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Determinants Of Tourism In Southern European Countries: A Dynamic Panel Data Model

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Abstract

This paper aims to investigate some of the most important factors of tourism demand in Southern European Countries. The System Generalized Method of Moments is applied to a panel of 15 relevant tourist generating countries, for the period from 2005 to 2021. The considered explanatory variables follow the expected signs and have statistically significant effects on international tourist arrivals. The results suggest that tourism demand is negatively affected by bilateral distance, and global health emergencies such as COVID-19 pandemic. Moreover, lagged tourist arrivals, per capita income in origin countries, and the existence of a common border have a positive effect on the considered dependent variable.

Keywords *Southern European Countries, System Generalized Method of Moments, tourism determinants.*

1. Introduction

Based on World Tourism Organization (UNWTO) data, international tourism has returned closer to pre-pandemic levels, with twice as many travellers in the first quarter of 2023 than in the same period in 2022. More specifically, international arrivals recovered to 80% of pre-pandemic levels in the first quarter of 2023. The European continent rebounded to nearly 90% of pre-pandemic levels, with results boosted by intra-regional demand. In addition, Europe showed [1]the best results in 2022 with 550 billion dollars in tourism receipts. Southern Mediterranean Europe has also has returned to its pre-pandemic levels in the first quarter of 2023, whereas Western Europe and Northern Europe were close to reaching those levels.[2]

According to official reports and relevant academic literature, Southern Europe, also known as Mediterranean Europe, includes Albania, Croatia, France, Greece, Italy, Malta, Montenegro, Portugal, Spain, Turkey, and other smaller countries such as Andorra, Gibraltar, San Marino, and Vatican. This definition is also based on specific climatic features such as hot, dry summers and cool, humid winters. Mediterranean Europe is generally hilly. The landscape varies from one area to another and includes rocky and sandy beaches, high mountains and green forests, natural parks, and a large number of islands. The tourism sector has become fundamental for

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[2] World Tourism Organization (UNWTO) data, 2023.

the development of Southern European countries, and a major source of employment and income generation. Furthermore, there are several initiatives and good practices of sustainable tourism in these countries, which will minimize the ecological impact of tourism and empower the local communities.

This paper aims to investigate some of the most important determinants of international tourism flows to Southern European countries. A dynamic panel model is estimated for a sample of 15 origin countries, for the period from 2005 to 2021. The remainder of this study is structured as follows. Section 2 presents an overview of the main variables and estimation methods considered in the literature. Section 3 introduces the proposed framework and reports the results. The last section concludes and highlights some future research direction.

2. Literature review

A vast amount of literature has been produced on the determinants of international tourism demand. Most of the empirical studies consider tourist arrivals as the measure of tourism demand (Ren, Can, Paramati, Fang and Wu, 2019). Tourist flows are often considered more precise and practical than tourism receipts (Okafor, Khalid and Then, 2018). The main factors that may impact the number of international tourists in a given destination include income per capita, tourism infrastructure, relative prices, bilateral distance, common language, political stability, level of security, climate, etc. (Gani and Clemes, 2017; Marti and Puertas, 2017). Several estimation methods have been proposed in the literature to estimate the magnitude and the sign of the coefficients associated with each variable. According to Eilat and Einav (2004), international tourism is driven by unique factors of production, and could be better dealt with in a single industry study than in a general equilibrium model. The authors consider a three-dimensional data set of tourist flows between countries and over years. The results show that tourism to developed countries has a price elasticity of nearly one, whereas tourism to less developed countries does not depend on price fluctuations. Other variables such as destination risk, fashions, common language, common border, and distance, are all statistically important in determining tourism flows. Surugiu, Leitão and Surugiu (2011) employ two econometric models, namely fixed effects and Tobit, to explain tourist demand in Romania during the period 1997-2008. The authors consider a panel dataset of 23 European origin countries. Estimation results indicate that 96% of the variation in tourist inflows can be explained by population, GDP per capita, trade relations, and prices. Agiomirgianakis and Sfakianakis (2014) focus on the determinants of tourism demand in Greece during the period 2004-2011. They use an Estimated Generalised Least Squares (EGLS) model on a panel of 22 countries and regions. In this case, the proposed equation includes GDP per capita, relative prices, prices in competing countries, extraordinary circumstances and major events, human capital, cost of traveling abroad, and the outward orientation of economies. The considered independent variables generally follow the initial expectations and explain a significant part of the variability of tourism demand. Lv and Xu (2017) investigate the relationship between tourism demand and corruption through a quantile regression model. The authors consider a panel dataset of 62 countries over the period 1998–2011. Empirical results show that the inverted-U relationship among tourism and corruption is significant only at the 50th and 75th quantiles. Moreover, the authors find a statistically significant relationship between income and tourism at all points of the demand distribution.

A considerable number of studies have followed a gravity framework to explore the determinants of international tourist arrivals. The basic gravity model is based on Newton's universal law of gravitation to describe the patterns of bilateral aggregate trade flows. Gravity models have been have been widely used to explain international flows of trade, foreign direct

investment, migration, etc. (Morley, Rosselló and Santana-Gallego, 2014). Chasapopoulos, Den Butter and Mihaylov (2014) investigate the determinants of international tourism demand in Greece, using a dataset of tourist flows from 31 countries. The estimated gravity model show that trade ties, bilateral distance and political stability are important factors of foreign demand for tourist services. On the other hand, relative prices, personal income of tourists, and the proxy of infrastructure and other facilities are statistically not significant. Khoshnevis Yazdi and Khanalizadeh (2017) explore the factors of international tourism demand to the United States. The authors estimate a gravity model on a panel sample of tourist arrivals from 14 countries for the period 1995–2014. Findings indicate that gross domestic product, real exchange rate, and consumer price index have a significant impact on tourism demand. Furthermore, tourism transport infrastructure positively influences tourist arrivals into USA. Xu, Wang, Li, Tang and Shao (2019) investigate the determinants of international tourism flows to China. The authors use a panel dataset of tourist arrivals from 21 origin countries during the period 1995-2014. Empirical findings show that the basic gravity variables have statistically significant effects on tourist arrivals. In addition, the results indicate that international tourism demand is income elastic and price inelastic. Bilateral trade, foreign direct investments, and preferential relationship proxies are other statistically significant variables. Ulucak, Yücel and İlkay (2020) analyze the demand-side variables that impact the number of international tourist arrivals to Turkey. The authors estimate a gravity model on a panel dataset of international tourists from the top 25 originating countries during the period 1998-2017. Empirical results indicate that per capita income, relative exchange rate, and globalization positively impact tourism demand, whereas the parameters of consumer price index, household debt level, violence/terrorism, and bilateral distance are negative.

A relatively small number of authors have chosen a dynamic specification for the analysis of tourism demand. According to Witt and Song (2000), static models suffer from spurious regressions, structural instability, and predictions failure. On the other hand, dynamic models incorporate possible changes in consumer preferences. This is usually achieved by including the lagged dependent variable as an explanatory variable. Naudé and Saayman (2005) employ cross-section and panel data for the period 1996–2000 to analyze the determinants of tourist arrivals to 43 African countries. The authors consider single-equation models, as well as static and dynamic panel data regressions. The respective findings suggest that tourism infrastructure, marketing and information, political stability, and destinations development are key factors of travel to Africa. On the other hand, income in the origin country, cost of travel, and relative prices are not significant in explaining tourism demand. Leitão (2015) studies tourism demand among Portugal and 26 countries during the period from 2003 to 2013. The author employs a panel unit root test and a dynamic panel data estimator. Empirical findings show that tourism demand can be explained by high-quality services, relative prices, human capital, government spending. Poprawe (2015) explores the effect of corruption on tourists' travelling behavior, using a panel dataset of more than 100 countries for a period of 16 years. The author consider different estimation methods, namely, "country fixed effects", "dynamic GMM (Generalized Method of Moments)" and "Hausman-Taylor". Empirical findings show that the effect of the Corruption Perception Index on total tourist inflows is positive and statistically significant. Furthermore, tourist inflows are positively impacted by GDP per capita, GDP growth and openness, and a temperate climate. Lim and Zhu (2017) study the tourism demand for Singapore using a panel error correction equation and three alternative estimators of the dynamic relationship among tourism and a vector of independent variables. The authors consider quarterly data of 16 origin countries, and show that the pooled mean group (PMG) estimator can provide efficient and consistent estimates of long-run relationships between tourism and the respective determinants. Empirical findings show that travel demand is positively associated with long-run income in origin countries, and negatively related to long-run tourism prices. Habibi (2017) studies the determinants of international tourist arrivals to

Malaysia on a panel data set of 33 origin countries during the period 2000–2012. The author estimates three alternative models, using the "Arellano and Bond GMM" estimator for dynamic panel data models. According to the empirical results, specific characteristics of tourism demand depend on variables that are not strictly economic, such as preferences (word-of-mouth) and habits of international tourist arrivals. Income, political stability, hotel room, and substitute tourism prices are other statistically significant variables.

3. Econometric specification and results

This section presents the methodological framework that was adopted for this research and discusses the respective results.

Initially, we consider a standard panel data equation with i = 1, ... , N, t = 1, ... , T:

$$y_{it} = \beta_0 + x_{it}'\beta + \varepsilon_{it} \quad (1)$$

where x_{it} is a K-dimensional vector of independent variables, β_0 is the intercept, β is a (K x 1) vector of slopes, and ε_{it} is an error term. We control for individual unobserved heterogeneity by decomposing ε_{it} in:

$$\varepsilon_{it} = \alpha_i + u_{it} \quad (2)$$

As a result, equation (1) can be written as:

$$y_{it} = \beta_0 + x_{it}'\beta + \alpha_i + u_{it} \quad (3)$$

where u_{it} is independent and identically distributed (iid) with zero mean and constant variance; and α_i captures the unobserved individual factors. Under a fixed effects model, x_{it} and u_{it} are assumed to be uncorrelated. Whereas, under a random effects model, α_i is assumed to follow a normal distribution with zero mean and constant variance. In this case we can include time invariant variables in the equation.

The inclusion of a lagged explanatory variable is well suited to capture the dynamic nature of the dependent variable. Thus, we consider a dynamic panel data model:

$$y_{it} = \beta_0 + \rho y_{i,t-1} + x_{it}'\beta + \alpha_i + u_{it} \quad (4)$$

where $|\rho|<1$. Nickell (1981) argue that standard estimation methods can lead to biased coefficients in dynamic models. The author considers the following equation, where the fixed effect is eliminated and time effects are omitted:

$$y_{it} - y_i = \rho(y_{i,t-1} - y_{i,-1}) + (x_{it} - x_i)'\beta + (u_{it} - u_i) \quad (5)$$

According to Arellano and Bond (1991), the lag of the dependent variable is often correlated with the individual effects of random errors, thereby causing endogeneity. The authors suggest a GMM estimation technique for deriving the respective moment conditions using instrumental variables. However, as proven by Blundell and Bond (1998), this estimator suffers from a weak instrument problem when ρ is relatively high. Blundell and Bond (1998) formulate the System GMM, where lagged levels in the differenced equation, and lagged first-differences in the levels equation are employed as instrumental variables.

Only a limited number of authors have used the System GMM technique to analyze the association between tourism and the respective determinants (Tavares and Leitao, 2017; Ghaderi, Saboori and Khoshkam, 2017; Zhang and Zhang, 2020; Lim and Zhu, 2018). The relationship among international tourism demand for Southern European countries and the considered explanatory variables can be expressed through the following dynamic equation:

$$\ln T_{ijt} = \beta_0 + \rho \ln T_{ij,t-1} + \beta_1 \ln INC_{it} + \beta_2 GEO_{ij} + \beta_3 D_{2020} + \beta_4 D_{2021} + \beta_5 BOR_{ij} + \alpha_i + u_{it} \quad (6)$$

where T_{ijt} denotes international tourist arrivals from origin i to Southern European country j, INC is the GDP per capita in origin i, GEO is the geographical distance[3] between origin i and tourist generating country j, and BOR is a dummy variable equal to unity for countries that share a common border. The model includes two additional dummy variables, namely D2020 and D2021, related to the years 2020 and 2021 when Covid-19 pandemic spread around the world. Tourist arrivals data are obtained from Eurostat, the respective national statistical offices, and other local institutions. GDP per capita is sourced from the World Bank. The dataset used in the study consists of a unbalanced panel of 2,227 annual observations for the period from 2005 through 2021. Table 1 presents a list of the considered origin and destination countries.

Table 1. List of the countries in the dataset.

Southern European countries (destinations)	Albania, Croatia, France, Greece, Italy, Montenegro, Portugal, Spain, Turkey.
Tourist origin countries	Germany, Belgium, France, Ireland, Italy, Netherlands, Portugal, United Kingdom, Switzerland, United States, Spain, Bulgaria, Poland, Romania, Sweden.

Table 2 presents the results of one-step and two-step System GMM regressions. The table also reports the p-values of serial correlation and over-identification tests. The p-values of the Hansen test show that the null hypothesis cannot be rejected, and hence the instruments are valid. Moreover, the Arellano–Bond tests indicate the absence of second-order serial correlation, and thus GMM is an appropriate estimation procedure.

The model parameters follow the expected signs and are statistically significant at 1% or 5% level. The lagged explanatory variable is positive and statistically significant at 1% level in both equations. This implies that the word of mouth plays a crucial role on the number of tourist arrivals in the considered destinations. This finding is consistent with several authors that have used dynamic estimation methods (see, for example, Naudé and Saayman, 2005; Leitão, 2015; Habibi, 2017). GDP per capita in origin countries has a positive and significant effect on changes in tourist arrivals to Southern European countries. The findings also suggest that geographical distance has a negative effect on tourism demand. The links between income, bilateral distance and the number of international tourists in a given destination has been confirmed in numerous empirical studies (see, for example, Eilat and Einav, 2004; Chasapopoulos, Den Butter and Mihaylov, 2014; Ulucak, Yücel and İlkay, 2020). Moreover, the existence of a common border between the considered origin and destination countries tends to increase international tourism demand. The COVID-19 dummies are negative and

[3] Tourism from distant and generally wealthier countries can be a significant contributor to the local economies of hosting countries, but it can also have an adverse impact on the respective natural resources and environment. On the other hand, local tourism and tourists from neighbouring territories has a relatively lower environmental and social impact; but, the contribution to the economy is obviously smaller in the second case. Authorities should focus on the implementation of sustainable tourism practices and policies, and promote fair employment opportunities.

statistically significant at 5% level in both models. Global health emergencies like COVID-19 pandemic have adversely affected the tourism industry and the tourists' behavior.

Table 2. Model estimation results.

Dependent variable: $\Delta \ln T_{ijt}$					
Explanatory variables	One-step SGMM	Pr(>|t|)	Two-step SGMM	Pr(>|t|)	Expected sign
$\Delta \ln T_{ij,t-1}$	1.2718	1.05e-31**	1.1928	1.03e-12**	positive
$\Delta \ln INC_{it}$	0.9727	0.0001**	0.8333	1.13e-52**	positive
$\Delta \ln GEO_{ij}$	-1.6346	0.0004**	-1.6848	0.0066**	negative
D2020	-1.4825	0.0026**	-1.3183	0.0031**	negative
D2021	-0.2190	0.0491*	-0.3057	0.0484*	negative
BOR	1.5175	0.0038**	1.5962	0.0001**	positive
AR(1)	0.0035		0.0001		
AR(2)	0.5164		0.6532		
Hansen test	0.7019		0.7195		

Note: 'Pr(>|t|)' indicates the test p-value. '**', '*', indicate statistical significance at 1%, and 5% level, respectively. AR(1) and AR(2) show the p-values of the Arellano–Bond test for the first-order autocorrelation, and second-order correlation, respectively.

4. Concluding remarks

Tourism has become crucial for the development of Southern European countries, and a major source of economic growth and job creation. This study presents an attempt at exploring the determinants of tourist arrivals in Southern European Countries by using a System GMM estimation technique. Only a relatively small number of authors have considered a dynamic specification for the analysis of tourism demand. Dynamic models incorporate potential changes in consumer preferences, usually by including the lagged dependent variable as an explanatory variable.

Our dataset consisted of tourist arrivals from 15 main origin countries during the period from 2005 to 2021. The considered determinants all had statistically significant effects on tourism demand in Southern European Countries. The results suggested that international tourist arrivals are negatively affected by bilateral distance, and global health emergencies such as COVID-19 pandemic. Moreover, the lagged explanatory variable, per capita income in origin countries, and the existence of a common border have a positive effect on tourism demand. Future research can extend this study by including more relevant explanatory variables and explore different types of proxies of tourism demand. Future studies also may apply other dynamic estimation techniques and consider larger datasets.

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