72	0.74	0.74	0.57
Slovakia	1.13	1.34	1.42	1.49	1.19	1.44	1.36	1.33	1.41	1.49	1.47	1.29	1.08	1.12
Slovenia	1.43	1.41	1.40	1.48	1.49	1.59	1.57	1.64	1.53	1.57	1.65	1.81	1.97	1.99
Spain	3.19	3.01	2.93	3.01	2.72	2.45	2.44	2.41	2.42	2.46	2.42	2.49	2.55	2.47
Sweden	0.56	0.65	0.67	0.64	0.55	0.61	0.71	0.69	0.63	0.63	0.56	0.56	0.55	0.52
UK	0.47	0.42	0.42	0.40	0.40	0.44	0.44	0.41	0.41	0.43	0.46	0.45	0.47	0.50
(EU28)	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Source: Own Elaborations on UNCTAD data, 2015 http://unctadstat.unctad.org/EN/Index.html

The mean values of the six indices over the period 2000-2013 are reported in table 7 for the main 5 Mediterranean countries.

Table 7 Mean values of the comparative advantage indices, 2000-2013

Mean	*B1*	*B2*	*B3*	*EB1*	*EB2*	*EB3*
France	1.40	1.20	1.35	1.36	1.13	1.27
Greece	4.74	1.51	1.71	5.30	1.96	2.21
Italy	1.42	1.55	1.76	1.46	1.56	1.75
Portugal	2.63	1.80	2.04	3.01	1.60	1.81
Spain	2.85	1.77	2.00	3.74	2.35	2.64

Source: Own Elaborations on UNCTAD data, 2015 http://unctadstat.unctad.org/EN/Index.html

5. The determinants of comparative advantages in tourism

In order to analyze the determinants of the European countries' comparative advantages in tourism, we have estimated a panel regression for the EU-28 countries. The analysis goes from 2000 to 2013.

Three alternative specifications, using pooled OLS, fixed effect and random effect modelling have been adopted. The first specification assumes that there is no heterogeneity across countries and is formally expressed as:

$$ln\,balassa_{it} = \alpha + \beta\, ln\, X_{it}^{'} + \gamma\, ln\, Y_{it}^{'} + e_{it} \quad (3)$$

where *ln* denotes natural logarithms, $balassa_{it}$ stands for the values of the six versions of the Balassa index computed for the *i* countries during the period of analysis *t*. α is the common intercept, *X* and *Y* are the vectors containing the explanatory variables including the traditional variables regarding a country's comparative advantage plus a group of controls. e_{it} is the error term i.i.d.

The OLS specification with fixed effects controls instead for heterogeneity among countries in the intercept parameter, and is expressed as:

$$ln\,balassa_{it} = \alpha_i + \beta\, ln\, X_{it}^{'} + \gamma\, ln\, Y_{it}^{'} + e_{it} \quad (4)$$

where α_i is country-specific and denotes the fixed effect. Thus α_i represents ignorance about all of the other systematic factors that predict comparative advantages, other than X' and Y'.

The FGLS specification with random effects treats the heterogeneity across countries as a random component, and it is expressed as:

$$ln\,balassa_{it} = \alpha + \beta\, ln\, X_{it}^{'} + \gamma\, ln\, Y_{it}^{'} + u_{it} + e_{it} \quad (5)$$

where u_{it} is the individual specific error or the between-entity error and e_{it} is the usual regression error or the within-entity error.

In accordance with the economic theory on country's comparative advantage, the X matrix includes the overall efficiency of countries and a number of explanatory variables related to the H-O theory.

To account for the overall efficiency of countries the following alternative variables[6] have been included:

[6] These variables have been considered in separate estimations due to their strong correlation above 90%.

- Relative[7] labour productivity per hour worked[8].

- GDP per capita[9] in PPP, which is known to be strongly correlated with local productivity levels and hence locally available technology[10] (Zhang ans Jensen, 2007), is a proxy for the level of economic development.

To account for the H-O theory the following variables enter the model:

- The UNESCO rate expressed as the ratio between the numbers of heritage sites included in the World Heritage List of UNESCO per 1.000.000 inhabitants. The UNESCO rate is an indicator of cultural and historical attractiveness of travel destinations. According to H-O theory, the comparative advantage of a country is due to the relative abundance of its factor endowments, which in the case of tourism, mirror specific destination's resource endowments - both inherited and created - like natural, historical and cultural resources.

- The coastline ratio constructed as the ratio between the length of coastline in meters over the total land area in squared kilometres of each considered country (m/km2). A coastline of zero indicates that the country is landlocked. This is an indicator of physiographical attractiveness of destinations.

- A dummy variable for Mediterranean countries (dmed) equals to 1 for the EU group of countries that surround the Mediterranean Sea[11], 0 otherwise. This is a proxy for the climatic elements and natural environment that can determine the attractiveness of a destination[12].

- A dummy variable for ancient historical heritage (dhistory) that is equals to 1 for Greece and Italy, 0 otherwise.

[7] Each country compared to the EU-average.

[8] A more precise proxy would be that one that considers productivity levels per sectors/industries but, due to data limitation, the choice has fallen on the average productivity levels for each countries and the EU as a whole. This allows for direct comparisons across EU countries. Most Ricardian models suggest using labour productivity to measure comparative advantage. This is fortunate in that manufacturing output and employment data are among the most available metrics for the broad grouping of countries under study. Labour is typically the only factor of production in Ricardian models, so a natural extension might be total factor productivity that also allows for capital accumulation as well. Unfortunately, capital data at the country-industry level for this sample is too sparse to be of benefit in a panel study.

[9] Hummels and Levinsohn (1995) argued that Helpman has used per capita income as a proxy for factor composition, i.e., for the overall capital-to-labour ratio to control for the Heckscher-Ohlin type of determinants of trade patterns. They continue that there are two problems with the use of per capita income as a proxy for factor composition. First, it is an appropriate proxy if there are only two factors of production and all goods are traded. Second, this approach runs afoul of a long-standing debate on whether per capita income is proxying factor endowments or consumer tastes. Linder (1961) hypothesized that manufactured products must first be developed for home markets before they can be exported successfully. Countries with similar demand structures would develop similar goods for home use and later export. If per capita income is a good gauge of demand, then two countries with similar per capita income will have similar demand, and will produce and export similar goods. Krugman (1979) and Bergstrand (1990) have subsequently demonstrated the importance of taste differences in more rigorous models of monopolistic competition with nonhomothetic demand. The empirical literature has generally interpreted differences in per capita income as a demand side phenomenon, and found good support for a negative relationship between per capita income and intra-industry trade. This leads to some confusion as to whether the difference in per capita income is proxying differences in factor composition, as posited by Helpman, or demand structure, as posited by Linder.

[10] Quantifying technology differences across countries and industries is extremely difficult.

[11] Croatia, Cyprus, France, Greece, Italy, Malta, Portugal, Slovenia and Spain.

[12] Two indicators of climatology, that is mean annual temperature (°C) and precipitation averaged over all stations in the country (mm), have not been considered for lack of data and high collinearity.

- Price level for hotels and restaurants, as a measure of relative endowments of factors used relatively more intensively in the production of services of hotels and restaurants.

We further incorporate in an augmented version of the model the new strand of trade theory which posits a special attention on the role of economies of scale and multinational corporations on trade (Krugman, 1983 and Helpman et al., 2004), the role of social environment and transportation cost. All these factors[13] that may drive a country's comparative advantage in the travel service industry enter the Y matrix and are proxied by:

- the average hotel size, given by the ratio between total number of bed-places and total number of hotels and other holiday accommodations to account for economies of scales;

- market integration, given by foreign direct investment intensity- as percentage of GDP, to mirror the multinational component;

- robbery rate, expressed as the number of robbery crimes recorded by the police per 100,000 inhabitants. This variable is a proxy of social order;

- Transportation costs, a further factor of the new trade theory.

Table A.1 in the Appendix reports a short description of the variables and the source of the data.

6. Empirical results

In accordance with the main theories on international trade, we have initially estimated a *Baseline Model* which includes tourism-specific factors following Heckscher-Ohlin, as well as a measure of the overall efficiency of countries, and then an *Extended Model* which comprises a wider range of factors that can influence destinations' comparative advantages. These models have been investigated in three settings: a pooled framework (eq. 3), a fixed effects framework (eq. 4), and a random effects framework (eq. 5).

To select the proper setting, we have first implemented a battery of F tests to verify if a pooled or a fixed panel estimation was more appropriate. Next, the Breusch and Pagan LM test helped us to decide between the random effects regression and the pooled OLS regression. Finally, the selection of model, fixed or random, was based on the Hausman χ^2 test. The results of these tests[14] have shown that there were significant individual (country) effects, implying that ignoring unobserved heterogeneity would have induced omitted variable bias. Therefore, the pooled OLS estimates were biased and inconsistent, and we accepted the presence of country effects. At the same time the Breusch and Pagan LM test indicated that random effects regression was more appropriate than the pooled OLS. The Hausman χ^2 test rejected the fixed effects model in favour of the random model.

[13] Other covariates such as Infrastructure, comprising a Road Index - given by the length of motorways over the area of the country- an Airport index- given by the number of airports over the population density- and an Healthcare Index – given by the number of hospital beds per 100000 inhabitants have been excluded for endogeneity problems. Similarly, country's Environmental preservation given by total greenhouse gas emissions or CO2 index has been excluded from the model.

[14] The results are not reported for reason of space, but they are available from the authors upon request.

The results of the random effect estimates for the baseline model considering the six Balassa indices are reported in Tables 8, 9, 10. The difference across the three tables is that the proxy for the overall efficiency of countries model varies. In Table 8 the overall efficiency of countries is proxied by labour productivity per hour worked. In Table 9 the overall efficiency of countries is proxied by GDP per capita. In Table 10 the price level for hotels[15] and restaurants is included.

The results show that the natural environment, cultural and historical heritage are economically and statistically significant in explaining revealed comparative advantage in tourism. At the same time they seem to show that, *ceteris paribus*, comparative advantages in tourism are negatively associated with the overall efficiency of the country. (Tourism seems to be the specialization of the less efficient, and then poorest, countries).

In particular, a higher labour cost (which usually reflects higher productivity) reduces comparative advantages. An increase in overall productivity by 1% reduces comparative advantages by a range of 0.10 to 0.30% (Table 8). A rise in per-capita GDP by 1% lessens comparative advantages by a range of 0.16 to 0.56% (Table 9). An upsurge in the price level for hotels and restaurants by 10% diminishes comparative advantages between 0.12 and 0.34% (Table 10).

The negative relationship between GDP per capita and comparative advantages in tourism reports probably the fact that, ceteris paribus, specialization in tourism services is a "specialization of poor", typical of countries that have failed to promote development or manufacturing activities or of higher value services (such as IT, finance, etc.).

The coastline variable would have a negligible role in explaining tourism comparative advantages as it enters with a coefficient near to zero in all the regressions. The empirical evidence would suggest that the geographical position of the country is relatively more important than its physiographic characteristics.

Contrary to the length of the coast, indeed, the Mediterranean dummy enters with a relevant coefficient in all the regressions, supporting the natural environment's contribution to a large tourism comparative advantage. In particular, both the Mediterranean dummy and the historical dummy have a positive impact with a large coefficient. In the three models, to surround the Mediterranean Sea and to be endowed with classical heritage (ancient Greek and Roman) increase the revealed comparative advantages. Specifically, to be a Mediterranean country increases tourism specialization by a factor of 0.3-0.9 above the average value of specialization than that of more inland countries.

This means that both natural inherited attractors – which define the environmental framework within which the tourists enjoy the destination, such as climate, flora and fauna – and cultural inherited attractors[16] are important for tourism.

Natural heritage with the number of UNESCO World Heritage sites used as proxy is consistently positive as well. This implies that the heritage and culture of a destination, its history, institutions, customs, architectural features, cuisine, traditions, artwork, music, handicrafts, dance etc., affect its comparative advantage.

[15] The price level for hotels and restaurants is highly correlated with GDP and productivity therefore the third model excludes these last two variables.

[16] The literature also stresses the importance of "created attractors" such as events, the range of available activities, entertainment and shopping. Notice, however, that created attractors are important in determining countries' competitiveness more than their tourism comparative advantages. For this reason, they have not been explicitly included in the analysis.

The Heckscher-Ohlin variables are statistically significant in all the baseline regressions and for each of the six dependent variables used. This suggests a key role for resource endowment effects in the tourism industry across countries.

On the whole, the results reported in Table 8, 9, 10 support the Heckscher-Ohlin framework to tourism service exports and imports. A country with a larger endowment of resources particularly important for the production of tourism services tend to specialize in tourism services, and particularly so, if its GDP per capita is lower.

Table 8 Determinants of comparative advantages in tourism 2000-2013, Baseline model with labour productivity

	Random effect FGLS lb1	***Random effect FGLS*** leb1	***Random effect FGLS*** lb2	***Random effect FGLS*** leb2	***Random effect FGLS*** lb3	***Random effect FGLS*** leb3
llabourprod.	-0.225 ***	-0.301 ***	-0.181 ***	-0.175 ***	0.0924	-0.0990 *
	(0.000)	(0.000)	(0.003)	(0.003)	(0.125)	(0.084)
lunescorate	0.379 ***	0.542 ***	0.592 ***	0.599 ***	0.414 ***	0.558 ***
	(0.005)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)
coastarea	-0.000774	-0.00141 *	-0.00257 ***	-0.00153 **	-0.00215 ***	-0.00144 *
	(0.342)	(0.057)	(0.001)	(0.046)	(0.007)	(0.059)
dmed	0.910 ***	0.774 ***	0.553 ***	0.377 *	0.604 ***	0.387 *
	(0.000)	(0.000)	(0.008)	(0.065)	(0.004)	(0.056)
dhistory	1.119 ***	1.096 ***	0.751 **	0.730 **	0.703 **	0.715 **
	(0.000)	(0.000)	(0.013)	(0.014)	(0.021)	(0.015)
_cons	0.564 ***	0.909 ***	0.359 *	0.406 **	-0.362 *	0.293
	(0.004)	(0.000)	(0.079)	(0.041)	(0.076)	(0.134)
N	374	374	374	374	374	374
P	1.02e-11	2.70e-16	4.39e-09	1.13e-08	0.00000617	0.000000388
F						
df_m	5	5	5	5	5	5
chi2	60.37	82.35	47.55	45.53	31.92	37.94

Notes: * Significant at 10%, ** significant at 5%, *** significant at 1%. 'l' logarithms. Dependent variables: b1=Balassa B1 index; eb1=Extended Balassa EB1 index; b2=Balassa B2 index; eb2=Extended Balassa EB2 index; b3=Balassa B3 index; eb3=Extended Balassa EB3 index.

Dummy variables: dmed (equals to 1 for the Mediterranean countries excluding Italy and Greece, 0 otherwise); dhistory (equals to 1 for Greece and Italy, 0 otherwise).

P-values in parentheses.

P = p-value of the model (overall model significance).

Table 9 Determinants of comparative advantages in tourism 2000-2013, Baseline model with gdp

	Random effect FGLS lb1	***Random effect FGLS*** leb1	***Random effect FGLS*** lb2	***Random effect FGLS*** leb2	***Random effect FGLS*** lb3	***Random effect FGLS*** leb3
lgdp	-0.339 ***	-0.557 ***	-0.165 *	-0.369 ***	0.0811	-0.297 ***
	(0.000)	(0.000)	(0.066)	(0.000)	(0.363)	(0.001)
lunescorate	0.492 ***	0.757 ***	0.605 ***	0.741 ***	0.368 ***	0.671 ***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.005)	(0.000)
coastarea	-0.00111	-0.00201 **	-0.00265 ***	-0.00190 **	-0.00206 ***	-0.00173 **
	(0.203)	(0.019)	(0.000)	(0.017)	(0.005)	(0.028)
dmed	0.974 ***	0.806 ***	0.611 ***	0.366 *	0.729 ***	0.401 **
	(0.000)	(0.000)	(0.001)	(0.070)	(0.000)	(0.044)
dhistory	1.075 ***	1.037 ***	0.718 **	0.696 **	0.729 ***	0.699 **
	(0.001)	(0.002)	(0.012)	(0.023)	(0.010)	(0.020)
_cons	1.436 ***	2.556 ***	0.563	1.569 ***	-0.460	1.352 ***
	(0.000)	(0.000)	(0.176)	(0.000)	(0.267)	(0.001)
N	390	390	390	390	390	390
P	8.53e-13	7.49e-18	1.27e-09	3.37e-11	0.000000171	1.19e-09
F						
df_m	5	5	5	5	5	5
chi2	65.57	89.78	50.19	57.86	39.71	50.32

Notes: * Significant at 10%, ** significant at 5%, *** significant at 1%. 'l' logarithms. Dependent variables: b1=Balassa B1 index; eb1=Extended Balassa EB1 index; b2=Balassa B2 index; eb2=Extended Balassa EB2 index; b3=Balassa B3 index; eb3=Extended Balassa EB3 index.
Dummy variables: dmed (equals to 1 for the Mediterranean countries excluding Italy and Greece, 0 otherwise); dhistory (equals to 1 for Greece and Italy, 0 otherwise).
P-values in parentheses.
P = p-value of the model (overall model significance).

Table 10 Determinants of comparative advantages in tourism 2000-2013, Baseline model with hotel and restaurant prices

	Random effect FGLS lb1	***Random effect FGLS*** leb1	***Random effect FGLS*** lb2	***Random effect FGLS*** leb2	***Random effect FGLS*** lb3	***Random effect FGLS*** leb3
lhotelsprice	0.0876	-0.257 ***	0.0649	-0.196 ***	0.338 ***	-0.123 *
	(0.233)	(0.002)	(0.423)	(0.008)	(0.000)	(0.088)
lunescorate	0.278 *	0.446 ***	0.472 ***	0.379 ***	0.317 **	0.367 ***
	(0.051)	(0.002)	(0.000)	(0.001)	(0.014)	(0.002)
coastarea	-0.000614	-0.00116	-0.00250 ***	-0.000933	-0.00217 ***	-0.000922
	(0.493)	(0.171)	(0.001)	(0.171)	(0.005)	(0.175)
dmed	1.098 ***	0.970 ***	0.691 ***	0.550 ***	0.757 ***	0.554 ***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.001)
dhistory	1.053 ***	1.132 ***	0.727 **	0.804 ***	0.706 **	0.794 ***
	(0.003)	(0.001)	(0.014)	(0.002)	(0.017)	(0.002)
_cons	-0.513	1.128 ***	-0.487	0.701 **	-1.588 ***	0.505
	(0.136)	(0.003)	(0.189)	(0.039)	(0.000)	(0.127)
N	308	308	308	308	308	308
P	8.03e-09	3.14e-12	0.000000100	1.31e-08	3.73e-10	0.000000109
F						
df_m	5	5	5	5	5	5
chi2	46.26	62.84	40.86	45.22	52.78	40.67

Notes: * Significant at 10%, ** significant at 5%, *** significant at 1%. 'l' logarithms. Dependent variables: b1=Balassa B1 index; eb1=Extended Balassa EB1 index; b2=Balassa B2 index; eb2=Extended Balassa EB2 index; b3=Balassa B3 index; eb3=Extended Balassa EB3 index.
Dummy variables: dmed (equals to 1 for the Mediterranean countries excluding Italy and Greece, 0 otherwise); dhistory (equals to 1 for Greece and Italy, 0 otherwise).
P-values in parentheses.
P = p-value of the model (overall model significance).

The results of the random effect estimates for the augmented model considering the six Balassa indices are reported in Tables 11, 12, 13, 14.

The overall efficiency proxies tend to be always significant with negative sign. The Heckscher-Ohlin proxies are significant too. Explicitly, the UNESCO rate and the two dummies drive with a positive sign the revealed comparative advantages. This suggests that a country with a large endowment of natural, cultural and historical resources has a strong comparative advantage in tourism services. In most cases the coastline variable is not significant in explaining the Balassa indices. Even when it is significant, it enters with a coefficient near to zero confirming its negligible impact on tourism comparative advantages. The negative sign could indicate that it is more the position of country with its weather and position on the Mediterranean Sea that matters rather than the length of the coast itself.

In short, the empirical findings on the augmented model confirm that the position of the country in the Mediterranean area, therefore its climate and natural environment, is relatively more important than its physiographic characteristics.

As regards the other covariates, the robbery rate – when significant – has a negative impact on the Balassa indices. The average hotel size, on the contrary, exerts a positive impact on comparative advantages. This can be motivated both by the economies of scale involved in setting up a sophisticated pricing policy, and by the consideration that the opportunity cost associated with potential empty rooms increases with the number of available bed places (Boffa and Succurro, 2012).

Transport prices are statistically significant in few estimates and tend to reduce comparative advantages. This supports the notion that relative transport prices matter.

In order to test if data present any specification problem, heteroskedasticity, serial autocorrelation and spatial autocorrelation were tested using the modified Wald's test, the Wooldridge's test and the Pesaran's test respectively. The diagnostic results have supported the robustness of the estimations and the goodness of the used models.

Table 11 Determinants of comparative advantages in tourism 2000-2013. Augmented model with labour productivity

	(1) lb1	(2) leb1	(3) lb2	(4) leb2	(5) lb3	(6) leb3
llabourprod	-0.490 ***	-0.453 ***	-0.638 ***	-0.299 ***	-0.491 ***	-0.279 ***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.002)
lunescorate	0.415 **	0.448 ***	0.640 ***	0.390 **	0.511 ***	0.360 **
	(0.014)	(0.005)	(0.000)	(0.014)	(0.000)	(0.022)
coastarea	-0.000361	-0.000598	-0.00171 ***	-0.000357	-0.00164 ***	-0.000330
	(0.649)	(0.406)	(0.001)	(0.619)	(0.001)	(0.645)
dmedup	0.857 ***	0.726 ***	0.435 ***	0.386 *	0.493 ***	0.402 **
	(0.000)	(0.000)	(0.002)	(0.055)	(0.001)	(0.044)
dhistory	0.913 ***	0.981 ***	0.246	0.581 *	0.319	0.603 *
	(0.008)	(0.002)	(0.251)	(0.062)	(0.147)	(0.052)
lrobberyrate	0.0401	-0.0620 *	-0.00190	-0.0230	-0.0167	-0.0224
	(0.230)	(0.090)	(0.952)	(0.504)	(0.593)	(0.504)
lmkt_integr	0.00303	0.0220 **	-0.0164 *	0.00869	-0.0519 ***	0.00386
	(0.752)	(0.042)	(0.090)	(0.389)	(0.000)	(0.693)
lnbeds	0.118	0.122 *	0.298 ***	0.143 *	0.230 ***	0.127 *
	(0.132)	(0.097)	(0.000)	(0.050)	(0.000)	(0.078)
_cons	-0.323	0.00817	-2.075 ***	-1.030	-1.403 **	-0.765
	(0.722)	(0.992)	(0.000)	(0.214)	(0.018)	(0.353)
N	230	230	230	230	230	230
P	1.91e-13	2.54e-14	3.22e-30	0.0000249	8.05e-26	0.0000647
F						
df_m	8	8	8	8	8	8
chi2	77.05	81.41	158.5	35.17	137.4	32.88

Table 12 Determinants of comparative advantages in tourism 2000-2013. Augmented model with gdp

	(1) lb1	(2) leb1	(3) lb2	(4) leb2	(5) lb3	(6) leb3
lgdp	-0.582 ***	-0.646 ***	-0.821 ***	-0.572 ***	-0.675 ***	-0.542 ***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
lunescorate	0.466 ***	0.529 ***	0.660 ***	0.507 ***	0.537 ***	0.475 ***
	(0.007)	(0.003)	(0.000)	(0.001)	(0.000)	(0.002)
coastarea	-0.000770	-0.000972	-0.00211 ***	-0.000648	-0.00195 ***	-0.000609
	(0.341)	(0.243)	(0.000)	(0.374)	(0.000)	(0.401)
dmedup	0.944 ***	0.825 ***	0.443 ***	0.361 *	0.508 ***	0.382 *
	(0.000)	(0.000)	(0.002)	(0.069)	(0.000)	(0.053)
dhistory	0.929 ***	0.942 ***	0.303	0.506	0.347	0.528 *
	(0.008)	(0.009)	(0.176)	(0.107)	(0.122)	(0.091)
lrobberyrate	0.0186	-0.0938 **	-0.0422	-0.0503	-0.0491	-0.0498
	(0.581)	(0.012)	(0.187)	(0.135)	(0.116)	(0.127)
lmkt_integr	0.00388	0.0243 **	-0.0146	0.00939	-0.0503 ***	0.00463
	(0.669)	(0.016)	(0.120)	(0.309)	(0.000)	(0.604)
lnbeds	0.0657	0.0999	0.216 ***	0.150 **	0.174 ***	0.137 **
	(0.374)	(0.193)	(0.000)	(0.027)	(0.000)	(0.041)
_cons	1.602 *	1.980 **	0.933	0.688	1.018	0.849
	(0.089)	(0.043)	(0.142)	(0.424)	(0.110)	(0.320)
N	240	240	240	240	240	240
P	1.54e-15	2.22e-15	2.74e-28	1.83e-09	1.89e-28	6.56e-09
F						
df_m	8	8	8	8	8	8
chi2	87.44	86.65	149.3	56.96	150.1	54.11

Table 13 Determinants of comparative advantages in tourism 2000-2013. Augmented model with hotel and restaurant prices

	(1) lb1	(2) leb1	(3) lb2	(4) leb2	(5) lb3	(6) leb3
lpricelevel	0.126	-0.256 **	-0.103	-0.242 **	0.0276	-0.182 **
	(0.191)	(0.015)	(0.297)	(0.011)	(0.767)	(0.050)
lunescorate	0.137	0.258	0.349 ***	0.248 *	0.254 *	0.227
	(0.464)	(0.166)	(0.010)	(0.090)	(0.058)	(0.119)
coastarea	-0.000568	-0.000662	-0.00193 ***	-0.000337	-0.00183 ***	-0.000339
	(0.554)	(0.470)	(0.002)	(0.625)	(0.003)	(0.623)
dmedup	1.205 ***	1.038 ***	0.708 ***	0.561 ***	0.748 ***	0.575 ***
	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)	(0.002)
dhistory	1.228 ***	1.192 ***	0.612 **	0.741 **	0.627 **	0.754 ***
	(0.003)	(0.002)	(0.020)	(0.011)	(0.017)	(0.010)
lrobberyrate	0.0757 **	-0.0548	0.00556	-0.0225	-0.00203	-0.0207
	(0.029)	(0.149)	(0.878)	(0.510)	(0.952)	(0.534)
lmkt_integr	0.00970	0.0212 **	-0.0163	0.00574	-0.0483 ***	0.00237
	(0.316)	(0.049)	(0.133)	(0.566)	(0.000)	(0.807)
lnbeds	-0.0738	-0.000108	0.0769	0.0560	0.0438	0.0436
	(0.374)	(0.999)	(0.171)	(0.363)	(0.433)	(0.477)
_cons	-0.0817	1.293	-0.767	0.237	-0.712	0.251
	(0.942)	(0.235)	(0.322)	(0.778)	(0.352)	(0.764)
N	240	240	240	240	240	240
P	0.000000384	4.66e-09	5.08e-09	0.00000541	1.04e-12	0.0000277
F						
df_m	8	8	8	8	8	8
chi2	44.90	54.88	54.69	38.78	73.38	34.92

Table 14 Determinants of comparative advantages in tourism 2000-2013. Augmented model with Transport prices

	(1) lb1	(2) leb1	(3) lb2	(4) leb2	(5) lb3	(6) leb3
llabourprod	-0.464 ***	-0.353 ***	-0.654 ***	-0.276 ***	-0.513 ***	-0.278 ***
	(0.000)	(0.001)	(0.000)	(0.005)	(0.000)	(0.004)
lunescorate	0.429 **	0.496 ***	0.635 ***	0.405 **	0.521 ***	0.361 **
	(0.013)	(0.003)	(0.000)	(0.012)	(0.000)	(0.024)
coastarea	-0.000334	-0.000525	-0.00172 ***	-0.000348	-0.00166 ***	-0.000335
	(0.678)	(0.477)	(0.000)	(0.634)	(0.001)	(0.644)
dmedup	0.844 ***	0.680 ***	0.440 ***	0.373 *	0.490 ***	0.402 **
	(0.000)	(0.001)	(0.001)	(0.069)	(0.000)	(0.049)
dhistory	0.891 **	0.909 ***	0.254	0.562 *	0.314	0.603 *
	(0.011)	(0.005)	(0.214)	(0.077)	(0.136)	(0.056)
lptransport	-0.122	-0.413 **	0.0640	-0.0958	0.0475	0.00309
	(0.455)	(0.023)	(0.697)	(0.577)	(0.772)	(0.985)
lrobberyrate	0.0379	-0.0678 *	-0.000661	-0.0240	-0.0160	-0.0220
	(0.258)	(0.063)	(0.983)	(0.488)	(0.608)	(0.513)
lmkt_integr	0.00101	0.0153	-0.0156	0.00713	-0.0513 ***	0.00391
	(0.919)	(0.169)	(0.124)	(0.496)	(0.000)	(0.700)
lnbeds	0.123	0.136 *	0.297 ***	0.147 **	0.235 ***	0.127 *
	(0.122)	(0.070)	(0.000)	(0.048)	(0.000)	(0.083)
_cons	0.0984	1.422	-2.305 ***	-0.713	-1.613 **	-0.782
	(0.926)	(0.178)	(0.004)	(0.486)	(0.047)	(0.438)
N	230	230	230	230	230	230
P	8.97e-13	4.16e-14	7.28e-33	0.0000734	3.76e-28	0.000202
F						
df_m	9	9	9	9	9	9
chi2	76.24	82.96	174.5	34.49	151.8	31.96

7. Conclusion

This study has investigated the comparative advantages in tourism and their drivers for the EU-28 countries and the Mediterranean group.

To this purpose, three traditional Balassa indices of comparative advantages and three extended versions of these indices have been calculated for the period 2000-2013. The specialization indices have allowed understanding the structure and determinants of international trade in tourism sector. They have further enabled us to identify the origins of comparative advantages. Taken altogether, the results suggest that:

- Mediterranean countries hold a leading position in terms of tourism exports.
- The degree of comparative advantages varies across the nine Mediterranean countries. Specifically these countries can be divided into three groups:

  → Croatia and Greece have strong comparative advantages;
  → Malta, Portugal and Spain own medium comparative advantages;
  → France, Italy, Cyprus, and Slovenia have low comparative advantages.

- Comparative advantages have remained stable over the sample period for Greece, Spain and Portugal, while have decreased somewhat for France and Italy.
- Croatia and Bulgaria have the strongest comparative advantage in tourism within EU.

This study finds empirical evidence that the Heckscher-Ohlin hypothesis has still validity and drive, together with the overall country's efficiency, comparative advantages in tourism. On the one hand, we find that being endowed with natural resources increases a country's relative advantage in exporting tourism services. The intuition is simple: following the law of comparative advantage, a country with a favourable natural environment should specialize in tourism exports rather than exporting other goods or services. The empirical results support this conclusion. On the other hand, labour productivity/cost adds additional advantage or disadvantage for travel service exports. Other factors may also add to exporting tourism relative to other exports, including economies of scales, market integration, social order and tourism infrastructure. However in the augmented models not all these extra-factors are significant across specifications and indices.

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Appendix

Table A.1 Description of variables and Source of Data

VARIABLES	SHORT DESCRIPTION	SOURCE
Exports and Imports of Tourism	236 Travel; Exports and Imports are expressed in US Dollar thousand	*UNCTAD data, 2015* http://unctadstat.unctad.org/EN/Index.html
Exports and Imports of Services	200 Total services; Exports and Imports are expressed in US Dollar thousand	*UNCTAD data, 2015* http://unctadstat.unctad.org/EN/Index.html
Exports and Imports of Goods and Services	Exports and Imports are expressed in US Dollar thousand	*UNCTAD data, 2015* http://unctadstat.unctad.org/EN/Index.html
EFFICIENCY FACTORS		
Labour productivity per hour worked Relative index: country compared to the EU-average	Labour productivity per hour worked is calculated as real output (deflated GDP measured in chain-linked volumes, reference year 2005) per unit of labour input (measured by the total number of hours worked). Measuring labour productivity per hour worked provides a better picture of productivity developments in the economy than labour productivity per person employed, as it eliminates differences in the full time/part time composition of the workforce across countries and years.	Eurostat
GDP per capita in PPP Index (EU28 = 100)	Gross domestic product (GDP) is a measure for the economic activity. It is defined as the value of all goods and services produced less the value of any goods or services used in their creation. The volume index of GDP per capita in Purchasing Power Parity (PPP) is expressed in relation to the European Union (EU28) average set to equal 100. If the index of a country is higher than 100, this country's level of GDP per head is higher than the EU average and vice versa. Basic figures are expressed in PPS, i.e. a common currency that eliminates the differences in price levels between countries allowing meaningful volume comparisons of GDP between countries. Please note that the index, calculated from PPS figures and expressed with respect to EU28 = 100, is intended for cross-country comparisons rather than for temporal comparisons.	Eurostat
Unit labour costs	Average Hourly Labour Costs, Current Prices.	Eurostat http://ec.europa.eu/eurostat/cache/metadata/EN/lci_esqrs.htm
HECKSCHER OHLIN FACTORS		
Coastline: Cost/Area ratio (m/km2)	Length of coastline, in meters. A coastline of zero indicates that the country is landlocked. Land Area Km2	https://en.wikipedia.org/wiki/List_of_countries_by_length_of_coastline
AREA of the country	Area of the regions In Square kilometre	Eurostat
The UNESCO rate: ratio between the numbers of heritage sites included in the World Heritage List of UNESCO over total population of the country per 1.000.000 inhabitants	An indicator of attractiveness of travel destinations is expressed by the number of heritage sites, which are included in the World Heritage List of UNESCO.	http://whc.unesco.org/en/list/
Price level index, restaurants and hotels	Price level indices (EU28=100)	Eurostat
POPULATION on 1 January (2000-2013) Persons	The number of persons having their usual residence in a country on 1 January of the respective year. When usually resident population is not available, countries may report legal or registered residents.	Eurostat
NEW TRADE THEORY FACTORS		
Accommodation Size Index	The ratio between the Number of bed-places and the Number of establishments	Eurostat

Total Number of establishments over Total area	Establishments include Hotels; holiday and other short-stay accommodation; camping grounds, recreational vehicle parks and trailer parks	Eurostat
Market Integration - Foreign Direct Investment intensity (% of GDP)	Average of inward and outward Foreign Direct Investment (FDI) flows divided by gross domestic product (GDP). The index measures the intensity of investment integration within the international economy. The direct investment refers to the international investment made by a resident entity (direct investor) to acquire a lasting interest in an entity operating in an economy other than that of the investor (direct investment enterprise). Direct investment involves both the initial transactions between the two entities and all subsequent capital transactions between them and among affiliated enterprises, both incorporated and unincorporated. Data are expressed as percentage of GDP to remove the effect of differences in the size of the economies of the reporting countries.	Eurostat
Robbery rate	Robbery recorded by the police. The robbery rate is normally expressed as the number of crimes per 100,000 habitants. E.g. a Community A has a population of 50,000. Last year they had 5 robberies (5 / 50,000) x 100,000 = 10 robberies per 100,000 population	Eurostat
Price level index, transport	Price level indices (EU28=100)	Eurostat
Motorway density	Length of motorways in metre divided by Area (m/km2)	Eurostat