
Macroeconomic Determinants of Tourist Demand in Romania. A Panel Data Approach

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Abstract

The objective of the present paper is to identify the macroeconomic determinants of tourism demand in Romania. Tourist demand is measured by the number of tourists arriving in Romania from 12 different countries. Four macroeconomic factors that could influence tourism demand are investigated: the GDP per capita in the origin country, the trade between Romania and each country of origin, the cost of tourism activities in Romania, the population of the origin country. In order to reach the objective, three panel data regression models are estimated on the sample of 12 countries for the period 1995 – 2018. Hausman test reveals that the fixed effects model is the most suited for the underlying dataset. Results are in line with the specialty literature and confirm that GDP per capita, trade openness and population in country of origin have a significant positive impact on the tourist demand in Romania. On the contrary, the price of tourism in Romania comparatively to the price of tourism in the origin country is negatively associated with the Romanian tourist demand, as expected. Findings from this paper could be used by policymakers in order to develop tourism support policies, especially considering the contraction of the tourism sector generated by the COVID19 pandemic. Moreover, the present study fills a gap in the literature, since the macroeconomic determinants of Romanian tourist demand over a larger period of time is an under-researched topic.

Keywords: tourism demand, macroeconomic determinants, panel data regression models, trade openness, tourism cost.

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Introduction

The tourism industry is one of the most important industries of the tertiary sector. Worldwide, it accounts for about 10% of the global GDP. Its rapid development in recent years has contributed largely to economic growth especially in tourism intensive countries (Martins, et al., 2017). It is considered a generator of employment and income in formal as well as informal sectors (Khalil, et al, 2007).

The focus of the present paper is identifying the macroeconomic determinants of tourism demand in Romania. Tourism demand has been studied from various perspectives, based on qualitative or quantitative methods (Brida and Risso, 2009). However, most of the studies addressing the tourism demand employ quantitative methods and econometric models in particular (Song and Li, 2010; Leitao, 2009; Garin-Munoz and Amaral, 2000). We investigate four macroeconomic determinants of tourism demand: the GDP per capita, the trade between Romania and each country of origin, the cost of tourism activities in Romania, the population of the origin country. The choice of factors is based on the important results drawn from the literature as outlined in the next section. The tourism demand is

modelled using three panel data regression models on a sample of 12 countries for the period 1995 – 2018.

The signs of the estimated coefficients and the statistical significance of the factor variables are in line with the economic theory. The study is innovative for the field since it refers to Romanian tourism demand for a longer period of time (1995 – 2018) and includes multiple tourists' origin countries, adding to the robustness of results. Since tourism was among the most affected sectors by the COVID19 pandemic (Uğur, 2020), knowing the macroeconomic factors that influence tourism demand becomes much more relevant for developing and adjusting policies that could support tourism.

The paper is structured as follows. In the next section we review the literature of articles related to the studied topic and also motivate our choice for the macroeconomic determinants. In section 2 we describe briefly the methodology and introduce the variables used. Section 3 discusses the results of the empirical analysis and finally, last section concludes.

Literature Review

Over the years, numerous studies have been conducted to analyze the factors that influence tourists to choose a holiday destination.

Internationally, Garin-Munoz and Amaral (2000) employed panel data regression models to study the impact of economic indicators on international tourism demand in Spain for the period 1985 – 1995. The dependent variable used in their study was the number of nights spent in Spain, while the independent variables were the GNP, population, exchange rate and relative prices. Results showed that all indicators are statistically significant, the Gross National Product having a positive influence on the number of nights, while the rest of the variables a negative influence. Thus, if the price of tourist services decreases, the number of tourist nights spent in Spain increases.

In another study, Song and Witt (2006) used a Vector Auto Regression model to predict the flow of international tourists visiting Macau, based on data for 8 countries (China, UK, etc.) over the period 1992 – 2003. Arrivals of foreign tourists by country of origin, GDP and relative prices between Macau and the country of origin were used as variables. The model predicted that tourists from China will be the most numerous in the period 2003-2008.

At microeconomic level, Gokovali, et al. (2007) analyzed the factors that determine the duration of the tourist stay in Turkey at individual level. Data were collected through a questionnaire and a large number of microeconomic variables were used, among them being age, level of education, income, nationality, number of visits made in the past, etc. Regression analysis showed that the cultural environment, the level of entertainment and the promotion of tourism can affect the duration of the stay. Moreover, income and experience in traveling are positively associated with the length of stay, while the education level, number and type of annual holidays have a negative association.

Although models based on regression analysis (on cross-sectional or panel data) are predominant in determining tourism influencing factors, a paper by Louca (2006) uses Granger causality and cointegration analysis to examine whether expenditures in the tourism sector contributed to the growth of the tourism economy in Cyprus for the period 1960 – 2001. The results show that with the increase of advertising and promotion expenses, both the income and the number of tourists increase.

Referring to Romania, various empirical studies have been conducted to analyze the tourism sector, leading to a broader understanding of tourism demand. For instance, Kulcsar (2008) used the multiple linear regression to analyze if tourism GDP depends on tourist arrivals in tourist accommodation, overnight stays, and investment in the hotel and restaurant sector for the period 1997 – 2007 in Romania. The results showed that tourist arrivals and investments are significant to predict the GDP of the Romanian tourism sector. A significant correlation was obtained between investments in the restaurant and hotel sector and tourist arrivals for the analyzed period. Zaharia, et al. (2008) analyzed through simple linear regression the relationship between tourist accommodation capacity and the number of tourists who visited Suceava County during 2000 – 2006. They obtained a strong significant relationship between the two variables. Thus the number of tourists is strongly influenced by the

accommodation capacity – if the accommodation capacity in Suceava County increases, the tourist flow will also increase.

Another relevant paper is that of Podașcă (2011) where the relationship between tourist capacity and the number of foreign tourists coming to Romania was analyzed over the period 1998 – 2008. The highly significant model obtained in this paper implies that knowing the accommodation capacity of the tourist structures, one can predict the number of foreign tourists who will arrive in Romania. The research done by Popescu (2016) followed the arrivals of tourists in Romania depending on the number of accommodation structures for the 8 development regions in Romania in the period 2007-2015. At national level, there is a strong positive correlation between the two indicators. The lowest correlation was obtained in the South-East region (with a correlation coefficient of only 0.25), while the highest was recorded in the Central region.

The tourist demand in Romania was also studied by Popescu, et al. (2017), by applying three linear regression models with data from 2007 – 2015. In the first regression model, the relationship between the arrivals of tourists and the tourist overnight stays as a dependent variable is estimated. There is a strong positive relationship between the two indicators (coefficient of determination of 0.72). The second regression model, between accommodation capacity and tourist overnight stays as a dependent variable, shows that only 17.45% of the variation of overnight stays is explained by the variation of accommodation capacity, a rather small value. This may be due to the seasonal nature of tourism but also to a discrepancy between the quality of tourist services and the tariffs applied. The last model shows that the number of beds in tourist structures depends on the arrivals of tourists in Romania, with a moderate positive association between the two indicators.

Research methodology

As aforementioned, we will study the impact of certain macroeconomic indicators on the number of tourists that arrived in Romania from 12 different countries, for the period 1995 – 2018. All estimations were done using Stata 13.

Taking into account geographical and cultural characteristics, for the proposed analysis we chose 12 countries, 7 countries falling into the high-income category (USA, Germany, Italy, Hungary, UK, Greece, Poland) and 5 countries in the upper middle income category (Belarus, Turkey, Israel, Moldova, Bulgaria), same as Romania. The number of tourists coming from these 12 countries to Romania in the period 1995 – 2018 represents 65% of the total number of foreign tourists from this period.

Next, based on the specialty literature, we defined the tourist demand in Romania as a function related to the Gross Domestic Product (GDP) per capita, the trade openness, the relative price of tourism and the population of the country of origin.

$$TUR_{it} = f(GDP_{it}, TRADE_{it}, RP_{it}, POP_{it}) \quad (1)$$

The dependent variable (TUR_{it}) is the tourist demand expressed as the number of tourists arriving in Romania from country “ i ” in year “ t ”. Data for tourist arrivals were collected from the National Institute of Statistics and are expressed in thousands of people.

The independent variables are explained briefly below.

GDP_{it} is the GDP per capita of each country of origin, expressed as index 2010 = 100 at comparable prices and PPP for 2010. The data were collected from the United Nations Economic Commission for Europe (UNECE).

According to the specialized literature, we expect the number of foreign tourists in Romania to increase with the increase of the GDP per capita in the country of origin. Thus, the coefficient should have a positive sign (Garin-Munoz and Amaral, 2000).

TRADE_{it} represents the volume of trade flow between Romania and each country of origin. The higher the index, a greater influence of trade between the two countries on domestic activities is expected.

Trade openness was calculated as follows (Surugiu, Leitão and Surugiu., 2011):

$$TRADE_{it} = \frac{E_{it} + I_{it}}{GDP_{Rt} + GDP_{it}} \quad (2)$$

Where:

- E_{it} – annual exports from Romania to country “i” in year “t”, expressed in USD
- I_{it} – annual imports from country “i” to Romania in year “t”, expressed in USD
- GDP_{Rt} – GDP per capita in Romania in year “t” (USD, at PPP for 2010, 2010 = 100)
- GDP_{it} – GDP per capita in country of origin “i”, in year “t” (USD, at PPP for 2010, 2010 = 100)

Data for annual imports and exports were collected from the International Financial Statistics Yearbook published by the International Monetary Fund and data for GDP/capita were collected from the United Nations Economic Commission for Europe (UNECE).

RP_{it} represents the cost of tourism activities in Romania relative to the tourists’ countries of origin. To calculate it we used the following formula (Song and Li, 2010):

$$RP_{it} = \frac{CPI_{Rt}/EX_{Rt}}{CPI_{it}/EX_{it}} \quad (3)$$

Where:

- CPI_R – consumer price index for Romania in year “t” (2010 = 100)
- CPI_{it} – consumer price index for the origin country in year “t” (2010 = 100)
- EX_{Rt} – exchange rate between RON and USD in year “t” (average annual value)
- EX_{it} – exchange rate between domestic currency and USD in year “t” (average annual value)

This variable embodies a plausible decision-making process by a tourist, a decision between domestic and international tourism. Data for the average annual exchange rate were collected from the International Financial Statistics Yearbook published by the International Monetary Fund, and those for the CPI from UNECE.

POP_{it} represents the population of the country of origin. According to Hanafiah and Harun (2010), the world’s population is constantly changing, so its influence on tourism activities is obvious. Data for population were collected from UNECE and are expressed in thousands of people.

The empirical analysis proposed in this paper is based on estimating panel data regression models. As a first step we will determine whether the dataset fits a panel regression or a regular OLS regression. According to Baltagi (2005), this can be done by testing individual effects, the null hypothesis is fitting a pooled OLS model (no fixed effects) and the alternative hypothesis the existence of the fixed effects.

The next step is to decide on the most appropriate model, either with fixed effects or with random effects. Hausman test will be applied to choose among the two models. However, in the specialty literature on tourism determinants, the fixed effects model has been used more frequently because the groups under analysis are often markets or countries, which have specific individual factors that influence the other explanatory variables of the model.

Table no. 1. Results of the Levin-Lin-Chu test for stationarity

Variables	p-value for the initial series	Stationarity	p-value for the logarithmic series	Stationarity
Tourists	0.0115	Stationary	0.0007	Stationary
GDP/capita	0.0017	Stationary	0.0013	Stationary
Relative price	0.0001	Stationary	0.0000	Stationary
Population	0.0000	Stationary	0.0005	Stationary
Trade openness	0.0267	Stationary	0.0001	Stationary

Source: Authors’ own computation.

Because the series have different measurement units and scales, the logarithmic form of all variables was used. Before estimating the regression models on the panel data, we tested the stationarity of the series using the Levin-Lin-Chu panel unit root test. Table 1 shows the values of the unit root test before and after taking the logarithm of the variables. The results confirm the lack of unit root and thus the stationarity of the variables, for a 0.05 level of significance.

Results and discussion

Results for estimating the three models (pooled OLS, fixed and random effects) are presented in Table 2. According to the F-test all models are statistically significant at a significance level of 5%. The Hausman test shows that the fixed effects model is the most suitable (Table 3). The fixed effects model has also the highest value for the coefficient of determination, 91.79 % of the variation of foreign tourists' arrivals in Romania is explained by the regression model. To correct the heteroskedasticity (Table 4) we estimated the model with robust standard errors, but the results did not change significantly. For the fixed effects model, the population no longer has a statistically significant coefficient, but the rest of the coefficients remain significant.

Table no. 2. Estimation results of the three regression models

Variables	Pooled OLS	Fixed effects (LSDV)	Random Effects	Expected sign
GDP/capita	1.2494 ***	0.9284 ***	0.9030 ***	+
Relative Price	0.4276 ***	-0.2003 *	-0.1482	-
Trade Openness	0.0044	0.1051 **	0.1060 ***	+
Population	-0.2454 ***	1.2291 *	0.0054	+
Intercept	1.1217 *	-5.2201 *	0.3959	
Country 2 (dummy)		1.3447 ***		
Country 3 (dummy)		0.0133		
Country 4 (dummy)		2.1603 ***		
Country 5 (dummy)		-0.2353		
Country 6 (dummy)		1.4258 ***		
Country 7 (dummy)		-0.6270		
Country 8 (dummy)		-1.5253 *		
Country 9 (dummy)		-0.4053		
Country 10 (dummy)		0.1004		
Country 11 (dummy)		-0.2634		
Country 12 (dummy)		-0.0769		
F test / Wald test	37.79 ***	202.75 ***	88.00 ***	
Degrees of freedom	283	272	283	
R-Square	0.3482	0.9179	0.6086	
RMSE	0.4089	0.1480	0.1506	
Effect test		179.88 ***	2010.85 ***	
Sample size	288	288	288	

Source: Authors' own computation; * p-value <0.05, ** p-value <0.01, *** p-value <0.001

Table no. 3. Hausman test results

Hausman test	P-value
16.44	0.0025

Source: Authors' own computation.

Table no. 4. Results of the heteroskedasticity test for FEM

Wald test	P-value
218.00	0.0000

Source: Authors' own computation.

In what follows, we will interpret and focus on the results obtained for the fixed effects model since according to the Hausman test this is the most suited for the underlying dataset. It is also worth mentioning that for the fixed effects model, the coefficients had the expected signs according to the literature, which does not apply to the model with random effects, nor to the pooled OLS model.

Coefficients for all four independent variables are statistically significant at 5% level of significance or less, as shown in Table 2. The GDP per capita has a positive impact on tourist demand in Romania. Therefore, the higher the standard of living of a country, the more willing its inhabitants are to travel. The sign was the expected one, as obtained by Garin-Munoz and Amaral (2000), Leitao (2009), Song, et. al (2010) and Surugiu, Leitão and Surugiu (2011).

Also, the trade openness between Romania and the country of origin has a positive influence on the tourist demand. The higher the trade flow, the higher the number of international tourist arrivals. The same result was obtained by Leitao (2009) and Surugiu, Leitão and Surugiu (2011).

Another significant variable that positively influences the flow of international tourists is the population of the country of origin. This was also included in the study conducted by Leitao (2009) and Surugiu, Leitão and Surugiu (2011), obtaining similar results.

The model shows that the price of tourism in Romania in relation to that of the tourism in the country of origin is an important factor in determining tourism demand. Therefore, domestic tourism is used as a factor of comparison when a person plans their international travels. This variable negatively influences people's decision to visit a destination, a result that was also obtained by Botti (2006), Song and Li (2010) and Surugiu, Leitão and Surugiu (2011).

The fixed effects test showed that there are significant individual effects, so the fixed effects model is more appropriate than the pooled one. Also, according to the Hausman test, the fixed effects model is preferred to the random effects model.

Conclusions

The aim of the present study is to identify potential macroeconomic determinants of tourism demand in Romania. Tourism demand is measured by the number of tourists arriving in Romania over the period 1995 – 2018, from 12 countries. Tourists arriving from these countries account for 65% of the total foreign arrivals. The macroeconomic variables investigated as potential determinants of Romanian tourism demand are: GDP per capita in the country of origin, the trade between Romania and each country of origin, the cost of tourism activities in Romania, the population of the origin country.

The tourism demand is modelled using three panel data regression models (pooled OLS, random and fixed effects) on the sample of 12 countries for the period 1995 – 2018. The fixed effects test and the Hausman test revealed that the fixed effects model is the most suitable for the dataset. Coefficients for all four macroeconomic variables are statistically significant at a 5% level of significance.

GDP per capita in the origin country is positively associated with the tourism demand suggesting that individuals from better developed countries are more likely to travel to Romania. Moreover, the higher the trade flow between the country of origin and Romania, the higher the number of tourists arriving from that country. As expected, the price of tourism in Romania compared to the one in the origin country is significantly negatively related to the tourism demand.

Therefore, in order to increase foreign tourist arrivals, authorities should focus on attracting tourists from countries where the tourism cost is higher than in Romania, have a good development level and have significant trade flows with Romania. Results are of great importance for policymakers since the COVID19 pandemic requires new measures for supporting and reshaping the tourism industry.

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