**THE RELATIONSHIP BETWEEN INTERNATIONAL TOURISM RECEIPTS AND ECONOMIC GROWTH IN ASIA PACIFIC COUNTRIES: A PANEL DATA ANALYSIS**

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***Abstract***

*In this research, the short-term and the long-term causality relationship between tourism receipts (TR) and economic growth (EG) was investigated. The dataset includes 483 observations for the period from 1995 to 2017 of the selected 21 Asia Pacific Economies. According to “Dumitrescu & Hurlin VAR Panel Causality Test”, which is employed to analyse the short-term causality, it is revealed that (a) “tourism receipts is the granger cause of economic growth”, and (b) “economic growth is the granger cause of tourism receipts.” Hence, it is concluded a bi-directional causality between tourism receipts and economic growth in the short-term. “Pesaran & Smith Mean Group Estimator”, which is performed to test the long-term relationship, indicated that (a) economic growth affects tourism revenues; a 1% increase in economic growth raises tourism revenues by 1.9% in long-term and vice versa, (b) tourism revenues affects economic growth; a 1% increase in tourism revenues raises the economic growth by 0.49 % in long-term, and vice versa. These results support the feedback hypothesis that claims a bi-directional reciprocal causality relationship between international tourism and economic growth.*

***Keywords:*** *Economic Growth, Tourism Receipts, Panel Data Analysis.*

**ASYA PASİFİK ÜLKELERİNDE ULUSLARARASI TURİZM GELİRLERİ İLE EKONOMİK BÜYÜME ARASINDAKİ İLİŞKİ: BİR PANELVERİ ANALİZİ**

***Öz***

*Bu araştırmada turizm gelirleri (TR) ile iktisadi büyüme (EG) arasındaki kısa ve uzun dönemli ilişkiler analiz edilmiştir. Analiz, seçilmiş 21 Asya Pasifik Ülkesi için 1995 ile 2017 arasındaki 23 yıllık dönemi kapsamaktadır. Seriler arasında kısa dönemli nedensellik “Dumitrescu & Hurlin VAR Panel Nedensellik Analizi” ile incelenmiştir. Kısa dönem analiz sonucuna göre; (a) “turizm gelirlerinin ekonomik büyümenin Granger nedenidir” ve (b) “ekonomik büyümenin turizm gelirlerinin Granger nedenidir” sonucuna varılmıştır. Buna göre kısa dönemde ekonomik büyüme ile turizm gelirleri arasında iki yönlü pozitif bir ilişki vardır. Değişkenler arasındaki uzun dönemli ilişkinin varlığı “Pesaran & Smith Ortalama Grup Tahmincisi” ile incelenmiştir. Uzun dönem analiz sonuçlarına göre; (a) ekonomik büyümenin turizm gelirlerini etkilemektedir: ekonomik büyümedeki% 1'lik bir artış/azalış, turizm gelirlerini % 1,9 yükseltmek/düşürmektedir, (b) turizm gelirleri ekonomik büyümeyi etkilemektedir: turizm gelirlerindeki % 1'lik bir artış/azalış, ekonomik büyümeyi % 0,49 arttırmakta/düşürmektedir.* *Bu sonuçlar, uluslararası turizm gelirleri ile iktisadi büyüme arasında çift yönlü karşılıklı nedensellik ilişkisi olduğunu öne süren “geri bildirim hipotezini” desteklemektedir.*

***Anahtar kelimler:*** *İktisadi Büyüme, Ekonomik Büyüme, Turizm Gelirleri, Panel Veri Analizi*

**Introduction**

The increasing globalization that has accelerated in the post-1990 period has resulted in the removal of trade obstacles and the accompanying technological developments between countries has led to a rapid and easy movement of goods and services between countries. These same changes have also been reflected in the tourism sector and made it possible for individuals to travel more comfortably, inexpensively and faster than in the past.

A key role of governments is to find and subsidize productive sectors in order to solve growth, unemployment, financial and monetary imbalances. Tourism is seen by policymakers as one of the most important industry sectors in supporting macroeconomic performance. Foreign exchange income provided by tourism is used to finance domestic and foreign debt. It creates employment opportunities for the sector and revitalizes many other sectors construction, logistics, hospitality, and the food and beverage sectors. Additionally, this sector generates tax revenues, encourages infrastructure, improves human resources and technology investments, creates a competitive environment, increases the efficiency of domestic companies, facilitates the utilization of economies of scale and affects economic activities through many different channels. This sector also provides revenue convergence between developed and developing economies. The tourism sector is therefore considered seen as an important policy tool to prevent regional income inequalities.

Tourism is a rapidly growing sector on a global scale which represents 5% of the world's GDP and about 30% of world service exports. According to the Tourism Report of the United Nations World Trade Organization (UNWTO), which was published in 2018, the highest increase since 2010 in international tourist arrivals was in 2017. International Tourist Arrivals increased by 7% over one million people by 2017, and TR increased by 5% to $1.340 billion. The international passenger transport services provided to non-residents also generated $240 billion in revenue. International TR reached a total of $1.6 trillion ($4 billion a day) and brought tourism to third place in the worldwide export category (UNWTO, 2018: 2-6). As reported by the World Travel and Tourism Council (WTTC), the share of travel and tourism sector in global GDP was 10.4% in 2017, and the share of the sector in global employment was 9.9% with the employment in the sector provided to 313 million people. The rise in international tourism over the last 10 years is a clear sign that the tourism sector is progressing in a strong and healthy manner worldwide (WTTC, 2018: 1). According to UNWTO’s forecast, the total number of international tourists will reach to 1.8 billion people by 2030 with an average increase by 3.3% each year (UNWTO, 2011: 30).

The Asia Pacific region is the largest market for global tourism with a 24% share in tourist arrivals and a 29% share of TR (UNWTO, 2018: 5). The rapidly increasing tourism sector is an important driver of economic prosperity for the region, not only for the revenue it provides but also for its contribution to employment and entrepreneurship. The main reasons for this growth are the increase in consumer purchasing power, advances in air connections, affordable travel options and the easing of visa procedures (UNWTO, 2018: 10).

In recent years, the causality between TR and EG has been a critical topic for scholars both in economics and tourism all over the world. Understanding the causality between these two variables is crucial in determining the right tourism policies to promote EG. Although existing studies show that there is a correlation between tourism and economic vitality, there is no consensus on the direction of the causality. Additionally, the extant literature shows that there are no studies on the correlation between TR and EG for the Asia Pacific region.

In the following section, a theoretical framework for the relationship between tourism and economic growth will be presented. Following this framework, there will be a review of the literature about the relationship between tourism and economic growth.

**1. Theoretical Framework**

In the economic literature, the relationship between TR and EG is generally dealt with two different approaches. The first is obtained from the multiplier effect explained by Keynesian theory. As it may trigger the EG with a positive multiplier effect on employment and revenues, international tourism can be regarded as an exogenous element of aggregate demand in Keynesian theory (Suresh and Senthilnathan, 2014: 2). The second approach “Endogenous Growth Theory,” is widely accepted in the literature. Thus, four different hypotheses were developed:

* tourism-led growth hypothesis (TLGH),
* growth-led tourism hypothesis (GLTH),
* the neutrality (NoCausal) hypothesis (NCH),
* the feedback (two-way causality) hypothesis (Kum et al., 2015: 1076).

The TLGH assumes that tourism is one of the fundamental components of long-term EG. According to this hypothesis, foreign exchange revenues created by tourism can be utilized for the importation of resources, which are necessary for the manufacturing of products and services that will generate economic expansion in the host country (Kum et al., 2015: 1077). On the contrary, the GLTH assumes that tourism is driven by EG. According to this hypothesis, a strategy for a country's EG and development should include well-designed economic policies and practices which favour endowments in tangible and human capital. This socio-economic competency will have more efficient use of economic resources which eventually will have a positive impact on tourism activities (Antonakakis et al., 2013: 4-5). The NCH assumes no causality between EG and TR. In other words, growth and development policies will not contribute to TR (Oh, 2005: 40). According to the feedback hypothesis, the relationship between tourism and EG is bidirectional. Because of this reciprocal causality, a change in either economic activity or tourism will have an impact on the other variable (Kum et al., 2015: 1077).

**2. Literature Review**

Studies that empirically examined the causality between tourism and EG vary according to the various econometric methods using cross-sectional/panel data or time series. In this study, the existing literature is classified based on the results of the aforementioned hypotheses. The extant literature indicates the prior research that has primarily targeted testing these hypotheses yielded contradictory results. Comparisons between previous studies are difficult because of different periods used and the share of tourism in total economy varies in selected countries.

Even though the studies on the link between EG and tourism started with Ghali (1976), the first published studies on the field belong to Lanza and Pigliaru (2000) and Balaguer and Cantavella-Jordá (2002). The research of Balague and Cantavella-Jordá (2002) which mentioned the GLTH for the first time in the literature has been accepted as one of the most important studies in this area. In their research, using data from Spain for the period of 1975-1997, they found a relationship between tourism and EG, and used a Granger's analysis of causality which led to the conclusion that the tourism industry triggered EG. Their work was supported by Brida et al. (2010), who suggested that tourist spending in Argentina had a positive effect on per capita income, and Eugenio-Martin et al. (2004) put forward the same relationship for other Latin American countries. Seetanah (2010) found that tourism development was the main factor in explaining economic performance using a study which analyzed the relationship between tourism and EG in island countries by applying the Generalized Method of Moments (GMM) technique in dynamic panel data for the period of 1990-2007.

The study conducted by Gökovalı and Bahar (2006) using the panel data from the Mediterranean countries for the period between 1987-2002 revealed that tourism contributes positively to EG by increasing the share of investment and labour force in GDP. The results of the fixed and random effect models confirmed the TLGH, showing that a 1% increase in TR rises the GDP growth rate by 8% in this region. Tang and Abosedra (2014) also found results confirming the TLGH. In order to explain the effect of tourism, energy consumption and political stability on EG in Middle Eastern and North African (MENA) countries, they used both static and dynamic GMM panel data estimation methods. According to the results of their study, a 10% increase in per capita TR in MENA countries causes a 0.7% increase in the EG in these countries. Gunduz and Hatemi (2005) conducted a study for Turkey covering the period 1963-2002. By using the leveraged bootstrap causality test they found a unidirectional causality from international tourism to EG. Thus, they confirmed the TLGH for Turkey. Kum et al. (2015), analyzed the relationship between tourism activity and EG for the Future 11 countries using the data from 1995-2013 and a panel cointegration technique. They found a positive relationship between tourist arrivals and GDP. According to the results, a 1% increase in tourist arrivals increases GDP by 0.06% in the Future 11 countries. Cárdenas-García et al. (2015) conducted research for 144 countries to test whether tourism causes economic development through EG. By using structural equation modelling, the study revealed that tourism led to economic development, but the results were found to vary across countries. Akinboade and Braimoh (2010) conducted a research to investigate this causality for African countries covering data 1980-2005, and their findings confirmed a one-way relationship from TR to real GDP.

Belloumi (2010), questioned the relationship between tourism and EG in Tunisia in 1970-2007 by using cointegration and causality tests. Granger causality relationship could not be found in the short term but, it was observed that tourism led to long-term real GDP growth. Therefore, the existence of NCH in the short term and the TLGH was accepted in the long term.

Fayissa et al. (2008) analyzed the causality between tourism income and economic growth rates between 1995-2004 for 42 African countries. The results of GMM and fixed random effects model suggested that TR contribute positively to the current output level and EG in Sub-Saharan African countries. By analyzing the relationship between tourism expenditures and EG with panel cointegration and panel Granger causality tests with the data from 49 countries, Seghir et al. (2015) confirmed a bidirectional relationship between these two variables in the long run.

Oh (2005), who also used the Granger causality test, found a one-way causality between tourism growth and economic expansion, using data from Korea. Using annual data, Kreishan (2010) investigated the causal relationship between TR and EG in Jordan for 1970-2009. The results of the Granger causality test confirmed a one-way causality from TR to EG.

Dritsakis (2004) using data from Greece and Durbarry (2004) from Mauritius also applying the error correction model, found a bidirectional relationship between tourism and EG. Durbarry (2004) concluded that tourism could be a source of EG when the revenue in exports for the Mauritius economy is decreasing. Kim et al. (2006), using the cointegration model and a Granger causality test, also found a two-way relationship between EG and tourism expansion, using Taiwanese data.

In his study conducted for Cyprus, Katırcıoğlu (2009) concluded that the increase in real income in the country encourages international tourist arrivals. Thus he rejected the TLGH. Similarly, Payne and Mervar (2010) using quarterly data and Toda-Yamamoto causality tests could not find a causal relationship between tourism development that leads to EG for Croatia. However, they found a one-way relationship from real GDP to TR. According to the authors, the implementation of policies promoting corporate transparency and positive investment environment will ensure the growth of the tourism sector. These policy implementations, which show the existence of a stable environment in the country, will play an increasing role in the number of tourists coming to the country and thus TR.

Fawaz and Rahnama (2014) analyzed the causal relationship between international tourism and EG in 144 countries by classifying them into 6 regions and 4 different income groups. They considered the period 1975-2010 by using the panel analytical estimation method based on fixed and GMM. The results of the study revealed that EG significantly contributes to TR per capita. Therefore, they accepted the GLTH in their study. In order to test the causality between TR and EG, Kızılgöl and Erbaykal (2008) applied Toda-Yamamoto approach. They found a one-way causality from EG to TR. Hence, confirmed the GLTH for Turkey. Suresh and Senthilnathan (2014) studied the causality between TR and EG empirically by using Granger causality test and error correction model for the period 1977-2012 in Sri Lanka and found a causality from EG to TR. Thus, the GLTH was accepted for Sri Lanka.

One of the pioneering studies in this field was conducted by Antonakakis et al. (2015) to investigate the nature of the relationship between EG and tourism by examining 10 European Union countries using a spillover index approach. In their analysis, the authors included both the countries that were severely affected by the 2008 global crisis and the ones less affected by the crisis. The results of the study revealed that the direction between the two variables changes over time. Some countries shifted from tourism-led growth to growth-led tourism during the crisis. The results showed that different economic events could change the causality direction between these two variables. Impact of the economic crisis found to be stronger particularly for Greece, Cyprus, Spain and Portugal.

Albaladejo et al. (2014) analysed the relationship between tourism and EG with Spain’s annual data considering the period 1970-2010 using Johansen cointegration error correction model and dynamic Granger causality test. According to the findings of the analysis, an increase in EG creates an increase in the arrival of tourists in the short run. In the long run, tourist arrivals, the quality of tourism accommodation facilities and global GDP are positively influential on real GDP in Spain. Their findings confirmed the feedback hypothesis. Samimi et al. (2011) analyzed the 1995-2009 period for developing countries by using the panel VAR approach. According to the results of the analysis, there is bidirectional causality and a positive long-term relationship between EG and tourism development.

Antonakakis et al. (2013) tested the relationship between tourism and EG for the selected 10 European countries using a vector autoregressive model (VAR). According to the results of the study, the TLGH for Italy and the Netherlands; the GLTH hypothesis for Cyprus, Germany and Greece; the BC hypothesis for Austria, Portugal and Spain; and the NCH for Sweden and England all were confirmed.

In the study conducted by Tugcu (2014) for European, Asian and African countries using panel data analysis with the annual data of 1998-2011 period, it is concluded that the causality between tourism and EG vary between countries and depends on the selected tourism indicators.

Arslanturk et al. (2011) analyzed the Granger causality between TR and GDP in Turkey for 1963-2006 period using the rolling window and time-varying coefficients estimation methods. The Vector Error Correction Model (VECM) revealed no Granger causality between the series. However, it was observed that TR had a strong power to explain the GDP in the early years of the 1980s. Therefore, the NCH was accepted by Turkey.

Dritsakis and Athanasiadis (2000) conducted a study for Greece applying the Ordinary Least Squares (OLS) model taking into account 1960:Q1-2000: Q4 period. They found a long-term cointegration relationship between tourism and EG.

Pavlic et al. (2014) used Johansen Maximum Likelihood cointegration and VECM techniques to study the causal relationship between tourism and EG in Croatia for the period 1996-2013. Based on the study results, there is a causal relationship between the openness of the economy and GDP; the real effective exchange rate and the GDP in the short term, but there is no causal relationship between the tourist arrivals and the GDP in the short term. Therefore, the NCH was accepted.

Schubert et al. (2011) used 1970-2008 period data to examine the casual relationship between EG and tourism development with VECM cointegration and Granger causality tests for Antigua and Barbuda. They found a one-way causal relationship between tourism and EG. Therefore, the TLGH was accepted for these countries.

Ozturk and Acaravcı (2009) investigated the long-term relationship between real GDP and international tourism in Turkey taking into account the period from 1987 to 2007. In the study where the TLGH was tested using VEC and autoregressive distributed delay (ARDL) models, neither Johansen’s cointegration test nor the ARDL boundary test revealed any long-term relationship between real GDP and international tourism. Therefore, the TLGH was rejected since no cointegration between variables was found.

Yıldırım and Öcal (2004) studied the relationship between TR and EG for Turkey using the data of 1962-2002 period. By applying the VAR method, they found that tourism revenue contributes to EG in the long term, but not in the short term. Therefore, they concluded that in the long run the TLGH and in the short run the NCH is valid in Turkey.

Chou (2013) studied the impact of tourism expenditures on EG for 10 transition countries between the period 1988-2011. The results of the panel data analysis revealed no causal relationship between these variables for Bulgaria, Romania, and Slovenia. A causal relationship, from tourism expenditures to EG, was found for Cyprus, Latvia, and Slovenia. In the Czech Republic and Poland, they found an inverse causal relationship, between EG and tourism expenditures.

Shahzad et al. (2017) conducted research on the top 10 tourist destinations to test the GLTH, by using the Quantile-to-Quantile (QQ) approach and a tourism index for the period 1990-2015. Although the results of the study revealed a positive relationship between these two variables, the relationship observed for China and Germany was weak. The authors attributed this result to the relatively lower share of tourism in these economies.

**3. Econometric Analysis**

**3.1. Data Set, Variables, Methodology**

The data set used in the analysis covers 483 observations for the economic growth and the tourism receipts for the period from 1995 to 2017 of the selected 21 Asia Pacific Economies[[3]](#footnote-3). Economic growth, which represents with GDP (current, US$), was defined as the predictor variable of the model, while tourism receipts, which represents with TR (current, US$), as the predicted variable. The dataset was downloaded from the World Bank database.

In the following titles, firstly, functional and statistical models will be established. In order to select the appropriate test methods to produce accurate results in panel data analysis, the cross-section and the stationary of the series, the appropriate “lag-lengths” and homogeneity of the model will be tested before performing panel causality analysis. Accordingly, the appropriate panel causality method will be defined to analyse the short-term relationship and similarly suitable panel cointegration method will be determined to test the long-term relationship between the variables.

**3.2. Model**

The model where “tourism receipts (TR)” is the predicted variable and economic growth (EG) is the predictor variable can be expressed functionally as in Equation (1) below.

|  |  |
| --- | --- |
| $$Tourism Revenues =f \left(Economic Growth\right)$$$$TR =f \left(EG\right)$$TR : Tourism receipts (current US$), EG : Gross Domestic Product (current-US$) | (1) |

The functional expression of the model given in Equation (1) can also be expressed statistically as given in Equation (2).

|  |  |
| --- | --- |
| $$TR\_{it}=a+β\_{1}EG\_{it} + u\_{it}$$ | (2) |

In equation (2), $a$ denotes the “constant term”; β is the coefficient that determines the relationship between the predicted variable and the predictor variable; $i \left(i=1….N\right)$ refers to countries, and $u\_{it}$ refers to the error term.

Because of Equation (2) is “a static model”, by taking the delayed values of the series (i) into the system, the dynamic equations can be described in the VAR system as follows.

|  |  |
| --- | --- |
| $∆TR\_{t}=a\_{11}+\sum\_{i=0}^{n}β\_{1i}∆TR\_{t-i}+ \sum\_{i=0}^{n}β\_{2i}∆EG\_{t-i}+ u\_{1t}$  | (3) |
| $∆EG\_{t}=a\_{21}+\sum\_{i=0}^{n}β\_{3i}∆EG\_{t-i}+ \sum\_{i=0}^{n}β\_{4i}∆TR\_{t-i}+u\_{2t}$  | (4) |

In the VAR system seen in Eq.3 and Eg.4, $∆$ displays “the first difference”, $u\_{1} $and $u\_{2} $ shows the “error terms” and n is the number of lag-lengths. VAR Model is a system of equations in which each variable is linear function that covers lagged values of both itself and other variables in the system. Accordingly, tourism receipts the predictor variable is defined by the delayed values of economic growth and tourism receipts itself in Equation (3). Similarly, economic growth the predictor variable is defined by the delayed values of economic growth itself and tourism receipts in Equation (4).

**3.3. Application and Findings**

Since the causality analysis is performed with station series, for this purpose, primarily the existence of the unit root will be investigated. On the other hand, the existence of a correlation between the units is critical to define the proper unit root test. If there is a correlation between the units, first-generation panel unit root test, if not, the second-generation panel unit root test should be selected. "Pesaran (2004) CD Test" is employed to determine the correlation between the units.

**3.3.1. Cross-Section (CD) Test**

Pesaran (2004) CD Test uses the residuals obtained from the estimation of the ADF regression in the testing correlation between units. Accordingly, the correlation of each unit, except itself, with all other units is calculated. Therefore, while N is the unit, number of the correlation calculated will be (N x N-1). Hypotheses are “ $H\_{0}:ρ\_{ij}=0$ and $H\_{1}:ρ\_{ij}\ne 0$”. In the hypotheses, $ρ$ shows the correlation coefficient between the residues of the i. and j. units. The results are summarized in Table 1.

**Table 1: Pesaran (2004) CD Test Results**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variables | CD-test | p-value | corr | Abs(corr) |
| *Ln*EG | 64.86  | 0.000\*  | 0.981  | 0.981  |
| *Ln*TR | 46.54  | 0.000\*  | 0.704  | 0.727 |

Note: “\*shows the cross-sectional dependence at the 1% significant level.”

Table 1 shows the results of CD-test statistics, p-value, Corr coefficient, and absolute value (corr) results. “the null hypothesis (H0): no correlation between the series” was tested against “the alternative hypothesis (HA): there is a correlation between the series”. The "p-value" of the LnGDP and LnTR variables are less than 0.05. Therefore, “H0 is rejected” and determined that there is a correlation between the series.

**3.3.2. Stationarity of the Series**

When there is a correlation between the units, it is necessary to choose “the second-generation panel unit root tests”. Therefore, Pesaran (2007) CIPS the unit root test, which takes into account the existence of a correlation between units, was performed and the results are summarized in Table 2.

**Table 2: Pesaran CIPS Test**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Variables | t-bar | CV10 | CV5 | CV1 | Z[t-bar] | P-value |
| *Ln*EG | -1.831  | -2.110  | -2.200  | -2.380  | - 0.374  | 0.354 |
| *Ln*TR | -1.860  | -2.110  | -2.200  | -2.380  | - 0.509 | 0.306 |
| *dLn*EG |  -2.783  | -2.110  | -2.200  | -2.380  | -4.764  | 0.000 \*  |
| *dLn*TR |  -3.046  | -2.110  | -2.200  | -2.380  | -5.976  | 0.000\*  |

“Note: \* denotes stationary at the 1% significance level.”

Pesaran (2007) added the cross-sectional averages of the lagged levels and first differences of the series as a factor to the DF or ADF regression in order to eliminate inter-unit correlation (Tatoglu, 2017:84). Table 4 shows the CIPS test results revealing the stationarity of the series in level and first differences. The test results of the p-value of the series in the level are higher than 0.05. Therefore, the series belong to LnEG and LnTR are not stationary in the level”. When the first-order differences of the series are taken, the test results of the p-value of the series become lower than 0,05. It means both series are stationary and the integration order of the series are I(1).

Once the integration order of the series defined as I (1), the panel causality analysis can be implemented. However, before conducting a causality analysis, a proper lag-length value should be identified. For this purpose, “Hansen J Test” was employed, and the results were presented in Table 3 below.

**Table 3: Hansen J Lag-Length Test**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| lag | CD | J | p-value | MBIC | MAIC | MQIC |
| 1 | .9999973  | 7.997432  | .9489428  | -80.97347\*  | -24.00257  | -46.90563\* |
| 2 | .9999803  | 1.213897  | .9999965  | -76.63565  | -26.7861 \*  | -46.82628 |
| 3 | .9999786  | .6749051  | .9999724  | -54.93191  | -19.32509  | -33.63951 |
| 4 | .9999748  | .4535422  | .999908  | -44.03191  | -15.54646  | -26.99799 |

According to the results seen in Table 3, the lag-length that makes the MBIC and MQIC model selection criteria minimum is 1. Therefore, the appropriate lag-length is selected as 1.

**3.3.3. Homogeneity Test**

In order to determine whether homogeneous or heterogeneous Panel VAR model should be used in VAR causality analysis, Swamy S the homogeneity test was performed. The results are presented in Table 4.

**Table 4: Swamy S Test**

|  |  |  |
| --- | --- | --- |
| *Reg.* | χ2 (57) | Prob > χ2 |
| $LnTR\_{t}=a\_{1}+ β\_{1i}LnTR\_{t-i}+ β\_{2i}LnEG\_{t}+u\_{1}$ | 187.05 | 0.0000\* |
| $$LnGDP\_{t}=a\_{2}+ β\_{3i}LnEG\_{t-i}+ β\_{4i}LnTR\_{t}+ u\_{2}$$ | 650.55 | 0.0000\* |

“Note: \* denotes stationary at the 1% significance level.”

In Table 4, first of all, the variables (*Ln*EGit-1 and *Ln*TRit-1) to be used in the analysis are derived, then a delayed panel VAR model is estimated with the random coefficients model of the variables. According to the Swamy S test results, the χ2 probability values are less than 0.05 for both regression, so the parameters are heterogenous.

**3.3.4. VAR Panel Causality Analysis**

Since it was revealed that the parameters are heterogonous with the Swamy S-Homogeneity Test, it was decided to use the heterogeneous VAR model in Panel causality analysis. Accordingly, Dumitresu & Hurlin (2012) Granger Panel Causality Test, which takes into account the heterogeneity, was employed and the results are presented in Table7.

**Table 5: Dumitrescu & Hurlin Granger Panel Causality Test Results**

|  |  |  |  |
| --- | --- | --- | --- |
|  H0 Hypothesis: | W-bar Stat. | Z-bar Stat. (p-value) | Z-bar tilde (p-value) |
|  TR does not Granger-cause EG EG does not Granger-cause TR | 3.24704.8619 | 7.2810 (0.000)\* 12.5141 (0.000)\*  | 5.6356 (0.000)\* 9.9099 (0.000)\*  |

Note: \* indicates casualty at the 1% significance level. (Lag order: 1)

According to the results of the “Dumistrescu & Hurlin (2012) Granger Panel Causality Test”, which is seen in Table 7, it is, concluded that

1. International tourism receipts (TR) is the granger cause of economic growth (EG).
2. Economic growth is the granger cause of international tourism receipts

As a result, there is bi-directional causality between EG and International tourism receipts as it is seen in Table 6 below.

**Table 6: Short-term Relationships of the Variables**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  Variable | The direction of The Causality |  Variable |
| EG | **⇔** | TR |

**3.3.5. Co-Integration Analysis**

Table 7 and Table 8 show the long-term relationship between variables with the help of "Mean Group Estimator (MG) Method". The MG method proposed by Pesaran and Smith (1995) is applied to the estimation of the cointegration model and the averages of the parameters for each unit.

**Table 7. Pesaran & Smith Mean Group Estimator**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |  |
| --- | --- |
| Obs per group”  | = 21 |
| min/avg/ max  | = 23/23/23 |
| Number of obs”  | = 483 |

 |

|  |  |
| --- | --- |
|  |  |
| Wald χ2  | = 18.91 |
| Prob > χ2  | = 0.0000 |

 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| TR | “Coef. ” | “Std.Err. ” | “t” | “P>|t|”  | “ [95% Conf. Interval] ” |
| EG | 1.949034  | .4482014 | 4.35  | 0.000\* | 1.070575  | 2.827492 |
| \_cons | -8.91102  | 13.15877 | -2.20  | 0.028\* | -54.70174  | -3.120312 |

Note : Root Mean Squared Error (sigma): 0.3403

**Table 8. Pesaran & Smith Mean Group Estimator**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|

|  |  |
| --- | --- |
| Obs per group”  | = 21 |
| min/avg/ max  | = 23/23/23 |
| Number of obs”  | = 483 |

 |

|  |  |
| --- | --- |
|  |  |
| Wald χ2  | = 76.15 |
| Prob > χ2  | = 0.0000 |

 |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| EG | “Coef. ” | “Std.Err. ” | “t” | “P>|t|”  | “ [95% Conf. Interval] ” |
| TR | .4921293  | .0563966  | 8.73  | 0.000\* | .3815939 | .6026647 |
| \_cons | 10.37816  | 1.346251  | 10.68  | 0.000\* | 11.73956  | 17.01677 |

Note: Root Mean Squared Error (sigma): 0.1970.

The estimation of the long-term parameter seen in Table 7 is approximately 1.95 and is significant. P> “|t|” and “Probe> χ2” values are below the 0.05 significance level. Accordingly, long-term EG affects tourism revenues. An increase of 1% in economic growth increases tourism revenues by 1.9%.

Similarly, when Table 8 is examined, the estimation of the long-term parameter is approximately 0.49 and is significant. “P >| t | and Probe> χ2” values are below the 0.05 the significant level. Accordingly, long-term tourism revenues affect economic growth. A 1% increase in tourism revenues increases economic growth by 0.49 %.

**Conclusion**

In this research, the long-term and the short-term causality between tourism revenues and economic growth in Asian Pacific Countries were examined. The study covers 23 years period between 1995-2017 and consists of 483 observations. The indicator of economic growth is the Gross Domestic Product (GDP - current US $), and the indicator of tourism is International Tourism Receipts (TR - current US $).

Primarily, the functional and statistical models were defined. Then, to choose the appropriate test method in panel data analysis, the following test methods were employed: correlation between the series by Pesaran CD Test Method; homogeneity of the parameters and model by “Swamy S Test Method”; stationarity of the series by “Levin-Lin-Chu Unit Root Test Method”; proper lag-length by “Hansen J Test Method”. Accordingly, Dumitrescu & Hurlin (2012) Panel Causality Test Method, which considers the heterogeneity, was conducted to determine the short-term relationship between the series. Pesaran & Smith (1995) Mean Group Estimator Method implemented to determine the existence of the long-term relationship between the variables.

The Dumitrescu & Hurlin Panel Causality Test revealed a bi-directional causal relationship between economic growth and international tourism receipts in the short-term. The Pesaran & Smith Mean Group Estimator Results found a bidirectional relationship between economic growth and tourism receipts in the long-term. This bidirectional relationship indicates that an increase of 1% in economic growth leads to a 1.9% increase in tourism receipts. Conversely, an increase of 1% in tourism receipts leads to a 0.49% increase in economic growth.

A review of the extant literature reveals that prior research reports conflicting results regarding the relationship between tourism and economic growth. These conflicting results are primarily due to the differences in countries selected, period and the methods used. The literature identifies four main hypotheses that describe the relationship between tourism and economic growth: the tourism-led growth hypothesis; the growth-led tourism hypothesis; the neutrality hypothesis and the feedback hypothesis. The results of this research, usıng both short and long-term analysis, support the feedback hypothesis whıch claims a bi-directional causal relationship exısts between international tourism and economic growth. With this respect, this article supports research conducted by Seghir et al. (2015), Albaladejo et al. (2014), Dritsakis (2004), Durbarry (2004), Samimi et al. (2011) and Kim et al. (2006).

A primary contribution of this paper is to examine the nature of the relationship between tourism receips and economic growth and extend the research domain to the Asia Pacific region. Critically important to the global economy the Asia Pacific region has the largest share of tourist arrivals (29%) and tourism revenues (24%) worldwide. While a bi-directional causal relationship was found, this study finds the magnitude of the relationship of economic growth on tourism receipts is substantially higher than its reciprocal. This result can be explained in part by the high level of infrastructure spending, transportation investment and the technological advances in the region. This region’s rapidly growing economy is a key driver of tourism and increased tourism in turn drive economic growth in a synergistic manner. These results should be useful for other developing countries regarding determining economic policies and allocation of resources.

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