

Private air transport and its implications on tourism

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Suggested Citation:

Paun, G. I. (2017). Private air transport and its implications on tourism. *Global Journal of Business, Economics and Management: Current Issues*. 7(2), 245-252.

Received February 6, 2017; revised April 6, 2017; accepted July 15, 2017.

Selection and peer review under responsibility of Prof. Dr. Gulzhanat Tayauova, Almaty Management University, Almaty, Kazakhstan.

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Abstract

The role of transport services in the tourism sector is very important – the tourist has to travel in order to reach a destination. The current economic crisis has profound implications on the entire world economy, also affecting national economies. Transport and tourism are important industries and their role in the overall economic development cannot be neglected. This paper explores the implications of private air transport on the evolution of tourism in Romania. We analyse a set of indicators that is important for the dynamics of these industries and the correlation degree between the tourist traffic indicators and some of the air transport indicators. We apply various econometric and statistical methods as the correlation coefficient and the regression method. The identification of these correlations is necessary for conceiving strategies of neutralisation of negative effects or of enhancement of positive influences in relation to tourism evolution.

Keywords: Private air transport, tourism, demand, supply, tourism evolution.

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1. Introduction

Transport is one of the basic components of a package tour. The role of transport is extremely important for the national, regional and global economy. In recent years, the importance of air transport is growing on all the three levels mentioned above. The development of this sector has positive and negative effects. The positive effects can be described in terms of reducing travel time, increasing distances between destinations and increasing the accessibility of some destinations. Some of the negative aspects are the adverse effects on the environment. Despite such growth period preceding the recent economic crisis, macroeconomic performance is not visible in the technical development of air transport (Becken, 2007). The authors argue that the size of the demand and supply of transport services is determined by several factors, among which the most important are technology, cost of services, fees, number of bidders and economic and social conditions. As in any other service, the quality–price ratio is given in particular, by the level of training and professionalism of employees. Specialists in this sector need to provide customers with all necessary information about packages and services, considering the fact that how they manage customer relations is reflected in the company's image. Now more and more software packages take this task of being the interface between customer and company for permanent communication, with regard to taking orders and making payments.

Some authors argue that a safe and efficient transport system is essential for a sustainable and successful tourism destination, but also for a vital economic activity (Henderson, 2009). Public and private investments and commitments are imperative, but ensuring adequate measures represents a heavy burden for countries with large territories and limited reserves.

Air transport is mainly responsible for greenhouse gas emissions in the transport sector and to reduce air pollution caused by aircraft is recommended installation of machinery to retain pollutants in take-off and landing, and the use of less polluting engines (Micu, Tuta & Mihai, 2013). Micu states that air and road transport play an important role in climate change and sustainable development, thus requiring the implementation of measures to counteract the negative effects on the environment.

The spread of low-cost carriers in Spain has accelerated certain processes such as specialisation of Mediterranean destinations coastal real estate, advancement and development plans for airports and even more so, it has encouraged private initiative, supported by regional governments, which have been significant changes in the national network of airports (Popescu, State & Marin-Pantelescu, 2008). Besides the mentioned aspects, the authors refer to the existence of other sectoral effects such as reduced profitability due to lower hotel occupancy rate caused by increased use of non-hotel accommodation, and lower average expenditure per tourist. Meanwhile, when it comes to perceptions of tourists on individual responsibility for greenhouse gas emissions, they make a separation of travel and their everyday life, where the responsibility for mitigation is felt to be greater (Rebollo & Baidal, 2009). In order for the tourism sector to achieve assumed objectives emission reduction, it requires an absolute reduction in recorded air transport until 2035. Thus aligning the national and international legislation to achieve a reduction of absolute emissions, the introduction of taxes on fossil fuels, boosting technology and transport infrastructure with low emissions, and developing a new vision for an economy of global tourism different, are goals that must be achieved (Scott, Peeters & Gossling, 2010). Considering all the important aspects mentioned above, it is necessary to analyse the linkages and their directions of air transport and tourism market.

2. Data and methodology

All the data series used in this paper are from the site of the National Statistics Institute (INSSE). The correlation between tourism indicators and air transport indicators will be tested and the present paper will also apply econometric and statistical methods such as correlation and regression coefficient.

The regression method consists of the measurement and the prediction of the influence exerted by one or more factors (the exogenous variable – cause X) on a certain indicator (endogenous variable – effect Y). The basic element in regression is the regression function, which presents the dependency of the Y variable on the X variable factor (Zaharia et al., 2010). The regression function can be validated by the dispersion analysis, which is calculated by the *F* test (Fisher Snedecor). The regression model is statistically significant if calculated *F* is greater than critical *F*. Also, the model can be considered statistically significant if significance *F* is lower than α , where α represents the significance threshold and $1 - \alpha$ represents the confidence level. Usually, $\alpha = 0.05$ or $\alpha = 0.01$, corresponding to a confidence level of 95% and 99%. The used data are presented in Table 1.

Table 1. The tourist traffic indicators and the air transport indicators – Romania

Year	Air transport			No. companies
	Departures abroad of Romanian visitors (thousands)	Arrivals of foreign visitors in Romania (thousands)	No. aircraft registered for passenger transportation	
1997	405	5,149	39	10
1998	447	4,831	34	17
1999	489	5,224	38	21
2000	535	5,264	28	30
2001	541	4,938	29	33
2002	527	4,794	32	35
2003	593	5,595	34	40
2004	687	6,600	33	44
2005	881	5,839	44	49
2006	1,225	6,037	57	54
2007	1,944	7,722	62	57
2008	2,404	8,862	71	57
2009	2,147	7,575	84	
2010	2,416	7,498	89	
2011	2,780	7,611	83	
2012	2,461	7,937	84	
2013	2,360	8,019	67	
2014	2,756	8,442	65	

Source: INSSE, <http://statistici.insse.ro/shop/?lang=ro>

The first set of the examined indicators represents the number of departures abroad of Romanian visitors and the number of aircraft licensed for passenger transport. The purpose is to observe how the number of aircraft affects the number of departures.

It can be noted (Figure 1) that between the years 1997 and 2004, the number of aircraft evolutions fluctuate, registering increases and decreases. After 2004, the evolution of this indicator has a positive trend until 2010, when the trend becomes negative. In terms of the number of departures, this indicator increases between 1997 and 2008, followed by a fluctuating period.

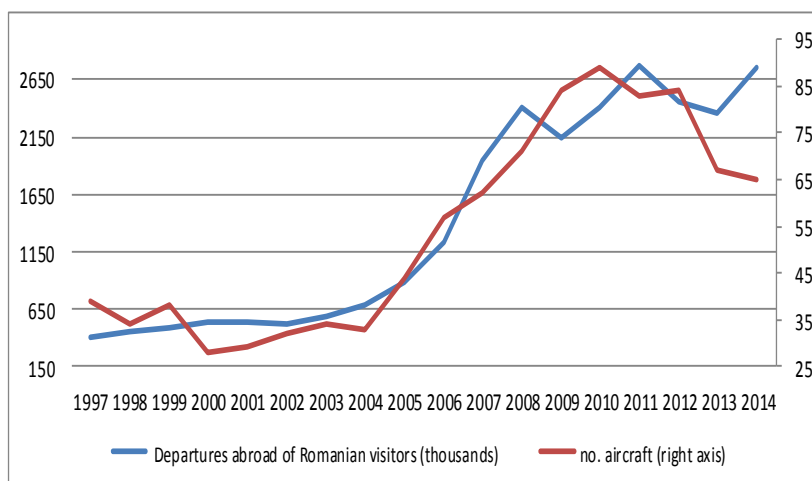


Figure 1. The evolution of departures abroad and number of aircraft

The following correlogram of both indicators has been carried out in order to allow a better understanding of the relationship between the two indicators.

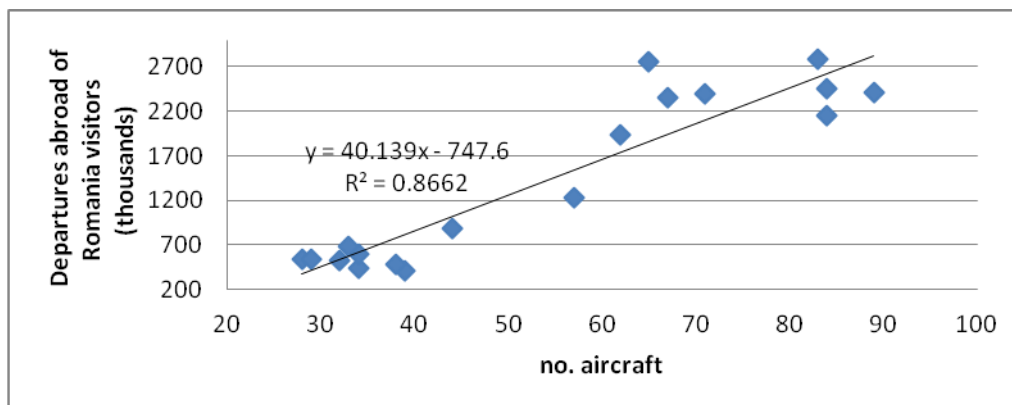


Figure 2. The departure – number of aircraft correlogram

Therefore, we can observe a very strong relationship between the indicators which can be explained by the fact that the determination degree is 0.87, which means that the departures are 87% influenced by the number of aircraft indicator.

Furthermore, we will analyse the data through the Excel spreadsheet and the results will be presented below (Figure 3).

Regression Statistics								
Multiple R	0,93070777							
R Square	0,86621695							
Adjusted R Square	0,85785551							
Standard Error	355,467272							
Observations	18							
ANOVA								
	df	SS	MS	F	Significance F			
Regression	1	13090156,08	13090156	103,5966193	0,0000000215			
Residual	16	2021711,7	126356,98					
Total	17	15111867,78						
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95,0%	Upper 95,0%
Intercept	-747,60317	229,0459547	-3,263988	0,004875355	-1233,158903	-262,0474	-1233,1589	-262,04744
No. Aircraft registered for passenger transportation (right axis)	40,1385992	3,943568789	10,178242	0,000000021	31,77860686	48,498592	31,7786069	48,4985916

Figure 3. The determination and testing of the regression model

The correlation ratio equals 0.9307, which shows us that there is a strong relationship between departure abroad and number of aircraft. The percentage used by the number of aircraft to influence tourists' departures is approximately 87% ($R^2 = 0.86621$). Due to the fact that the significance threshold is lower than 0.05 (Significance $F = 0.0000000215 < 0.05$), the regression model is valid. The model was testing for $\alpha = 0.05$. The correlation coefficient between these indicators is 0.931, which means that there is a strong positive relationship.

$$\text{The model is: } y = -747.603 + 40.138 x \tag{1}$$

In Eq. (1) y represents the number of departure (expressed in thousands of visitors) and x represents number of aircraft. As $t_a = 3.2639$ and significant level (P -value) is $0.004875 < 0.05$, it means that the coefficient is statistically significant, considering that fact that the coefficient is taking values between the lower (Lower 95%) and upper limit (Upper 95%) of 1233.1589 to 262.0474.

The number of aircraft coefficient (40.13855) indicates that the average number of aircraft increased with 1 unit and the number of departures abroad increased by about 40,100 visitors. Since $t_b = 10.17824$ and P -value is $0.000000021 < 0.05$, the coefficient is statistically significant. Confidence interval ranges from the lower limit (Lower 95%) and upper limit (Upper 95%) of 31.778606–48.4985916.

The next set of indicators analysed consists of arrivals of foreign visitors in Romania and the number of aircraft.

It can be seen below (Figure 4) that tourist arrivals fluctuated throughout the observed period, while the numbers of aircraft fluctuate only at the beginning and at the end of the period and between 2004 and 2010 the indicator has a positive trend.

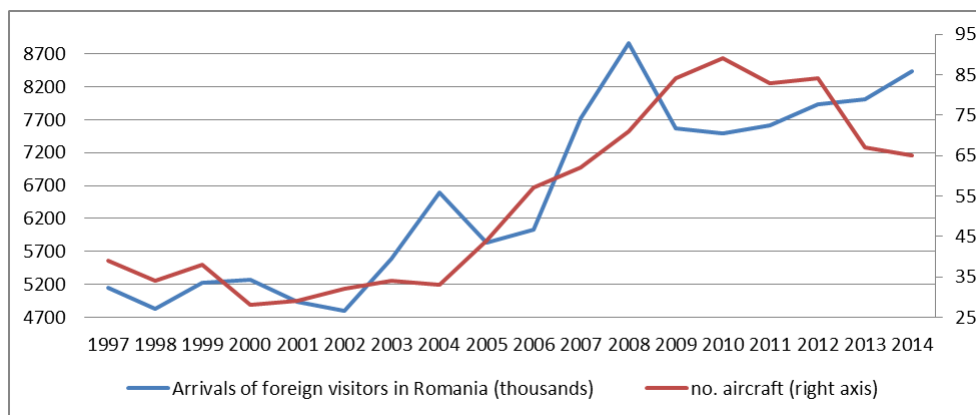


Figure 4. The evolution of arrival of foreign visitors in Romania and number of aircraft

The representation of data through a correlogram (Figure 5) allows us to observe a linear dispersion of the data.

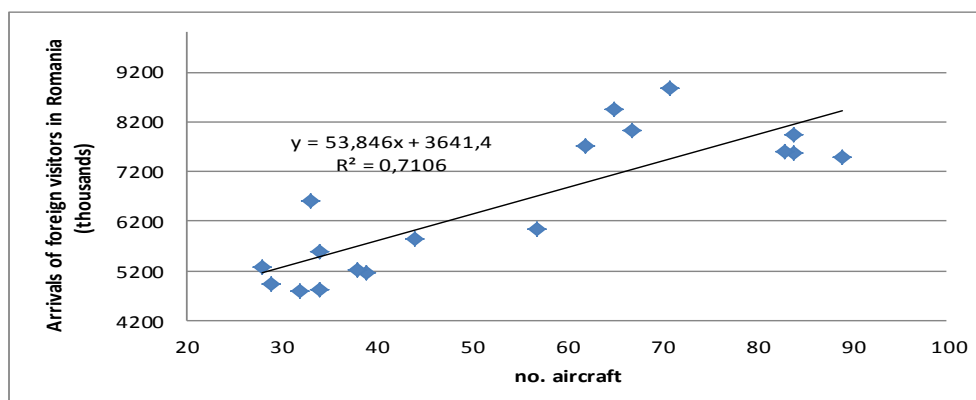


Figure 5. The arrivals of foreign visitors – number of aircraft correlogram

We will analyse the data through the Excel spreadsheet and the results will be presented below (Figure 6).

Regression Statistics						
Multiple R	0,8429839					
R Square	0,7106219					
Adjusted R Squar	0,6925357					
Standard Error	774,31455					
Observations	18					
ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	23557416,63	23557417	39,29097671	0,0000112106	
Residual	16	9593008,311	599563			
Total	17	33150424,94				
Coefficients						
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	3641,3789	498,9309257	7,298363	0,0000017862	2583,692561	4699,065
No. Aircraft registered for passenger transportation (right axis)	53,846023	8,590278004	6,268251	1,12106E-05	35,63544702	72,0566

Figure 6. Determination and testing of regression model

The data presented in Figure 6 shows that between the arrivals of foreign visitors and the number of aircraft there is a strong connection (multiple $R = 0.8429$). The percentage's of number of aircraft influence on the number of arrivals is about 71% ($R^2 = 0.71062$). Since significance $F = 0.00001121 < 0.05$, the regression model is valid. The model was tested for $\alpha = 0.05$.

$$\text{The model is: } y = 3641.37 + 58.846 x \tag{2}$$

In Eq. (2), y represents the number of arrivals of foreign visitors (expressed in thousands) and x represents the number of aircraft. As $t_a = -7.2983$ and significant level (P -value) is $0.0000017862 < 0.05$, it means that the coefficient is statistically significant, due to the fact that the coefficient is taking values between the lower (Lower 95%) and upper limit (Upper 95%) of 2583.69–4699.065.

The coefficient of number of aircraft (53.846023) indicates that the average number of aircraft increased by 1 unit and the number of arrivals of foreign visitors increased by about 53,843 visitors. Since $t_b = 6.268$ and P -value is $0.000011 < 0.05$, the coefficient is statistically significant. Confidence interval ranges from the lower limit (Lower 95%) and upper limit (Upper 95%) of 35.63544–72.0566.

The correlation coefficient for the analysed set of indicators reached a value of 0.78 for the number of aircraft and departures and a value of 0.75 for arrivals and company number, which shows that there is a strong positive association for indicators between 1997 and 2008.

3. Conclusions

By considering the analysis, we may conclude that private air transport has a very important role in national tourism. Thus, it appears that the number of aircraft in this sector is an important influential factor in the departures of Romanians abroad; the latter being influenced 87% in relation to the first. In this way, the importance of investment in the transport market is highlighted. If the number of investment in this sector increases, the demand for air services is stimulated. Investment grade reflected by the indicator number of aircraft exhibits a strong influence on the number of arrivals of foreigners in national territory. The percentage of number of aircraft influence on the number of arrivals is about 71%. At the same time, there is a strong positive association for indicator arrivals and

departures and the indicator number of company between 1997 and 2008. So you can see that air transport is essential for the Romanian tourism development strategy. Investments in this sector can be stimulated by reducing the overall tax burden, and by reducing bureaucracy. Previous stimulation methods are preferred because they contribute to a healthy natural growth of the sector compared to alternatives, in which the state assumes the role of investor and thereby increasing the overall tax burden, with adverse consequences borne by the entire Romanian society.

Acknowledgements

This work was co-financed by the European Social Fund Operational Programme Human Resources Development 2007–2013, project number POSDRU/187/1.5/S/155656 ‘Support for PhD in economics’.

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