Modelling the Determinants of International Tourism Demand in Cabo Verde Islands by European Countries: A Dynamic Panel Data Econometric Analysis

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Abstract

Tourism in Cabo Verde is considered the engine of the country's economic growth, representing a significant weight in GDP, being the largest source of foreign exchange and the main export sector for services in the country. The purpose of this study was to identify and measure the impact of the main determinants of the inbound international tourism inflow. To achieve this, a panel data approach was used. The annual panel's data set includes the number of arrivals from the nine (9) European generating countries, published by INE in the period 2000 - 2018, and several possible explanatory variables. Taking into account the changing structure of consumer preferences, a dynamic model is estimated using the GMM-DIFF estimator. The results suggest that the international demand for tourism in Cabo Verde depends strongly on the evolution of economic activity in each of the issuing countries and is strongly influenced by the previous demand. The results also show that external shocks, such as economic and financial crises, negatively impact the demand for tourism in Cabo Verde. As policy measures, the study recommends diversifying the promotion of tourism to different countries, in order to limit vulnerability to changing economic conditions in a single region or specific economic bloc.

Keywords: Cabo Verde; Dynamic panel data; Econometric model; GMM estimators; International tourism demand

Introduction

Located in the Atlantic Ocean, about 450 km from the West African coast, towards Senegal, with an area of 4,033 km², Cabo Verde is an island country of volcanic origin, consisting of ten islands and several desert islets arranged in two groups in depending on its position and in relation to the dominant winds: Barlavento (Santo Antão, São Vicente, Santa Luzia, São Nicolau, Sal and Boavista) and Sotavento (Maio, Santiago, Fogo and Brava). The islands are mostly mountainous and rocky, with the exception of the more eastern islands (Sal, Boavista and Maio) which have very smooth topography, with a predominance of flat areas, and are the closest to the African continent. With a population, according to data from the National Statistics Institute (INE), of approximately 544 thousand inhabitants and an economy based mainly on the services sector, the country has a geostrategic location that together with the climate that is hot, dry subtropical, with mountainous landscapes and extensive beaches spread over several islands, as well as a set of cultural and human characteristics, an ideal destination for the development of tourist activity. In their structure, the islands present differences in both the orographic and climatic aspects, each having its own specificity in terms of potential for tourism.

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The Marketing Plan for Tourism in Cabo Verde (2010–2013), in its marketing strategy, classifies the islands in terms of organizing the offer as follows: The Essense Islands (Santiago and São Vicente), the Sun Islands (Sal, Boa Vista and Maio) and the Senses Islands (Santo Antão, São Nicolau, Fogo, Brava and Santa Luzia). Also according to that document, in terms of segmentation and positioning strategy and based on the experience base and the potential identified in the islands of each group, the Essence Islands position themselves through the offer of business, events and culture, the Sun Islands, position themselves as destinations of sun and sea (ideal for families with or without children and for lovers of sports associated with the sea and the wind), the Senses Islands, position themselves as a natural product, ideal for individuals or groups looking for alternative vacation experiences, seeking total relaxation within rural communities and virgin nature, as well as for niche markets made up of explorers and scientists with a view to studying natural phenomena and species of unique fauna and flora, or in danger of extinction. The truth is that the country has configured itself as Sun and Beach tourism, dominated by the all-inclusive model (AIs), anchored in some international brands (particularly RIU and Meliá), with an emphasis on the Sal and Boa Vista Islands (World Bank, 2018).

In terms of economic importance, tourism is seen in all of Cabo Verde's main strategic documents, as being the country's economic growth engine, contributing considerably both directly and indirectly to the local economy, boosting and developing several related sectors, as well as in attracting foreign investment flows. The data from Banco of Cabo Verde (BCV) points out that tourism contributes approximately 23% of GDP and more than 60% of the total exports of services, being the main foreign exchange source in the country. This justifies the interest in better understanding the international demand for tourist services in Cabo Verde. However, in contrast to the important role of the tourism sector in the Cabo-Verdean economy, little attention has been paid to its quantitative analysis or focusing on demand modelling.

Indeed there are several unpublished academic works (master's theses and doctoral theses) and some published, as well as diagnostic studies carried out by national and international organizations, dealing with different aspects of tourism on the islands of Cabo Verde. Some of these academic works are about qualitative aspects of tourism and economic development or about the competitiveness of the destination and market (see, for example, Cabral, 2005; Lopes, 2010; Monteiro, 2014). Other studies focus attention on the sociological, cultural and environmental aspects of tourism (see, for example, Amarante, 2012; Santos, 2009; Morais, 2016) and others on aspects of the country's tourism image or marketing (see, for example, Carvalho, 2010; Neves, 2012; Moniz, 2016). There are also qualitative studies based on the results of fieldwork focusing on residents' perception and attitude towards the impact of tourism on specific islands (see, for example, Ribeiro, 2009; López-Guzmán, Borges, Hernández-Merino & Cerezo, 2013; Bernardo, 2015). Among the quantitative studies, we can highlight those carried out by Mitchell (2008), Braga de Macedo and Brites Pereira (2010), Twining-Ward (2010), Tavares (2015) as well as the report from the Government of the Canary Islands (2009) and the analysis carried out by McElroy and Hamma (2010).

It is also important to highlight the studies carried out by the Government of Cabo Verde such as: - The Strategic Plan for Tourism Development in Cape Verde 2010–2013 (Ministry of Tourism, Industry and Energy, 2009) and Study on the Value Chain of the Tourism Sector in Cabo Verde (Strategic Policy Center - Office of the Primer Minister of Cabo Verde, 2010). Added to these studies, those carried out or supported by the World Bank such as: - Environment and Social Assessment Study of the Tourism Sector in Cape Verde (World Bank, 2017) and Local Sourcing in the Cabo Verde Tourism Food Supply Chain (World Bank, 2019). However, with the exception of Tavares (2015), none of the listed quantitative studies focuses on the analysis of tourism demand modelling for Cabo Verde, even though demand models are

advisable to estimate elasticities and to analyze the effects of alternative policies and scenarios (Garín-Muñoz & Amaral, 2000). This is the contribution that this research offers. Therefore, given the importance of the tourism sector to Cabo Verde and the scarcity of studies with empirical results that help to better understand its dynamics, this work seeks to contribute to a better understanding of international tourist flows to the country, with a focus in its input influencing factors, using the dynamic panel data model. Thus, the paper offers fundamental elements to assist in the decision making about the destination. The rest of the paper is organized as follows. In Section 2, an analysis of the evolution of tourism demand is presented, from the perspective of the number of inflows and gross revenues generated, as well as supply indicators; in section 3 there is a review of the literature on tourist demand and its determinants, as well as the models used in empirical studies; section 4 presents the econometric methodology and description of the variables; section 5 contains the results of the estimates and their economic interpretation and section 6 summarizes the final considerations.

Tourism demand in Cabo Verde

In this section, an analysis is made of the evolution of the indicators for the international inflow of tourists and gross revenue generated, based on official data published by INE and BCV, in the period 2000-2018. Tourism is a sector that has been increasing at an accelerated rate and gaining increasingly fluent importance in the Cabo Verdean economy. The country in the last 19 years has experienced an accelerated increase both in terms of demand and in terms of tourism supply. Major public investments (eg: creation and modernization of international airports; paved road networks, etc.) were carried out and large hotel infrastructures were built and this allowed the country to perform well in terms of tourism demand and supply indicators. The vitality of the tourism sector and especially of the hotel sector in Cabo Verde can be expressed by the flow of tourists and the revenues it generates for the country.

Figure 1 shows the growth in international tourist arrivals (number of non-resident guests in hotel establishments), as well as the gross revenues generated and their growth. International inflows went from 115,015 tourists in 2000 to 709,653 in 2018, reflecting a significant increase of 517% at an average annual growth rate of approximately 11%. In the same period, gross tourism revenue jumped from 4,686 million Cabo Verdean escudos (CVE) to 43,513 million Cabo Verdean escudos (CVE), representing a significant increase of 828% in average annual growth of approximately 15%. However, the evolution of arrivals and revenues did not have homogeneous growth in all periods. It can be seen that in 2002 right after the September 11, 2001 attack in the USA, inflows decreased 6.2% after having increased by 16.7% in 2001, however, it did not affect the revenues that increased in the same period, 14.8%. The drop in entries may be related to the events of 2001 that affected world tourism as well as the slowdown in growth and / or the economic recession in some important generating countries at that time (eg: Portugal, Germany, Italy, etc.). Between 2003 and 2007, both international inflows and revenues continued to experience continuous and accelerated growth (average of 16.5% and 28.1%, respectively) so that, in 2008 and 2009, there was a marked slowdown in growth due to the economic crisis and 2008 global financial, which also affected the world economy and the international tourist flow. In 2009, inflows grew by only 0.7% and revenues decreased by 16.1%. After this period, growth continued, until again seeing a fall in 2014 (-1.8% in inflows and -3.7% in revenues), resulting essentially from the crisis in the eurozone that started in 2010, which lasted until 2014 and which had a visible impact on the pace growth in tourism in Cabo Verde in 2013 and 2014. From this period until 2018, tourism continued its growth path, albeit with less acceleration compared to the beginning of the sample.
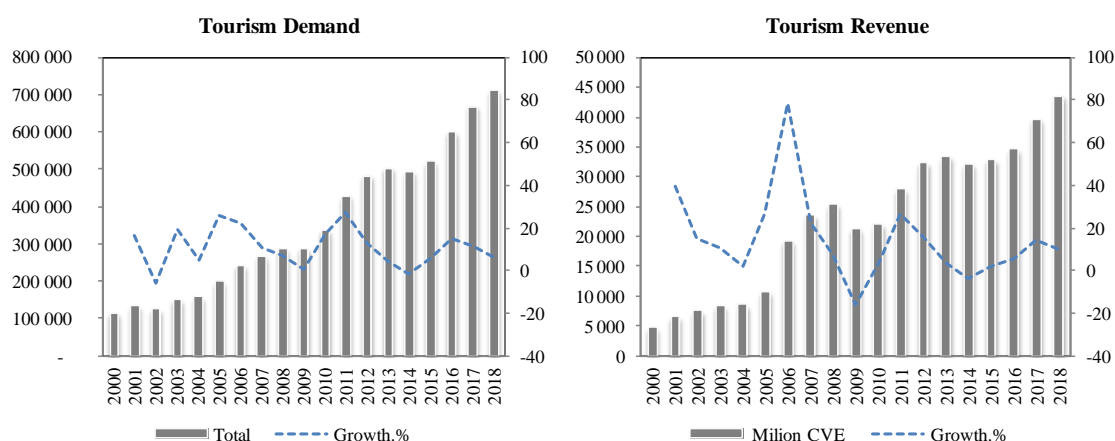
Figure 1: Inbound international tourist and Gross tourism revenue (2000-2018)
Source: INE - Tourism Statistics and BCV - Board of Directors Report

The traditional tourism market for the Cabo Verde Islands has been Europe. According to INE data, since the year 2000, the distribution of demand by sending markets reveals a high dependence on a small number of European countries. In 2000, Portugal was the country with the highest number of tourists to Cabo Verde, representing about 28% of the total international tourists who entered the country that year. Since 2009, the United Kingdom has been the largest issuing market, reaching in 2018 around 25% of the total international inflows. In addition to the United Kingdom, currently, the other four (4) main markets are Germany (12.7%), France (10.9%), the Netherlands (10.8%) and Portugal (10.0%). Tourists who entered the country are mainly concentrated on Sal and Boa Vista Island. In 2018 the Sal Island received 49.5% of the total inflows, followed by the Boa Vista Island, with 26.9% and Santiago with 11.2%.

Table 1: International tourist arrivals by country of origin – 2018

Country	"Number of arrivals (guests at hotel establishments)"	Percentage share of the total
United Kingdom	174 078	24.5
Germany	90 157	12.7
France	77 127	10.9
Netherlands	76 798	10.8
Portugal	70 974	10.0
Sweden	37 329	5.3
Italy	30 969	4.4
Czech republic	22 873	3.2
Poland	17 068	2.4
Spain	13 916	2.0
Switzerland	10 292	1.5
United State of America	6 886	1.0
Others	81 186	11.4
Total	**709 653**	**100.0**

Source: INE - Tourism Statistics (2018)

In terms of tourist offer, according to data from the annual Inventory of the Hotel Establishments carried out by INE, at the end of 2018, 284 hotel establishments were active, 259% more than in 2000. These hotel establishments offered an accommodation capacity of 27,860 rooms; 21,046 beds, 13 187 rooms and had 9 417 people employed, representing a significant increase compared to 2000 of 432%, 370%, 452% and 410%, respectively.

Table 2: Evolution of the number of establishments, rooms, beds, capacity and staff, 2000-2018)

Year	No. of establishments	No. of rooms	No. of beds	Accommodation capacity	Staf
2000	88	2 391	4 475	5 239	1 845
2001	88	2 489	4 628	5 450	2 046
2002	93	2 820	5 159	6 062	2 043
2003	105	3 146	5 715	6 682	2 281
2004	108	3 150	5 804	6 749	2 165
2005	132	4 406	8 278	10 342	3 199
2006	142	4 836	8 828	10 450	3 290
2007	150	5 368	9 767	11 544	3 450
2008	158	6 172	11 420	13 708	4 081
2009	173	6 367	11 720	14 096	4 120
2010	178	5 891	11 397	13 862	4 058
2011	195	7 901	14 076	17 025	5 178
2012	207	8 522	14 999	18 194	5 385
2013	222	9 058	15 995	19 428	5 755
2014	229	10 839	18 188	23 171	6 282
2015	226	10 626	18 055	22 954	6 426
2016	233	11 435	18 382	24 376	7 742
2017	275	12 463	20 421	26 987	8 825
2018	284	13 187	21 046	27 860	9 417

Source: INE - Yearly Inventory of the Hotel Establishments

According to the Tourist Expenditure and Satisfaction Survey (TESS) conducted annually by INE, of the total number of tourists who visited Cabo Verde in 2018, 44.4% did so in the low season and 55.6% in the high season, with the majority travelling for vacation reasons (94.2%). To organize the trip, 47.0% say they get information through the internet, 29.8% through travel agencies and 19.0% through information from friends. Women are the ones that most visited Cabo Verde in 2018, representing 53.5% of total entries. The average age of tourists was 45 years old, and, in the age group, the most expressive group was between 45 and 54 years old (22.7%) and between 25 and 34 years old (22.3%). Most tourists were workers (83.7%), followed by those who were retired (12.2%). 27.4% of the tourists who entered the country in 2018 had a family income of 60 thousand Euros or more, followed by those with income between 48 thousand and 60 thousand Euros, representing 19.4% of the tourists. A significant percentage, 18.3%, had an annual family income between 36 thousand and 48 thousand Euros. Of the total number of tourists who visited Cabo Verde in 2018, 81.0% travelled on a tour package and, of these, 75.8% travelled on an all-inclusive package. In general terms, the average overnight in Cabo Verde was 8.6 days (more than 80% compared to the year 2000), having an average daily spend of approximately 4 546 CVE and tourists who did not travel in the package presented higher expenses (an average of 13 554 CVE per day). These expenses were mainly on food and beverages (29.8%) and accommodation (21.5%). In general, in 2018, tourists showed satisfaction with the goods and services provided in Cabo Verde, and in the overall assessment of the stay in face of expectations, there was a positive response balance of 94.2%. Most tourists recommend Cabo Verde as a tourist destination and expressed an intention to return to the country, 97.8% and 95.0%, respectively. This high rate of intention to return and recommend the country as a holiday destination gives a clear indication of the loyalty to the destination, as well as the importance of word of mouth.

Literature review

Tourism is a sector of activity that has long been growing and showing its value in the world economy and in countries in particular. Given its importance, several authors have triggered studies that allow a deeper understanding of its dynamics. As noted by Song and Li (2008), research interest in the field of tourism has been growing and gaining strength, in parallel with the phenomenal growth in demand for tourism in the world. According to Li, Song and Witt (2005), since the 1960s there has been a considerable increase in research that focuses on tourist demand with regard to the diversity of research interests, depth of theoretical foundations and advances in research methodologies, at the same time that, in the last decade, there have been several published empirical studies focusing on tourism modelling, focusing on the determinants of tourist demand and, mainly, on forecasting tourist demand (Song & Li, 2008).

There has also been, in empirical studies, a wide discussion on the concepts of tourism demand and its measurement, as well as the conditioning factors to be incorporated in the applied models. Mathieson and Wall (1982) define tourism demand as the total number of people who travel or wish to travel, using tourism equipment or services outside their home and work. In economic terms, Pearce (1989: 109) claims that "tourist demand is considered as the significant amount of goods and services that consumers, in this case, tourists, are willing to buy at a specific price in a given period of time and in a particular place". In turn, Song and Witt (2000) refer that the international tourist demand is measured in terms of the number of tourist visits originating from a country to destination countries, or in terms of tourist expenses incurred by visitors originating from other countries in the areas destination. In the perspective of Cooper, Fletcher, Fyall, Gilbert, and Wanhill (2005), tourist demand can be treated as a consumption process influenced by certain factors, which may be a combination of wants and needs, availability of time and money, or images, perceptions and attitudes. However, with regard to its measure, empirical studies have identified in the models of international tourist demand, the arrivals/departures of tourists and expenses/revenues (dependent variables) as being the most frequently used measures to measure tourist demand (Lim, 1997; Pearce, 1995; Song, Li, Witt & Fei, 2010; Song & Witt, 2000; Uysal, 1998; Witt & Witt 1995). In addition, according to Leitão (2010), the nights spent (number of overnight stays) in the country were also used in the studies, but much less frequently.

Divisekera (2003) states that travelling abroad is one of many options that the consumer has, and when this decision is made, the consumer is faced with several alternative choices in terms of destinations. However, the decision to choose whether to leave your usual place, as well as to choose between the various existing destinations to consume tourist services, depends, besides the will and availability of the traveller (consumer) (Cooper et al., 2005), a set of conditioning factors that can be of an economic, social, psychosociological nature, as well as exogenous factors (Uysal, 1998). The challenge is, in empirical studies, to choose which of these factors and the best way to incorporate them in the models of tourist demand. Martin and Witt (1987), claims that, in general, the existing works in the literature on modelling tourism demand focus on the analysis of the effects of the various determinants of tourism demand.

However, factors (independent variables) such as income, expressed as gross domestic product per capita or gross national product or national income or real income, total personal income, permanent income, relative prices and exchange rates (these were used as a proxy variable for price or together with price variables) are the most used in works with econometric modelling or forecasting (see: Song & Witt, 2000; Garín-Muñoz & Amaral, 2000; Lim & McAleer, 2001; Luzzi & Fluckiger, 2003; Eilat & Einav, 2004; Nordström, 2005; Maloney & Rojas, 2005; Seetanah, 2006; Phakdisoth & Kim, 2007; Song & Fei, 2007; Kareem, 2007; Mervar & Payne, 2007; Garín-Muñoz & Montero -Martín, 2007; Muhammad & Andrews, 2008; Habibi, Rahim, Ramchandran & Chin, 2009; Allen & Yap, 2009; Garín-Muñoz, 2009;

Hanafiah & Harun, 2010; Leitão, 2010, Surugiu, Leitão & Surugiu, 2011, Habit & Abbasinejad, 2011; Ibrahim, 2011; Kusni, Kadir & Nayan, 2013, Faragalla, 2018).

Surugiu et al. (2011) claim that, in addition to income and relative prices, there are exogenous factors that influence tourist demand and that have been incorporated into the models. This is the case of: - cost or price of transport, often introduced in the models through the *proxy* variable distance between the destination and the countries that emit tourists or crude oil price (see: Lim & McAleer, 2001; Naudé & Saayman, 2005); Phakdisoth & Kim, 2007; Garín-Muñoz & Montero-Martín, 2007; Muhammad & Andrews, 2008; Allen & Yap, 2009; Hanafiah & Harun, 2010; Leitão, 2010; Surugiu et al., 2011; Faragalla, 2018), network infrastructure (see: Proença & Soukiazis, 2005; Seetanah, 2006; Phakdisoth & Kim, 2007; Aslan, Kaplan & Kula, 2009); population (see: Hanafiah & Harun, 2010; Leitão, 2010; Surugiu et al., 2011; Massidda & Etzo, 2012), introduced based on the fact that the size of the population is a determinant of the size of the market (Yang, Lin & Han, 2010), and the larger the population of the country of origin, the greater tourist demand they will generate (Garín-Muñoz, 2009; Surugiu et al., 2011; Vencovská, 2014); - the tourist infrastructure as a accommodation capacity (see: Proença & Soukiazis, 2005; Seetanah, 2006; Aslan et al., 2009, Habit & abbasinejad, 2011); - promotion / marketing and advertising expenses (Song & Witt, 2000); - consumer tastes or fashion (see: Song & Witt, 2000; Eilat & Einav 2004); - bilateral trade (see: Leitão, 2010; Surugiu et al., 2011; Ibrahim, 2011) among others.

The effects of different types of phenomena such as: -economic / financial crises or extreme situations, special factors such o crime rate, political instability, special events, climate changes, among others (Surugiu et al., 2011), are also considered very important for understanding the dynamics of world tourism. In econometric models, these phenomena are incorporated through dummy variables (see: Eilat & Einav 2004; Garín- Muñoz & Amaral, 2000; Phakdisoth & Kim, 2007; Kareem, 2007; Mervar & Payne, 2007; Song & Fei, 2007; Garín -Muñoz & Montero-Martín, 2007; Habibi et al., 2009; Allen & Yap, 2009; Garín-Muñoz, 2009; Taylor & Ortiz 2009; Hanafiah & Harun, 2010, Habit & Abbasinejad, 2011; Kusni et al., 2013; Faragalla, 2018).

In general, the literature points to other factors or events that influence or condition international tourist demand, such as, for example, tourist education, security at the destination (Ibrahim, 2011), among others, however, given the lack of data or difficulty in obtaining it, makes it difficult and often impossible to incorporate in econometric models. There is no theoretical or empirical consensus on the appropriate set of independent variables (influencing factors) to be used in the models (Morley, 1993), and there is a finding that some factors have a greater influence than others in different countries (Surugiu et al., 2011).

In terms of modelling tourism demand, Song and Li (2008), in the article entitled "Tourism demand modelling and forecasting — A review of recent research", finds that most published studies use quantitative methods, in particular, time series and econometric models to model and predict tourist demand, pointing out examples from studies by Crouch (1994), Li et al. (2005), Lim (1997a, 1997b, 1999), Witt and Witt (1995) etc. Faragalla (2018) have found the use of several econometric techniques to estimate the function of tourist demand, grouped the published works in three (3) groups, with the first group framing those that used the econometric technique using cross-sectional data and classical multiple regression (for example, Witt & Witt, 1995; Lim, 1997 & 1999; Crouch, 1994); The second group of empirical studies used the modern technique of time series data and cointegration (for example, Kulendran & Witt, 2001; Song et al., 2003; Narayan, 2004; Drivisekera, 2007; Ouerfelli, 2008). And the third group of studies makes a combination of cross-sectional data and time-series data in tourist demand using regression with panel data and different estimation methods (Generalized Least Squares method (GLS) like Naudé and Saayman (2005), Generalized

Method of Moment (GMM) in which case studies from Aguiló, Riera and Roselló (2005); Proença and Soukiazis (2005); Muñoz and Montero-Martín (2007); Aslan and Kula (2008); Brida and Risso (2009); Allen and Yap (2009); Leitão (2009); Leitão (2010); Habibi and Abbasinejad (2011); Ibrahim (2011); Kusni et al. (2013); Surugiu et al. (2011); Habibi (2017), etc.).

The most recent studies (see, for example, Aguiló et. al., 2005; Muñoz & Montero-Martín, 2007; Aslan at al., 2008; Brida & Risso, 2009; Leitão, 2010; Habibi & Abbasinejad, 2011; Habibi, 2017; Faragalla, 2018) have given much emphasis to the econometric modelling of the determinants of international tourist demand using the dynamic panel data approach, which, through the inclusion of the lagged dependent variable as an explanatory variable, quantifies the persistence of the habit and the repetition and/or the mouth-to-mouth effect (Faragalla, 2018; Muñoz & Montero-Martín, 2007), which has practical relevance in terms of decision-making to improve destinations. In the case of Cabo Verde, in particular, except for the master's dissertation by Tavares (2015), in which he sought to model the determinants of international tourist demand for Cabo Verde by applying the static model with panel data, an unpublished work, there is no evidence of empirical work published on the modelling and forecasting of tourist demand in Cabo Verde using econometric models, a contribution that is intended to be made with this paper.

Econometric methodology and data description

According to Wong and Song (2002), when modelling tourist demand, it is necessary to choose between univariate or multivariate modelling, between static or dynamic specification and the selection of the type of data to be used, which may be: - time-series data, cross-sectional data or panel data. The advantage of using panel data, as pointed out by Song and Witt (2000), is that it allows a combination of transversal data and time series. On the other hand, panel data provides more informative data, more variability, less collinearity between variables, more degrees of freedom and more efficiency (Baltagi, 2001). However, using a panel data approach, it is possible to use statistical or dynamic modelling. In particular, statistical modelling, as pointed out by Witt and Song (2000), may suffer from several problems, including structural instability, bad forecasts and spurious regressions, or fail to take into account possible changes in consumer preferences. Alternatively, researchers have been employing dynamic models to avoid these problems and place special emphasis on trying to introduce several possible changes in consumer preferences. According to Muñoz and Montero-Martín (2007) *apud* Fujii & Mak (1981), Witt and Martin (1987), one way of dealing with the dynamic structure of preferences is to consider changes in taste/preference as endogenous, including previous demand in the model (that is, the lagged dependent variable). In addition, the inclusion of the lagged dependent variable allows us, according to the literature, to measure the formation of habits and preferences of visitors. Taking this into account, this work uses the dynamic panel data model, through the application of the popular GMM-system estimator developed by Holtz-Eakin (1988); Arellano and Bover (1995) and Blundell and Bond (1998).

Model specification

$$Y_{it} = \beta'_i X_{it} + \mu_{it} \qquad (1)$$

On what, Y_{it} (dependent variable) represents the number of international tourist arrivals from the country of origin i in year t, β'_i represents parameter vectors and X_{it} corresponds to vectors of explanatory or explanatory variables, including lagged dependent variable (Y_{it-1}).

Therefore, in our case, the tourist demand function takes the following form:

$$G_{it} = f(G_{it-1}, GNI_{it}, RP_{it}, TC_{it} \text{ time dummies}) \qquad (2)$$

where G_{it}, t is the number of tourists who enter and stay at hotel establishments in Cabo Verde from country i during year t; GNI_{it} is the national income per capita (in dollars) in each of the issuing countries; RP_{it}, is the relative cost of living for tourists in Cabo Verde and TC_{it} is the cost of transportation. Equation (2) is a theoretical relationship between the variables under consideration. However, in practice, we need to specify the functional form of the model. In the present study, the tourist demand model adopted the form of double-logarithmic, which means that the parameter estimates will be read in percentage (elasticity). The model can be rewritten in the following dynamic representation:

$$lnG_{it} = \alpha + \beta_1 lnG_{it-1} + \beta_2 lnGNI_{it} + \beta_3 lnRP_{it} + \beta_4 lnTC_{it} + \beta_5 d_{2009} + \beta_6 d_{1314} + \lambda_t + \mu_i + \varepsilon_{it} \quad (3)$$

being that, in Eq. (3), $v_{it} \equiv \lambda_t + \mu_i + \varepsilon_{it}$ is the decomposition of fixed effects of the error term, where λ_t e μ_i are the time and country-specific effects, respectively. It is assumed that the error component ε_{it} is serially uncorrelated with zero mean and distributed independently among countries, but heteroscedasticity over time and countries is allowed. Furthermore, it is assumed that ε_{it} is not correlated with the initial condition lnG_{it}, para $t=2$, …, T, and with the individual effects μ_i for any t.

According to Brida and Risso (2009), Muñoz and Montero-Martín (2007), when a model for panel data includes the lagged dependent variable in the explanatory variables, the simple estimation procedures are asymptotically valid only when there are a large number of observations in the temporal dimension (T), which does not verify for our case, given that T = 19 years is not enough. The available answer to this problem (Arellano & Bond, 1991; Holtz-Eakin, 1988; Hsiao, 2003) is to differentiate the equation first to remove the individual effects and then estimate using instrumental variables (IV), using the values of the dependent variable. This treatment leads to consistent, but not efficient, estimates, because it does not use all the currently available conditions. These conditions can be explored in a generalized method of moments GMM structure. The estimation procedure used in this study is the GMM proposed by Arellano and Bond (1991). The dynamic model to be estimated will therefore be:

$$\Delta lnG_{it} = \alpha + \beta_1 \Delta lnG_{it-1} + \beta_2 \Delta lnGNI_{it} + \beta_3 ln\Delta RP_{it} + \beta_4 ln\Delta TC_{it} + \beta_5 \Delta d_{2009} + \beta_6 \Delta d_{1314} + \Delta\varepsilon_{it} \quad (4)$$

onde $i=1$, ..., 9; $t=2000$, ..., 2018; and all variables are in the first difference. Which means $\Delta lnG_{it} = lnG_{it} - lnG_{it-1}$. As Garín-Muñoz and Montero-Martín (2007) state, one of the advantages of using a dynamic model is that short and long term elasticities can be obtained. Another advantage is related to the fact that, differing (lagging) the data, we avoid the problem of non-stationarity and this method will give us confidence in the reported coefficient and in the standard errors. Thus, the parameter β_1 indicates the degree to which the current tourist demand is determined by the value of the previous tourist demand. As it is a dynamic model, the estimated coefficients are the short-term elasticities. Long-term elasticities are obtained by dividing each coefficient by $(1-\beta_1)$.

Variable specification and data

The sample includes data on international tourist arrivals from the nine (9) sending European countries, covering the period 2000 to 2018. The choice of countries was made based on the data available in a regular and disaggregated series since 2000. This allowed us to constitute a data panel of 144 observations. These data are obtained from INE, through the annual survey

of hotel establishments: Tourism Statistics - Movement of Guests, a survey that officially monitors the international inflows of tourists in Cabo Verde.

Dependent variable
The number of arrivals (annual number of non-resident guests in hotel establishments in Cabo Verde) was used, broken down by country of origin.

Independent variable
Income - as referenced in the literature, the most important determinant of tourists' decision to travel abroad is the level of their personal income. This case, the per capita gross national income (GNI - in dollar) of each origin country has been considered as an indicator of tourists 'income level. Source of this data is OECD, 2018. Relative Prices (RP) - another important factor that can influence international tourist demand is relative prices. A common practice in empirical studies is to use the relative price proxy as the ratio between the destination and country of origin CPIs, adjusted by the exchange rate, that is:

$$RP_{i,t} = \frac{CPI_{CV,t}}{CPI_{it}} \times ER_{i,t} \quad (5)$$

where $CPI_{CV,t}$ and $CPI_{i,t}$, are Cabo Verde's consumer price index and country of origin respectively, and $ER_{i,t}$ is the exchange rate between Cabo Verde and the country of origin. Source of data for the CPI of the issuing countries is OECD (base year = 2015) and for Cabo Verde CPI is the INE (base year = 2015). The bilateral exchange rate between issuing countries and Cabo Verde was collected from the BCV.

Transport cost (TC) **-** the cost of transport is another aspect that can influence the decision of tourists to visit a specific region or not. In empirical studies, as mentioned in the literature review, it has been captured through the proxy variables distance or price of crude oil. In our case, we consider the average annual crude oil price as a proxy. Data source - Bloomberg.

dummy d2009 e d1314 – used as a proxy for external shocks related to the economic and financial crise of 2008 and the crisis in the Eurozone of 2010-2014, with d2009 = 1 for 2009 and 0 for other years; d1314 = 1 for the years 2013 and 2014 and for other years. The years in which the dummy variables take on value 1, are the years that crises are believed to have impacted national tourism.

Empirical results
This section presents the Eq. (4) estimate using the Arellano and Bond GMM-DIFF estimator using the STATA v.12.0 econometric software. The consistency of estimates in the dynamic panel data model, shown in Table 3, depends on whether the lagged values of the endogenous and exogenous variables are valid instruments in the regression (Muñoz & Montero-Martín, 2007; Leitão, 2010), which was ensured through Sargan specification test and second-order autocorrelation. That is, the non-rejection of the null hypothesis of the Sargan specification test shows that there is no problem with the validity of the instruments used and the autocorrelation test denotes the absence of second-order autocorrelation, which supports the model estimated in this study.

Table 3: Estimation results for the dynamic model (2000–2018)

Variables	GMM-system estimator of Arellano and Bond
lnG_{it-1}	0.753 (0.000)***
GNI_{it}	0.480 (0.016)**
RP_{it}	0.298 (0.201)
TC_{it}	0.209 (0.025)**
d_{2009}	-0.239 (0.000)***
d_{1314}	-0.198 (0.031)**
Autocorrelation2	0.153 (0.871)
Sargan (106)	97.614 (0.707)
Wald Test (6)	678.19 (0.000)***
No. observations	144

Dependent variable: Logarithm of the number of arrivals (number of non-resident guests in hotel establishments) - lnG_{it} . P-value in parenthesis. *** and ** means statistically significant ant 1% and 5% percent, respectively. The estimates are obtained by using the instruments lnG_{it} lagged up to two periods.

Source: research result

According to the results, most of the explanatory variables considered in the study revealed statistically significant coefficients. The lagged dependent variable has an estimated positive and statistically significant coefficient. It shows that the formation of habits has a considerable effect on tourist demand in Cabo Verde. In fact, approximately 75% of tourist demand in Cabo Verde by the European countries considered is explained by repeated visits and, therefore, the word of mouth effect plays an important role in tourist demand. This result is consistent with our expectations, given that the results of the TESS point to the high degree of the desire of tourists to return to Cabo Verde as well as recommending the country as a visiting destination. The estimated coefficient for the income variable shows a positive and statistically significant sign at the 5% level. As the log-log model was used, the coefficients are directly interpreted as short-term elasticities. To obtain long-term elasticities, as mentioned in the methodology, the estimated parameters are divided by $(1-\beta1)$, this assuming that the long-term balance is: $lnG_{it} = lnG_{it-1}$. According to the results, the value of income elasticity in the short term, 0.48, means that tourist demand in Cabo Verde has an inelastic income, although it becomes elastic in the long term (1.94). This means that the demand for tourism is considered a necessity in the short term, however, in the long term it suggests that tourism depends a lot on the economic conditions of the issuing countries. It is noted that both income and the habit of persistence is very important to explain the international tourist demand in Cabo Verde. As a result, it would be advisable to diversify the promotion effort for different countries, mainly for countries outside Europe, in order to avoid vulnerability to the evolution of economic conditions in a specific region or economic bloc. The relative price variable showed a sign contrary to economic theory, but not statistically significant.

In turn, the cost of travel had a positive and statistically significant effect on tourism in Cabo Verde. The result shows that the increase in the price of crude oil, used as a proxy for the cost of transportation, may favour tourist demand in Cabo Verde. This may be justified, in part, by the fact that this rise has a negative effect on competing destinations where the weight of transport is more significant in the total cost of travel, which could benefit the country positively. It is an important indicator that leads to future studies on the incorporation of

relative prices from potential competing destinations. In other words, the country will benefit from the diversion of tourists from other destinations when the international transport price increases.

The dummy variable d2009 and d1314 were included to reflect the impact of the 2008 financial and economic crisis and the crisis in the Eurozone (2010-2014). The results confirm the expected negative sign and show that it is significant to explain the number of arrivals, reinforcing the idea that tourism in Cabo Verde depends a lot on the economic conditions of the sending countries and is affected by their economic and financial instability.

Conclusion

Knowing the main determinants of tourist demand in Cabo Verde by European country can be very important to assist in decisions, given the contribution of this market of origin to the country. Based on this premise, the objective of this study was to measure the impact of the main determinants of the international tourist flow to Cabo Verde, taking into account the main factors identified in the literature. For this, the dynamic panel data model was used to estimate the coefficients. The dynamic methodology, based on cross-section and time-series data, has the advantage of taking into account all information related to the data set under consideration, allowing to capture the heterogeneity between countries and obtain efficient estimates of the coefficients. The model was used to assess the performance of tourist demand in the nine issuing countries between 2000 and 2018 and was estimated using the GMM-DIFF estimator proposed by Arellano and Bond (1991).

One of the main conclusions of the study is the significant value of the lagged dependent variable (0.753), which shows that the habit of persistence is important to explain the Cabo Verdean tourist demand. This result can be interpreted as high consumer loyalty to the destination and / or as an important word-of-mouth effect in the consumer's decision in favour of the destination. According to Muñoz and Montero-Martín (2007), the political implication of this result is that, in order to attract more tourists to the destination, suppliers of tourism products/services must improve their service quality and update their image and brand, on the other hand, says the authors, the presence of repeated guests can also possibly be considered an impediment to quality "cheating".

The values of income elasticity suggest that the economic conditions of the generating countries are also an important factor in determining tourist demand in Cabo Verde. Therefore, it would be advisable to diversify the promotion of tourism to different countries in order to limit the vulnerability to changing economic conditions in a market or in a single region. Reinforcing this idea, it was discovered that external shocks can impact tourism demand. The results indicate that the economic and financial crisis of 2008, as well as the crisis in the eurozone that ran between 2010 and 2014, negatively affected tourism in Cabo Verde.

Another important conclusion of this study is related to the fact that the results indicate that the increase in international transport costs benefits the tourist demand in Cabo Verde. Captured in the model through the proxy variable, crude oil price, the sign of this variable was positive and significant. This may indicate that an international increase in the price of a barrel of oil may negatively influence potential competing destinations and cause an additional deviation in tourist demand in Cabo Verde. Bearing in mind that tourism in Cabo Verde is predominantly all-inclusive (includes transportation), the increase in transportation costs may not affect much the all-inclusive packages sold by a small number of operators, which also have aeroplanes for these services, to the detriment of the more considerable increase in potential competing destinations. On the other hand, the relative price variable proved

insignificant. In general, additional research can improve the results, including prices of alternative destinations in the model and testing which can be considered as substitute markets.

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