Zagreb International Review of Economics & Business, Vol. 17, Special Conference Issue, pp.65-80, 2014

ISSN 1331-5609; UDC: 33+65

Economic Growth and Tourism Demand in Croatia: the Cyclical Component Analysis

Tonći Svilokos *
Meri Šuman Tolić *
Ivana Pavlić *

Abstract: *Development of tourism has often been considered as a positive contributor to economic growth. The impact of tourism to a country economy is multifaceted. As such, tourism may represent an excellent tool for development. This paper presents preliminary findings using descriptive statistics and spectral analysis. Therefore, the main purpose of this research is to examine the relationship between the cyclical components of Croatian economy for periods 1972-2013. Using spectral analysis the authors compare the cyclical fluctuations of gross domestic product (GDP) and total tourist arrivals. VAR analysis is also applied in order to detect the relationship between analysed cyclical components in Croatia.*

Keywords: tourist arrivals, economic growth, cycle components, VAR, Croatia

JEL Classification: E42, L83, E27, O40, C22

Introduction

In emerging countries, where problems such as high rate of unemployment, limited foreign exchange resources, unfavourable trade balance and single-product economy prevail, systematically and cautiously planned tourism development plays an important and dominant role in the country's economy. Increasing tourism flows can bring many positive economic consequences to host countries, particularly in terms of income and employment opportunities, revenues and foreign exchange earnings. It can generate demand for new goods or services that can stimulate development of those industries instead of import.

* Tonći Svilokos, Meri Šuman Tolić and Ivana Pavlić are at University of Dubrovnik, Department of Economics and Business, Dubrovnik, Croatia.

In Croatia, tourism is an economy driving force. The total contribution of Travel & Tourism (T&T) to GDP consists of direct, indirect and induced contributions. The direct contribution of Travel & Tourism (T&T) to GDP in Croatia was 11.9% of total GDP in 2012. Another important fact is that tourism is a labour intensive industry. In 2012 Travel & Tourism directly supported 138.500 jobs in Croatia, which is 13.1% of total employment (WTTC, 2013). The total contribution of T&T includes its 'wider impacts' on the economy, identified as indirect and induced impacts. According to WTTC report (2013) its total contribution in Croatia comprised 27.8% of GDP in 2012 and generated over 319.000 jobs (30.2% of total employment). As such, tourism certainly represents an excellent tool for development.

The importance and the role of irregular trends and cycle components in tourism has been long time ago recognized. Major business cycle fluctuations strongly influence consumer behaviour, especially tourist demand, considering the fact that tourism travel has been considered as luxury good. In times such as recession and economic boom, change in tourism demand is evident due to high degree of substitution effects between types of destinations or types of demanded goods and services. This would mean that cycle movements in tourist arrivals may be explained by the delayed effects of the economic cycles. In order to analyse the interaction between tourism and business cycle components this paper examines the relationship between the cyclical components of tourist arrivals and GDP in Croatia for period 1972-2013 by means of spectral analysis and VAR modelling. If interception between tourism cycle and overall economic cycle can be determined than tourism policy makers could react on time with countercyclical measures to soften the impact of unfavourable economic conditions and to take the advantage of the delay between the two cycles.

The paper is organized as follows. Firstly, the theoretical and empirical findings related to the topics are summarized. Hereinafter, methodology, model, data and interpretation of empirical results are explained. Final part of the paper offers the concluding remarks.

Literature Review

The relationship between tourism and economic growth has been empirically tested in two theoretical hypotheses: economic driven tourism growth (EDTG) and tourism led economic growth (TLEG). Empirical studies that support the economic-driven tourism growth (EDTG) hypothesis are Lanza et al. (2003) and Narayan (2004). The Tourism-Led Economic Growth (TLEG) hypothesis is based on the assumption that the economic growth could be generated through expanding international tourism as a non-traditional export. Applying the TLEG hypothesis, tourism is considered to be a major factor of overall long run economic growth. This theory is effective when tourism stimulates impacts over the whole economy in the form of overflows and other externalities (Marin, 1992).

There are two theoretical statements of economic impact of tourism that support TLEG. The first one is called Export-Led Growth (ELG) hypothesis based on the assumption that economic growth can be achieved via increases in the volume of inputs. Another economic relationship is known as Tourism Capital Imports to Growth (TKIG). The TKIG hypothesis confirmed that economic development and industrialization were achieved since the early sixties through imports of capital goods mainly financed by tourism receipts (Sinclair & Bote Gómez, 1996). Hazari and Sgro (1995) suggested a dynamic growth model of trade in which an auspicious effect of an international tourism demand and revenues would have a positive impact on the long-run small open economy growth. Balauguer and Cantavella-Jorda (2002) have pointed out that tourism-led growth hypothesis is not characteristic for the developing countries. Gunduz and Hatemi (2005) also confirmed suitability of tourism-led growth hypothesis with the empirical research in the case of Turkey.

To determine the impact of tourism on the national economy, the scientists applied a different methodology. The most widely used and the most popular methodology is cointegration and Granger causality test (Balaguer & Cantavella-Jorda, 2002; Brida, Barquet, & Risso, 2009; Brida, Carrera, & Risso, 2008; Cortés-Jiménez, Pulina, Riera i Prunera, & Artís Ortuño, 2009; Dritsakis, 2004a; Durbarry, 2004; Kim, Chen, & Jang, 2006; Lee & Chang, 2008; Nowjee, Poloodoo, Lamport, Padachi, & Ramdhony, 2012; Oh, 2005). Brau et al. (2003) researched the relationship between economic growth, country size and tourism. They made a categorization of small countries according to an average degree of tourism specialization. Tourist consumption can contribute to the balance of payments, production and employment through foreign exchange earnings and can also represent an important income source for the whole national economy (Balaguer & Cantavella-Jorda, 2002). They determined a steady long-run relationship between tourism development and economic growth using Granger causality test in Spain. Dritsakis (2004b), analysing the relationship between tourism and long-run economic growth in Greece, found out cointegrated vector among GDP, real effective exchange rate and tourism earnings and concluded that international tourism earnings and real exchange rate cause economic growth with a ‘strong causal’ relationship, while economic growth and real exchange rate cause international tourism earnings with a ‘simply causal’ relationship. Durbarry (2004) examined the relationship between tourism and economic growth in Mauritius and he found out that tourism had a great impact to economic growth and development. Eugenio-Martin et al. (2004) analysed the connection between tourism and economic growth using the panel data approach with generalized method of movements (GMM) estimation) techniques and they found out a significant relationship among tourism and economic growth and other macroeconomic variables.

Oh (2005) disagreed with this theory explaining that this theory was applicable only in the case of the top recipients of world international tourist revenues, such as France and Spain. He used this model on the case of South Korea and found out that in such case economic growth had impact on tourism expansion and not inversely. Kim et al. (2006) examined causal relationship between tourism expansion and economic development in Taiwan and they found out a long-run equilibrium relationship and further bi-directional causality among the two factors. The conclusion was that tourism and economic development fortified each other. Nowak et al. (2007) researched the relationship between tourism and economic growth. In the model they included imports of capital goods as an additional factor. They have attempted to examine the relevance of EKIG hypothesis (export, capital, good imports and growth) for a TKIG (tourism, capital goods imports and growth) mechanism. Carrera et al. (2008) found out that tourism receipts initially had caused economy shortfall, but then a significant positive effects on economic development were achieved. Lee and Chang (2008) applied a heterogeneous panel cointegration technique to reinvestigate the long run co-movements and causal relationship among tourism development and economic growth in OECD and non OECD countries. They determined the existence of a long-run causality between tourism and real GDP related at least in one direction.

Cortes-Jimenez, et al (2008) expanded the existing research of the economic impact of tourism by considering both exports and tourism as potential influencing factors for economic growth in Italy and Spain. Their findings reveal the significance of both exports and tourism towards long-term growth. Brida et al. (2009) investigated the causality between tourism growth, relative prices and economic expansion. They found out one cointegrated vector among real GDP, tourism and relative prices where the corresponding elasticity was positive and that the tourism and relative prices were weakly exogenous to real GDP. Eeckels et al. (2012) examined the relationship among the cyclical components of GDP and international tourism revenue applying spectral analysis and he found out that cyclical component of tourism income had significantly influenced the cyclical component of GDP and he supported the TLG hypothesis.

Although the relationship between cycle components of tourism demand and economic growth has been researched for five decades in empirical works of McKinnon (1964), Bryden (1973) and Belise and Hoy (1980), the relevant empirical literature on this topic is still scarce (Šergo & Poropat, 2010; Filis & Leon, 2006; Song, Witt, & Li, 2008). Reviewing the relevant literature it can be realized that spectral analysis has not been applied very frequently in economic literature. The basic premise of spectral analysis, in this univariate version, is the decomposition of a stationary and ergodic time series in different frequencies and the estimation of amplitudes and phase shifts in individual time series (Leon & Eeckels, 2011). The decomposition allows for a more detailed analysis of the cyclical behaviour of variable series in comparison to the traditional approach.

Methodology

In this paper spectral analysis (Stoica & Moses, 1997), Augmented Dickey- Fuller test ADF (Dickey & Fuller, 1979), Kwiatkowski-Phillips-Schmidt-Shinn KPSS test (Shin & Schmidt, 1992), Hodrick-Prescott filter HP (Hodrick & Prescott, 1997), Johansen Cointegration test and Vector autoregressive model VAR (Johansen, 1991) were used.

Evaluating the problem of business cycle extraction from the spectral point of view can help understanding the properties of series and will allow a comparison of their performances. If y_t is stationary process with mean μ and γ_j denote the j-th autocovariance of y_t such that:

$$\gamma_j = E(y_t - \mu)(y_{t-j} - \mu) \tag{1}$$

If the autocovariances are absolutely summable then we have scalar function:

$$\Gamma_y(z) = \sum_{j=-\infty}^{\infty} \gamma_j z^j \tag{2}$$

were z is a complex scalar, and $\Gamma_y(z)$ is autocovariance generating function of y_t. If we equation (2) divide by 2π and evaluated at $z = e - i\omega = \cos\omega - i \cdot \sin\omega$ we have:

$$s_y(\omega) = \frac{1}{2\pi}\Gamma_y\left(e^{-i\omega}\right) = \frac{1}{2\pi}\sum_{j=-\infty}^{\infty} \gamma_j e^{-i\omega j} \tag{3}$$

Expression (3) is called population spectrum of y_t (Ladiray, Mazzi, & Sartori, 2003). We can notice that population spectrum is a function of real scalar ω. The spectrum function is used to map each frequency to the intensity of the frequency. The higher explanatory power among all frequencies can be found in frequencies that dominate the spectrum. Hence, the important cyclical movements of the series can be adequately captured by the superposition of dominant frequencies.

In statistics and econometrics, an augmented Dickey–Fuller test (ADF) is a test for a unit root in a time series sample. It is an augmented version of the Dickey–Fuller test for a larger and more complicated set of time series models. The augmented Dickey–Fuller (ADF) statistic, used in the test, is a negative number. The more negative it is, the stronger the rejection of the hypothesis that there is a unit root at some level of confidence (Greene, 2003)

Kwiatkowski–Phillips–Schmidt–Shin (KPSS) test has been developed to complement unit root tests as the last have low power with respect to near unit-root and long-run trend processes. These tests are used for testing a null hypothesis that an observable time series is stationary around a deterministic trend. Such models were proposed in 1982 by Alok Bhargava in his Ph.D. thesis where several John von Neumann or Durbin–Watson type finite sample tests for unit roots were developed (Bhargava, 1986)

The Hodrick and Prescott filter is the most known and commonly used univariate method for the estimation of potential output. It is largely used in scientific papers as well as by international organisations like the IMF and the OECD. The application of the Hodrick and Prescott filter extracts from y_t the growth component g_t. The estimation of g_t is obtained through the minimisation of the sum of squares of the transitory component subject to a penalty for the variation in the second differences in the growth component. That is g_t is the solution to the following minimisation problem:

$$min\sum_{t=1}^{T}\left[\left(y_t-g_t\right)^2+\lambda\left[\left(g_{t+1}-g_t\right)-\left(g_t-g_{t-1}\right)\right]^2\right] \tag{4}$$

where λ is a penalty parameter which is closely related to the "smoothness" of the estimated trend. For this filter the role of the smoothing parameter λ is crucial. By increasing the value of λ we obtain smoother estimates of the growth component g_t. In their original paper Hodrick and Prescott (1997) propose some recommended values for λ. They suggest λ=100 for annual data; λ=1600 for quarterly data, and λ=14400 for monthly data.

To perform cointegration analysis, the most popular method is Johansen cointegration test, which is based on the concept of covariance non-stationarity. Covariance stationarity of time series means that the time series have a constant mean, a constant variance and that the covariance between two time periods depends only on the interval, and not the timing. For determining that fore mentioned ADF and KPSS were used.

VAR model is model of vectors of variables as autoregressive processes, where each variable depends linearly on its own lagged values and those of the other variables in the vector. A vector autoregressive model of order k (VAR(k)) has form:

$$y_t=\beta_1 y_{t-1}+\beta_2 y_{t-2}+...+\beta_k y_{t-k}+u_t \tag{5}$$

where $y_t = (y_{1,t}, y_{2,t},... y_{g,t})'$ is multivariate stochastic time series in vector notation, β_i , i=1, 2, ..., p are deterministic g×g matrices, and $u_t = (u_{1,t}, u_{2,t},... u_{g,t})'$ is a multivariate white noise.

Johansen test is performed on VAR that is turned into a vector error correction model (VECM) in the form:

$$\Delta y_t = \Pi\, y_{t-k} + \Gamma_1 \Delta y_{t-1} + \Gamma_2 \Delta y_{t-2} + ... + \Gamma_{k-1} \Delta y_{t-(k-1)} + u_t \tag{6}$$

where:

$$\Pi = \left(\sum_{i=1}^{k} \beta_i \right) - I_g\,, \tag{7}$$

$$\Gamma_i = \left(\sum_{j=1}^{i} \beta_j \right) - I_g \tag{8}$$

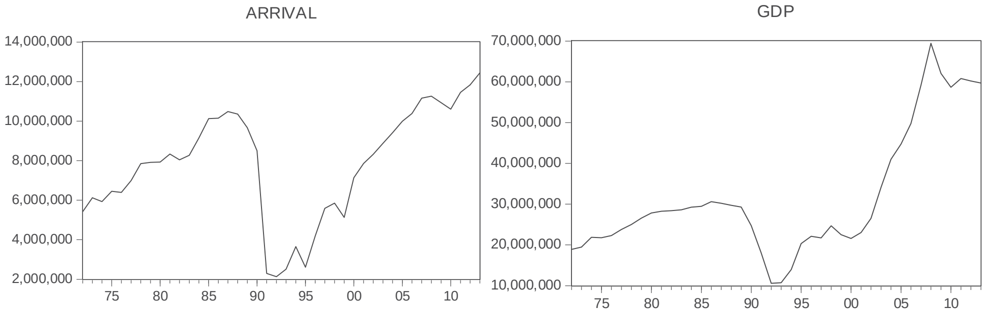
I_g is unit matrix of order g. Π can be defined as a long-run coefficient matrix since in equilibrium, all the Δy_{t-i} will be zero. Γ_i has information about the short-run adjustment to changes in y_t. Also in a long-run u_t matrix should be equal to zero. The Johansen test is based on an examination of a rank of the Π matrix via its eigenvalues. If time series variables are not cointegrated, the rank of Π matrix will not be significantly different from zero, i.e. the number of eigenvalues that are significantly different from zero will be less than the number of variables in the VECM model.

Empirical Results

The analysis of the relationship between Gross Domestic Product and tourist arrivals in Croatia has been based on cyclical component of series GDP and ARRIVAL. In this study yearly data from 1972 to 2013 of the Croatian GDP (based on USA $ in 1990) were obtained from Tica (2004), and data for tourist arrivals were obtained from Croatian Bureau of Statistics (Tourism in Seaside Resorts and Municipalities, 2009). The tourist arrivals variable is still the most popular measure of tourism demand over the past few years. Specifically, this variable was measured by total tourist arrivals from an origin to a destination, which could be decomposed further into holiday tourist arrivals, business tourist arrivals, tourists arrivals for visiting friends and relatives (VFR) purposes (e.g., (Kulendran & Wong, 2005; Turner & Witt, 2001). Although it would be worthy to examine the link between the cyclical fluctuations of tourist arrivals and economic growth using higher frequency data, we have decided to perform the analysis on yearly data because the quarterly series of Croatian BDP for this time span was not available. The actual data of series are presented at figure 1, and descriptive statistic in table 1.

The graphs in figure 1 show break in series ARRIVAL in 1991 and for GDP in 1992 due to the war circumstances in Croatia in that period. The data in table 1 indicate the highest level of Croatian GDP in 2008 (69.446 mil US$), and the largest number of arrivals in 2013 (12.44 mil).

Figure 1: Movement of GDP and ARRIVALS



Source: Authors' calculations

Table 1: Descriptive statistics

	ARRIVAL	GDP
Mean	7850548.	31709690
Median	8155000.	27204937
Maximum	12441000	69445950
Minimum	2135000.	10596100
Std. Dev.	2788610.	15430852
Skewness	-0.477327	1.072164
Kurtosis	2.368276	2.991677
Jarque-Bera	2.293268	8.046865
Probability	0.317704	0.017891
Sum	3.30E+08	1.33E+09
Sum Sq. Dev.	3.19E+14	9.76E+15
Observations	42	42

Source: Authors' calculations

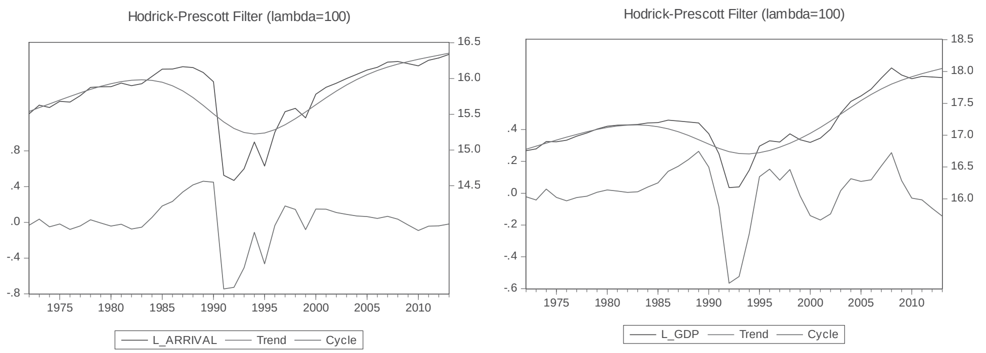
Usual procedure for econometric analysis is to perform calculation on log of series rather on levels. Method for extracting the cyclical component of y_t is to decompose it as follows:

$$yt=Trt+Set+Ct+ut \tag{9}$$

where Tr_t, Se_t, C_t, u_t are the long-run trend, the seasonal component, the cyclical and the irregular (noise) components of the series, respectively. Seasonality does not exist because we use annual data. We also assume that noise takes an average value of zero, so, on average, Cyclical component plus noise is equal to Actual data minus Estimated trend.

The long-run trends have been estimated with the Hodrick-Prescott (HP) filter with smoothing parameter $\lambda = 100$. The difference between actual data and estimated trend expresses the percentage change of each observation at time t from the estimated trend at the same time. The cyclical components of the variables are denoted as L_GDP_C for GDP and L_ARRIVAL_C for tourist arrivals. The long-run developments of the series are presented in

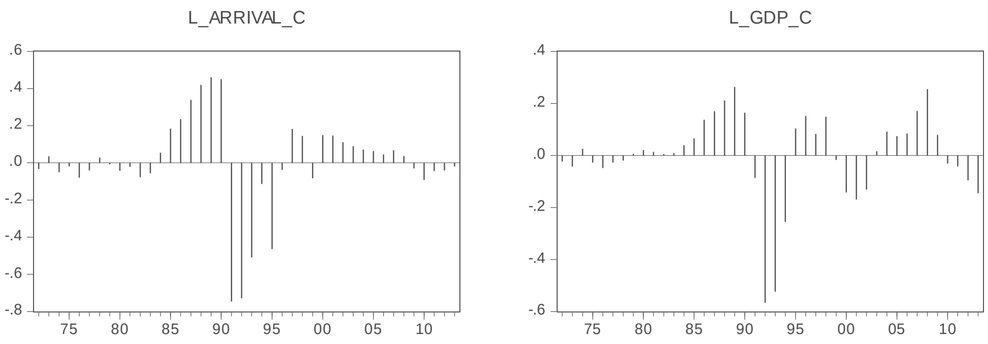
Figure 2: Long-run trends of L_ARRIVAL and L_GDP



Source: Authors' calculations

Hodrick Prescott long run trends of L_ARRIVAL and L_GDP presented in figure 2 have similar movement patterns and they are in accordance with movement of original series (see Figure 1). From figure 3 we can observe that in analysed period a cycle started for both series from 1984. The first cycle for L_ARRIVAL_C ends in around 1994-95 whereas for L_GDP_C ends in around 1995-96.

Figure 3: Cyclical components of L_ARRIVAL and L_GDP



Source: Authors' calculations

The amplitude of the observed variables is significantly different. Variable L_ARRIVAL_C has higher amplitude than L_GDP_C, which means that tourist arrivals exhibit higher volatility than L_GDP_C. Standard deviation is used as a proxy of amplitude of the oscillation. The standard deviation for L_GDP_C is 17%, whereas for L_ARRIVAL_C it is 25%. Jarque-Bera normality test proves that all series are normally distributed (see table 2).

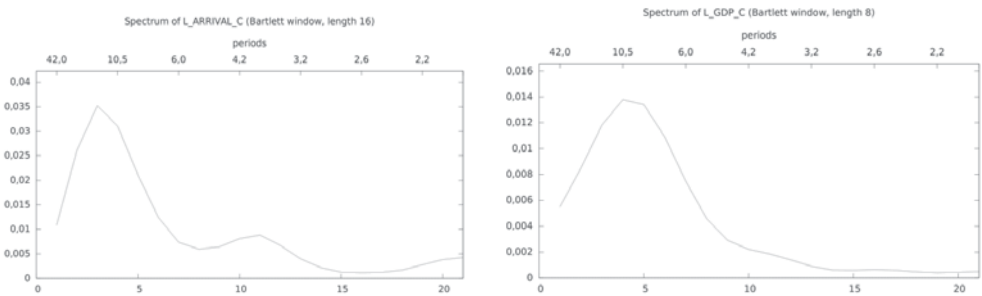
Table 2: Descriptive statistics of L_GDP_C and L_ARRIVAL_C

	L_GDP_C	L_ARRIVAL_C
Mean	-8.06E-14	-1.10E-13
Median	0.011028	-0.012285
Maximum	0.263027	0.460651
Minimum	-0.565282	-0.744980
Std. Dev.	0.167395	0.249199
Skewness	-1.488999	-1.106628
Kurtosis	6.310827	5.427949
Jarque-Bera	34.70257	18.88852
Probability	0.000000	0.000079
Sum	-3.39E-12	-4.61E-12
Sum Sq. Dev.	1.148869	2.546100
Observations	42	42

Source: Authors' calculations

Further, the spectral analysis was applied in order to determine the dominant length of the cycles.

Figure 4: Spectral density estimates



Source: Authors' calculations

Table 3: Spectral densities of L_ARRIVAL_C and L_GDP_C

Periodogram for L_ARRIVAL_C Number of observations = 42 Using Bartlett lag window, length 16				Periodogram for L_GDP_C Number of observations = 42 Using Bartlett lag window, length 8			
Omega	Scaled frequency	Periods	spectral density	Omega	Scaled frequency	Periods	spectral density
0.14960	1	42.00	0.010898	0.14960	1	42.00	0.0055049
0.29920	2	21.00	0.026174	0.29920	2	21.00	0.0085090
0.44880	3	14.00	0.035242*	0.44880	3	14.00	0.0110832
0.59840	4	10.50	0.031044	0.59840	4	10.50	0.0113798*
0.74800	5	8.40	0.021103	0.74800	5	8.40	0.0113411

Note: * indicates the dominant cycle

Peridiograms' maximum values (the peaks of graphs in figure 4) correspond to the estimated dominant length of the cycle (table 3). The dominant length of the L_ARRIVAL_C is 14 years, and for L_GDP_C is 10.50 years. This is relatively in accordance with Šergo and Poropat (2010), who have estimated a dominant cycle for GDP in Croatia of 11 years.

The next step of empirical research is to check for stationarity of series in order set VAR model. Table 4 contains the result of ADF and KPSS stationarity tests. Null hypothesis for ADF tests is that series is nonstationary (has a unit root), and null for KPSS is that series is stationary. As shown in table 4, the ADF and KPSS tests suggest that both series (L_ARRIVAL_C and L_GDP_C) are stationary in levels I(0). For getting optimal lag length and bandwidth Swarz-Information Criterion and Newey-West bandwidth were used, respectively. Spectral estimation method is Bartlett Kernel. These test results are a very important precondition for further modelling of multivariate time series models.

Table 4: Unit root test for L_ARRIVAL_C and L_GDP_C

Variables	ADF	Critical Values (1%)	KPSS	Critical Values (1%)
L_ARRIVAL_C	-4.124103 (4)	-3.621023	0.047904 (3)*	0.739000
L_GDP_C	-5.189954 (1)	-3.605593	0.054189 (1)*	0.739000

Notes: 1) Lag lengths and bandwidths are shown in parenthesis and asterisk denotes 1% significance level. 2) For ADF tests: H0 – series is nonstationary – has a unit root, 3) for KPSS test: H0 – series is stationary, 4) * - we cannot reject H0 at level 1% Critical value

In order to determine lag length VAR Lag Order Selection Criteria is used. All tests (LR, FPE, AIC, SC and HQ tests) indicate that two lags in VAR model should be used (table 5).

Table 5: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	21.04108	NA	0.001258	-1.002162	-0.915973	-0.971497
1	39.24122	33.52658	0.000596	-1.749538	-1.490972	-1.657542
2	61.27874	38.27569*	0.000231*	-2.698881*	-2.267937*	-2.545555*
3	61.74063	0.753615	0.000280	-2.512665	-1.909344	-2.298008
4	63.41363	2.553514	0.000320	-2.390191	-1.614492	-2.114203

Note: * indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

All tests suggest that we could proceed to the estimation of the VAR(2) model presented in Table 6. The main findings imply that L_GDP_C is significantly influenced by its own lagged values as well as by L_ARRIVAL_C lagged values, and that L_ARRIVAL_C is positively influenced by the first lag of L_ARRIVAL_C. Lagged values of L_GDP_C do not influence L_ARRIVAL_C, but lagged values of L_ARRIVAL_C do influence L_GDP_C, (second lag negatively) which is in line with TLEG hypothesis. Similar results have been reported in empirical studies of Brida et al., 2008a; Cortés-Jiménez et al., 2009; Croes & Vanegas, 2008a, 2008b; Eeckels et al., 2012; Fayissa, Nsiah, & Tadasse, 2008; Ishikawa & Fukushige, 2007; Katircioglu, 2009; Louca, 2006.

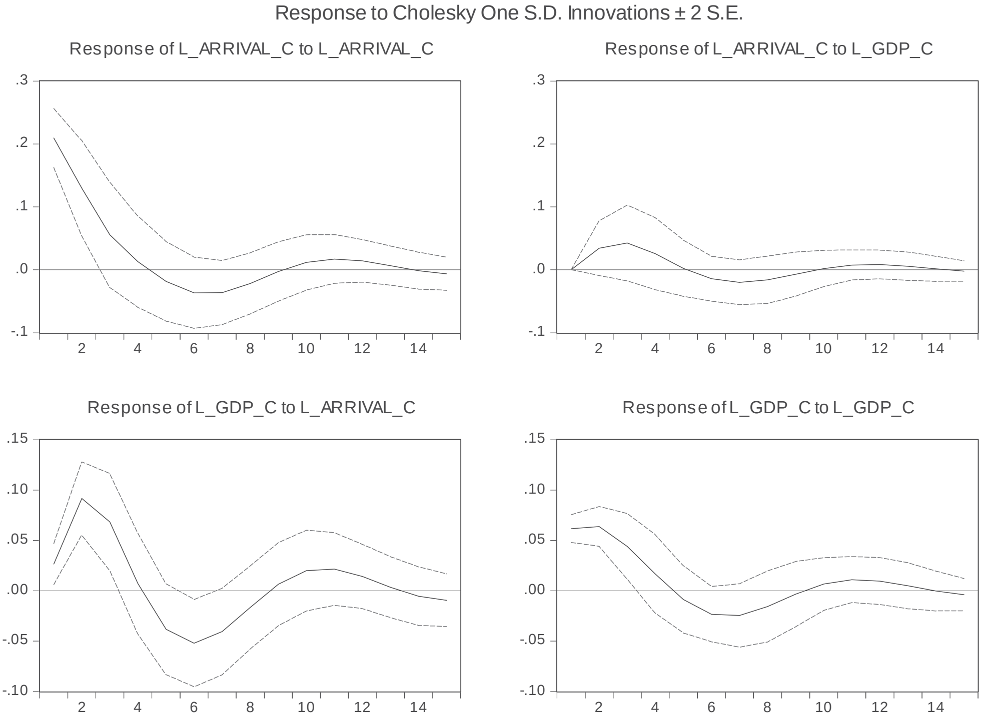
Table 6: VAR (2) results

Variables	L_ARRIVAL_C(-1)	L_ARRIVAL_C(-2)	L_GDP_C(-1)	L_GDP_C(-2)	C
L_ARRIVAL_C	0.548431*	-0.293263	0.557456	-0.192458	-0.001519
Std. Error	(0.18042)	(0.20098)	(0.34632)	(0.29791)	(0.03315)
t-Statistic	[3.03970]	[-1.45919]	[1.60967]	[-0.64603]	[-0.04582]
Prob.	0.0045	0.1534	0.1165	0.5225	0.9637
L_GDP_C	0.306924*	-0.249988*	1.033550*	-0.523628*	0.000417
Std. Error	(0.05785)	(0.06444)	(0.11105)	(0.09552)	(0.01063)
t-Statistic	[5.30528]	[-3.87920]	[9.30735]	[-5.48164]	[0.03919]
Prob.	0.0000	0.0004	0.0000	0.0000	0.9690

Note: * indicates significant at 1%

Further, VAR model has been used to explore the dynamic adjustment of analysed variables to exogenous stochastic structural shocks. Cholesky decomposition has been used for the observation of impulse response among analysed variables and results are shown in figure 5. The response of cyclical component of tourist arrivals to their own cycle shift (L_ARRIVAL_C to L_ARRIVAL_C) is higher than is the response of GDP to its own shock. From figure 5 it could be concluded that response of L_GDP_C on L_ARRIVAL_C is much higher than conversely, which is another confirmation of the TLEG hypothesis.

Figure 5: Impulse response function of L_ARRIVAL_C and L_GDP_C



Conclusions

Economic cycle fluctuations and tourist demand are in interrelationship. Economic recession can influence change in consumer behaviour: especially because tourism has been recognized as luxury good and high substitution between tourist destinations. Tourist can withdraw from tourist consumption or can choose cheaper destination. On the other side, applying the Tourism-led growth hypothesis (TLGH), tourism is considered to be a major factor of overall long run economic growth.

This paper examines cyclical components of tourist arrivals and GDP and their interaction in Croatia during the period 1972-2013. It confirms that tourism demand, represented by tourist arrivals, responds to the business cycle with some delay. Hodrick Prescott long run trends indicate that in analysed period a cycle started for both series from 1984 with duration of about six years. The first cycle for tourist arrivals ends in 1994-95 whereas for GDP ends in 1995-96. Variable of cyclical components of tourist arrivals has a higher amplitude than cyclical components of GDP, which means that tourist arrivals exhibit higher volatility than GDP. Spectral analysis indicates that the dominant length of the cycle of tourist arrivals C is 14 years, and for GDP is 10.50 years. This is relatively in accordance with Šergo and Poropat (2010), who have estimated a dominant cycle for GDP in Croatia of 11 years. The main findings of VAR model confirm TLEG hypothesis because results show that lagged values of cyclical components of tourist arrivals do influence cyclical movements of GDP. Cholesky decomposition confirms that response of cyclical movements of GDP on cyclical components of tourist arrivals is much higher than conversely, which is another confirmation of the TLEG hypothesis.

The selection of data used in this paper was based on their availability. Recommendation for the further research of the relationship among the cyclical fluctuations of tourism demand and economic growth would be using higher frequency data (such as quarterly and/or monthly data) or some other variables such as tourism income, unemployment, tax burden etc. The findings of the study could be useful to the economic and tourism policy makers.

REFERENCES

Balaguer, J., & Cantavella-Jorda, M. (2002). 'Tourism as a long-run economic growth factor: the Spanish case'. *Applied Economics*, *34*(7): 877–884.

Belisle, F. J., & Hoy, D. R. (1980). 'The perceived impact of tourism by residents a case study in Santa Marta, Colombia'. *Annals of Tourism Research*, *7*(1): 83–101.

Bhargava, A. (1986). 'On the theory of testing for unit roots in observed time series'. *The Review of Economic Studies*, *53*(3): 369–384.

Brau, R., Lanza, A., & Pigliaru, F. (2003). 'How fast are tourism countries growing? The cross country evidence'. In: Working Paper CRENoS 200614, Centre for North South Economic Research, University of Cagliari and Sassari, (Sardinia).

Brida, J. G., Barquet, A., & Risso, W. A. (2009). 'Causality between economic growth and tourism expansion: Empirical evidence from Trentino-Alto adige'. *TOURISMOS: An International Multidisciplinary Journal of Tourism*, *5*(2): 87–98.

Brida, J. G., Carrera, E. S., & Risso, W. A. (2008). 'Tourism's impact on long-run Mexican economic growth'. *Economics Bulletin*, *3*(21): 1–8.

Brida, J. G., & Risso, W. A. (2009). 'Tourism as a factor of long-run economic growth: An empirical analysis for Chile'. *European Journal of Tourism Research*, *2*(2).

Bryden, J. M. (1973). *Tourism and development: a case study of the Commonwealth Caribbean*. Cambridge Univ. Press. (London).

Cortés-Jiménez, I., Pulina, M., Riera i Prunera, C., & Artís Ortuño, M. (2009). 'Tourism and Exports as a means of Growth'. *Documents de Treball (IREA)*, (10), 1.

Croes, R., & Vanegas, M. (2008). 'Cointegration and causality between tourism and poverty reduction'. *Journal of Travel Research*, *47*(1): 94–103.

Dickey, D. A., & Fuller, W. A. (1979). 'Distribution of the estimators for autoregressive time series with a unit root'. *Journal of the American Statistical Association*, *74*(366a): 427–431.

Dritsakis, N. (2004a). 'Cointegration analysis of German and British tourism demand for Greece'. *Tourism Management*, *25*(1): 111–119.

Dritsakis, N. (2004b). 'Tourism as a long-run economic growth factor: an empirical investigation for Greece using causality analysis'. *Tourism Economics*, *10*(3): 305–316.

Durbarry, R. (2004). 'Tourism and economic growth: the case of Mauritius'. *Tourism Economics*, *10*(4): 389–401.

Eeckels, B., Filis, G., & Leon, C. (2012). 'Tourism income and economic growth in Greece: empirical evidence from their cyclical components'. *Tourism Economics*, *18*(4): 817–834.

Eugenio-Martin, J. L., Morales, N. M., & Scarpa, R. (2004). *Tourism and economic growth in Latin American countries: A panel data approach*. In: FEEM Working Paper No. 26

Fayissa, B., Nsiah, C., & Tadasse, B. (2008). 'Impact of tourism on economic growth and development in Africa'. *Tourism Economics*, *14*(4): 807–818.

Filis, G., & Leon, C. (2006). 'The transmission mechanism of the cyclical components of the Greek output, investments and stock exchange'. In *1st International Conference on Accounting and Finance, Thessaloniki* (pp. 7–8).

Greene, W. H. (2003). *Econometric analysis*. Pearson Education (India).

Gunduz, L., & Hatemi-J, A. (2005). 'Is the tourism-led growth hypothesis valid for Turkey?' *Applied Economics Letters*, *12*(8): 499–504.

Hazari, B. R., & Sgro, P. M. (1995). 'Tourism and growth in a dynamic model of trade'. *Journal of International Trade and Economic Development*, *4*(2): 143–252.

Hodrick, R. J., & Prescott, E. C. (1997). 'Postwar US business cycles: an empirical investigation'. *Journal of Money, Credit, and Banking*: 1–16.

Ishikawa, N., & Fukushige, M. (2007). 'Impacts of tourism and fiscal expenditure to remote islands: the case of the Amami islands in Japan'. *Applied Economics Letters*, *14*(9): 661–666.

Johansen, S. (1991). 'Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models'. *Econometrica: Journal of the Econometric Society*: 1551–1580.

Katircioglu, S. T. (2009). 'Revisiting the tourism-led-growth hypothesis for Turkey using the bounds test and Johansen approach for cointegration'. *Tourism Management*, *30*(1): 17–20.

Kim, H. J., Chen, M.-H., & Jang, S. (2006). 'Tourism expansion and economic development: The case of Taiwan'. *Tourism Management*, *27*(5): 925–933.

Kulendran, N., & Wong, K. K. (2005). 'Modeling seasonality in tourism forecasting'. *Journal of Travel Research*, *44*(2): 163–170.

Ladiray, D., Mazzi, G. L., & Sartori, F. (2003). 'Statistical methods for potential output estimation and cycle extraction'. *Office for Official Publications of the European Communities,* (Luxembourg).

Lanza, A., Temple, P., & Urga, G. (2003). 'The implications of tourism specialisation in the long run: an econometric analysis for 13 OECD economies'. *Tourism Management*, *24*(3): 315–321.

Lee, C.-C., & Chang, C.-P. (2008). 'Tourism development and economic growth: a closer look at panels'. *Tourism Management*, *29*(1): 180–192.

Leon, C., & Eeckels, B. (2011). 'A dynamic correlation approach of the Swiss tourism income'. In: Matias, A., Nijkamp, P. & Sarmento, M. (eds.) *Tourism Economics: Impact Analysis,* Heidelberg: Springer Verlag: 127-147

Louca, C. (2006). 'Income and expenditure in the tourism industry: time series evidence from Cyprus'. *Tourism Economics*, *12*(4): 603–617.

Marin, D. (1992). Is the export-led growth hypothesis valid for industrialized countries? *The Review of Economics and Statistics*: 678–688.

McKinnon, R. I. (1964). 'Foreign exchange constraints in economic development and efficient aid allocation'. *The Economic Journal*: 388–409.

Narayan, P. K. (2004). 'Economic impact of tourism on Fiji's economy: empirical evidence from the computable general equilibrium model'. *Tourism Economics*, *10*(4): 419–433.

Nowak, J.-J., Sahli, M., & Cortes-Jimenez, I. (2007). 'Tourism, capital good imports and economic growth: theory and evidence for Spain'. *Tourism Economics*, *13*(4): 515–536.

Nowjee, A., Poloodoo, V., Lamport, M., Padachi, K., & Ramdhony, D. (2012). 'The relationship between exchange rate, tourism and economic growth: evidence from Mauritius'. In *Proceedings of the 2nd International Conference on International Trade and Investment*.

Oh, C.-O. (2005). 'The contribution of tourism development to economic growth in the Korean economy'. *Tourism Management*, *26*(1): 39–44.

Shin, Y., & Schmidt, P. (1992). 'The KPSS stationarity test as a unit root test'. *Economics Letters*, *38*(4): 387–392.

Sinclair, M. T., & Bote Gómez, V. (1996). 'Tourism, the Spanish economy and the balance of payments'. *Tourism in Spain: Critical Perspectives, CAB International, Wallingford*: 89–117.

Song, H., Witt, S. F., & Li, G. (2008). *The advanced econometrics of tourism demand*. Routledge. (New York).

Stoica, P., & Moses, R. L. (1997). *Introduction to spectral analysis* (Vol. 1). Prentice hall Upper Saddle River, (New York).

Šergo, Z., & Poropat, A. (2010). 'The output GAP and cyclical movements of tourism, GDP, and their transmission mechanism: case of Croatia'. In: *Economic integration, competition and co-operation = Intégrations* économiques*, concurrence et coopération*: research monograph / Kandžija, V. & Kumar, A., (ed), Rijeka; Ljubljana; Antwerpen; Paris: Faculty of Economics ; Faculty of Economics; University of Abtwerpen; Institut CEDIMES: 18-34.

Tica, J. (2004). 'The Estimation of 1910-1989 per Capita GDP in Croatia'. *Zagreb International Review of Economics and Business*, *7*(1): 103–133.

Tourism in Seaside Resorts and Municipalities (2009). Statistical reports, Croatian Bureau of Statistics, (Zagreb).

Turner, L. W., & Witt, S. F. (2001). Factors influencing demand for international tourism: Tourism demand analysis using structural equation modelling revisited. *Tourism Economics*, *7*(1): 21–38.

World Travel & Tourism Council (WTTC): "Travel & Tourism Economic Impact 2012- Croatia", accessed 20 March 2013