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REGIONAL ECONOMIC GROWTH AND TOURISM: A PANEL DATA APPROACH

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Abstract
Tourism is currently one of the largest and most dynamically developing sectors of the world. In many countries, including Croatia, has an extremely important role in the economy. The aim of this paper is to analyse complex links that exist between the tourism industry and processes of economic growth and development on regional level. Croatia has been divided into 20 counties and the capital city of Zagreb. The purpose is to investigate the impact of tourism on the economic growth of Croatian counties. In the research, two variables have been used, GDP as one of the main tools for measuring the economic growth, and overnight stays as a proxy variable for tourism.

The obtained results show positive correlation between economic growth and tourist overnight stays. Panel model shows that regional economic growth is influenced by tourism. But research shows also the differences between the counties. Based on conducted analysis, authors suggest that the investment and development should be encourage and in other Croatian counties. Local and regional authorities have to create conditions for increasing competitiveness in tourism, that will in ultimately stimulate economic growth and development. Empirical findings in this study may provide guidance for private, local and government tourism policy makers and authorities in Croatia.

Keywords: economic development, GDP, tourist overnights, Croatian counties, panel data analysis.

Jel Classification: L83; C33; O40; Z32

INTRODUCTION

Tourism is currently one of the largest and most dynamically developing sectors of the world. Tourism expansion is considered to be a potential mode for achieving growth and development. Developing countries have set their policy in such way that they attract foreign visitors and develop tourism sector on the basis of its multiplier effect on other sectors as well (Cortes-Jimenez and Pulina 2010).

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Over the last few decades, the importance of tourism industry for the economy of many countries has been increasing (Oh 2005). Also, the role of regions in national economies has recently changed considerably as a result of globalization and structural adjustment. According to Stimson et al. (2006), regional economic development is the implementation of economic processes and resources available to a region, resulting in sustainable development and desirable economic outcomes for the region, its entrepreneurs and residents. Understanding these processes is crucial for making regional economic analyses and for planning regional development.

International tourism has grown substantially in recent decades, with technological improvements, rising living standards and broader processes of globalization leading to rapid increases in visitor numbers (Milne and Ateljevic 2001). According to the United Nations World Tourism Organization Report (2016), international tourist arrivals reached 1.235 billion in 2016, which is 4% more than in 2015. Europe has realized 615 million international tourist arrivals, and 2.873 billion tourist overnights. The share of tourism in world GDP in 2016 was 10% (UNWTO 2016).

In many countries of the world, including Croatia, tourism has an extremely important role in economy. In 2016 over 78 million overnights in accommodation were realized, which represents an increase of 9%, compared to 2015. Tourism is a branch that employs 6 to 7 per cent of the total number of the employed, while foreign currency tourism income is 18.1 % in relation to GDP (Croatian Chamber of Commerce 2016).

Tourism is one of the economic activities with the potential to stimulate economic development because of its complementarity with other economic activities. Tourism should create employment and income, lead to a steady balance of payments, stimulate tourism supply sectors, and lead to generally increased levels of economic activity in countries. Croatia is one of the countries with the highest share of tourism in GDP compared to other member states of the European Union. In 2015, this share was 18.1% (Eurostat, 2016). However, such an indicator suggests high dependency of the economy on tourism and points to the insufficiently developed economic structure of Croatia (Krstinic Nizic, Sverko Grdic, and Hustic 2016).

The main aim of this paper is to analyse the complex relations that exist between tourism and economic development at regional level. Croatia is divided into 20 counties and the capital city of Zagreb. According to the Nomenclature of Territorial Units for Statistics (NUTS) of the European Union, Croatia has two large regions, Adriatic and Continental Croatia (Eurostat 2013). Adriatic Croatia comprises 7 counties, and Continental Croatia 13 counties and the capital. The purpose of the paper is to explore the impact of tourism, i.e. tourist overnights on regional economic development and to analyse the difference between the counties. The basic research question asked in the paper is which counties are more developed, and does the GDP increase with the number of tourist overnights? The motive for the research lies in the fact that tourism in Croatia has a long tradition and is especially developed in coastal counties. Furthermore, the research wants to discover whether tourism has an impact on economic development in continental counties as well.

The paper is organized as follows. After the introduction, the next section reviews various studies related to tourism development. The third section describes the data and methodology used. The fourth section contains results and discussion, and the final section brings conclusions and the limitations of the research.

1. LITERATURE REVIEW

The discoveries that tourism is considered to be the largest industry of the 21st century in many countries, and one of the fundamental drivers of local and national development, is unquestionable. In last two decades, several researchers have empirically examined the role of tourism in economic growth (Kumar and Hussain 2014; Pulido-Fernandez, Cardenas-Garcia, and Sanchez-Rivero 2014; Ekanayake and Long 2012; Cortes-Jimenez and Pulina 2010).

One of the main reasons why governments support and promote tourism in the world is that tourism has a positive impact on economic growth and development (Ivanov and Webster 2007). The importance of tourism for national economic development is widely acknowledged because of its contribution to the balance of payments, production and employment. Tourism helps in paying the imports and mitigates the pressure on the balance of payments (Blazevic 2007). Many developing countries consider tourism as possibility for raising export earnings (Ivanovic, Bogdan, and Baresa 2014). There are also strong relations between tourism and other economic sectors, including transport, retail, wholesale, manufacturing, agriculture, arts and crafts, and other services. From a regional point of view, tourism can act in such a way that it distributes development far from industrial centres towards less developed regions (Soukiazis and Proenca 2007). Tourism can be a key factor in economic growth and development, and many regions have achieved economic growth thanks to their ability to manage resources and promote tourism sector (Simundic and Kulis 2016).

There are a large number of studies on tourism and economic growth and development. These studies can be grouped into two broad categories; studies that have analysed only one country over a number of years (time series analysis) and studies that have included more countries and more years (panel data analysis). Massidda and Mattana (2013) analyse the relationship between GDP, tourist arrivals and total trade in Italy in period 1987–2009, and confirm the two-way causality of tourist arrivals and economic growth, while economic growth affects total trade and total trade affects tourism.

Lorde, Francis, and Drakes (2011) use the following variables: GDP, tourist arrivals and exchange rate in the case of Barbados, and prove the same result as previous authors. Kim and Jang (2006) in the analysis of Taiwan and Dritsakis (2004) in the analysis of Greece also demonstrate the reciprocal link between tourism and economic growth. Katircioglu (2011) uses in its analysis GDP, tourist arrivals and exchange rate and proves the one-way causality of tourism to economic growth for Singapore in the period 1960–2007.

On the other hand, Dritsakis (2012) provides a panel analysis of seven Mediterranean countries over a period of 27 years. He analyses the ratio of GDP per capita, the number of tourist arrivals per capita, income per capita and the exchange rate per capita, confirming the tourism-led hypothesis. Ekanayake and Long (2012) analyse developing countries, 140 of them, 1995–2009, and the variables they use are GDP, tourism receipts, physical capital and labour.

Granger causality test does not prove the causal relation between GDP and labour, capital and tourist receipts. The results also show that tourism do not have statistically significant impact on GDP in some regions. Cortes-Jimenez (2008) studies Spanish and Italian regions, analysing the ratio of investment to GDP, human capital indicators, ratio of

government consumption to GDP, domestic and international tourist arrivals and overnights as proxy variables for tourism. The results show a positive influence of domestic and international tourist overnights on regional economic growth but only in coastal regions and regions with Mediterranean coast.

Trinajstic (2018) investigates the relationship between tourist arrivals and regional economic development for Croatia. The correlation coefficient (Pearson) was examined and interpreted. The results show positive correlation in the most counties. Oh (2005) investigates GDP and tourist receipts in South Korea, and proves that economic growth contributes to tourism growth. Cortes-Jimenez et al. (2011) have been confirmed the same relation, analysing GDP, tourist receipts and imports on the example of Tunisia.

From the above literature review, it is evident that tourism can play an important role in stimulating larger growth and development, reducing regional asymmetries, creating employment and positive impacts that affect (directly or indirectly) other economic activities. This paper will focus on the impact of tourism on regional development.

2. DATA AND METHODOLOGY

The studies focused on the existence of a causal relations between tourism and economic growth and development are relatively new and have increased in number since 2002 (Pablo-Romero and Molina 2013).

Various authors have conducted the analysis of the tourism impact on economic development, thereby using various variables in their research.

Compared to the existing empirical research conducted at regional level, this study includes two variables, GDP as one of the main tools for measuring economic development, and tourist overnights as a proxy variable for tourist development. Statistical analysis consists of analyzing and interpreting the correlation coefficient (Pearson coefficient) between two regions, conducting regression analysis and cluster analysis and preforming fixed effect model.

The collected data will be processed using Stata 13.0. program. The annual data on GDP of each county, as well as the number of tourist overnights, is taken from the Central Bureau of Statistics just before the research. Time period is 15 years (2001–2015) for 21 counties. The analysis will cover 2 large regions: Adriatic and Continental Croatia, and within them individual counties.

3. RESULTS AND DISCUSSION

Table 1 shows the correlation between tourist overnights and GDP of Adriatic and Continental Croatia.

Table 1. Correlation of Adriatic and Continental Croatia

Region	coefficient	p
Adriatic Croatia	0.8569	<0.001
Continental Croatia	0.8464	0.0001

From the above table we can notice a very positive correlation between tourist overnights and GDP of Adriatic Croatia (0.8569) at the significance level of $p < 0.001$. A high positive correlation is also present in Continental Croatia (0.8464).

After the established correlation between tourist overnights and GDP in two regions, in this empirical analysis, there is used the panel data technique. Purpose of this research is to investigate the relationship between the Gross domestic product in Croatian counties in HRK (GDP) and the total number tourist overnights (domestic and international tourists) spent in the tourist establishments (TN). To avoid the seasonality problems, annual data were used.

The descriptive statistics for panel data is presented in the following table.

Table 2. Descriptive statistics of panel data

Variable (in level)		Mean	Std. Dev.	Min	Max	Observations
GDP	overall	1.41e+07	1.99e+07	1,896,692	1.13e+08	N = 315
	between		1.98e+07	3,002,365	9.58e+07	n = 21
	within		4558030	-2.29e+07	3.15e+07	T = 15
TN	overall	2,662,620	4698965	7,877	2.10e+07	N = 315
	between		4753140	16,683.93	1.79e+07	n =21
	within		703725.6	-407,644.5	6805549	T =15

The total number of observations is 315, there are observed 21 units (counties in Croatia) in time period 2001–2015. This panel data is balanced, because all entities have measurement in all time periods. Mean value (overall) of GDP is HRK 14.125 billion, while mean value (overall) of tourist nights is 2,662,620.

„Between" statistics are calculated on the basis of summary statistics of the 21 counties in Croatia regardless the time period, while „within" statistics by summary statistics of 15 time periods regardless of counties.

In order to graphically see how two regions are oriented on tourism, the following graph presents ratio of tourist overnights spent in the tourist establishments per capita in a given county.

By looking at Figure 1, one notices that it can be confirmed that regions in Croatia can be divided by ratio of tourist nights per capita. Tourism in Adriatic Croatia prevails with minimum of 29.3 tourist overnights per capita in Split-Dalmatia county, while Istria county has the highest ratio of 100.7 nights per capita in Croatia.

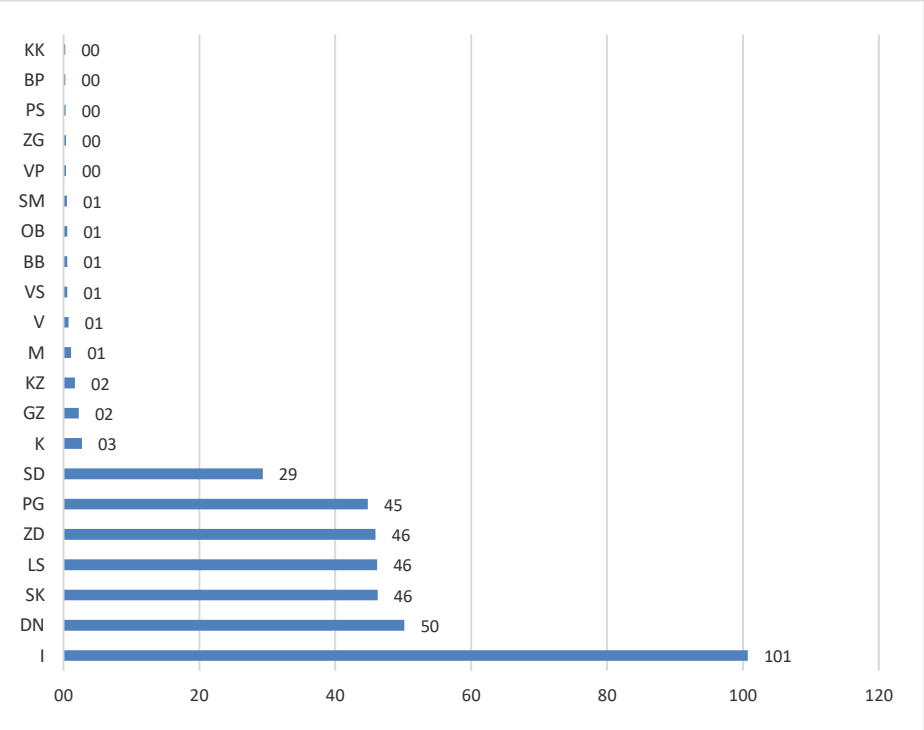

Figure 1. Tourist Overnights per capita in Croatian counties in 2015

Note: Instead of writing full names of Croatian counties there are used abbreviations: BB–Bjelovar-Bilogora, BP–Brod-Posavina, DN–Dubrovnik-Neretva, I–Istria, K–Karlovac, KK–Koprivnica-Krizevci, KZ–Krapina-Zagorje, LS–Lika-Senj, M–Medjimurje, OB–Osijek-Baranja, PS–Pozega-Slavonija, PG–Primorje-Gorski Kotar, SM–Sisak-Moslavina, SD–Split-Dalmatia, V–Varazdin, VP–Virovitica-Podravina, VS–Vukovar-Srijem, ZD–Zadar, ZG–Zagreb, SK–Sibenik-Knin, GZ–City of Zagreb.

In order to measure economic impact of tourist overnights on GDP in Croatian counties, a variety of different models for panel data have been examined. Broadly, this models can be arranged as pooled regression, fixed effect and random effect. In order to find which model is appropriate there are conducted formal tests to examine individual and time effects. Variables in the model have been log transformed.

First test was to find if pooled OLS is more appropriate than fixed effect model. Considering that null hypothesis of the F-test is rejected fixed effect model is more suitable. Random effects have been tested by the Breusch-Pagan Lagrange multiplier (LM) test, since null hypothesis is rejected, it can be concluded that random effect model is favoured over the pooled OLS. To find out whether fixed effects estimation would be appropriate, commonly-used Hausman specification test was the next step. "The specification test devised by Hausman (1978) is used to test for orthogonality of the common effects and the regressors." (Greene 2012, 379). The Hausman statistic is distributed as χ^2 and:

$$H = (\beta_c - \beta_e)'(V_c - V_e)^{-1}(\beta_c - \beta_e) \quad (1)$$

β_c and β_e present coefficient vectors from the consistent and the efficient estimator, while V_c and V_e present covariance matrices of the consistent and the efficient estimator.

Table 3. Result of Hausman test

	Fixed	Random	Difference	S.E.
lTN	.4155	.3822	.0333	.0082
Prob>chi2 = 0.00				

The *Hausman test* (Table 3) rejects the null hypothesis random effects versus fixed effects, it can be concluded that the fixed effects model is the preferred specification for these data. After performing tests, one-way cross-section fixed effects model was chosen as the most appropriate.

Before presenting the final model, regression assumptions for panel data were tested. First it was checked if the error terms have constant variance. It is conducted a modified Wald test for groupwise heteroskedasticity in the fixed effect regression model and after rejecting null hypothesis it can be concluded that heteroskedasticity is present.

After conducting test for serial correlation in the idiosyncratic errors of a linear panel data model discussed by Wooldridge (2002) we have concluded that serial correlation is present also. Next step was to plot GDP against tourist overnights.

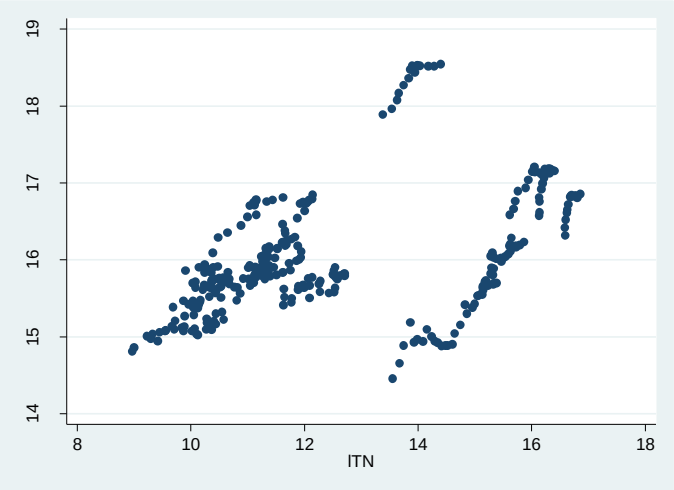

Figure 2. Log-log scatterplots of GDP against tourist nights

According to Figure 2 we have decided to use cluster analysis and divide our sample in five groups according to dendrogram on Figure 3.

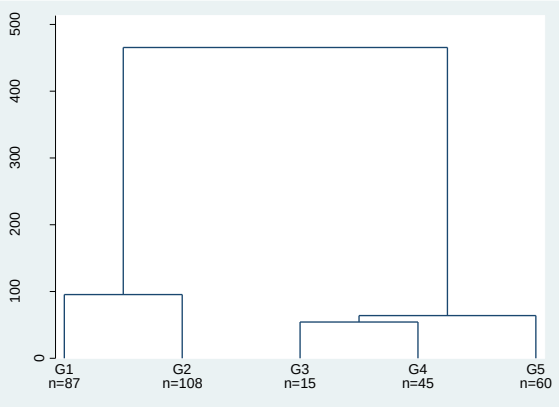

Figure 3. Dendogram for cluster analysis

We have used robust variance estimate method based on a clustered sandwich estimator (Williams 2000; Wooldridge 2002; Rogers 1993; and Froot 1989). The clusters are determined by cluster analysis by Ward's method with L2 measure of the difference and by the correcting the clusters within the dominant cluster. "The name 'sandwich' refers to the mathematical form of the estimate, namely, that it is calculated as the product of three matrices: the matrix formed by taking the outer product of the observation-level likelihood/pseudolikelihood score vectors is used as the middle of these matrices (the meat of the sandwich), and this matrix is in turn pre and postmultiplied by the usual model-based variance matrix (the bread of the sandwich)" Gutierezz and Drukker. Finally, we present model in Table 4.

Table 4. One-way cross-section fixed effects model

lGDP	Coef.	Robust Std. Err.	t	P>|t|	95% Conf.	Interval
lTN	.4155	.07757	5.36	0.00	.2001	.6308
_cons	10.7775	.98308	10.96	0.00	8.0480	13.5069
sigma_u	.9358					
sigma_e	.1294					
rho	.9812					
R-sq Within = 0.46					F (1,4) = 28.69	
Between = 0.20					Prob > F = 0.01	
Overall = 0.21						

Using this robust estimation produces higher standard errors, thus lower t-statistics and a larger probability of not rejecting the null of parameters being different from zero. According to the results displayed, independent variable lTN is positive as expected and significant at the .01 level. If lTN change by 1% we would expect lGDP to change by 0.42% It can be concluded that variations in GDP per county can be in large explained by variations in the TN, and it is confirmed by R^2=0.46.

By analysing the results obtained, it can be concluded that there is a correlation between tourist overnights and GDP within counties, and that regional economic development is influenced by tourism. The correlation coefficient between tourist overnights and GDP in the Adriatic, as well as in the Continental Croatia is highly

positive. The most tourist overnights compared to the number of inhabitants have Istrian, Dubrovnik-Neretva and Sibenik-Knin counties. The Istrian county also has the largest GDP, which states that this county is the most developed.

The analysis has shown that there are differences between counties. By cluster analysis, counties are grouped into 5 groups. In the Adriatic Croatia, the smallest number of tourist overnights has Lika-Senj county as well as the smallest GDP. From this it can be concluded that tourism in this county is still not sufficiently developed. One should further explore total accommodation capacity and possibility of new forms of tourism, which would increase the number of tourist overnights, and thus of the GDP of this county.

In the Continental Croatia, the city of Zagreb has the most tourist overnights, and thus the highest GDP. Several counties have a medium correlation between tourist overnights and GDP (Sisak-Moslavina, Karlovac, Bjelovar-Bilogora, Pozega-Slavonija). Varazdin county has a statistically insignificant correlation. This county has a smaller number of tourist overnights, and it is in the 7th place from all counties for its GDP, so it can be concluded that tourism is not the main activity in this county, some other activities, such as textile, F&B industry, increase its GDP. But tourism development should definitely not be neglected.

CONCLUSION

The aim of this paper was to examine whether tourism may be considered as an important factor for economic growth and development on a sample of Croatian counties. Empirical research was conducted using a statistical analysis on a sample of 21 counties over a period of 15 years (2001–2015).

The results have confirmed that tourist overnights, and by that tourism as well, have a positive impact on economic development of counties. Increasing tourist overnights affects the GDP.

The results of this paper can provide implications for tourist policy makers. Local and regional tourist holders have to create conditions for increasing the competitiveness of individual counties, stimulate real investment in less developed tourism counties, and encourage the creation of regional partnerships, which will ultimately stimulate economic growth and development. The role of tourism in social development and the well-being of local communities should also be emphasized. Therefore, tourism development should be encouraged in all counties.

The conducted research included two variables, which is referred to as the first limitation of this paper. For future research, the analysis should include tourism income, foreign exchange rate, employment, human capital, investments. The second limitation refers to the sample. The recommendation for a further research is to include the regions of neighboring tourist countries, eg Italy, Slovenia, Austria, or Mediterranean countries. Nevertheless, the contribution of this paper is evident in the fact that it covers two regions, Adriatic and Continental Croatia, and all Croatian counties.

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