https://doi.org/10.31410/tmt.2021-2022.133

Estimating the Output Response to Tourism Spending in the Mediterranean Countries

Marko Senekovič[1]
Jani Bekő[2]

Received: October 25, 2021
Accepted: February 24, 2022

Keywords:
Tourism Spending Multiplier;
Economic activity;
Vector Autoregression Model;
Determinants

Abstract: *The aim of this chapter is, first, to assess the impact of changes in tourism spending on economic activity in 16 Mediterranean countries and, second, to examine whether country-specific characteristics affect the size of tourism spending multipliers. Based on aggregate SVAR model estimates, the authors confirmed a statistically significant response of output to the shock in tourism spending in 88% of the analyzed cases at least over the part of the forecast horizon. In 56% of the examined cases, the value of the respective multiplier is above two. The existence of the multiplier mechanism is documented in 13 economies for domestic and foreign tourism spending within a particular forecast horizon. Tourism spending generates stronger GDP growth in countries that record a higher standard of living, have a better state of road and railroad transport infrastructure, and, to some extent, display higher consumer price levels of hotels and restaurants.*

1. INTRODUCTION

Tourism represents one of the most vibrant sectors of economies successfully complementing the needs of growing international trade in goods and services and, at the same time, peoples' aspirations to visit remote geographical areas, discover hidden tourist destinations, and experience foreign cultures. The sector's strong interlacement with the general economy creates demand for products, services, and production factors from other industries on domestic and foreign markets on one hand. On the other hand, it creates diversification of tourism services, the development of innovative organizational practices, and a more efficient allocation of resources in the tourism industry. It also increases the supply potential of other economic sectors. There are numerous channels through which tourism development influences the general economy. The expansion of the tourism sector generates employment, increases household income, and added value, and fosters investments. It is a source of additional tax revenue and – by creating foreign exchange earnings – mitigates the economy's current account imbalances (Dritsakis, 2012; Massidda and Mattana, 2012; Bacovic et al., 2020). Speaking holistically, this service sector can immensely contribute to the economic growth and overall socio-economic progress of the country (Shahzad et al., 2017).

To explicate the process of economic growth and describe the origin of output growth, one can distinguish between two basic approaches (Pérez-Montiel et al., 2021). The supply-side explanation of economic growth rests on neoclassical models of growth and models of endogenous economic growth (Valdés, 1999). An aggregate production function is employed in neoclassical growth models under the assumption that output growth is a function of accumulated production factors whereas competition assures the most efficient allocation of disposable resources. Theories of endogenous economic growth anticipate further dynamic productivity gains from increasing returns to scale arising from technological rivalry, research and development spillovers, and accumulation of human capital. Therefore, the tourism industry is a supply-led growth

[1] Faculty of Economics and Business, University of Maribor, Razlagova 14, 2000 Maribor, Slovenia
[2] Faculty of Economics and Business, University of Maribor, Razlagova 14, 2000 Maribor, Slovenia

generator when this sector is potent enough to create dynamic increasing returns of scale, disseminate productivity gains, enhance competition, provide access to new services, and acquire knowledge and organizational capital. On the other hand, the demand-based economic growth approach presupposes that GDP growth is fundamentally constrained by the bulk of effective aggregate demand (Thirlwall, 2002). Thus, every increase in autonomous expenditures brings through the Keynesian multiplier mechanism a rise in equilibrium output. Under this approach, tourism may act as an exogenous demand with expenditure potential to determine output growth.

The goal of this study is to deepen the empirical discussion about the complex nature of linkages between tourism and economic growth using the recent available annual datasets for a group of 16 Mediterranean countries. Two innovations are particularly important in our econometric exercise. First, relying on the methodological framework of Blanchard and Perotti (1999) and Perotti (2002), we calculate the size of tourism spending multipliers based on the structural vector autoregression (SVAR) approach, both on an aggregate and disaggregate expenditure levels. Second, we scrutinize the role of country-specific characteristics that dictate the size of the tourism spending multiplier based on the regression analysis and panel vector autoregression (VAR) model utilized in Ilzetzki et al. (2013) and Koh (2017). The study is organized as follows. Section 2 contains a brief evaluation of relevant empirical literature. Section 3 presents the utilized econometric methodology while in Section 4 the description of employed data and the required specification of variables are given. The discussion of empirical results is reserved for Section 5. Potential extensions of the current research are elaborated in Section 6. The final section summarizes the main findings of the study.

2. LITERATURE REVIEW

There is a relatively wide range of empirical literature that addresses the nature of the relationship between tourism development and economic growth based on specific methodological approaches and employed on different datasets. Although the underlying research question is rarely unified in the studies, the focus is on the empirical assessment of causality in most cases. Only then the focus is on the estimation of the effect of tourism spending on economic activity and other (macro)economic variables. To identify relevant causal links, authors usually rely on a variety of causality tests whereas for assessing the impact of tourism spending on economic growth, input-output analysis (Pratt, 2015), general equilibrium models (Alaminos et al., 2020), and econometric estimation techniques are applied. The inspection of relevant literature reveals that the econometric methodology is the most frequently adopted approach, especially in examining Mediterranean countries. Within this research approach, multiple regressions, autoregressive distributed lag (ARDL) models, VAR models, and vector error correction (VEC) models are at the forefront of researchers' interests. Nevertheless, there is a noticeable lack of empirical work that directly addresses the scale of the impact of tourism spending on economic activity or, in other words, the size of the tourism spending multiplier. Therefore, the upcoming text evaluates the current state of empirical findings on this research subject briefly.

Chou (2013) presents mixed results regarding the interlacement of tourism spending and economic growth in a sample of 10 transition economies from 1988 to 2011 based on the panel causality approach. The results indicate no existing causal connection for Bulgaria, Romania, and Slovenia while in Estonia and Hungary tourism spending and economic growth mutually influence each other. One-way Granger causality from tourism spending to economic

growth was detected in Cyprus, Latvia, and Slovakia while the opposite was found in the Czech Republic and Poland. Similar inconsistencies in results are traced in Tugcu (2014) where the direction of causality depends on the country group and the selected tourism indicator. The quoted research is based on data for European, Asian, and African countries that border the Mediterranean Sea and covers the period 1998-2011 with annual frequency. Tugcu (2014) reports that European countries are better able to generate growth from the tourism sector in the Mediterranean region. A more unified nexus is reached in Aslan (2014) who, based on the panel Granger causality test, discovers a unidirectional causal link between economic growth and tourism development in the group of Mediterranean countries, consequently backing up the growth-led tourism hypothesis. Furthermore, for the sample of 12 Mediterranean countries from 1995 to 2012, Bilen et al. (2017) identified bidirectional permanent causality between tourism development and economic growth. Belke et al. (2021) add to previous research and, again on the sample of 14 Mediterranean countries, apply hidden panel co-integration and asymmetric panel causality tests. Their results indicate a significant long-term relationship between the development of the tourism sector and overall economic activity. However, economic growth is more sensitive to the increase in tourism revenues than to the decrease in tourism earnings. The outcome of the causality test clearly supports the tourism-led growth hypothesis for the observed countries.

The authors of non-strictly causality papers implement diverse estimation techniques and upgrade the evidence on the tourism activity-output growth link for Mediterranean countries substantially. Tecel et al. (2020), for example, found support for tourism-led growth thesis based on bootstrap panel co-integration test and panel pooled mean group autoregressive distributed model (PMG-ARDL). More precisely, they identified the long-run equilibrium relationship among relevant variables and estimated a positive and significant link between tourism and economic growth, both in the short and the long run. For the period 1998-2018, Bacovic et al. (2020) estimate using the VAR model, VEC model, and fixedeffects panel OLS model that the export of travel services has a positive impact on GDP growth in the short-run while in the long-run, positive effect is detected only at the 10% significance level. Results for the panel of 12 European Mediterranean countries support the tourism-led growth hypothesis. Perovic et al. (2021) employ the panel VAR approach for the period 1995-2016 to investigate the long-run relationship and the direction of causality among trade openness, foreign direct investment, output growth, international tourism receipts, and the number of tourist arrivals. Among others, they found that shocks in tourism receipts per capita have a positive contemporaneous impact on GDP per capita growth in a sample of 19 Mediterranean countries.

Because in the last few decades, the tourism sector in various countries across the world gained significant economic relevance, this inspired experts to test the relevance of the Dutch disease phenomenon for this buoyant, expanding service sector. Examining the period 1995-2007, Ghalia and Fidermuc (2018) find in a sample of 133 countries, among them, 32 economies highly dependent on tourism, that tourism specialization per se has no significant effects on economic growth. At the same time, however, economies highly dependent on trade and tourism tend to report significantly lower output growth. This result might imply that tourism can have an analogous effect on economic performance as predicted by Dutch disease. On the sample of Mediterranean countries, Tuncay and Özcan (2020) do not find evidence of the Dutch disease in the overall sample based on panel data analysis. On country-based results, however, the Dutch disease is identified in some countries, notably Albania, Bosnia, Croatia, Egypt, Greece, Italy, Morocco, and Turkey.

Some studies investigate the relationship between tourism development and economic activity in a specific country. Massidda and Mattana (2012), for example, based on the structural VEC model for Italy pinpoint bidirectional causality between tourism arrivals and GDP. In addition, a long-run connection among the observed variables based on the co-integration test is also detected. With data covering the period 2000Q1-2013Q3 and with the OLS technique Kasimati (2016) estimates the value of tourism expenditures multiplier for Greece to be 1.21. Maden et al. (2019) provide results for Turkey based on the ARDL error correction model and annual dataset for 1980-2016. They document a positive and significant relationship between tourism income and GDP per capita both in the short and long run. Recently, Mariolis et al. (2021) gauged and forecast the effect of Covid-19 related measures on the tourism sector and then on the aggregate Greek economy. They find that decrease in international travel receipts in the range of 3.5 to 10.5 billion EUR would lead to a decrease in GDP of about 2% to 6% accompanied by a fall in the level of employment and deterioration of trade balance deficit.

The second part of our empirical research focuses on elucidating the variability of the size of the tourism spending multiplier whereby we can only partially build on existing empirical literature. Lejárraga and Walkenhorst (2010) addressed the issue of the changeability of the size of tourism spending multipliers based on a sample of more than 150 countries via the estimation of correlation between linkage and leakage tourism multipliers and other economic indicators, namely GDP per capita, tariffs, and days required to start a business. The quoted authors found a negative relationship between tariffs and tourism (linkages and leakages) multipliers while lower linkage and higher leakage tourism multipliers are associated with the increasing number of days to start a business. A positive correlation is detected between GDP per capita and both types of tourism multipliers. However, the results indicate statistical significance only for linkage multipliers. In addition, Pascariu and Ibănescu (2018) evaluate the effect of selected determinants on the size of tourism multipliers in the sample of EU countries based on stepwise regression analysis. Their findings predict that the size of tourism multipliers is in positive relation to the state of the business environment while in the cases of international openness, ground and port infrastructure, and Gini coefficient negative connection is detected. The study also implies core-periphery dynamics in the distribution of the size of tourism spending multipliers across EU countries. It is important to emphasize that both previously mentioned studies do not estimate the tourism spending multipliers. They merely calculate them based on data on the direct and total contribution of the tourism sector to GDP provided by WTTC (2021).

3. METHODOLOGICAL FRAMEWORK

To estimate the tourism spending multipliers, we used the methodological framework of Blanchard and Perotti (1999), which was also used in Perotti (2002) in its expanded version and was primarily developed for modeling fiscal policy actions. After minor modifications, the same model of vector autoregression was used to estimate tourism spending multipliers, first, separately on times series data and, second, on panel data sample.

Therefore, the methodological framework was adapted to our data sample, and a system with three variables was designed. To identify the system, models use a set of restrictions introduced by economic theory where several restrictions vary according to a specific observed economic phenomenon. Through shocks in structural form, results can be then interpreted through the impulse response function in the context of economic theory.

Assume that three variables are included in our basic model, namely, the logarithm of real internal tourism and travel consumption ($ittc_t$), the logarithm of the real GDP (y_t), and the logarithm of the price level (p_t). The vector of endogenous variables can be written as X_t and the vector of residuals in reduced form as U_t. Consequently, the reduced VAR format is given as:

$$X_t = A(L)X_{t-1} + U_t, \tag{1}$$

where $X_t = [ittc_t, y_t, p_t]'$ and $U_t = \left[u_t^{ittc}, u_t^y, u_t^p\right]'$, L is the lag operator, and A(L) is the polynomial of the corresponding degree. The reduced form of residuals of the variable $ittc_t$, i.e. u_t^{ittc}, can be interpreted as a shock.

Based on the so-called AB model (Lütkepohl, 2005), we wrote a system of equations in the matrix form represented by the following equation:

$$AU_t = BE_t, \tag{2}$$

where U_t is the vector of the VAR residuals and $E_t = [e_t^{ittc}, e_t^y, e_t^p]'$ is a vector of structural shocks or innovations. We can define matrices A and B. The equation (2) is written in the form:

$$\begin{bmatrix} 1 & 0 & 0 \\ -\alpha_{ittc}^y & 1 & 0 \\ -\alpha_{ittc}^p & -\alpha_y^p & 1 \end{bmatrix} \begin{bmatrix} u_t^{ittc} \\ u_t^y \\ u_t^p \end{bmatrix} = \begin{bmatrix} \beta_{iitc}^{ittc} & 0 & 0 \\ 0 & \beta_y^y & 0 \\ 0 & 0 & \beta_p^p \end{bmatrix} \begin{bmatrix} e_t^{ittc} \\ e_t^y \\ e_t^p \end{bmatrix}. \tag{3}$$

For the system to be identified, $(2k^2 - 1/2\ k[k+1])$ of restrictions are necessary where k is equal to the number of endogenous variables which is 3 in our case.

The ordering of the variables defines the causal relationships between them. Real GDP and price level respond contemporaneously to the changes in tourism spending. However, at the same time, tourism spending does not react to the changes in output and price level within the same period. Furthermore, price level does not affect output within the same period.

SVAR methodology and the structural impulse response function were also used in auxiliary models with disaggregated tourism spending variables. The cause-and-effect relations were retained from the basic model and, thus, we defined the restrictions in the same way. This system is also precisely identified since it contains an appropriate number of restrictions (12 restrictions).

Based on the results from the SVAR model, the structural impulse response function of the SVAR model assessed the dynamics and values of the responses of individual components to shock in tourism spending or the case of auxiliary SVAR model with disaggregated tourism spending variables, the responses of other variables to shock in domestic or foreign tourism spending. The structural impulse response function introduced the shock at a selected variable in the size of one standard deviation of the same variable. The results are accompanied by a 90% confidence interval. The results were standardized in such a way that we converted the size of the shock from one standard deviation to 1% of the GDP. Consequently, the responses of all variables are measured in percentage. Using this adapted methodological framework, we estimated the tourism spending multipliers for each country separately.

Next, for the assessment of a tourism spending multiplier on a panel dataset, we followed the aforementioned methodological framework of Blanchard and Perotti (1999) with referencing to panel VAR model modifications in Ilzetzki et al. (2013) and Koh (2017). In this study panel, the VAR model is adapted for purpose of estimating tourism spending multipliers.

Like in the case of the time series model, the baseline panel VAR model covers three macroeconomic variables: real internal tourism and travel consumption ($ittc_{i,t}$), real GDP ($y_{i,t}$), and price level ($p_{i,t}$). The vector of endogenous variables can be written as $X_{i,t}$ and the vector of residuals as $U_{i,t}$. A reduced form of the panel vector autoregression is defined in Equation (4):

$$X_{i,t} = C(K)X_{i,t-1} + U_{i,t} \tag{4}$$

where $X_{i,t} = \left[ittc_{i,t}, y_{i,t}, p_{i,t}\right]'$ and $U_t = \left[u_{i,t}^{ittc}, u_{i,t}^{y}, u_{i,t}^{p}\right]'$, K is the operator of lag structure and $C(K)$ is the polynomial of corresponding degrees.

To identify shocks in tourism spending, we use Cholesky decomposition where the ordering of the variables is crucial. Results are based on the following system of equations:

$$AX_{i,t} = \sum_{k=1}^{K} C_k X_{i,t-k} + BE_{i,t} \tag{5}$$

where $X_{i,t}$ is a vector of endogenous variables for a given country i and a year t. C_k is the matrix of the own and cross effects of the kth lag of the variables. Matrix B is diagonal. Therefore, $E_{i,t}$ represents orthogonal shocks to tourism spending (Ilzetzki et al., 2013). Thus, our model consists of variables in the following order: real tourism spending, real GDP, and price level. For estimation purposes, the panel vector autoregression package for Stata provided by Abrigo and Love (2016) was utilized. The generalized method of moments is used as an estimation technique.

Ordering of the variables in the panel VAR model defines the causal relationships between them and it is the same as in the previously described times series VAR model. The GDP responds contemporaneously to the changes in tourism spending but on the other hand, tourism spending does not react to the changes in output within the same period. Price level responds contemporaneously to the changes in tourism spending and output. Within the same period, however, it affects neither of them.

To examine relations between the size of the impact tourism spending multipliers and specific country characteristics, we used panel VAR approach and regression analysis based on ordinary least squares estimation technique which is defined as follows:

$$TM_i = \beta_0 + \beta_1 X_i + e_i \tag{6}$$

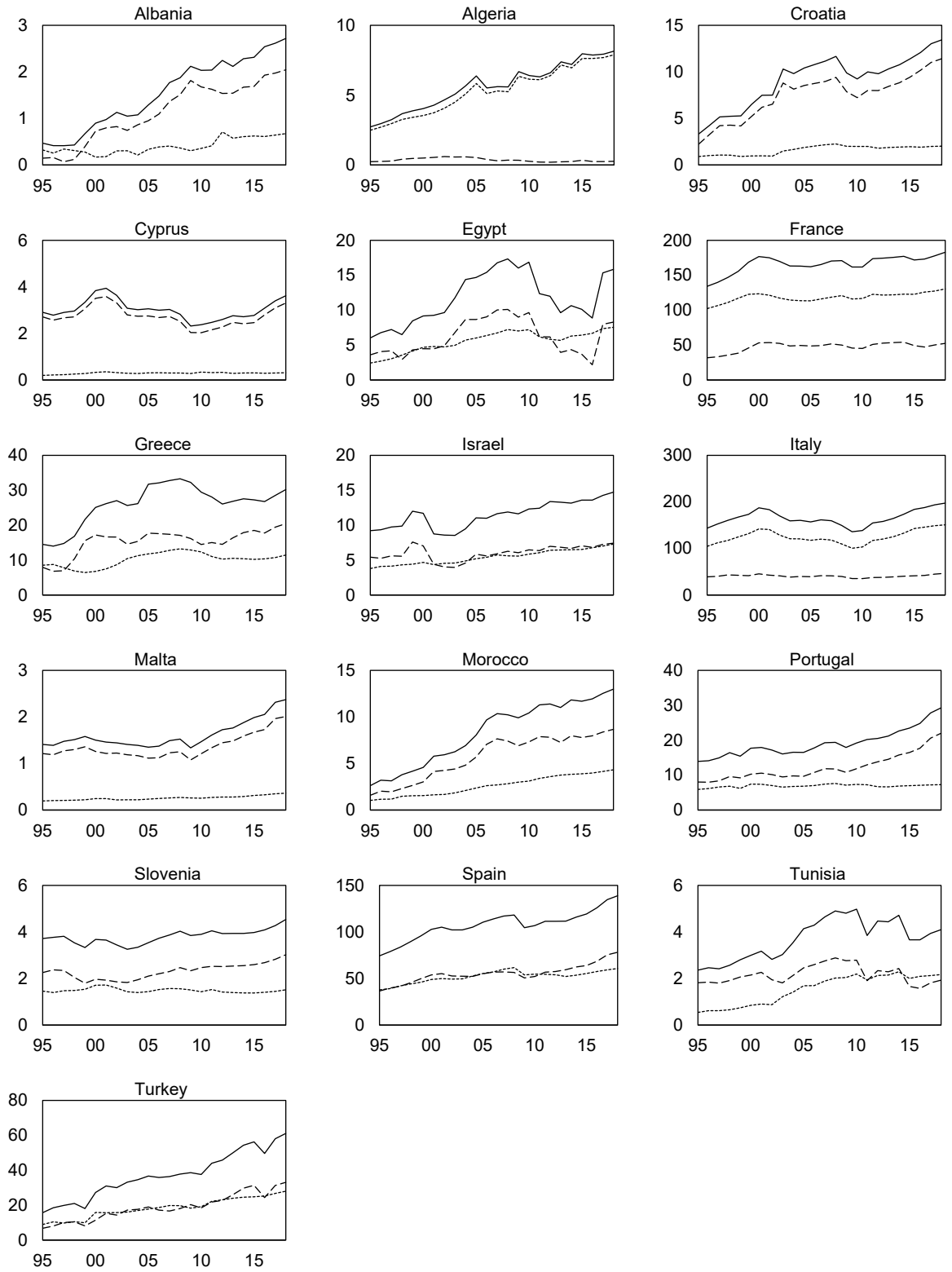
where TM_i is the impact tourism spending multiplier of a country i, β_0 is a constant term, β_1 is slope regression coefficient, and X_i is a country-specific characteristic of a country i. We considered four country-specific factors of estimated tourism spending multipliers: road infrastructure quality index, railroad infrastructure quality index, GDP per capita, and hotel and restaurant price index. Therefore, a separate regression analysis was run for all four country-specific characteristics.

4. PRESENTATION OF APPLIED DATA

The baseline vector autoregression model in our study comprises real tourism spending, real GDP, and price level. All variables have annual frequency and cover the period between 1995 and 2018 for 16 Mediterranean countries (Albania, Algeria, Croatia, Cyprus, Egypt, France, Greece, Israel, Italy, Malta, Morocco, Portugal, Slovenia, Spain, Tunisia, and Turkey). Data for real GDP and price levels are collected from the World Bank (2021a), specifically from the World Development Indicators database, the former in the form of constant US dollars and the latter in the form of the consumer price index. After transformation, both variables have the base year in 2017. Data for tourism spending, more specifically internal tourism and travel consumption are collected from a separate World Bank (2021b) data stream which plays a role of a secondary data source whereas primary data are provided by the World Travel and Tourism Council (2021). In addition to the baseline model, we compiled two auxiliary models in which we assess the difference between domestic and foreign tourism spending on the dynamics of economic activity and price levels. Consequently, data are collected for two more disaggregated series, namely domestic tourism spending and foreign tourism spending where all three variables are expressed in constant 2017 US dollars. All five variables are stated in logarithmic form. After calculating tourism spending multipliers separately for individual countries, data were organized in a strongly balanced panel data sample. Data for different tourism spending variables are available only from the year 1995 onward in annual frequency whereby for the year 2019 data are still reported as projections and consequently excluded from our research.

Additional variables are collected to examine the role of countries' characteristics. Thus, we employed the road quality index and railroad quality index from TheGlobalEconomy.com database (2021a, 2021b) to establish the level of basic public transport infrastructure of Mediterranean countries. Then, with hotel and restaurant price index data from the same database (TheGlobalEconomy.com, 2021c), the selected countries were classified according to their absolute price level differences where the hotel and restaurant price index was used as a proxy for tourism prices. Next, data on the GDP per capita in constant 2010 USD are employed by the World Bank (2021a) to classify countries into two groups according to their level of development. Basically, all collected classifiers rank countries in different ways according to their level of development in a broader sense. Except for the hotel and restaurant price index which refers to data from the year 2017, we used data from the year 2018 for the other three variables.

The road and railroad infrastructure quality indicators are two of the components of the Global Competitiveness Index published annually by the World Economic Forum. Assessment of aforementioned quality indices in a given country is based on data from the World Economic Forum Executive Opinion Survey, a long-running and extensive survey tapping the opinions of over 14,000 business leaders in 144 countries. The score for both indices, road, and rail infrastructure quality is dispersed between 1 which marks underdeveloped infrastructure, and 7 which marks extensive and efficient infrastructure by international standards. The hotel and restaurant price index shows the relative prices of those services across 167 countries. Greater values of the index indicate higher prices where the value of 100 represents the world average. The primary data source for the hotel and restaurant price index is World Bank International Comparison Program (TheGlobalEconomy.com, 2021a, 2021b, 2021c).



Solid line represents internal tourism and travel consumption, dot line represents domestic tourism spending, dash line represents foreign spending; all variables are in real 2017 billion USD; period: 1995-2018.

Graph 1. The dynamics of tourism spending in Mediterranean countries

Source: World Bank, 2021

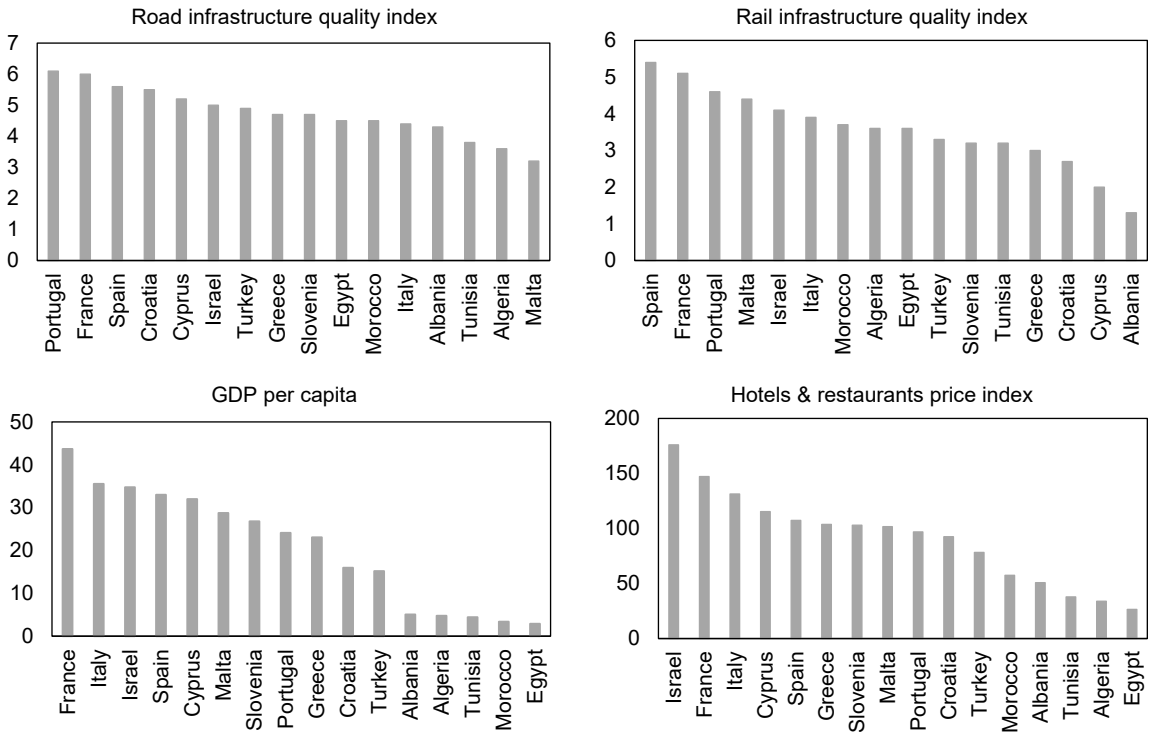
In determining the relative thresholds for individual characteristics, this study determines relative thresholds according to the nature of our sample, which is rather small. To obtain an appropriate number of estimates in both groups, we rank countries based on the median value of a specific threshold variable. If the road quality index exceeds the value of 4.71, that country is classified as one with better road infrastructure. According to the rail infrastructure quality index, countries with values less than 3.61 are considered less equipped with rail infrastructure. To rank countries concerning the level of economic development, we include countries into a group of less and more developed economies. Namely, the median real GDP per capita in the year 2018 is used as the threshold. Similarly, the median value of the hotel and restaurant index, 99.22, is used to classify countries into two groups.

Values of tourism spending multipliers represent the output effect of tourism spending measured in absolute currency terms. The impulse and response variables are expressed in logarithmic form and, consequently, the results can be interpreted as elasticities. To obtain tourism spending multipliers, values of elasticities are divided by an average share of tourism spending to GDP in the sample. The calculations of the short-term multipliers are reported.

According to the data in Graph 1, the tourism sector has gradually become a vital part of the national economies, which is also resembled in its gaining role as an important employer of a domestic workforce. At the same time, however, there are differences in the structure of tourism sectors across countries. Specifically, the share of foreign tourism spending in total tourism spending is different across our sample and it is especially high in Albania, Croatia, Cyprus, Greece, Malta, Morocco, and Portugal. In these countries, the economy is even more dependent upon the tourism sector and, thus, much more vulnerable to any external shocks that act as a global inhibitor to travel and tourism. The outbreak of a new coronavirus is an extreme case of this type of shock.

Since the 1990s, a rapid acceleration of globalization occurred and the tourism sector has gradually begun to gain its proportional size in comparison with more traditional economic sectors. Simultaneously, it helped to compensate for classic industry job losses in the process of deindustrialization in developed countries. On the other hand, even in less developed economies, the tourism sector helps to contribute to a slightly higher standard of living through a non-negligible inflow of foreign exchange into the country. In the last decades, however, the rapid growth of the tourism sector on a global scale made this industry very lucrative and, therefore, prone to intensive capital spending by private and public funds. Companies from the tourism sector recognized that investment spending is crucial to attracting new customers in a fierce and extremely competitive race on a global stage.

Graph 2 indicates that our sample countries differ in their transport infrastructure quality and the level of development measured with GDP per capita and absolute price level. Spain, Portugal, and France are positioned as countries with relatively high-quality public transport infrastructure while countries on the other end of the scale differ between our two measures of quality of transport infrastructure. We argue that public infrastructure might be an important driver of the size of the tourism spending multiplier. Regarding the level of development and absolute price level measured via hotel and restaurant prices, the highest scores are observed for France, Italy, and Israel. Both measures indicate overall country economic performance which very likely at least indirectly includes some information about the state of public and private infrastructure in the specific country.



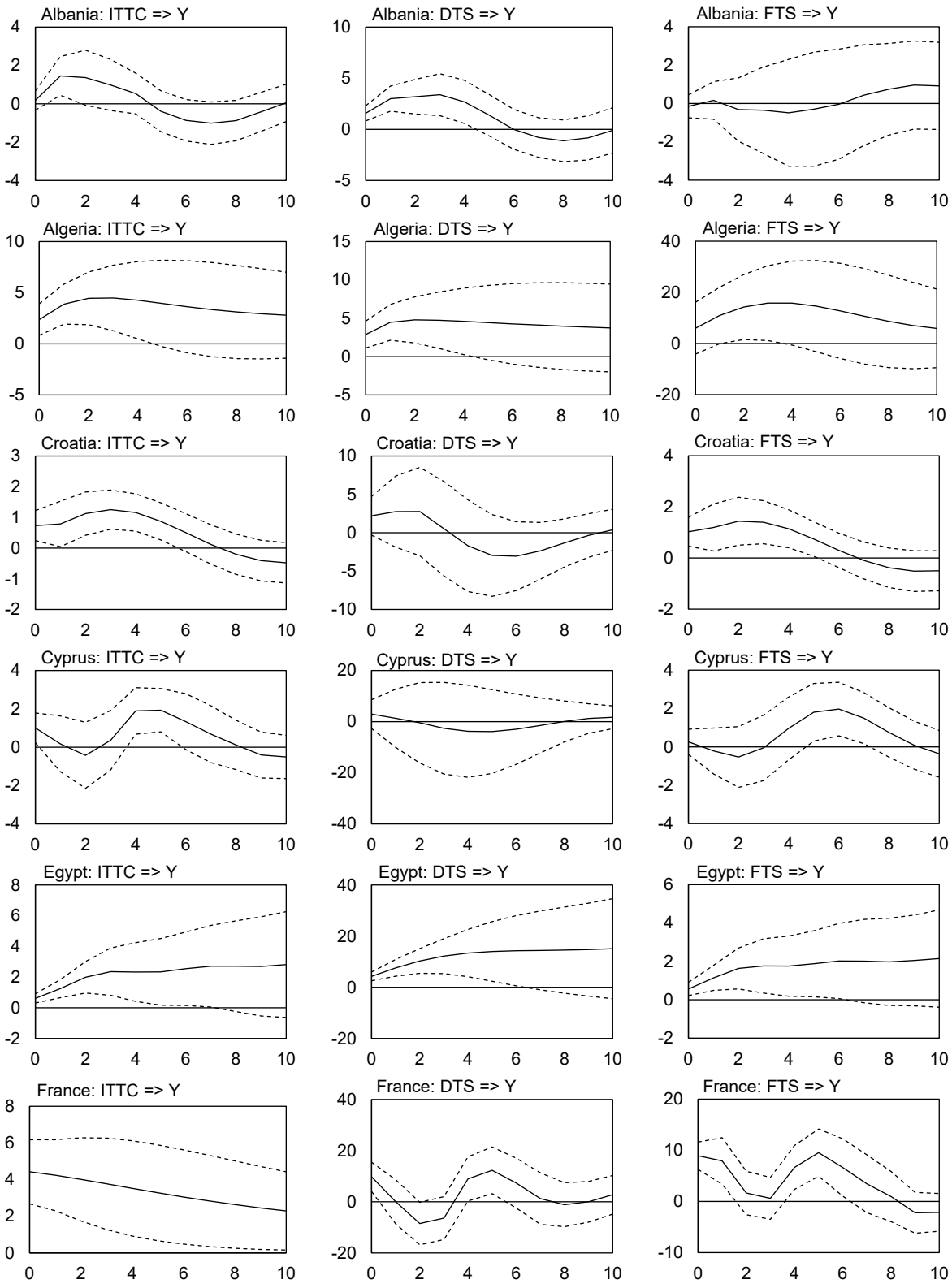
Graph 2. Mediterranean countries ranked by selected indicators

Source: World Bank, 2021

5. OVERVIEW OF EMPIRICAL RESULTS

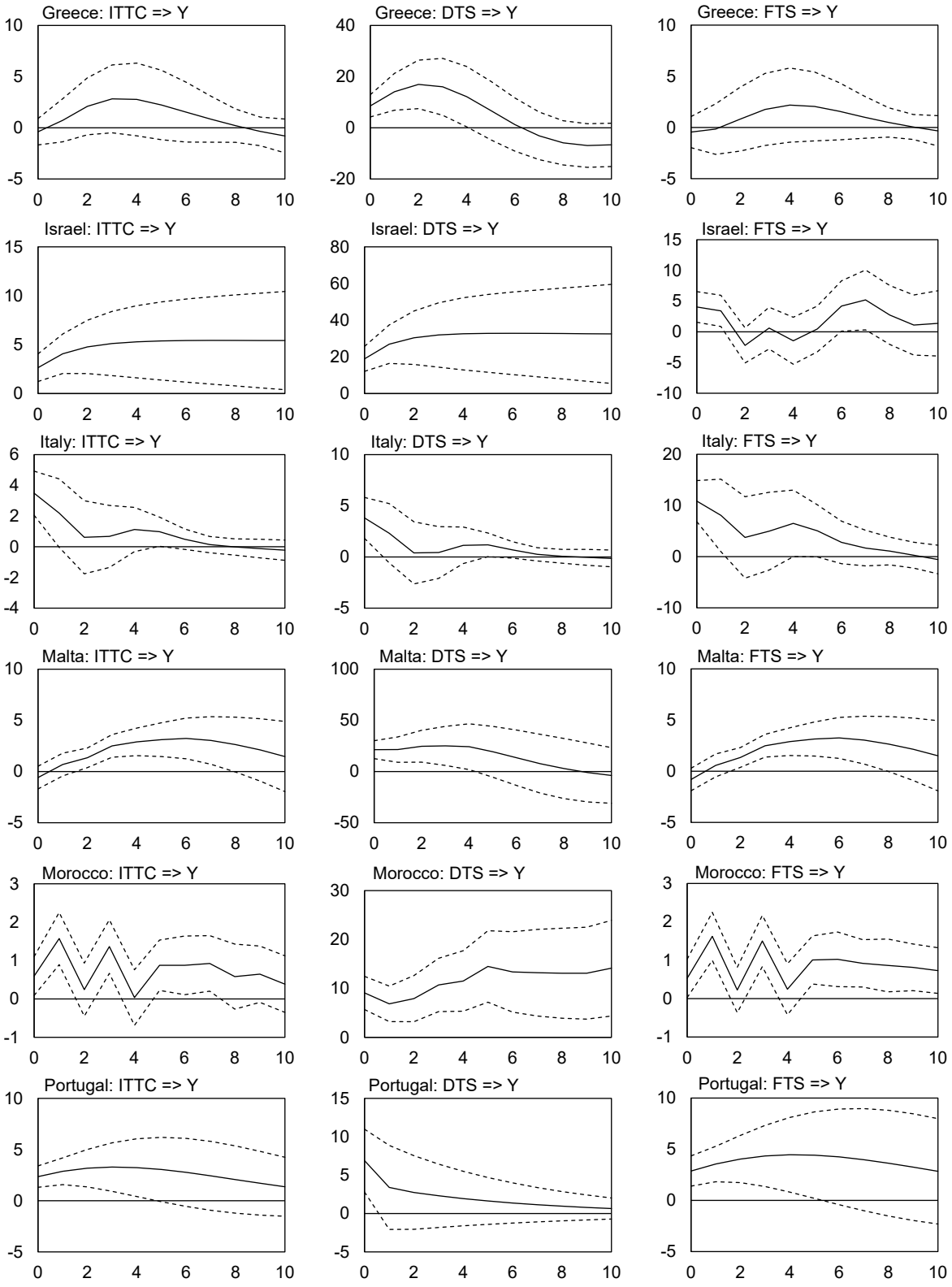
The results of this study are presented in two parts. In the first part, we estimate tourism spending multipliers individually for each country where the shock is introduced either in the tourism spending variable (ITTC) or in both disaggregated tourism spending variables, namely domestic tourism spending (DTS) and foreign tourism spending (FTS) (Graph 3). In addition to this, price level response to a tourism spending shock is also estimated individually for each country (Graph 4). The solid line represents the output response to a positive shock in a specific tourism spending variable in the magnitude of 1% of GDP. Dash lines represent a 90% confidence bound. The results are presented over 10 years forecast horizon. In the second part of the research, we analyze the variation of the size of the tourism spending multiplier with respect to four country-specific characteristics, first, by regression analysis (Table 1) and second, by panel VAR approach where we estimate the average tourism spending multipliers according to specific subsamples (Graph 6). In Graph 6, the solid line represents a statistically significant output response and the dashed line represents the statistically insignificant response of GDP. The magnitude of the shock in the tourism spending variable is still 1% of GDP.

The results in Graph 3 show a statistically significant response of output to the shock in tourism spending, at least over the part of the forecast horizon, for all countries except for Greece and Slovenia. Although the magnitude of the output response, or in other words, the size of the tourism spending multiplier, varies between countries, they all have in common that the multiplier is positive almost over the entire forecast horizon. At least within a certain forecast horizon, the tourism spending multiplier is greater than one in 14 out of 16 countries. In 9 economies the value of the corresponding multiplier even exceeds two. The presented estimations indicate that the tourism sector is not only a vital part of Mediterranean economies but also acts as a generator of economic growth because tourism spending has a statistically significant multiplicative effect on output.



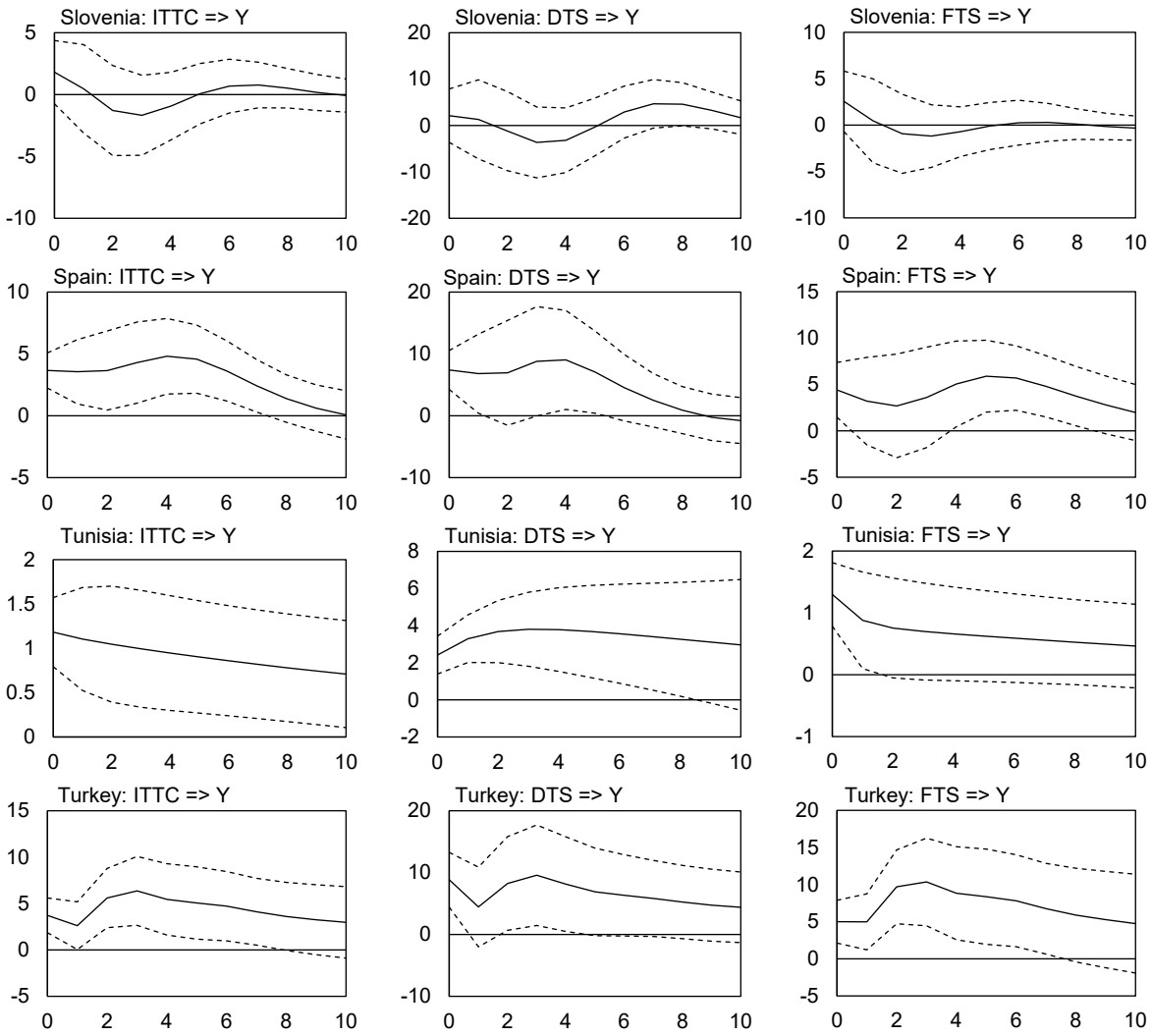
Graph 3. Estimates of tourism spending multipliers (part 1)

Source: Authors calculation



Continuation of **Graph 3** (part 2)

Source: Authors calculation

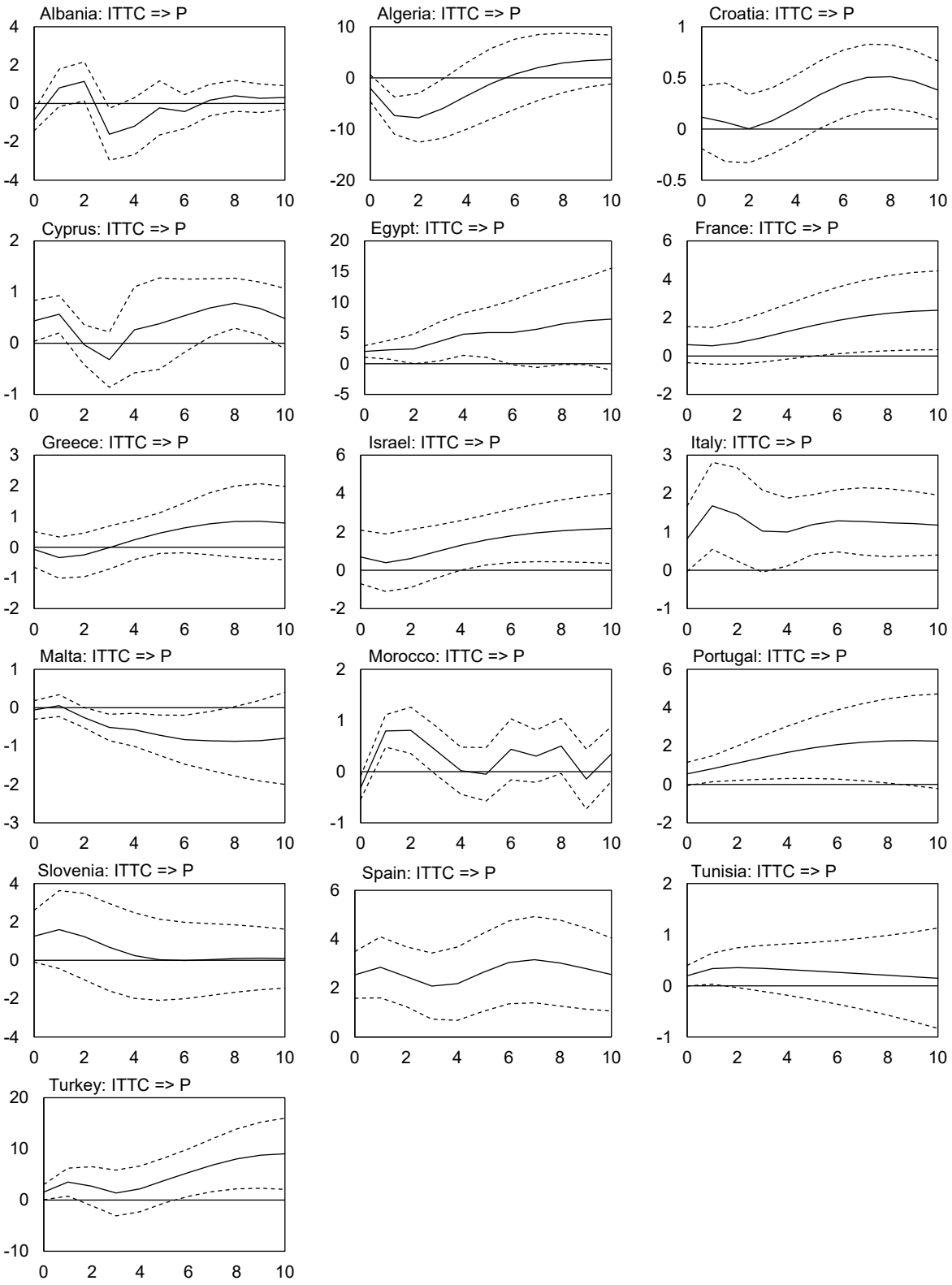


Continuation of **Graph 3** (part 3)

Source: Authors calculation

Furthermore, Graph 3 shows country-specific output responses to a positive shock in disaggregated tourism spending variables, namely domestic tourism spending and foreign tourism spending. Aware of the fact that, in general, disaggregated variables are in absolute terms smaller than total tourism spending, we must assume that the results are consequently less robust because even small changes in the dynamics of individual disaggregated variables of tourism spending can be due to standardization process which distorts the magnitude of the output response. Based on disaggregated tourism spending variables, our SVAR model estimations show that for the remaining Mediterranean countries, with the exclusion of Croatia, Cyprus, and Slovenia, there is a significant positive reaction of real GDP to the shock in domestic tourism spending at least over a section of the forecast horizon. Furthermore, we were able to discover significant output effects derived from the mechanism of the foreign tourism multiplier in 13 countries from the sample of 16 countries.

Price level response to a positive shock in tourism spending is statistically different from zero in 75% of the observed cases, at least in some parts of the forecast horizon (Graph 4). The results suggest that higher tourism spending may stimulate the growth of the price level. However, this adjustment of an overall price level is relatively heterogeneous across countries. The magnitude of price level impact on tourism spending is particularly pronounced in Spain, Turkey, Egypt, and Portugal. We can conclude that additional tourism spending triggers to a certain extent inflationary pressures while on the other hand, a positive shock in tourism spending boosts economic activity at least over the short term.



Graph 4. Price level response to a positive shock in tourism spending

Source: Authors calculation

Next, we scrutinize four country-specific characteristics which may affect the size of the tourism spending multiplier. Based on the results of regression analysis (Table 1), considering impact multipliers as a dependent variable and the specific determinants as independent variables, we find that both selected proxy variables for the state of public infrastructure are

statistically significant and affect the size of the impact tourism spending multiplier positively. The same can be seen in Graph 5 where the scatter plots clearly show a positive correlation between the size of impact tourism spending multipliers and the road and railroad infrastructure quality indices. When we apply the panel VAR approach to the sample of the same Mediterranean countries and define two subsamples according to the median values of road and railroad infrastructure quality indices, the results (Graph 6) guide us to the same conclusion. The average tourism spending multiplier is statistically different from zero in both cases. However, it is higher in countries with better road and rail transport infrastructure.

Table 1. Determinants of the size of tourism spending multiplier - regression analysis

$$TM_i = \beta_{0,i} + \beta_{1,i}X_i + e_i$$

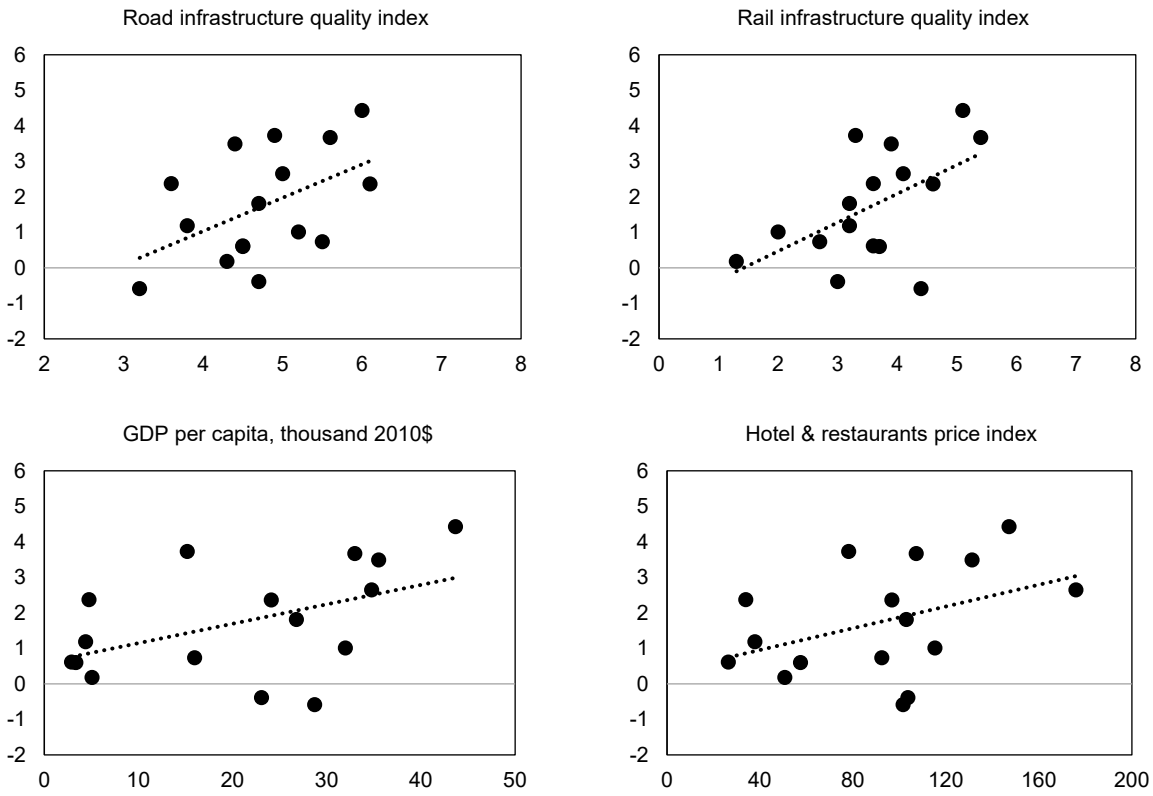
X_i	β_0	β_1	t-stat (p-value)	R^2
Road infrastructure quality index	-2.729	0.941	2.127 (0.052)	0.244
Rail infrastructure quality index	-1.148	0.809	3.018 (0.027)	0.304
GDP per capita, constant 2010 USD	0.600	0.056×10^{-3}	2.033 (0.061)	0.228
Hotels & restaurants price index	0.342	0.015	3.018 (0.111)	0.171

Notes: TM_i represents impact tourism spending multiplier of a country i, X_i represents determinant of the size of tourism spending multiplier in country i.

Source: Authors calculation

According to scatter plots in Graph 5, there is also detected slim positive correlation in the cases of GDP per capita and price levels of hotels and restaurants, which is supported by the positive sign of both slope coefficients in Table 1. In the case of GDP per capita, the slope coefficient is statistically significant but its magnitude implies only a weak positive connection. On the other hand, the estimated slope coefficient by hotel and restaurant prices barely missed the 90% confidence interval. Nevertheless, the results from the panel VAR model in Graph 6 support the notion that differences in both, the level of economic development and absolute price levels in the tourism sector, dictate the differences in the size of the tourism spending multiplier to some extent.

To sum up, the performed calculations indicate positive and statistically significant tourism spending multipliers whose size is positively correlated with the state of public transport infrastructure, level of economic development measured via the GDP per capita, and the price levels of hotels and restaurants. We can infer not only that rise of tourism visitors' spending has multiplicative potential but also that capital spending on public and private infrastructure is crucial to achieving such growth potential. According to findings in Gherghina et al. (2018) and Lenz et al. (2018), investments in various types of transport infrastructure propel economic growth in EU countries significantly and produce a longstanding positive output effect although evidence about the positive growth impact of railway infrastructure lacks in Central and Eastern EU members probably due to insufficient public investments in these transport capacities and, consequently, outdated rail infrastructure (Lenz et al., 2018). Besides transport infrastructure and the quality of logistics services, Gavurova et al. (2021) found the development of ICT (information and communication technologies) infrastructure as an additional driver of tourism spending in the sample of 36 countries of the Organization for Economic Co-operation and Development (OECD). Improvement of general transport infrastructure combined with private and public investments in ICT infrastructure assure the necessary expansion of the economy's production capacities, increase the scale of supply, and, in turn, allow greater flexibility and more space for innovation and marketing activities of tourism enterprises.



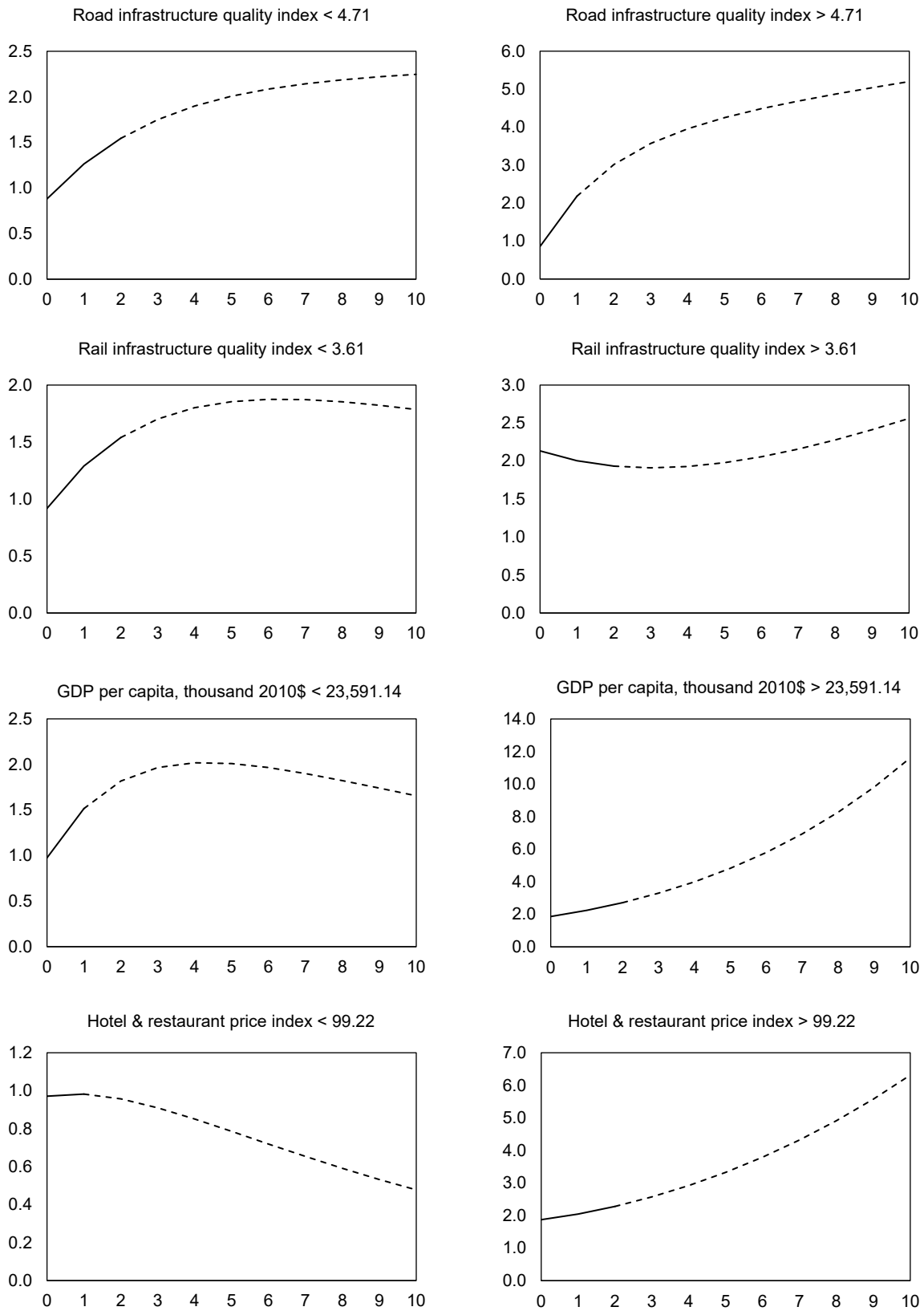
Notes: y-axis measures values of tourism spending multiplier, x-axis measures values of specific determinants.

Graph 5. Determinants of the size of tourism spending multiplier - scatter plot

Source: Authors calculation

Following the empirical outcomes in this section, more developed Mediterranean countries reveal higher values of tourism expenditure multiplier. The significance of GDP per capita to magnify the effect of tourism expenditure increases output points to the circular income mechanism. Accordingly, more developed economies tend to spend larger amounts on services (among others on tourism services). However, they are also able to attract larger demand from other countries because they have capacities to provide a broader range of services and the products consumed intensively in the travel and hospitality industry. At the sectoral level, therefore, tourists with growing real income will spend more and look for new destinations to experience services with higher quality, which will extend the chain of increasing expenditures and generate additional income.

The dynamics of the price level of hotels and restaurants is an additional factor that influences the size of the tourism multiplier effect in our study. The underlying determinants of price level increases of tourism services are faster productivity growth in this sector, rising relative sectoral wages, and mark-ups, as well as an overall improvement in the quality of provided services in the travel and hospitality industry. Bekő and Boršič (2020) offer conclusive evidence in favor of purchasing power parity when the real exchange rates are based on consumer price indices for hotels and restaurants in 15 Mediterranean countries. Because the reported validity of purchasing power parity is indirect evidence of effective price competition among tourism sectors, the strengthening tradability of tourism services through further convergence of respective price levels can provoke multiplier effects on aggregate output in the observed countries.



Graph 6. Determinants of the size of tourism spending multiplier - panel VAR model

Source: Authors calculation

6. FUTURE RESEARCH DIRECTIONS

Future research should focus on a broader range of countries with possible quarterly data frequency availability and deeper disaggregation of tourism spending variables. Further empirical evidence could be obtained by estimating long-run relationships between tourism spending and economic activity in these economies. Moreover, additional determinants of the size of the tourism spending multiplier should be included in the testing procedure to clarify which of these possible new structural or sectoral indicators can help to further explain the variation in the magnitude of corresponding expenditure multipliers. Gradually more complete and unified view of the multiplicative role of tourism spending might arise.

7. CONCLUSION

This research provides a detailed range of estimations about the significance of output impact coming from tourism spending in Mediterranean countries. The study contributes to existing empirical literature in the following ways. First, it gauges the size of tourism spending multipliers based on the SVAR approach, both on the aggregate and the disaggregate expenditure levels. Second, it assesses the role of country-specific characteristics that determine the magnitude of the tourism spending multiplier based on the regression analysis and the panel VAR model. And third, the most recently available annual dataset of the selected Mediterranean countries is tested in our econometric investigation.

Four crucial empirical findings can be emphasized in the current study. First, following the aggregate estimates from the SVAR model, a statistically significant response of output to the shock in tourism spending was confirmed in 88% of the analyzed cases at least over the part of the forecast horizon. On the detected forecast horizon, the tourism spending multiplier is greater than one in 14 countries. In 56% of the analyzed cases, the value of the respective multiplier is above two. Second, from disaggregated tourism visitors' spending, we were able to prove the existence of the multiplier mechanism in 13 economies from the sample of 16 Mediterranean countries for domestic and foreign tourism spending within a particular forecast horizon. Third, the price level response to a positive shock in aggregate tourism spending is statistically different from zero at least in some parts of the forecast horizon in three-quarters of the cases examined. Fourth, our results imply that tourism spending generates stronger GDP growth in countries that record a higher standard of living, have a better state of road and railroad transport infrastructure, and, to some extent, display higher consumer price levels of hotels and restaurants.

The empirical outcomes described in this analysis are in line with the view sustained by advocates of the tourism-led growth development concept. However, the tourism-driven growth narrative for the scrutinized Mediterranean countries requires an amendment. Our identification of key determinants influencing the size of tourism spending multipliers namely suggests that the expenditure effect of the tourism industry upon output growth can be considerably higher when accompanied by increases in the remaining components of aggregate demand, notably governmental investment expenditures, which further contribute to real GDP directly or indirectly (via fueling consumption in tourism sector). Recently, Deleidi et al. (2020), Petrović et al. (2021), and Konstantinou and Partheniou (2021) demonstrated conclusively that public investments stimulate private consumption, boost labor demand and private investments, and ultimately invigorate aggregate economic activity in EU members, OECD, and non-OECD countries. Furthermore, enlarging public investments in transport infrastructure is vital for the working of the economy and the competitiveness of the tourism industry in particular

(Gherghina et al. 2018; Lenz et al., 2018). To spur the growth impact of the domestic tourism sector in Mediterranean countries, policymakers should expand public investment expenditures especially when the economies are functioning well below their full capacity (Konstantinou and Partheniou, 2021) paying appropriate attention to the efficiency of public investment management.

REFERENCES

Abrigo, M. R. M., & Love, I. (2016). *Estimation of panel vector autoregression in Stata: a package of programs.* University of Hawaii Working Paper No. 16/2, University of Hawaii, Hawaii.

Alaminos, D., León-Gómez, A., & Sánchez-Serrano, J. R. (2020). A DSGE-VAR analysis for tourism development and sustainable economic growth. *Sustainability, 12*(9), 3635. https://doi.org/10.3390/su12093635

Aslan, A. (2014). Tourism development and economic growth in the Mediterranean countries: evidence from panel Granger causality tests. *Current Issues in Tourism, 17*(4), 363-372. http://doi.org/10.1080/13683500.2013.768607

Bacovic, M., Jacimovic, D., & Cerovic Smolovic, J. (2020). Impact of export of travel services on current account balance and growth in Mediterranean countries. *Prague Economic Papers, 29*(6), 710-728. https://doi.org/10.18267/j.pep.748

Bekő, J., & Boršič, D. (2020). Are the Mediterranean countries with tourism price indices in the purchasing power parity zone? In V. Bevanda & S. Štetić (Ed.), *5th International Thematic Monograph: Modern Management Tools and Economy of Tourism Sector in Present Era*, (pp. 107-130). Association of Economists and Managers of the Balkans. https://doi.org/10.31410/tmt.2020.107

Belke, M., Bolat, S., & Hatemi, A. (2021). The impact of tourism on the economic growth in the Mediterranean countries: evidences from hidden panel cointegration test. *Journal of Economics and Administrative Sciences Faculty, 8*(1), 399-419. https://doi.org/10.30798/makuiibf.822194

Bilen, M., Yilanci, V., & Eryüzlü, H. (2017). Tourism development and economic growth: a panel Granger causality analysis in the frequency domain. *Current Issues in Tourism, 20*(1), 27-32. http://doi.org/10.1080/13683500.2015.1073231

Blanchard, O., & Perotti, R. (1999). *An empirical characterization of the dynamic effects of changes in government spending and taxes on output*. NBER Working Paper No. 7269, National Bureau of Economic Research, Cambridge.

Chou, M. C. (2013). Does tourism development promote economic growth in transition countries? A panel data analysis. *Economic Modelling, 33*, 226-232. http://dx.doi.org/10.1016/j.econmod.2013.04.024

Deleidi, M., Iafrate, F., & Levrero, E. S. (2020). Public investment fiscal multipliers: An empirical assessment for European countries. *Structural Change and Economic Dynamics*, *52*, 354-365. http://doi.org/10.1016/j.strueco.2019.12.004

Dritsakis, N. (2012). Tourism development and economic growth in seven Mediterranean countries: A panel data approach. *Tourism Economics*, *18*(4), 801-816. http://doi.org/10.5367/te.2012.0140

Gavurova, B., Belas, J., Valaskova, K., Rigelsky, M., & Ivankova, V. (2021). Relations between infrastructure innovations and tourism spending in developed countries: a macroeconomic perspective. *Technological and Economic Development of Economy*, *27*(5), 1072-1094. http://doi.org/10.3846/tede.2021.15361

Ghalia, T., & Fidrmuc, J. (2018). The curse of tourism? *Journal of Hospitality & Tourism Research, 42*(6), 979-996. http://doi.org/10.1177/1096348015619414

Gherghina, S. C., Onofrei, M., Vintila, G., & Armeanu, D. S. (2018). Empirical evidence from the EU-28 countries on resilient transport infrastructure systems and sustainable economic growth. *Sustainability*, *10*(8), 1-34. http://doi.org/10.3390/su10082900

Ilzetzki, E., Mendoza, E. G., & Végh, C. A. (2013). How big (small?) are fiscal multipliers? *Journal of Monetary Economics*, *60*(2), 239-254. http://doi.org/10.1016/j.jmoneco.2012.10.011

Kasimati, E. (2016). Does tourism contribute significantly to the Greek economy? A multiplier analysis. *European Journal of Tourism, Hospitality and Recreation, 7*(1), 55-62. http://doi.org/10.1515/ejthr-2016-0006

Koh, W. C. (2017). Fiscal multipliers: New evidence from a large panel of countries. *Oxford Economic Papers*, *69*(3), 569-590. http://doi.org/10.1093/oep/gpw066

Konstantinou, P. T., & Partheniou, A. (2021). The effects of government spending over the business cycle: A disaggregated analysis for OECD and non-OECD countries. *The Quarterly Review of Economics and Finance*, *80*, 809-822. http://doi.org/10.1016/j.qref.2019.09.017

Lejárraga, I., & Walkenhorst, P. (2010). On linkages and leakages: measuring the secondary effects of tourism. *Applied Economics Letters, 17*(5), 417-421. http://doi.org/10.1080/13504850701765127

Lenz, N. V., Skender, H. P., & Mirković, P. A. (2018). The macroeconomic effects of transport infrastructure on economic growth: the case of Central and Eastern EU member states. *Economic Research - Ekonomska Istraživanja*, *13*(1), 1953-1964. http://doi.org/10.1080/1331677X.2018.1523740

Lütkepohl, H. (2005). *New Introduction to Multiple Time Series Analysis*. New York, USA: Springer.

Maden, S., Bulgan, G., & Yildrim, S. (2019). The effect of tourism sector on economic growth: an empirical study on Turkey. *Journal of Yasar University, 14*(55), 215-225.

Mariolis, T., Rodousakis, N., & Soklis, G. (2021). The COVID-19 multiplier effects of tourism on the Greek economy. *Tourism Economics.* http://doi.org/10.1177/1354816620946547

Massidda, C., & Mattana, P. (2012). A SVECM analysis of the relationship between international tourism arrivals, GDP and trade in Italy. *Journal of Travel Research*, *52*(1), 93-105. http://doi.org/10.1177/0047287512457262

Pascariu, G. C., & Ibănescu, B. C. (2018). Determinants and implications of the tourism multiplier effect in EU economies. Towards a core-periphery pattern? *Amfiteatru Economic, 20*(12), 982-997. http://doi.org/10.24818/EA/2018/S12/982

Pérez-Montiel, J., Dejuán Asenjo, O., & Manera Erbina, C. (2021). A Harrodian model that fits the tourism-led growth hypothesis for tourism-based economies. *European Journal of Tourism Research*, *27*(2706), 1-17.

Perotti, R. (2002). *Estimating the effects of fiscal policy in OECD countries*. ECB Working Paper No. 168, European Central Bank, Frankfurt.

Perovic, J., Raicevic, M., & Delibasic, M. (2021). Foreign direct investment, tourism, economic growth and trade: panel vector auto regression (VAR) model. *Transformations in Business & Economics, 20*(1), 140-153.

Petrović, P., Arsić, M., & Nojković, A. (2021). Increasing public investment can be an effective policy in bad times: Evidence from emerging EU economies. *Economic Modelling*, *94*, 580-597. http://doi.org/10.1016/j.econmod.2020.02.004

Pratt, S. (2015). The economic impact of tourism in SIDS. *Annals of Tourism Research, 52*, 148-160. http://doi.org/10.1016/j.annals.2015.03.005

Shahzad, S. J. H., Shahbaz, M., Ferrer, R., & Kumar, R. R. (2017). Tourism-led growth hypothesis in the top ten tourist destinations: New evidence using the quantile-on-quantile approach. *Tourism Management*, *62*, 223-232. http://doi.org/10.1016/j.tourman.2016.12.006

Tecel, A., Katircioğlu, S., Taheri, E., & Bekun, F. V. (2020). Causal interactions among tourism, foreign direct investment, domestic credits, and economic growth: evidence from selected Mediterranean countries. *Portuguese Economic Journal, 19,* 195-212. https://doi.org/10.1007/s10258-020-00181-5

TheGlobalEconomy.com (2021a). *Roads quality - country rankings*. Retrieved from https://www.theglobaleconomy.com/rankings/roads_quality/

TheGlobalEconomy.com (2021b). *Railroad infrastructure quality - country rankings*. Retrieved from https://www.theglobaleconomy.com/rankings/railroad_quality/

TheGlobalEconomy.com (2021c). *Hotel and restaurant prices - country rankings*. Retrieved from https://www.theglobaleconomy.com/rankings/hotel_and_restaurant_prices_wb/

Thirlwall, A. P. (2002). *The Nature of Economic Growth*. Cheltenham: Edward Elgar Publishing.

Tugcu, C. T. (2014). Tourism and economic growth nexus revisited: a panel causality analysis for the case of the Mediterranean region. *Tourism Management, 42*, 207-212. http://dx.doi.org/10.1016/j.tourman.2013.12.007

Tuncay, N., & Özcan, C. C. (2020). The effect of Dutch disease in the tourism sector: the case of Mediterranean countries. *Tourism and Hospitality Management, 26*(1), 97-114. https://doi.org/10.20867/thm.26.1.6

Valdés, B. D. (1999). *Economic Growth, Theory, Empirics and Policy*. Cheltenham: Edward Elgar Publishing.

World Bank (2021a). *World Development Indicators*. Retrieved from https://databank.worldbank.org/source/world-development-indicators

World Bank (2021b). *TCdata360*. Retrieved from https://tcdata360.worldbank.org/

WTTC. (2021). *World travel and tourism council*. Retrieved from https://wttc.org/