

Identifying Tourism and Economic Growth Nexus: Hurlin-Venet Approach

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Abstract: This paper seeks to identify causality between tourism and economic growth within Hurlin-Venet approach using the panel data of 135 countries for the period 1995–2008. Countries are classified by income levels. The unidirectional causality from economic growth to tourism revenue is found only in case of high income countries group.

Key words: Tourism Income, Economic Growth, Panel Unit Root, Panel Causality

JEL Classification Number: C23, L83, O40, O57

1. Introduction

Following the export oriented economic growth concept tourism sector has been receiving large interest. Tourist oriented use of favorable natural environment, and geographical locations or ethno-cultural features of countries represents source for economic growth. Indeed, millions of tourists travel to the different areas which are reflected in rising income level of receiving countries.

According to the World Tourism Organization (2012) after the global economic crisis, international tourism recovered faster than expected and international tourism continued to sustain in 2011. In opposition to previous years, this expansion was faster in developed countries (+4.8%) than in developing countries (+4.3%) in 2011. According to the World Tourism Organization (UNWTO), international tourist arrivals reached 50 million in Africa, 156 million in Americas, 217 million in Asia & the Pacific, 504 million in Europe, 55 million in Middle East. International tourist receipts also increased up to US\$ 33 / € 23 billion in Africa, US\$ 199 / € 143 billion in Americas, US\$ 289 / € 208 billion in Asia &

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the Pacific, US\$ 463 / € 333 billion in Europe, US\$ 46 / € 33 billion in Middle East (UNWTO, 2012, p.7).

Due to potentials of tourism in sustaining economic growth performance it has been suggested for developing countries to provide with necessary conditions to increase tourist arrivals. It is also true that under the conditions of better services, infrastructure and security higher income countries are able to attract more tourists. Studies on the relationship between tourism and economic growth conclude about both unidirectional and bidirectional causalities. This paper aims to investigate the causality between tourism revenue and economic growth using the panel data for 135 countries. Being different from previous studies Hurlin-Venet approach to causality analysis is adopted.

This paper is structured as follows: next section summarizes main panel data studies on the tourism and economic growth relationship, Section 3 presents methodology, data description is in Section 4, Section 5 summarizes empirical results and conclusions are given in Section 6.

2. Literature Review

Panel data studies on the relationship between tourism and economic growth have resulted in mixed results. Most of the studies conclude about importance of tourism for economic growth. However its magnitude and direction of causality differs by country groups included in the analysis.

Some studies with panel data examine importance of tourism within the growth equations applying dynamic panel data techniques. Thus, Eugenio-Martin, Morales and Scarpa (2004) show that tourism has significant positive impact on economic growth performance of Latin American countries. Further division of the sample into high, medium and low income groups demonstrates high significance of tourism for growth of low and medium income countries. Following this study Sica (2005) confirms importance of tourist arrivals for economic growth in South-East Asia and Pacific countries. Analogously studies by Fayissa, Nsiah and Tadesse (2007, 2009) on African and Latin American countries support the view about positive impact of tourism on economic growth. Sequeira and Nunes (2008) use broad sample - 91 countries, and finds importance of tourism for economic growth, while its significance in case of small countries is not confirmed. Chang, Khamkaev and McAleer (2010) use more larger panel data -159 countries and evaluate within panel threshold model. Results show positive relationship between economic growth and tourism. However, instrumental variable estimation of the model indicates that tourism has higher impact on economic growth in countries with lower level of trade openness and investment. Studies by Cortes-Jimenez (2007) on Spain and Italy and by

Soukiazis and Proenca (2008) on Portuguese regions confirm the significance of tourism for regional economic growth.

Another part of studies aims to identify the cointegration and causality relations between tourism and economic growth. De Mello-Sampayo and De Sousa-Vale (2010) find panel co-integration relation between tourism and economic growth in European countries and indicate that tourism has higher impact on GDP in case of South and North European countries. Lee and Chang (2008) applying heterogeneous panel co-integration technique for OECD and non OECD countries indicate that in both samples there is panel co-integration between tourism development and GDP. Although, in the long run unidirectional causality relationships from tourism development to economic growth in case of OECD countries is found, while in the sample of non OECD countries bidirectional relationship is indicated. Kareem (2008) states about the same bilateral causality between tourism and real GDP exist in the sample of 35 African countries. Narayan et al. (2010) using the data of Pacific Island countries finds cointegration between real GDP and tourism export.

Although most studies support the view that tourism is important for economic growth, results on the causality relationship are mixed. Adamou and Clerides (2009) in their panel data study of 162 countries argue about nonlinearity of this relationship. Initially at lower levels of specialization tourism is associated with higher rates of economic growth, but eventually its contribution decreases. Moreover, research papers state that importance of tourism for economic growth depends on other social and economic factors, such as infrastructure, trade openness, level of per capita income.

3. Methodology

Hurlin and Venet (2001) approach is an extension of the Granger (1969) causality definition to panel data models with a fixed coefficient. In this approach, four different causality relationship hypotheses are investigated for causality. First hypothesis is defined as Homogenous Non-Causality hypothesis (HNC) shows that no individual causality relationships exist. The test statistic is calculated as:

$$F_{HNC} = \frac{(RSS_2 - RSS_1)/(Np)}{RSS_1/[NT - N(1+p) - p]}$$

where RSS_2 and RSS_1 are the restricted sum of squared residuals and the unrestricted sum of squared residuals of the model, respectively. Np and $NT - N(1+p) - p$ are degrees of freedom of F_{HNC} statistic. If HNC hypothesis is not rejected, it means that variable X is not causing Y in all cross-section units and the testing procedure comes to an end. If HNC

hypothesis is rejected, Homogeneous Causality (HC) hypothesis should be researched. While RSS_3 is the restricted sum of squared residuals, F statistic is computed as follows:

$$F_{HC} = \frac{(RSS_3 - RSS_1) / p(N-1)}{RSS_1 / [NT - N(1+p) - p]}$$

If HC hypothesis is rejected, there is no homogeneous causality. However, it does not mean that there is no causality, but there is non-homogenous causal relationship. At this stage, Heterogeneous Non-Causality (HENC) hypothesis is used for investigation of non-homogeneous causal relationship between the variables. According to HENC hypothesis, F statistic is computed as follows:

$$F_{HENC} = \frac{(RSS_{2,i} - RSS_1) / p}{RSS_1 / [NT - N(1+2p) - p]}$$

where $RSS_{2,i}$ shows the restricted sum of squared residual. RSS_4 is the restricted sum of squared residuals obtained for the subgroups and the F test statistics are computed as follows:

$$F_{HENC} = \frac{(RSS_4 - RSS_1) / n_c p}{RSS_1 / [NT - N(1+p) - n_c p]}$$

If HENC hypothesis is rejected, it implies that there is the causal relationship between variables in all subgroups. In the last step, HEC hypothesis searches the heterogeneous causality between the variables.

4. Data

Empirical papers on the relationship between tourism and economic growth generally use the regional classification (for instance: Lee and Chang, 2008; Kareem, 2008; Chang, Khamkaew and McAleer, 2009; Adamou and Clerides, 2009; Mello-Sampayo and de Sousa-Vale, 2010, Çağlayan et.al. 2012) or income levels (for instance: Eugenio-Martin, Morales and Scarpa 2004) for the sample. Taking into account the significance of level of income for the tourism-growth relationship we follow previous studies and use this classification.

In the classification by income level 5 groups are used. They are classified as High income (31 OECD countries_hic), High income (11 non_ OECD countries_nohic), Upper Middle income (40 countries_umic), Lower Middle income (36 countries_lmlic), Low income (17 countries_lic). The list of countries is given in Appendix 1. These classifications are consistent with the database of World Development Indicators and Global Development

Finance. Real tourism revenue and real gross domestic product in constant 2000 U.S dollars for 1995–2008 years are used from the World Bank database. Real tourism revenue (LTR) and real growth domestic product (LGDP) are expressed in natural logarithms.

5. Empirical Results

Im, Pesaran and Shin (1997) panel unit root test (hereafter IPS) is used for identification of the order of integration of variables. Results are presented in Table 1.

Table 1: Results of IPS Panel Unit Roots Test

Groups	LGDP		LTR	
	Level	First Difference	Level	First Difference
Hic_OECD	2.0798	-3.3360*	2.7823	-5.0669*
	-0.9812	0.0000	-0.9973	0.000
	0.0017	-2.8365*	0.1667	-4.8637*
Non_OECD_Hic	-0.5007	-0.0023	-0.5662	0.000
	2.5699	-6.6350*	-0.4826	-11.2057*
Umic	-0.9949	0.000	-0.3147	0.000
	3.4492	-6.6284*	0.9027	-12.5036*
Lmic	-0.9997	0.000	-0.8167	0.000
	-0.6502	-6.9507*	<u>-3.1928*</u>	
Lic	-0.2578	0.000	0.000	

Note: *denotes the rejection of the null hypothesis of unit root at the 5% level.

LGDP and LTR are integrated into one (1) in hic_oecd, hic_non_oecd, umic and lmic. In all groups, LGDP is integrated into one (1). LTR is integrated into one (1) in all groups, except low income groups (I(0)).

According to the integrated level of variables, HNC and HC tests of Hurlin-Venet are applied for panel causality analysis. The appropriate lag lengths are selected with Schwartz criteria for both variables. The lag lengths were selected as 2 in hic_OECD, umic, lmic and as 1 in non_OECD_hic, lic.

The results of Hurlin-Venet test on the income level classification are presented in Table 2. As it is shown HNC hypothesis is rejected only in the high income OECD countries. Examination of the Homogenous Causality (HC) hypothesis for the high income OECD countries shows that the panel causal relationship between variables is unidirectional which is also unidirectional from economic growth to tourism (LGDP→LTR).

Table 2: Results of Hurlin - Venet Test by Income Level

Countries	Variables	HNC	HC
	LGDP → LTR	2.348*	0.031
Hic_OECD ^a	LTR→LGDP	-0.798	
	LGDP→ LTR	1.366	
Hic-Non_OECD ^b	LTR→ LGDP	-2.385	
	LGDP→ LTR	0.447	
Umic ^c	LTR→LGDP	0.089	
	LGDP→ LTR	1.281	
Lmic ^a	LTR→ LGDP	0.047	
	LGDP→ LTR	-4.255	
Lic ^d	LTR→ LGDP	1.788	

Note: * denotes the rejection of the null hypothesis at the 5% level according to tests.

^aHNC test critical values are 2.37, 1.92, 1.72 for hic_OECD, lmic(1%, 5 %, 10%)

^bHNC test critical values are 3.27, 2.38, 2.01 for non_OECD_hic(1%, 5%, 10%)

^cHNC test critical values are 1.99, 1.70, 1.57 for umic(1%, 5%, 10%)

^d HNC test critical values are 2.78, 2.15, 1.87 for lic(1%, 5%,10%)

^eThe critical values are 2.15, 1.78, 1.60 for HC test (1%, 5%, 10%)

6. Conclusions

This paper aims to investigate the causal relationship between tourism revenue and economic growth within Hurlin -Venet methodology. Countries are classified by income levels. The unidirectional causality from economic growth to tourism is found in case of high income OECD countries only. This result is contrast to findings of Eugenio-Martin, Morales and Scarpa (2004) and Adamou and Clerides (2009) that tourism has significant impact in low and middle income countries, while has less importance in high income countries. On the other hand, to some extent this result confirms the argument of importance for tourism growth necessary infrastructure conditions that may require higher economic growth performance.

Therefore, our findings show that there is unidirectional causal between tourism and economic growth. Moreover, it underlines the significance of income level of countries in identification this relationship. Within these results it may be stated that more concrete investigation of tourism and economic growth relationship necessitates the taking into

consideration other possible determinants, such as regional factors or level of economic development.

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Appendix: List of Countries by Groups

HIC OECD	HIC non OECD	UMIC	LMIC	LIC
Austria	Bahamas, The	Albania	Angola	Bangladesh
Australia	Bahrain	Algeria	Armenia	Benin
Belgium	Barbados	Argentina	Belize	Burundi
Canada	Croatia	Azerbaijan	Bhutan	Cambodia
Czech Republic	Cyprus	Belarus	Bolivia	Central African Republic
Denmark	Hong Kong SAR, China	Botswana	Cameroon	Ethiopia
Estonia	Kuwait	Brazil	Cote d'Ivoire	Haiti
Finland	Macao SAR, China	Bulgaria	Egypt, Arab Rep.	Kenya
France	Malta	China	Fiji	Kyrgyz Republic
Germany	Singapore	Colombia	Georgia	Madagascar
Greece	Trinidad and Tobago	Costa Rica	Ghana	Mali
Hungary		Dominica	Guatemala	Nepal
Iceland		Dominican Republic	Guyana	Niger
Ireland		Ecuador	Honduras	Rwanda
Italy		Grenada	India	Tanzania
Japan		Iran, Islamic Rep.	Indonesia	Togo
Israel		Jamaica	Lao PDR	Uganda
Luxembourg		Jordan	Lesotho	
Korea, Rep.		Kazakhstan	Moldova	
New Zealand		Latvia	Mongolia	
Netherlands		Lithuania	Morocco	
Norway		Macedonia, FYR	Nigeria	
Poland		Malaysia	Pakistan	
Portugal		Mauritius	Papua New Guinea	
Slovak Republic		Mexico	Paraguay	
Slovenia		Panama	Philippines	
Spain		Peru	Samoa	
Sweden		Romania	Senegal	
Switzerland		Russian Federation	Solomon Islands	
United States		Seychelles	Sri Lanka	
United Kingdom		South Africa	Sudan	
		St. Kitts and Nevis	Swaziland	
		St. Lucia	Syrian Arab Republic	
		St. Vincent and the Grenadines	Tonga	
		Suriname	Ukraine	
		Thailand	Yemen, Rep.	
		Tunisia		
		Turkey		
		Uruguay		
		Venezuela, RB		