TOURISM REVENUES AND ECONOMIC GROWTH: A PANEL DATA ANALYSIS OF MEDITERRANEAN COASTAL COUNTRIES

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Abstract

Purpose – This study examines the impact of tourism revenues on economic growth in Mediterranean coastal countries from 2000 to 2022 using panel data methodology. By encompassing various economic cycles and significant global events, this research provides a comprehensive analysis of both short-term and long-term effects of tourism receipts on GDP.
Methodology – In the study, 10 countries in the Mediterranean (France, Italy, Spain, Türkiye, Greece, Tunisia, Egypt, Morocco, Malta and Algeria) were selected by simple random sampling method. Annual data covering the period 2000-2022 were used in the analyses and the panel ARDL method was used to reveal the purpose of the study.
Findings – The panel ARDL method reveals that tourism revenues significantly boost economic growth, emphasizing the tourism sector's critical role in fostering development. These findings offer crucial insights for policymakers, stakeholders, and investors in the Mediterranean region's economic dynamics.
Originality – The study contributes to the literature by utilizing recent data and multiple variables to capture the nuanced relationship between tourism and growth.
Keywords Tourism, Economic Growth, Panel Data Analysis, Mediterranean, ARDL

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INTRODUCTION

Tourism plays a pivotal role in economic growth, stimulating income and employment growth, infrastructure development, international trade and technology diffusion (Haini et al., 2024). The advent of information technologies has empowered the tourism sector to align with consumer demands and tap into new markets, offering long-term growth prospects (Ying et al., 2024). The tourism sector is experiencing a period of rapid growth, supported by technological developments, and is contributing to economic growth in a number of ways, including the generation of income, foreign exchange earnings and employment. Furthermore, the sector is exerting a significant impact on the balance of payments and the development of the hotel industry (Zheng et al., 2023). Consequently, all economies widely acknowledge the contribution of the tourism sector and its development to economic growth (Ali et al., 2024). In 2022, as one of the world's largest economic sectors, tourism contributed to 7.6% of the global GDP, with 975 million international tourist arrivals and $1,135 billion in international tourism receipts (WTTC, 2022; UNWTO, 2023). The forecast indicates that the contribution of travel and tourism to the gross domestic product (GDP) is poised to reach 10.8% by the culmination of 2026 (Rasool & Tarique, 2021, 2). Expenditures related to tourism serve as a supplementary type of export, offering a favorable impact on a nation's balance of payments, fostering employment, and creating additional tax income. Additionally, the revenues derived from tourism can play a constructive role in promoting a country's economic growth by means of foreign exchange earnings and income generation (Pablo-Romero & Molina, 2013, 28; Agaraj & Murati, 2009, 83).

The relationship between specialization in tourism and growth has been examined by two distinct branches in the literature. The first perspective is rooted in the Keynesian multiplier theory. According to this viewpoint, (international) tourism is considered an external component of total demand, exerting a positive influence on income and, consequently, employment

through the multiplier effect. A more comprehensive approach extensively discussed in the literature involves applying a two-sector endogenous growth model to the case of tourism (Figini and Vici, 2010, 790). The second branch is defined by Lanza and Pigliaru's (1995), pioneering work which associates the maximization of the growth rate with specialization in tourism (Seetanah, 2011:294). Lanza and Pigliaru's (2000) study analyzed the importance of natural resources in the tourism sector and concluded that countries with touristic natural resources and a significant labor force potential have the possibility of developing a comparative advantage in tourism. Such countries tend to achieve faster growth than countries specialized in other sectors. These findings suggest that the impact of tourism on economic growth is contingent on factors such as the availability of natural resources and the size of the labor force. Within this framework, the tourism industry emerges as one of the most rapidly expanding sectors globally, wielding a significant influence on economic progress (Pjanić, 2019, 291-292).

Tourism revenues have been demonstrated to stimulate investment, infrastructure development and employment opportunities in recipient countries (Mejjad et al., 2022). Nevertheless, unregulated expansion can result in adverse environmental consequences. The sustainability of tourism is a significant challenge, with certain forms of pollution having the potential to contribute to global warming (Yıldırım et al., 2023). The implementation of effective management strategies in Mediterranean coastal areas has the potential to facilitate long-term economic growth, contingent on the generation of sustainable tourism revenues. However, the Mediterranean countries offer exceptional climatic conditions, as evidenced by the 266 million tourists who visited in 2022, according to the most recent data from that year.

This study, which examines the relationship between tourism revenues and economic growth in Mediterranean countries, is of great importance in the context of economic recovery efforts, which are of vital importance for the tourism sector in the region. The utilization of long-term data spanning the period from 2000 to 2022 circumvents the constraints imposed by outdated data sets observed in previous studies, thereby facilitating a more precise examination of the prevailing trends and dynamics within the tourism sector. The study offers a comprehensive assessment of the relationship between tourism and economic growth, examining a range of variables, including tourism revenue, international tourist arrivals, expenditure, employment, and infrastructure. The utilization of panel data techniques enhances the reliability of the results by addressing both short-term fluctuations and long-term trends between tourism and economic growth in a methodological manner. This study makes a contribution to the existing literature on the relationship between tourism and economic growth in Mediterranean countries. The utilisation of the panel ARDL method and the Dumitrescu-Hurlin Panel Causality Test facilitates a more profound comprehension of the immediate and long-term consequences of tourism revenues on economic growth. In particular, the comparison of PMG and MG estimators enhances the results of the analyses by elucidating the methodological discrepancies in the relationship between tourism and growth. The study also demonstrates the considerable short-run influence of capacity utilisation rates and underscores the pivotal role that sectoral investments and tourism policies can play in propelling economic growth.

In conclusion, this study not only addresses significant gaps in the existing literature but also paves the way for new avenues of research examining the economic impact of tourism. It contributes to the development of effective tourism policies that can support economic resilience and sustainable development in the Mediterranean region.

1. LITERATURE REVIEW

Scholarly inquiries into the relationship between tourism and economic growth can be generally classified into two primary groups: those focused on a single country and those involving multiple countries. Furthermore, the empirical outcomes of these studies can be categorized into three main groups:

The initial group of studies asserts that the tourism sector plays an integral role in actively promoting economic growth, emphasizing its pivotal contribution to overall economic development. In contrast, the second group of studies aligns with the concept of economic-focused tourism growth or growth-focused tourism, positing that economic growth serves as a catalyst for the advancement and enlargement of the tourism industry. The third group of studies suggests a bidirectional relationship between tourism and economic growth, indicating mutual influences between the two (Öztürk et al., 2019 47).

The tourism-driven growth hypothesis suggests that tourism revenues act as a catalyst for economic development. Balaguer and Cantavella-Jorda's (2002) research posited that international tourism serves as a primary catalyst for sustained economic growth. The study proposed that income generated from international tourism positively influences a country's economic growth, playing a significant role in the anticipated parameters of the long-term multiplier effects of tourism activity. Examinations conducted on Mediterranean countries reveal that tourist revenues exert a more substantial influence on the Gross Domestic Product (GDP). Moreover, there is a general observation that the real exchange rate significantly affects economic growth rates (Dritsakis, 2012, 814). The findings suggest that, in the short term, tourism does not exhibit a statistically significant impact on economic growth. However, over the long term, it demonstrates a statistically significant effect, with a 10% rise in tourist arrivals correlating with a 3% increase in GDP growth (Öztürk & Al-Kuwarı, 2021, 598).

In a study assessing the impact of tourism on the economic growth of Pacific Island Countries (PICs), the findings indicate that a 1% increase in tourism exports leads to a 0.72% long-term increase in GDP and a 0.24% short-term increase (Narayan et al., 2010, 169). In a study examining the connection between tourism development and economic growth in Mediterranean nations from 1995 to 2010, it was found that Portugal displays a mutual causality relationship between tourism development and economic growth. In contrast, Spain, Italy, Tunisia, Cyprus, Croatia, Bulgaria, and Greece exhibit a unidirectional causality relationship from economic growth to tourism development. However, no causality relationship was identified for Malta and Egypt. The overall findings suggest that governments in Mediterranean countries should prioritize economic policies to stimulate tourism as a potential driver of economic growth (Aslan, 2014, 363). In a separate investigation, Ertugrul and Mangir (2015) utilized panel data analysis spanning from 1995 to 2012 to study Mediterranean countries. Their findings revealed a noteworthy positive correlation between tourism and economic growth, especially in nations with well-established tourism sectors. Katircioglu (2009) emphasizes the interaction between tourism revenues and various sectors of the economy, particularly the agricultural sector, in the Mediterranean region. Through the application of panel cointegration techniques, the study discerned that while tourism tends to stimulate economic growth, a balanced approach is essential to prevent adverse effects on other sectors. In a study by Belke et al. (2021) concerning Mediterranean countries, it is highlighted that economic growth exhibits greater sensitivity to increases in tourism revenues (positive shocks) compared to decreases in tourism revenues (negative shocks).

Conversely, in an alternative study, while demonstrating effectiveness in elucidating per capita GDP growth, the findings have not presented compelling results in elucidating the growth of employment (Mazzola et al., 2019, 1431). Tugcu (2014) concluded that if the share of resources allocated to tourism is less than its contribution to economic growth, there is no causal relationship between economic growth and tourism. In their study, Dogan and Zhang (2023) posited that the relationship between tourism and economic growth is not linear. The study by Sequeira and Campos (2007) revealed no statistically significant correlation between tourism and economic growth. The findings suggest that, in general, tourism-related variables do not exert a notable influence on economic growth. In a different study, Saboori et al. (2023) demonstrated that diversification of the tourism market has no significant impact on economic growth in high-income countries.

Another aspect that some researchers have touched upon is the quality of tourism. Candela and Figini (2010) highlighted that not just the quantity, but the quality and diversity of tourism are crucial drivers for sustainable economic growth in coastal Mediterranean countries. Lastly, Tang and Jang (2009) provided insights into the challenges faced by Mediterranean coastal countries in maximizing the economic benefits of tourism. They underscored the importance of infrastructural development, political stability, and environmental sustainability.

In Akadiri and Akadiri (2021) study, the hypotheses of tourism-led growth, exchange rate-led tourism, and exchange rate-led growth for tourism island states (SIDS) were supported. A bidirectional causal relationship was found between tourism and economic growth, indicating that tourism has predictive power over economic growth and vice versa. Improvement of tourist destinations and efficient tourism marketing can increase economic growth by attracting international tourists more frequently. As tourism boosts growth in these regions, the higher the number of international tourists, the higher the tourism revenues, and hence the higher the economic growth. Consequently, efficient pricing systems are necessary for stable economic growth.

The studies reviewed above emphasize the positive impact of tourism revenues on economic growth. In particular, the direct and indirect economic benefits of tourism are considerable in Mediterranean coastal countries. Various panel data analyses and econometric models have demonstrated that tourism revenues contribute to GDP growth and stimulate labor markets. However, it is important to recognize that fluctuations and external shocks in the tourism sector should also be taken into account. In this context, sustainability and diversification in tourism are critical for economic stability and growth. Future research is essential to analyze these dynamics in greater depth and provide more comprehensive strategic recommendations for policymakers. The objective of this study is to extend the existing literature in the context of Mediterranean coastal countries and to analyze the effects of tourism on economic growth in greater detail.

2. DATA, METHODOLOGY AND MODEL SPECIFICATION

The objective of this study is to uncover the impact of tourism revenues on the growth of nations surrounding the Mediterranean Sea. The panel ARDL method was employed for this purpose. There are a total of 23 countries bordering the Mediterranean Sea: Spain, France, Monaco, Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Albania, Greece, Türkiye, Syria, Lebanon, Israel, Palestinian Authority, Egypt, Libya, Tunisia, Algeria, Morocco, Malta, Turkish Republic of Northern Cyprus and Greek Administration of Southern Cyprus. In the conducted research, data pertaining to tourism from the years 2000 to 2022 was scrutinized to explore the correlation between the tourism revenues of 10 Mediterranean countries and variables that contribute to growth. In the panel analysis, 10 out of 23 countries were selected as simple random samples. Simple random sampling gives each element in the research population an equal chance of being selected for sampling (Gürbüz & Sahin, 2014). Notably, coastal areas attract the highest number of tourists, positioning coastal tourism as a pivotal economic driver and employment generator for these nations (Drius et al., 2019, 1302-1303). The Mediterranean region forms the backbone of the economies and development strategies of the countries in the region due to the sectoral synergies it triggers (e.g., transportation, accommodation, food and beverage, and entertainment industries) (Plan Pleu, 2022). It seems reasonable to posit that these characteristics include factors such as favorable weather conditions, historical and cultural sites, beautiful beaches, and well-

developed tourism infrastructure. These common features facilitate a comparison of the countries in terms of their ability to attract tourists and generate tourism revenues, which is a crucial aspect of the study's analysis of the impact of tourism on economic growth. The objective of selecting countries with comparable tourist characteristics is to ensure that the variations in economic growth can be more reliably attributed to differences in tourism revenues than to other confounding factors. The utilization of the simple random sampling approach and the explicit criteria for the selection of countries with analogous tourist characteristics serve to reinforce the study's methodological rigor and its endeavors to yield unbiased and generalizable findings. While the random sampling approach mitigates the potential for biases resulting from the researchers' choices, it is essential to acknowledge that the socio-political and environmental contexts of these destinations can exert a pronounced influence on tourist appeal, which in turn affects tourism revenues and economic growth. The abbreviations for the variables and their sources can be observed in Table 1.

Table 1: **Variables definition**

Variable	Abbreviation	Description of Criterion Used	Source
GDP Growth Rate	GDP_Growth	Annual percentage change in GDP	World Bank, UNWTO
Inflation	Inflation	Annual percentage change in the Consumer Price Index (CPI), indicative of overall price changes.	World Bank, UNWTO
Tourist Arrivals	ARR	Total tourist arrivals (domestic and international) or international arrivals only	World Bank, UNWTO
Tourism Revenues	Tour_income	Total tourism revenues, specifying the sectors within NACE	World Bank, UNWTO
Tourism Income to GDP Ratio	Tour_income/GDP (%)	Tourism revenues as a percentage of GDP, specifying the GDP sector	World Bank, UNWTO
Contribution to Employment	Tour_employment	Share of tourism in total employment	World Bank, UNWTO
Tourism Spending	Spending	Tourist expenditure within the country, specify measurement method	World Bank, UNWTO
Tourism Facilities	Tourism_Facilities	Number of tourism facilities, potentially weighted by country size (area or population)	World Bank, UNWTO
Accommodation Capacity	Tour_Capacity	Total number of available rooms and beds in tourism facilities.	World Bank, UNWTO

These indicators are of critical importance for the measurement and analysis of the economic and social impacts of tourism. The measurement of economic growth allows for the assessment of a country's economic performance and the contribution of tourism to that growth. The GDP Growth Rate (GDP_Growth) represents the annual percentage change in GDP, serving as an indicator of economic growth, with data sourced from the World Bank and UNWTO. Inflation is measured by the annual percentage change in the Consumer Price Index (CPI), reflecting overall price changes, and is also sourced from the World Bank and UNWTO. Tourist Arrivals (ARR) denotes the total number of tourist arrivals, including both domestic and international or exclusively international arrivals, with data from the same sources. Tourism revenues (Tour_income) represent total tourism revenues, specified within the NACE sectors. The Tourism Income to GDP Ratio (Tour_income/GDP (%)) indicates tourism revenues as a percentage of GDP, highlighting the sector's contribution to the overall economy. Contribution to Employment (Tour_employment) measures the share of tourism in total employment. Tourism Spending (Spending) accounts for tourist expenditures within the country, specifying the measurement method. Tourism Facilities (Tourism Facilities) are quantified by the number of tourism facilities, potentially weighted by country size (area or population). Lastly, Accommodation Capacity (Tour_Capacity) reflects the total number of available rooms and beds in tourism facilities. Data for all these variables is obtained from the World Bank and UNWTO.

2.1. Empirical analysis, data and methodology

In this study, panel data analysis is used to examine the impact of tourism revenues on economic growth in 10 countries bordering the Mediterranean Sea. Annual data covering the period 2000-2022 are used in the analysis.

2.2. Panel ARDL model

The combination of cross-sectional and time series data in panel data analysis offers a number of advantages over the use of either type of data alone. As posited by Baltagi (2001) and Gujarati (2003), this approach yields a greater number of observations and enables more effective accounting for heterogeneity by considering variables pertaining to countries over time. Furthermore, panel data techniques mitigate the issue of multicollinearity among variables and facilitate econometric analysis even when there are limited time series or cross-sectional observations. Overall, panel data methods provide a more

robust framework for econometric analysis by increasing the number of observations and accounting for heterogeneity among samples, such as countries and firms.

In cross-sectional and time estimations, pooled regression is mostly used for estimations, and mostly two methods are preferred. These are the Random Effects method and the Fixed Effects method. The main difference between these methods arises from the constant terms. There are mainly two approaches: the fixed effects model and the random effects model, for the K-variable panel data model in question.

$$y_{it} = \beta_{1it} + \beta_{2it}X_{2it} + \cdots . + \beta_{Kit}X_{Kit} + \varepsilon_{it} \quad (1)$$

It is expressed in such a way. In Equation(1) i=1,…,N, cross-sectional units are represented, and t=1,…,T represents time, while the non-stochastic error term ε is assumed to have a constant variance and a mean value of zero. In this case (Baltagi, 2001: 11).

y_{it}: the value of the dependent variable for the i' cross-sectional unit at time t.
X_{Kit}: the value of the i' explanatory variable for the K $h$ith cross-sectional unit at time t.
B_{Kit}: the estimated coefficient value for the : i'explanatory variable for the K unit and at time t.

In Equation (1), the beta coefficients vary across different time periods and units. Consequently, when analyzing the model, several assumptions pertaining to the constant term, error term, and slope coefficients of the model are considered, allowing for the examination of different models. The primary distinction between the Random Effects Method and the Fixed Effects Method lies in the treatment of constant terms. In Fixed Effects Estimation Method, the panel's individual differences are accounted for by incorporating distinct constants for each cross-section. On the other hand, the Random Effects Method assumes that cross-sectional characteristics are unobservable, and these random effects stem from the distribution of error terms. The decision of whether to adopt the model with fixed or random effects is determined by the Hausman (1978) test. If the probability of the Chi-square value from the Hausman (1978) test is below 1%, it is inferred that the Fixed Effects model is appropriate (Çetin, 2013: 42-43). In this section of our study, regression coefficients will be estimated for both the Fixed Effect model and the Random Effect model. The Pesaran (2004) test will be utilized to assess cross-sectional dependence in the study. The null hypothesis of the Pesaran cross-sectional dependence test posits that cross-sections are independent, while the alternative hypothesis suggests the presence of cross-sectional dependence.

Table 2: **Cross-sectional dependence test result**

	Test stat.	**Probability**
Pesaran Cross Section Dependence	5.54	0.00*

***, **, and * represent the 1%, 5%, and 10% levels of statistical significance, respectively

Based on the outcomes presented in Table 2 from the cross-sectional dependence test, the null hypothesis is declined at a 1% significance threshold. Given these findings, it's inferred that cross-sectional dependence exists among the variables under investigation (Pesaran, 2004). In this segment of the research, unit root tests will be employed on the variables. This is essential for the forthcoming ARDL tests, which aim to discern both long-term and short-term associations, ensuring that the variables are stationary. Due to the detected cross-sectional dependence in our research, the Cross ADF – CIPS unit root test, which accounts for this particularity, is chosen.

Table 3: **Panel unit root test at level**

Variables	Constant model		
	CIPS Value t-Bar	**z- bar**	**P value**
GDP_Growth	-0.91	-1,09	0.98
Inflation	-1.00	-1.54	0.91
ARR	-1.14	-2.11	0.98
Tour_income	-2.12*	-2.11	0.00
Tour_income/GDP (%)	-3,73*	-1,91	0.00
Tour_employment	-0,19	-1,06	3,19
Spending	-0,17	-1,00	4,10
build	-3.43*	-2.41	0.00
room	-2.44*	-2.00	0.00
bed	-0,09	-1.99	3,19
Critical values	-1.99 (%10)	-2.12(%5)	- 2.10(%1)
Variables	**Constant and trend Model**		
	CIPS Value t-Bar	**z- bar**	**P Value**
GDP_Growth	-0.80	-1,02	0.78
Inflation	-1.00	-1.54	0.79
ARR	-1.10	-2.01	3.01
Tour_income	-5,91*	-4.14	0.00
Tour_income/GDP (%)	-3,73*	-1,91	0.00
Tour_employment	-0,19	-1,06	3,19
Spending	-0,17	-1,00	4,10
build	-3.43*	-2.40	0.00
room	-2.40*	-189	0.00
bed	-0,12	-1.25	3,00
Critical values	-2.10(10)	-2.23(%5)	-2.21(%1)

***, **, and * represent the 1%, 5%, and 10% levels of statistical significance, respectively

The results of the unit root test at the level, whether with a constant or with a constant and a trend, indicate that only the variable representing employment workers is stationary at the level. In contrast, the remaining variables are found to exhibit a unit root. Consequently, the process is iterated by differencing the non-stationary variables. Following the differencing, all variables that were not stationary at the level become stationary. At this juncture of the study, a cointegration relationship will be identified among the series. In the existing literature, tests such as those proposed by Pedroni et al. require that, for the level values of the variables, the estimated long-term coefficients and the estimated short-term error correction coefficients obtained using the first differences must be equal. However, this approach is susceptible to reducing the robustness of the tests, potentially leading to the erroneous rejection of a cointegration relationship between the variables even when it exists. In response to the limitations of the Pedroni tests, Westerlund (2007) introduced four panel cointegration tests based on the error correction model. Two of these tests are known as group mean statistics, while the other two are labeled as panel statistics. Westerlund's test operates on the assumption that the series comprising the panel are stationary at the same degree and at the first difference, denoted as I(1) (Westerlund 2007, 718). In our study, the Westerlund (2007) test has been employed. The null hypothesis of this test posits the absence of a cointegration relationship in the panel, while the alternative hypothesis suggests the presence of a cointegration relationship.

Table 4: **Westerlund cointegration test results**

Durbin h test	Durbin H Value	Probability
Durbin H Group Statistic	2.30	0.026
Durbin H Panel Statistic	4.81	0.00

Based on our cointegration findings, as both the group and panel values fall below the 1% threshold, the null hypothesis has been refuted. This implies that the variables examined in our study exhibit a cointegration relationship with one another.

2.3. Panel ARDL boundary test estimates

As a result of both first-generation and second-generation unit root tests, it was decided that the panel ARDL model, which allows for counteraction relations at different stationarity levels, is the most appropriate model since different degrees of stationarity are achieved. The general form of the panel ARDL(p,q) model can be seen in Equation (2).

$$Y_{it} = \sum_{j=1}^{p} \partial_{ij} Y_{i,t-j} + \sum_{j=0}^{q} \gamma_{ij} X_{i,t-j} + \mu_i + e_{it} \quad (2)$$

In equation (2), the vector of the dependent variable is expressed with Y_{it}, while the vector of the independent variable is expressed with $X_{i,t}$). In the analysis of cointegration relations, the problem of deviation from long-term balances is encountered. For this reason, with the help of error correction model, short-term relationships and how long it takes for short-term deviations to reach equilibrium can be analyzed. The error correction model to be applied for this purpose can be followed in equation (3).

$$\Delta Y_{it} = \emptyset_i\left(Y_{i,t-1} - \beta' X_{i,t-1}\right) + \sum_{j=1}^{p-1} \omega_{ij}\Delta Y_{i,t-j} + \sum_{j=1}^{q-1} \delta_{ij}\Delta X_{i,t-j} + \mu_{\text{i}} + e_{it} \quad (3)$$

In Equation (3), the short-run coefficients are expressed with ω_{ij} and δ_{ij}. Where β represents the long-run coefficients, $\emptyset_i$i represents the error correction term. The error correction term is expected to be between 0 and 1 and negative. Paseran et al. (1999) developed two estimators for the ARDL model, namely the Pooled Mean Group estimator (PMG) and the Mean Group Estimator (MG). MG does not place any limits on the ARDL definition variable.

It also derives its long-term definitions from the long-term definition mean from ARDL estimates. The shortcoming of said estimator is that it does not allow certain parameters to be the same among the units that make up the panel. This deficiency is eliminated by the PMG estimator. Hausman type tests are preferred to decide whether the obtained prediction coefficients are heterogeneous or homogeneous. If the obtained results show homogeneity, the PMG estimator is more efficient than the MG (Mean Group) estimator, which allows heterogeneity. In other words, PMG estimator should be preferred in case of homogeneity of long-term coefficient estimations, and MG estimator in the opposite case. While determining the optimal number of delays in the analysis, the Akaike information criterion was used and it was understood that the appropriate model was ARDL (3,3,1,2,2,1,2,1,1,2). The long-term ARDL equation is as in equation (4).

$$lnGDP_t = \alpha_0 + \sum_{i=1}^{m} \alpha_{1i} Inflation_{t-i} + \sum_{i=0}^{n} \alpha_{2i} ARR_{t-i} + \sum_{i=0}^{p} \alpha_{3i} tour\_income_{t-i} + \sum_{i=1}^{r} \alpha_{4i} T/GDP_{t-i} + \sum_{i=0}^{s} \alpha_{5i} Tour\_employment_{t-i} + \sum_{i=0}^{p} \alpha_{6i} Spending_{t-i} + \sum_{i=0}^{p} \alpha_{6i} build_{-i} + \sum_{i=0}^{p} \alpha_{6i} room_{t-i} + \sum_{i=0}^{p} \alpha_{6i} bed_{t-i} + \mu_t \quad (4)$$

The long-term ARDL estimation results in the study can be seen in Table 5.

Table 5**: Panel ARDL estimation results**

Long Term	***PMG***	***MG***	***Hausman***
Inflation	-0,0731*	$-0{,}042(0{,}00)$	$chi\ square(7) = 5.17$
ARR	0,091***(0,00)	0,112***(0,00)	Probability=0,58
Tour_income	0,0222*(0,01)	0,10*(0,00)	
Tour_income/GDP (%)	0,011*(0,00)	-0,147*(0,00)	
Tour_employment	0,0245*(0,00)	-0,041*(0,00)	
Spending	0,013*(0,160)	-0,016(0,171)	
build	0,0354*(0,01)	0,10*(0,00)	
room	0,015*(0,00)	-0,147*(0,00)	
bed	0,0865*(0,00)	-0,041*(0,00)	

Note: *, ** and *** denote significance at the 1%, 5% and 10% level, respectively. Values in parenthesis represent standard errors.

Based on the findings presented in Table 5 all the variables appear to be statistically significant and consistent with our anticipations. Further, the Hausman test outcomes suggest that the coefficients display homogeneity. Given these results, the choice was made to employ the PMG estimator. The table presents long-term coefficient estimates for various independent variables using two econometric estimation techniques, namely PMG (Pooled Mean Group) and MG (Mean Group).

A comprehensive examination of the long-term effects of various economic variables reveals notable distinctions between the pooled mean group (PMG) and mean group (MG) models. Inflation negatively affects the dependent variable, with statistically significant coefficients of -0.0731 and -0.042 under the PMG and MG models, respectively. The Hausman test indicates a preference for the PMG model, with a chi-square value of 5.17 and a probability of 0.58. The variable representing the number of arrivals (ARR) has a positive influence on the dependent variable, with highly significant coefficients of 0.091 (PMG) and 0.112 (MG). Furthermore, tourism income demonstrates a positive influence, with coefficients of 0.0222 (PMG) and 0.10 (MG), both of which are statistically significant. However, the impact of tourism income as a percentage of GDP is found to be contradictory. While it is positively correlated with the PMG model (0.011), it is negatively correlated with the MG model (-0.147), both of which are statistically significant. A similar pattern is observed in the case of tourism employment, which shows a positive effect in the PMG model (0.0245) and a negative effect in the MG model (-0.041), both of which are statistically significant. The results indicate that spending does not significantly impact the dependent variable in either model. The non-significant coefficients for spending in the PMG and MG models are 0.013 and -0.016, respectively. The results indicate a positive association between building activity and the dependent variable in both models, with significant coefficients of 0.0354 (PMG) and 0.10 (MG). The number of rooms and beds available also has significant effects. In the PMG model, rooms show a positive impact (0.015), while beds show a negative impact (-0.147). In contrast, in the MG model, beds are positively correlated (0.0865), while rooms show a negative impact (-0.041). These findings illustrate the intricate relationships

between economic factors and the dependent variable, with the PMG model offering a more favorable fit in most cases. Following the long-term results, short-term results derived from the error term are estimated, and these outcomes are detailed in Table 6.

Table 6: **Panel ARDL short-term estimation results**

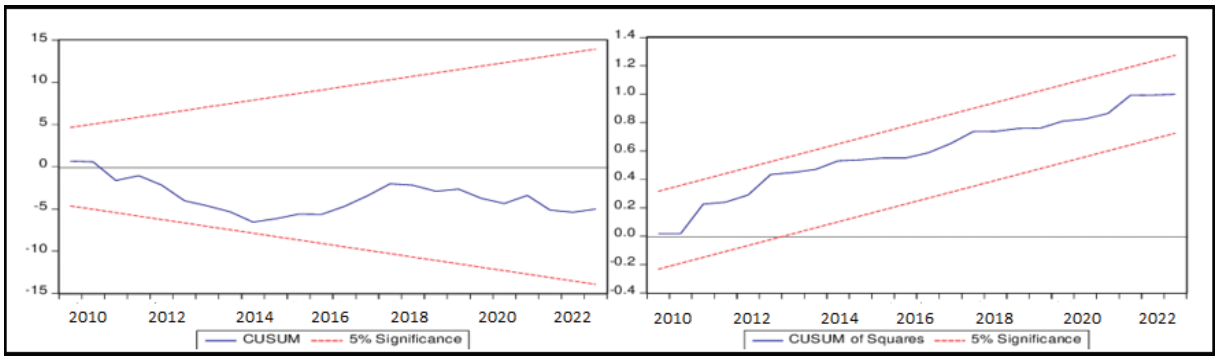
Short Term	PMG	MG
Inflation	-0,032*(0,02)	-0,034(0,00)
ARR	-0,018*(0,00)	-0,009(0,01)
Tour_income	0,070***(0,00)	0,080***(0,00)
T/GDP	0,070***(0,00)	0,068(***(0,00)
Tour_employment	0,014*(0,01)	0,011*(0,00)
Spending	0,069*(0,01)	0,07--68*(0,02)
Build	-0,016*(0,03)	-0,14*(0,00)
Room	-0,010*(0,00)	-0,09*(0,00)
Bed	0,032*(0,03)	-0,041*(0,00)
ECT	-0,25*(0,00)	-0,27(0,03)
C	-0,68*(0,57)	-4,67(7,18)

Note: *, ** and *** denote significance at the level of 1%, 5% and 10%, respectively. Values in parentheses are probability values.

In the short-term analysis, a number of economic factors have been identified as exerting a significant impact on the dependent variable, as observed in both the pooled mean group (PMG) and mean group (MG) models. The coefficient for inflation is negative, with values of -0.032 (PMG) and -0.034 (MG), both of which are statistically significant. Additionally, the Arrivals (ARR) variable exerts a negative influence, with coefficients of -0.018 (PMG) and -0.009 (MG), both of which are statistically significant. Tourism income has a positive influence on the dependent variable, with highly significant coefficients of 0.070 (PMG) and 0.080 (MG). Similarly, the proportion of tourism income to gross domestic product (T/GDP) exhibits a positive influence, with significant coefficients of 0.070 (PMG) and 0.068 (MG). The effect of tourism employment on the dependent variable is positive, with coefficients of 0.014 (PMG) and 0.011 (MG), both of which are significant. Furthermore, a positive impact is observed with regard to spending, as indicated by significant coefficients of 0.069 (PMG) and 0.0768 (MG). Conversely, the construction of buildings exerts a negative influence on the dependent variable, with coefficients of -0.016 (PMG) and -0.14 (MG), both of which are statistically significant. The number of rooms available exerts a negative influence, with coefficients of -0.010 (PMG) and -0.09 (MG), both significant. The impact of bed availability is ambivalent, with a positive coefficient in the PMG model (0.032) and a negative coefficient in the MG model (-0.041), both significant.

The Error Correction Term (ECT) in both PMG and MG forecasts indicates a notable rate of adjustment towards equilibrium, with coefficients of -0.25 and -0.27, respectively. The negative values indicate that the system corrects long-run equilibrium deviations by 25 and 27 percent per period, thereby allowing for a rapid adjustment of short-term shocks. The high significance of the ECT coefficients corroborates the existence of a robust mechanism that continuously propels the system towards equilibrium. The similarity in the adjustment rates observed in both models underscores the robustness and reliability of the error correction process, thereby demonstrating the efficacy of the model in capturing the dynamic adjustments essential for maintaining long-term equilibrium. In other words, it can be said that almost all of the short-term deteriorations disappeared in 4 quarters. The remarkable point in short-term forecasts is that the capacity utilization rate, which is statistically insignificant in the long-term, is significant in the short-term. This result indicates that the capacity utilization rate has a short-term effect on the country risk premium and this effect disappears in the long-term. When the short-term coefficient results, it can be asserted that their impact is comparatively less pronounced than that of the long-term, with effects intensifying as the duration extends. Again, weakening can be observed in the one-period lagged effects of short-term relationships. According to the results, it is revealed that the errors show a normal distribution. The CUSUM and CUSUMSQ tests performed to test the structural breaks and stability of the parameters of the econometric analysis, in other words, to determine the stability of the model, can be seen in Figure 1.

Figure 1: **CUSUM and CUSUMQ test**



According to Figure 1 since the solid line remains within the limits indicated by the dashed lines at the 5% significance level, it is understood that the parameters are stable and there is no structural change. In econometric studies, causality analyzes are preferred to understand whether two variables are in a causal relationship.

In this study, the causality test extended for heterogeneous panels by Dumitrescu and Hurlin (2012), which is applicable when all parameters are heterogeneous, was utilized. The null hypothesis (H0) posits the absence of homogeneous panel causality from X to Y, while the alternative hypothesis assumes the presence of a causality relationship in some units. The table presents a summary of hypothesis testing for a range of economic relationships, with significant p-values indicating robust statistical evidence. To illustrate, the relationships between GDP and ARR, GDP and inflation, and ARR and GDP are all statistically significant with p-values of 0.00, indicating robust bidirectional influences. Similarly, the effects of GDP on tour income, T/GDP, and spending, and vice versa, are statistically significant (p-values of 0.01 or 0.02), thereby highlighting meaningful interactions. However, the relationships involving build, room, and bed show mixed results with varying significance levels and p-values, indicating less clear-cut associations. Overall, the results reveal substantial and consistent impacts among most variables, while some relationships require further investigation due to less conclusive evidence.

Table 7: **Dumitrescu and Hurlin panel causality test**

H0 Hipotezi	W Statistics	ZTilde Statistics	P-Value
GDP to ARR	2,218	2.019	0,00 *
ARR to GDP	2,018	2,001	0,00 *
GDP to Inflation	2,200	2.010	0,00 *
Inflation to GDP	2,012	2,001	0,00 *
GDP to Tour_income	1,019	1,312	0,01 **
Tour_income to DP	1,209	1,111	0,02**
GDP to T/GDP	1,019	1,312	0,01 **
T/GDP to GDP	1,209	1,111	0,02**
GDP to Tour_employment	1,019	1,311	0,01 **
Tour_employment to GDP	1,209	3,103	0,02**
GDP to Spending	1,019	1,312	0,01 **
Spending to GDP	1,412	1,303	0,02**
GDP to Build	4,132	2,910	2,019
Build to GDP	3,018	3,018	3,001
GSP to Room	1,019	1,009	2,156
Room to GDP	1,222	2,189	1,018
GDP to Bed	1,412	1,303	0,02**
Bed to GDP	4,132	2,910	2,019

The table illustrates the existence of notable causal relationships between a number of economic variables. Both unidirectional and bidirectional causality are evident. For example, there is a significant effect of GDP on ARR and inflation, and vice versa. Furthermore, ARR and inflation exert a significant influence on GDP. Similarly, causality is identified from GDP to variables such as tour income, T/GDP, and spending, as well as from these variables back to GDP. However, some relationships, such as those involving build, room, and bed, either lack clear significance or show mixed results. Overall, the table indicates strong and statistically significant interactions among most variables, with certain relationships demonstrating clear and reciprocal influences.

3. CONCLUSIONS AND DISCUSSION

3.1. Conclusion

This research seeks to investigate the correlation between tourism and economic growth, with a specific emphasis on Mediterranean countries. The primary variables under scrutiny include tourism revenues, international tourist arrivals, expenditure, employment, and facilities. The primary aim of this study is to scrutinize the relationships and interconnections among these variables and to evaluate the hypothesis of tourism-driven growth. The research adopts the panel Autoregressive Distributed Lag (ARDL) approach for cointegration analysis, and the Dumitrescu and Hurlin Panel Causality test is applied to discern the direction of causality.

The study findings suggest a substantial influence of tourism revenues on economic growth. Results from panel data analysis indicate that the rise in income within the tourism sector positively contributes to economic growth, with this effect being statistically significant. Additionally, the outcomes of the Hausman test indicate homogeneity in the coefficients. Based on these findings, it is recommended that exploring the impact of tourism revenues on economic growth (GDP) in select Mediterranean countries through PMG and MG estimators may yield more robust and consistent results.

Additionally, the study demonstrates that increasing tourism revenues in Mediterranean countries is an effective way to promote economic growth. The analysis results reveal variations in the relationships between the variables used in the study and GDP, depending on whether PMG or MG estimators are employed. This suggests that factors beyond the variables analyzed in the study can also influence GDP, such as various economic and social factors (e.g., pandemics, conflicts, terrorism, international tensions, etc.). The increase in tourism revenues is found to have a positive impact on gross domestic product (GDP) and employment in these countries. These findings highlight the potential role of investments in the tourism sector and tourism policies in supporting economic growth.

In the short-term projections, it is notable that the capacity utilization rate, which lacks statistical significance in the long term, becomes significant in the short term. This finding implies that the capacity utilization rate exerts a short-term impact on the country's risk premium, but this influence diminishes over the long run. Analysis of the coefficient results for short-term relationships suggests that they exhibit lower efficacy compared to the long term, with effects intensifying as the time horizon extends. Additionally, a weakening of short-term lagged effects in short-term relationships is observable. The coefficients for both short-term and long-term relationships share the same signs, and their effects align in the same direction across both periods.

The short-term effects of capacity utilization rates on growth are significant, while no significant impact is observed in the long term. The application of CUSUM and CUSUMSQ tests to assess structural breaks and parameter stability in the econometric analysis indicates that the parameters remain constant, signifying no structural change. In econometric studies, causality analyses are often employed to discern whether two variables share a causal relationship. The outcomes of this study align with those of Romero and Molina (2013), Agaraj and Murati (2009), and Balaguer and Cantavella-Jorda (2002), suggesting a positive influence of tourism revenues on economic growth. In summary, this research supports the widespread applicability of the tourism-led growth hypothesis in the context of Mediterranean countries. The results highlight the beneficial impact of tourism on economic growth. In light of the significant influence of tourism on national economies, it is crucial to foster and invest in the tourism sector. The advancement of tourism infrastructure and the promotion of exemplary practices are pivotal strategies for enhancing economic growth and employment in Mediterranean countries and analogous regions.

3.2. Theoretical contribution

Empirical studies demonstrate a positive correlation between tourism revenues and GDP, with significant implications for employment and investments in tourism infrastructure. For instance, Dritsakis (2012) conducted a panel data analysis on seven Mediterranean countries, confirming a long-run relationship between tourism development and economic growth. However, although the analyses confirm the positive impact of tourism revenues on GDP, it is emphasized that this relationship may vary depending on the econometric models used. The results of the Hausman test indicate that the impact of tourism on economic growth is generally consistent across Mediterranean countries and that there is homogeneity in the coefficients. However, the complexity of causal relationships in different contexts should also be taken into account. Furthermore, the study underscores the significance of methodological rigor in elucidating the intricacies of the tourism-economic growth nexus. The dual approach employed in this study offers a more comprehensive understanding of the interaction between tourism revenues and economic growth, thereby reinforcing the notion that local contexts are of significant importance in shaping these relationships. The findings of the study indicate that while tourism revenues exert a direct positive influence on GDP and employment, broader economic and social factors also exert a significant influence on this relationship. In terms of practical contributions, the findings underscore the necessity for Mediterranean countries to invest in tourism infrastructure and develop policies that enhance tourism competitiveness. The positive correlation between tourism revenues and economic growth suggests that strategic investments in the tourism sector can yield substantial economic benefits. As indicated by Adedoyin et al. (2022), the quality of institutions also moderates the impact of tourism on economic growth, suggesting that effective governance and policy frameworks are crucial for maximizing tourism's economic potential. Furthermore, the study underscores the role of external factors, such as economic stability and social conditions, in shaping the dynamics between tourism and economic growth. This suggests that tourism expenditures can serve as an alternative form of exports, positively affecting the balance of

payments and overall economic growth. In conclusion, this study not only lends support to the tourism-led growth hypothesis but also contributes to the development of the theoretical framework surrounding the tourism-economic growth nexus by providing empirical evidence from Mediterranean countries.

3.3. Practical contribution and Managerial implication

We observed that increased tourism revenues significantly contribute to economic growth. In particular, Mediterranean countries can facilitate broader economic development by strategically leveraging their tourism sectors, which can result in increased national income and job creation. Tourism's economic impact demonstrates its ability to act as a critical engine for growth in these economies, providing important opportunities for economic expansion. In light of these findings, the study provides a robust foundation for policymakers to develop tourism-oriented strategies that will contribute more to economic growth. Given the significant GDP contribution of the sector, we recommend that governments prioritize investments in tourism infrastructure, marketing, and service enhancements to draw in international tourists. By concentrating their efforts on these areas, policymakers can stimulate economic development, enhance the quality of life for local populations, and guarantee the viability of the tourism sector. The findings underscore the necessity for a strategic approach that prioritizes tourism as a core component of national development policies. The study underscores the necessity for long-term planning in the context of tourism development. Although the short-term economic benefits of tourism are apparent, the most substantial impacts often emerge over an extended period. This insight suggests that stakeholders should prioritize long-term investments in tourism and optimize the sector's future economic potential. Stakeholders can increase the sector's capacity to contribute to long-term economic prosperity by concentrating on development initiatives, ensuring that tourism continues to be a stable and growing contributor to national income.

For tourism managers, the positive correlation between tourism revenues and economic growth underscores the critical need for increased investment in tourism-related infrastructure, such as transportation, accommodation, and recreational facilities. It is essential for those responsible for managing tourism to take a leading role in advocating for initiatives that improve the overall tourist experience, ensuring the sector's continued contribution to economic growth. It is probable that enhanced infrastructure will result in a greater number of visitors and increased expenditure by tourists, thus leading to a rise in economic contributions. Furthermore, the study indicates that diversification of tourism offerings has the potential to attract a broader range of market segments, thereby enhancing revenue streams. The development of niche tourism markets, including eco-tourism, cultural tourism, and adventure tourism, enables managers to appeal to a wider audience and ensure that tourism continues to make a multifaceted and dynamic contribution to economic growth. Managers must prioritize efforts to improve operational efficiency and fully utilize tourism assets to maximize economic returns. Additionally, involving local communities in tourism development is essential to ensuring the equitable distribution of its benefits. We recommend forming alliances with local stakeholders to create community-based tourism initiatives, which can empower residents and enhance their quality of life. This collaborative approach not only distributes economic benefits but also enriches the authenticity of tourist experiences, thereby further attracting visitors. In this context, it is essential that managers implement robust data collection and analysis mechanisms to assess the effectiveness of tourism initiatives.

3.4. Future research directions

In light of the findings of the study, it is deemed essential to undertake comprehensive sector-specific analyses and to assess the impact of distinct sub-sectors of the tourism industry (such as accommodation, food and beverage, and entertainment) on economic growth. Such analyses can assist in identifying which sub-sectors contribute more to economic growth. Furthermore, the long-term effects of tourism on economic growth require more detailed analysis. By examining the influence of economic and social factors on tourism revenues and economic growth, it may be possible to identify the negative impacts on the tourism sector and to develop strategies to minimise these impacts. Finally, comparative studies between Mediterranean countries and other regions with similar tourism potential are recommended. Such studies could help to elucidate whether the relationship between tourism and economic growth is universal or regional, and to identify policy differences between different regions.

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