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ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE

BOOTSTRAP PANEL CAUSALITY TESTING OF TOURISM AND GDP NEXUS FOR UPPER-MIDDLE INCOME COUNTRIES

YÜKSEK-ORTA GELİRLİ ÜLKELERDE TURİZM VE GSYİH ARASINDAKİ BOOTSTRAP NEDENSELLİK ANALİZİ

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ABSTRACT

Tourism is one of the sources that increases the income of countries. Several studies show that there are causal associations between GDP and tourism in various countries and country groups. In this respect, the purpose of the paper is to explore the causal relationship between tourism and GDP in 33 upper-middle income countries. Therefore, bootstrap panel causality test of Emirmahmutoğlu and Köse (2011) is applied to annual data from 1995 to 2018. This test is powerful both under cross-section dependency and independency, and also when the number of observations is small. The findings reveal that a unidirectional causality from tourism to GDP for Grenada and South Africa; a unidirectional causality from GDP to tourism in Albania, Bulgaria, Dominic Republic, Ecuador, Jamaica, Peru, Sri Lanka and the whole panel; bidirectional causality between tourism and GDP in Armenia, Mauritius and North Macedonia; and no causality for the remaining 21 countries.

Keywords: Tourism, GDP, Upper-Middle Income Countries, Bootstrap Causality.

JEL Classification Codes: C23, O40, Z32.

ÖZ

Ülkelerin gelirlerini artıran kaynaklardan biri de turizmdir. Birçok çalışma çeşitli ülkelerde ve ülke gruplarında GSYİH ile turizm arasında nedensel ilişkiler olduğunu göstermektedir. Bu çerçevede, mevcut çalışmanın amacı üst-orta gelir grubundaki 33 ülke için turizm ve GSYİH arasındaki nedensellik ilişkisini incelemektir. Bu amaca yönelik olarak 1995-2018 dönemini kapsayan yıllık verilere Emirmahmutoğlu ve Köse (2011) tarafından önerilen bootstrap nedensellik testi uygulanmıştır. Bu test hem yatay kesit bağımlılığı ve bağımsızlığı durumlarında, hem de gözlem sayısı düşükken uygulanabilen güçlü bir testtir. Sonuçlar Grenada ve Güney Afrika için turizmden GSYİH'ye tek yönlü bir nedensellik; Arnavutluk, Bulgaristan, Dominik Cumhuriyeti, Ekvador, Jamaika, Peru ve Sri Lanka için GSYİH'den turizme tek yönlü bir nedensellik; Ermenistan, Mauritius ve Kuzey Makedonya için turizm ve GSYİH arasında çift yönlü nedensellik olduğunu; ancak geriye kalan 21 ülke için nedenselliğin olmadığını göstermiştir.

Anahtar Kelimeler: Turizm, GSYİH, Üst-Orta Gelirli Ülkeler, Bootstrap Nedensellik.

JEL Sınıflandırma Kodları: C23, O40, Z32.

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1. INTRODUCTION

The development of the tourism sector has benefited directly and indirectly from many channels on economic performance. It is stated that the development in the tourism sector contributes to GDP, employment, investment, foreign exchange earnings, as well as causing a significant socio-cultural and environmental development. Therefore, many governments are striving to stimulate economic growth with the tourism sector (Archer, 1995; Balaguer and Cantavella-Jorda, 2002; Dritsakis, 2004; Durbarry, 2002; Nowak, Sahli and Cortés-Jiménez, 2007; Lee and Chang, 2008; Payne and Mervar, 2010).

Among great numbers of studies on tourism economics, investigation of tourism and economic growth relationship is paid special importance. After the initial study of Lanza and Pigliaru (2000), studies examining the association between tourism and growth have increased. One of the popular topics is to examine the causality between tourism and economic growth. This causal association is classified by the way of causality into four hypotheses:

(1) Tourism-led growth hypothesis: Unidirectional (one-way) causality from tourism to economic growth,

(2) Conservation (growth-led tourism) hypothesis: Unidirectional (one-way) causality from economic growth to tourism,

(3) Feedback hypothesis: Bidirectional (two-way) causality between tourism and economic growth, and

(4) Neutrality hypothesis: No causality.

The goal of this work is to explore causal relationship between tourism receipts and GDP for 33 upper-middle income countries using yearly data from 1995 to 2018. Our study differs from previous works in two aspects. First, there is no work, as far as we know, especially focuses on the causal relationship between tourism and GDP for upper-middle income countries. Therefore, there is no clear information on the way of causality. Tourism-led growth hypothesis is supported in many papers in the literature. We have tested whether this applies to the upper-middle income countries as well. Second, most of other studies use conventional causality tests which take no account of cross section dependency. Here, we employ novel causality approach suggested by Emirmahmutoğlu and Köse (2011). Causality tests of Granger (1969) and Sims (1972) require stationary series. However, series can be integrated or cointegrated at different levels. Toda and Yamamoto (1995) present a modified-Wald statistic to overcome such problems. Since the series used in this paper are integrated at different levels and have cross-section dependency, the approach of Emirmahmutoğlu and Köse (2011) which is built upon Toda and Yamamoto's (1995) procedure is applied. The outcomes of causality tests show that tourism causes GDP in Grenada and South Africa; GDP causes tourism in Albania, Bulgaria, Dominic Republic, Ecuador, Jamaica, Peru, Sri Lanka and the whole panel; tourism and GDP mutually cause each other in Armenia, Mauritius and North Macedonia; and no causality in Azerbaijan, Botswana, Brazil, China, Colombia, Costa Rica, Dominica, Fiji, Guatemala, Guyana, Jordan, Malaysia, Mexico, Paraguay, Romania, Russian Federation, Samoa, St. Lucia, St. Vincent and The Grenadines, Thailand and Turkey.

The remainder is organized as follows: Section 2 reviews the related literature, Section 3 presents data, model and methodology, Section 4 shows empirical findings, and the last section concludes.

2. RELATED LITERATURE

There are lots of studies focus on tourism and economic growth nexus. A brief summary of the works is given in Table 1. Among these studies, Balaguer and Cantavella-Jordá (2002) for Spain; Gündüz and Hatemi-J (2005) for Turkey; Lee and Chang (2008) for OECD countries; Brida, Barquet and Adrian (2010) for Italy; Narayan, Narayan, Prasad and Prasad (2010) for Pacific Island Countries (short-run); Chou (2013) Cyprus, Latvia and Slovakia; Tuğcu (2014) for Asian countries; Bilen, Yılancı and Eryüzlü. (2015) for 12 Mediterranean countries (using Dumitrescu-Hurlin causality test); Durgun Kaygısız (2015) for Turkey; Hatemi-J (2016) for United Arab Emirates; Tang and Tan (2015) for Malaysia; and Ohlan (2017) for India; and Hatemi-J, Gupta, Kasongo, Mboweni and Netshitenzhe (2018) for France, Germany and the USA find results that support tourism-led growth hypothesis.

Table 1. Selected Works on Tourism-Economic Growth Nexus

Author	**Country**	**Period**	**Way of causality**
Balaguer and Cantavella-Jordá (2002)	Spain	1975Q1-1997Q1	Tourism → GDP
Dritsakis (2004)	Greece	1960Q1-2000Q4	GDP ↔ tourism
Gündüz and Hatemi-J (2005)	Turkey	1963-2002	Tourism → GDP
Oh (2005)	Korea	1975Q1-2001Q	GDP → tourism
Lee and Chang (2008)	OECD and non-OECD countries	1990-2002	Tourism → GDP (OECD) Tourism ↔ GDP (non-OECD)
Akinboade and Braimoh (2009)	South Africa	1980-2005	Tourism → GDP
Katırcıoğlu (2009)	Turkey	1960-2006	Tourism --- GDP
Öztürk and Acaravcı (2009)	Turkey	1987-2007	Tourism --- GDP
Brida, Barquet and Adrian (2010)	Northeast Italy	1980-2006	Tourism → GDP
Narayan et al. (2010)	Pacific Island Countries	1988-2004	GDP → tourism (SR) Tourism → GDP (LR)
Payne and Mervar (2010)	Croatia	2000Q1-2008Q3	GDP → tourism
Ekanayake and Long (2011)	Developing countries	1995-2005	GDP → tourism (SR) Tourism --- GDP (LR)
Kumar and Kumar (2012)	Fiji	1980-2008	GDP → tourism
Mulok et al. (2012)	Malaysia	1974-2010	GDP → tourism (SR)
Aslan (2013)	12 Mediterranean countries	1995-2010	Tourism ↔ GDP (panel and Portugal) GDP → tourism (Spain, Italy, Tunisia, Cyprus, Croatia, Bulgaria and Greece)
Chou (2013)	10 transition economies	1988-2011	Tourism → GDP (Cyprus, Latvia and Slovakia) GDP → tourism (Czech Republic and Poland) Tourism ↔ GDP (Estonia and Hungary) Tourism --- GDP (Bulgaria, Romania and Slovenia)
Tuğcu (2014)	European, Asian and African countries that border the Mediterranean Sea	1998-2011	Tourism receipts ↔ GDP (European countries) Tourism expenditures ↔ GDP (European countries) Tourism receipts → GDP (Asian countries) Tourism expenditures ↔ GDP (Asian countries) Tourism receipts --- GDP (African countries) Tourism expenditures --- GDP (African countries)
Bilen et al. (2015)	12 Mediterranean countries	1995-2012	Tourism → GDP Tourism ↔ GDP
Durgun Kaygısız (2015)	Turkey	2003Q1-2013Q4	Tourism → GDP
Hatemi-J (2016)	United Arab Emirates	1995-2014	Tourism → GDP
Seghir *et al.* (2015)	49 countries	1988-2012	GDP ↔ tourism
Tang and Tan (2015)	Malaysia	1975-2011	Tourism → GDP (SR and LR)
Tang and Abosedra (2016)	Lebanon	Jan.1995-Dec.2011	Tourism ↔ GDP
Khoshnevis Yazdi et al. (2017)	Iran	1985–2013	Tourism ↔ GDP (SR and LR)
Ohlan (2017)	India	1960-2014	Tourism → GDP (LR) Tourism --- GDP (SR)
Hatemi-J et al. (2018)	G7 countries	1995-2014	Tourism → GDP (France, Germany, the USA)

Arrows show the way of causality. --- indicates no causality. Causalities other than between GDP and tourism are ignored. SR (short-run), LR (long-run).

Oh (2005) for Korea; Narayan et al. (2010) for Pacific Island Countries (long-run); Payne and Mervar (2010) for Croatia; Ekanayake and Long (2011) for developing countries (short-run); Mulok, Kogid, Asid, Lily and Mansur (2012) for Malaysia; Aslan (2013) for Spain, Italy, Tunisia, Cyprus, Croatia, Bulgaria and Greece; and Chou (2013) for Czech Republic and Poland confirm that the conservation hypothesis is hold.

Studies that support feedback hypothesis are Dritsakis (2004) for Greece; Lee and Chang (2008) for non-OECD countries; Aslan (2013) for 12 Mediterranean countries and Portugal; Chou (2013) for Estonia and Hungary; Tuğcu (2014) for European and Asian countries (tourism variable changes); Bilen et al. (2015) for 12 Mediterranean countries (panel frequency causality test); Seghir, Mostéfa, Abbes and Zakaryaa (2015) for 49 countries; Tang and Abosedra (2016) for Lebanon; and Khoshnevis Yazdi, Homa Salehi and Soheilzad (2017) for Iran.

Finally, Katırcıoğlu (2009) and Öztürk and Acaravcı (2009) for Turkey; Ekanayake and Long (2011) for developing countries (short-run); Chou (2013) for Bulgaria, Romania and Slovenia; and Tuğcu (2014) for African countries (tourism variable changes) come across the findings that confirm the neutrality hypothesis.

3. DATA AND METHODOLOGY

3.1. Data

The annual data consist of GDP (constant 2010 US$), tourism receipts (constant 2010 US$) for 33 upper-middle income countries[3] spanning 1995-2018. Tourism receipts converted to constant 2010 US$ using consumer price index (2010=100). The series are sourced from World Bank's (2020) World Development Indicators. Each variable is employed in its natural log and abbreviated as $\ln y$ for natural log of GDP and $\ln tr$ for natural log of tourism receipts.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
y	792	3.59e+11	1.06e+12	3.46e+08	1.08e+13
tr	792	6.66e+09	1.95e+10	2.46e+07	3.80e+11
$\ln y$	792	24.18902	2.453376	19.66206	30.01031
$\ln tr$	792	21.10385	1.8609	17.0183	26.66399

Descriptive statistics are given in Table 2. There are 792 observations for each variable. For 33 middle-income countries in 1995-2018, average real GDP is about 359 billion US$ (with 1 trillion US$ standard deviation, roughly) when average real tourism receipts are about 6.5 billion US$ (with 19.5 billion $ standard deviation, roughly).

3.2. Methodology

Before starting to test the causality between the variables, Im, Pesaran and Shin (IPS) (2003) unit root test for heterogeneous panels, which is built upon Dickey and Fuller's (1979) augmented unit root test (ADF), is applied.

Emirmahmutoğlu and Köse (2011) have improved the lag augmented vector autoregression (LA-VAR) method recommended by Toda and Yamamoto (1995) using meta-analysis to test Granger causality in mixed heterogeneous panels and examined finite sample properties of the test by considering both cross-section independency and dependency via Monte Carlo simulations. Results uncover that the power of LA-VAR procedure is very high under considering both cross-section independency and dependency even when N (number of cross sections) and T (time periods) are small.

Following Emirmahmutoğlu and Köse (2011), level VAR model with $k_i + d \max_i$ lags in heterogeneous mixed panels below is considered:

[3] Albania, Armenia, Azerbaijan, Botswana, Brazil, Bulgaria, China, Colombia, Costa Rica, Dominica, Dominic Republic, Ecuador, Fiji, Grenada, Guatemala, Guyana, Jamaica, Jordan, Malaysia, Mauritius, Mexico, North Macedonia, Paraguay, Peru, Romania, Russian Federation, Samoa, South Africa, Sri Lanka, St. Lucia, St. Vincent and The Grenadines (SVTG), Thailand and Turkey.

$$\ln tr_{i,t} = \mu_i^{\ln tr} + \sum_{j=1}^{k_i+d\max_i} A_{11,ij} \ln tr_{i,t-j} + \sum_{j=1}^{k_i+d\max_i} A_{12,ij} \ln y_{i,t-j} + u_{i,t}^{\ln tr} \quad (1)$$

$$\ln y_{i,t} = \mu_i^{\ln y} + \sum_{j=1}^{k_i+d\max_i} A_{21,ij} \ln tr_{i,t-j} + \sum_{j=1}^{k_i+d\max_i} A_{22,ij} \ln y_{i,t-j} + u_{i,t}^{\ln y} \quad (2)$$

Here, $d\max_i$ represents maximum integration order for each i. Although we show only to test causality from $\ln tr$ to $\ln y$ in Equation (2), same steps are also valid for Equation (1) to test causality from $\ln y$ to $\ln tr$.

The first stage is determination of maximum integration orders of variables for each i using unit root tests and estimate Equation (2) using ordinary least squares for each i and specify lag lengths (k_i's) using information criteria.

The second stage is the estimation of Equation (2) by considering k_i and $d\max_i$ under the null of no causality, namely $A_{21,i1} = \cdots = A_{21,ik_i} = 0$ and get residuals for each i.

$$\hat{u}_{i,t}^{\ln y} = \ln y_{i,t} - \hat{\mu}_i^{\ln y} - \sum_{j=k_i+1}^{k_i+d\max_i} \hat{A}_{21,ij} \ln tr_{i,t-j} - \sum_{j=k_i+1}^{k_i+d\max_i} \hat{A}_{22,ij} \ln y_{i,t-j} \quad (3)$$

In the third step, as proposed by Stine (1987), residuals have to be centered with herein below where $\hat{u}_t = (\hat{u}_{1t}, \hat{u}_{2t}, \dots, \hat{u}_{Nt})'$, $k = \max(k_i)$ and $l = \max(d\max_i)$:

$$\tilde{u}_t = \hat{u}_t - (T-k-l-2)^{-1} \sum_{t=k+l+2}^{T} \hat{u}_t \quad (4)$$

Next, $[\tilde{u}_{i,t}]_{N\times T}$ is developed from these residuals. To conserve the cross-covariance structure of the errors, a full column with replacement from the matrix at a time is randomly selected. Bootstrap residuals are indicated as $\tilde{u}_t^*$ $(t = 1,2,\dots,T)$.

In the fourth stage, bootstrap sample of y under the null hypothesis is generated as follows:

$$\ln y_{i,t}^* = \hat{\mu}_i^{\ln y} + \sum_{j=k_i+1}^{k_i+d\max_i} \hat{A}_{21,ij} \ln tr_{i,t-j} + \sum_{j=1}^{k_i+d\max_i} \hat{A}_{22,ij} \ln y_{i,t-j}^* + \tilde{u}_t^* \quad (5)$$

In the fifth step, $\ln y_{i,t}^*$ is replaced for $\ln y_{i,t}$ with no parameter restrictions. Then the individual Wald statistics are calculated to test the null hypothesis of no causality on an individual basis for each i. Individual p-values are estimated using corresponding individual Wald statistics. Afterward, Fisher test statistic is calculated as follows:

$$\lambda = -2\sum_{i=1}^{N} \ln(p_i)\ i = 1,2,\dots,N \quad (6)$$

where p_i is the p-value corresponding to the Wald statistic of the i-th individual.

The bootstrap empirical distribution of Fisher test statistics is made by replicating third and fifth steps and specifying bootstrap critical values by choosing the proper percentiles of these sampling distributions.

This paper also employs Pesaran's (2004) cross-sectional dependence test, which is proper method when time dimension (T) is lesser than the cross-section dimension (N). Pesaran's (2004) test statistic can be computed both for homogeneous/heterogeneous and nonstationary series.

4. EMPIRICAL FINDINGS

The outcomes of IPS (2003) unit root test are given in Table 3. The table shows W-statistic for panel and intermediate ADF t-statistics for countries. As seen, $\ln y$ and $\ln tr$ are stationary in different integration orders in the most of cases.

Table 3. Results of IPS (2003) Individual Unit Root Tests (With Intercept)

i	Country	$\ln y$	$\Delta \ln y$	$\Delta^2 \ln y$	$\ln tr$	$\Delta \ln tr$	$\Delta^2 \ln tr$	d max$_i$
0	Panel	5.2229	-12.5917***	-30.9361***	2.1798**	-15.6049***	-30.7425***	1
1	Albania	-1.2117	-1.5882	-8.6313***	-8.2728***	-3.9057***	-6.5254***	2
2	Armenia	-1.3913	-3.0089**	-5.7782***	-2.1372	-3.9660***	-5.2886***	1
3	Azerbaijan	-2.0426	-2.0461	-3.5430**	-0.7737	-4.9814***	-10.294***	2
4	Botswana	-0.7216	-5.6014***	-6.1303***	-1.5842	-6.0680***	-8.2047***	1
5	Brazil	-1.3528	-3.1829**	-6.8843***	-1.4255	-5.8492***	-8.1109***	1
6	Bulgaria	-0.3443	-4.2779***	-9.1373***	-5.1149***	-4.2273***	-10.499***	1
7	China	-1.0184	-1.3377	-4.3667***	-2.7076*	-4.9055***	-6.8359***	2
8	Colombia	0.1247	-2.8644*	-5.5937***	-0.4373	-3.5860**	-5.8927***	1
9	Costa Rica	-0.8532	-4.2254***	-5.0615***	-2.0444	-4.6529***	-5.7059***	1
10	Dominica	-1.7486	-4.7277***	-8.9330***	-1.5372	-4.1368***	-3.8231**	1
11	Dom. Rep.	-0.0436	-3.4154**	-5.4646***	-1.0643	-3.6158**	-6.8403***	1
12	Ecuador	-0.4836	-3.4627**	-6.1181***	-2.5097	-1.7836	-5.9107***	2
13	Fiji	0.8494	-5.1947***	-8.6929***	-0.9820	-5.7570***	-6.7400***	1
14	Grenada	-1.5654	-4.6364***	-5.3980***	-0.1554	-4.4014***	-5.3553***	1
15	Guatemala	-0.6321	-4.5958***	-5.1334***	-2.2180	-3.1071**	-4.9833***	1
16	Guyana	0.6347	-3.9939***	-5.6505***	-1.4329	-4.6156***	-5.8000***	1
17	Jamaica	-1.1411	-2.7183*	-4.9383***	-0.8783	-3.3212**	-4.8567***	1
18	Jordan	-2.0419	-1.3962	-4.6932***	-0.3512	-1.9701	-12.092***	2
19	Malaysia	1.7464	-5.8046***	-11.898***	-1.0778	-4.1063***	-5.2096***	1
20	Mauritius	-2.4324	-4.4922***	-8.4935***	-2.1701	-4.7647***	-5.4404***	1
21	Mexico	-1.9182	-3.6943**	-7.0234***	-3.0860**	-3.0654**	-6.8960***	1
22	N. Macedonia	-0.2139	-3.7817***	-6.1046***	-2.6495*	-6.3913***	-10.076***	1
23	Paraguay	1.7339	-1.2642	-6.8761***	-2.1537	-3.1920**	-5.8989***	2
24	Peru	0.5568	-3.6481**	-8.5289***	-0.1514	-3.4876**	-5.5576***	1
25	Romania	0.4451	-3.0458**	-6.5170***	-3.9538***	-2.2587	-6.2254***	1
26	Russian Fed.	-0.8069	-3.6226**	-6.4678***	-3.4821**	-3.1739**	-5.1290***	1
27	Samoa	-2.2589	-3.4150**	-5.1550***	-0.0635	-4.0178***	-6.7607***	1
28	South Africa	-1.9499	-2.7529*	-5.3535***	-1.7106	-3.2802**	-5.9015***	1
29	Sri Lanka	0.2027	-3.6337**	-6.8226***	0.0355	-4.3244***	-7.2302***	1
30	St. Lucia	-0.9833	-4.7366***	-7.5340***	-0.2910	-4.2704***	-6.8521***	1
31	SVTG	-1.9011	-2.3071	-4.4563***	-0.8297	-3.6533**	-6.3887***	2
32	Thailand	0.3407	-3.9036***	-6.7386***	0.8017	-4.7900***	-4.4760***	1
33	Turkey	0.2773	-4.3257***	-7.6057***	-5.0191***	-2.7434*	-5.4430***	1

*, ** and *** typify significance at 10%, 5% and 1% levels, respectively. Lag lengths are chosen by minimizing Schwarz Information Criterion. Δ and Δ^2 represent first and second differences, respectively.

Table 4 presents results of individual causality tests. According to the results, tourism-led growth hypothesis, which indicates that tourism receipts cause GDP, is accepted for Grenada and South Africa. Conservation hypothesis that show a causality from GDP to tourism receipts is valid for Albania, Bulgaria, Dominic Republic, Ecuador, Jamaica, Peru and Sri Lanka. For Armenia, Mauritius and North Macedonia, bidirectional causality is observed between tourism receipts and GDP which supports feedback hypothesis.

Table 4. Results of Individual Causality Tests

			H_0: ln tr does not cause ln y		H_0: ln y does not cause ln tr		
Country	k_i	d max$_i$	W_i	p_i	W_i	p_i	**Decision**
Albania	3	2	2.476	0.480	9.714	0.021**	Conservation
Armenia	1	1	3.998	0.046**	3.437	0.064*	Feedback
Azerbaijan	3	2	3.567	0.312	0.392	0.942	Neutrality
Botswana	2	1	0.258	0.879	1.310	0.519	Neutrality
Brazil	2	1	4.165	0.125	0.991	0.609	Neutrality
Bulgaria	3	1	2.719	0.437	14.630	0.002***	Conservation
China	2	2	1.101	0.577	1.456	0.483	Neutrality
Colombia	2	1	0.127	0.938	1.338	0.512	Neutrality
Costa Rica	1	1	2.531	0.112	0.379	0.538	Neutrality
Dominica	1	1	0.242	0.623	0.060	0.806	Neutrality
Dom. Rep.	1	1	0.172	0.679	4.474	0.034**	Conservation
Ecuador	1	2	0.245	0.621	3.671	0.055*	Conservation
Fiji	1	1	3.692	0.055*	0.019	0.890	Neutrality
Grenada	1	1	2.930	0.087*	0.174	0.676	Tourism-led growth
Guatemala	2	1	0.323	0.851	2.438	0.296	Neutrality
Guyana	3	1	2.305	0.512	3.666	0.300	Neutrality
Jamaica	2	1	1.568	0.457	10.026	0.007***	Conservation
Jordan	1	2	0.310	0.578	1.890	0.169	Neutrality
Malaysia	1	1	0.074	0.786	1.250	0.264	Neutrality
Mauritius	3	1	7.473	0.058*	9.250	0.026**	Feedback
Mexico	2	1	2.020	0.364	2.605	0.272	Neutrality
N. Macedonia	3	1	6.553	0.088*	50.657	0.000***	Feedback
Paraguay	3	2	2.039	0.564	2.741	0.433	Neutrality
Peru	2	1	1.096	0.578	8.995	0.011**	Conservation
Romania	2	1	1.850	0.397	0.448	0.799	Neutrality
Russian Fed.	1	1	2.450	0.118	0.753	0.386	Neutrality
Samoa	1	1	0.055	0.815	0.725	0.394	Neutrality
South Africa	1	1	5.522	0.019**	0.007	0.934	Tourism-led growth
Sri Lanka	2	1	1.478	0.478	12.482	0.002***	Conservation
St. Lucia	1	1	0.393	0.531	0.027	0.869	Neutrality
SVTG	1	2	0.882	0.348	0.004	0.948	Neutrality
Thailand	1	1	0.139	0.709	0.994	0.319	Neutrality
Turkey	1	1	0.588	0.443	0.430	0.512	Neutrality

*, ** and *** typify significance at 10%, 5% and 1% levels, respectively. W_i is Wald statistics and p_i is probability. Lag lengths (k_i) are chosen by minimizing Schwarz Information Criterion.

Finally, remaining countries do not have causality in respect to GDP and tourism receipts. Therefore, neutrality hypothesis is accepted for Azerbaijan, Botswana, Brazil, China, Colombia, Costa Rica, Dominica, Fiji, Guatemala, Guyana, Jordan, Malaysia, Mexico, Paraguay, Romania, Russian Federation, Samoa, St. Lucia, SVTG (St. Vincent and The Grenadines), Thailand and Turkey.

Table 5. Results of Panel Causality Tests

H_0	Fisher test stat. (λ)	1%	5%	10%	Decision
ln tr does not cause ln y	76.332	129.161	109.884	101.571	Neutrality
ln y does not cause ln tr	155.565	131.236	110.564	101.785	Conservation

The outcomes of panel causality test are given in Table 5. The null of "tourism receipts do not cause GDP" is rejected since the test statistic is lower than bootstrap critical values. For the null of "GDP does not cause tourism receipts", the test statistic is higher than 1% bootstrap critical value. Therefore, it is decided that there is a unidirectional causality from GDP to tourism receipts for upper-middle income countries. This result supports conservation hypothesis.

5. CONCLUSIONS

Scarce sources that countries already have are turning these countries into diverse their income items. Tourism is one of the outstanding factors to stimulate the economy. Thus, lots of countries improve their balance of payments and provide economic growth by increasing export revenues from tourism. This paper investigates this relationship for 33 middle-income countries using causality test suggested by Emirmahmutoğlu and Köse (2011).

Tourism led-growth hypothesis is accepted Grenada and South Africa. This finding for South Africa is in accordance with Akinboade and Braimoh (2009). Unidirectional causality from tourism expenditures to GDP points that tourism expenditures play key role on economic growth as a complementary to factors of production. Therefore, expansionary policies on tourism expenditures could be supported in these countries.

Conservation hypothesis is valid for Albania, Bulgaria, Dominic Republic, Ecuador, Jamaica, Peru and Sri Lanka, as well as the whole panel. This finding for Bulgaria is in accordance with Aslan (2013) when incompatible with Chou (2013). Also, this finding on the whole 33 upper-middle income countries is in harmony with Ekanayake and Long (2011), who find that GDP causes tourism in the short-run in developing countries. Unidirectional causality from GDP to tourism receipts means that economic growth contributes tourism receipts. Therefore, policies on tourism receipts will not affect the economic growth.

Feedback hypothesis is accepted for Armenia, Mauritius and North Macedonia. Bidirectional causal connection between tourism expenditures and GDP entails these countries to take into consideration both variables when designing economic policies.

Finally, it is seen that neutrality hypothesis is acceptable for the remaining countries. Lack of causality between tourism and GDP for Malaysia is incompatible with Tang and Tan's (2015) results which indicate tourism causes GDP. No causality between tourism receipts and GDP shows that expansionary or contractionary policies on tourism will have no impacts on economic growth. Therefore, economic policies can be designed regardless of tourism related issues in these countries.

Future research may use time-varying parameter VAR models to test the causality and may find different results for different periods.

REFERENCES

Archer, B. (1995). Importance of tourism for the economy of Bermuda. *Annals of Tourism Research*, 22(4), 918-930.

Aslan, A. (2013). Tourism development and economic growth in the Mediterranean countries: Evidence from panel Granger causality tests. *Current Issues in Tourism*, 17(4), 363-372. doi:10.1080/13683500.2013.768607.

Balaguer, J. and Cantavella-Jordá, M. (2002). Tourism as a long-run economic growth factor: the Spanish case. *Applied Economics*, 34(7), 877-884. doi:10.1080/00036840110058923.

Bilen, M., Yılancı, M. and Eryüzlü, H. (2015). Tourism development and economic growth: a panel Granger causality analysis in the frequency domain. *Current Issues in Tourism*, 20(1), 27-32. doi:10.1080/13683500.2015.1073231.

Brida, J. G., Barquet, A. and 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.

Chou, M. C. (2013). Does tourism development promote economic growth in transition countries? A panel data analysis. *Economic Modelling*, 33, 226-232. doi:10.1016/j.econmod.2013.04.024.

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

Dritsakis, N. (2004). 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.

Durgun Kaygısız, A. (2015). Net turizm gelirleri ve büyüme ilişkisi: VAR model-Granger nedensellik analizi. *Journal of Alanya Faculty of Business/Alanya Isletme Fakültesi Dergisi*, 7(2), 155-164.

Ekanayake, E. M. and Long, A. E. (2012). Tourism development and economic growth in developing countries. *The International Journal of Business and Finance Research*, 6(1), 51-63.

Emirmahmutoğlu, F. and Köse, N. (2011). Testing for Granger causality in heterogeneous mixed panels. *Economic Modelling*, 28, 870-876.

Granger, C. W. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica: Journal of the Econometric Society*, 37(3), 424-438.

Gündüz, L. and Hatemi-J, A. (2005). Is the tourism-led growth hypothesis valid for Turkey? *Applied Economics Letters*, 12, 499-504.

Hatemi-J, A. (2016). On the tourism-led growth hypothesis in the UAE: a bootstrap approach with leveraged adjustments. *Applied Economics Letters*, 23(6), 424-427. doi:10.1080/13504851.2015.1078440.

Hatemi-J, A., Gupta, R., Kasongo, A., Mboweni, T. and Netshitenzhe, N. (2018). Does tourism cause growth asymmetrically in a panel of G-7 countries? A short note. *Empirica*, 45(1), 49-57.

Im, K. S., Pesaran, M. H. and Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115, 53-74.

Katırcıoğlu, S. (2009). Revisiting the tourism-led-growth hypothesis for Turkey using the Bounds test and Johansen approach for cointegration. *Tourism Management*, 30, 17-20.

Khoshnevis Yazdi, S., Homa Salehi, K. and Soheilzad, M. (2017). The relationship between tourism, foreign direct investment and economic growth: Evidence from Iran. *Current Issues in Tourism*, 20(1), 15-26.

Lanza, A. and Pigliaru, F. (2000). Tourism and economic growth: Does country's size matter? *Rivista Internazionale di Scienze Economiche e Commerciali*, 47, 77-85.

Lee, C. C. and Chang, C. P. (2008). Tourism development and economic growth: A closer look at panels. *Tourism Management*, 29, 180-192. doi:10.1016/j.tourman.2007.02.013

Mulok, D., Kogid, M., Asid, R., Lily, J. and Mansur, K. M. (2012). Tourism and economic growth linkages in Malaysia. *Journal for Sustainable Tourism Development*, 1(1), 3-10.

Narayan, P. K., Narayan, S., Prasad, A. and Prasad, B. C. (2010). Tourism and economic growth: a panel data analysis for Pacific Island countries. *Tourism economics*, 16(1), 169-183.

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

Oh, C. O. (2005). The contribution of tourism development to economic growth in the Korean economy. *Tourism Management*, 26, 39-44. doi:10.1016/j.tourman.2003.09.014.

Ohlan, R. (2017). The relationship between tourism, financial development and economic growth in India. *Future Business Journal*, 3, 9-22. doi:10.1016/j.fbj.2017.01.003.

Özturk, İ. and Acaravcı, A. (2009). On the causality between tourism growth and economic growth: Empirical evidence from Turkey. *Transylvanian Review of Administrative Sciences*, 5(25), 73-81.

Payne, J. E. and Mervar, A. (2010). Research note: The tourism–growth nexus in Croatia. *Tourism Economics*, 16(4), 1089-1094.

Seghir, G. M., Mostéfa, B., Abbes, S. M. and Zakaryaa, G. Y. (2015). Tourism spending-Economic growth causality in 49 Countries: A dynamic panel data approach. *Procedia Economics and Finance*, 23, 1613-1623. doi:10.1016/S2212-5671(15)00402-5.

Sims, C. A. (1972). Money, income, and causality. *The American economic review*, 62(4), 540-552.

Stine, R. A. (1987). Estimating properties of autoregressive forecasts. *Journal of the American Statistical Association*, 82, 1072-1078.

Tang, C. F. and Abosedra, S. (2016). Tourism and growth in Lebanon: New evidence from bootstrap simulation and rolling causality approaches. *Empirical Economics*, 50(2), 679-696.

Tang, C. F. and Tan, E. C. (2015). Does tourism effectively stimulate Malaysia's economic growth? *Tourism Management*, 46, 158-163.

Toda, H. Y. and Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of econometrics*, 66(1-2), 225-250.

Tuğcu, C. T. (2014). Tourism and economic growth nexus revisited: A panel causality analysis for the case of the Mediterranean Region. *Tourism Management*, *42*, 207-212. doi:10.1016/j.tourman.2013.12.007.

World Bank (2020). *World Development Indicators*. Access address: https://databank.worldbank.org/reports.aspx?source=world-development-indicators, (April 10, 2020).