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SUSTAINABLE DEVELOPMENT AND TOURISM IN ASIA: PANEL DATA ANALYSIS

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Abstract

While as a major sector of the world economy, tourism's contribution to economic growth is widely accepted, the situation is not clear when it comes to sustainable development. This study empirically investigates whether there is a relationship between sustainable development and tourism in Asia-Pacific countries with rapidly growing economies and a promising tourism sector. In the panel data analysis where data from the period 2000-2015 was used, adjusted net savings set as sustainable development indicators, as well as tourist arrivals and tourism revenues representing the tourism sector were used. The empirical estimates across the panel indicate that tourist arrivals in Asia-Pacific countries have a negative impact on sustainable development accompanied by a positive impact on tourism revenues.

Keywords: Sustainable Development; Tourism; Asia-Pacific countries; Panel Data Analysis.

Subject classification codes: O11, Z32, O52, C23

1. INTRODUCTION

Incorporating many different sectors, the tourism industry is also called the "invisible export" industry. Tourism is a key sector in terms of generating revenues and attracting foreign exchange, creating new jobs, increasing investment opportunities in tourist hot-spots, and supporting the national or regional development of countries (Mathieson & Wall, 1982; Frechtling, 1994; Lew, 2011; Marin 2015). The 1970s saw factors such as global liberalization policies, the removal of travel restrictions between countries, easier visa access, technological progress, and a reduction in transport costs which gave the tourism industry a new boost. And the industry is still growing steadily despite global political uncertainties, threats to human health, and economic crises. According to the United Nations World Tourism Organization Tourism Highlights (UNWTO, 2017), in

2016, 16% of the world's population, which is equivalent to 1,235 million tourists, traveled to other countries for touristic purposes. It is estimated that by 2030 international tourist arrivals will have reached 1.8 trillion. The same report states that international tourism revenues were close to USD 1,300 billion in 2015, compared to USD 17.9 billion in 1970.

In recent years, the rapidly growing tourism sector has begun to play a more distinctive role in increasing consumption compared to previous periods, contributing to the overuse of scarce resources and surpassing the self-renewal capacity of natural resources (Goldin & Winters, 1995; Frechtling, 2000; Dauvergne, 2010; Kaypak, 2011). The tourism sector triggers various negative externalities (Andereck, Valentine, Knopf &Vogt, 2005; Avcı, 2007; Duran, 2011; Shariff, Afshan & Nisha, 2017), including increased use of fossil fuels in transportation due to the increase in tourism demands, release of harmful waste materials into the environment by tourism companies (accommodation, food and beverage businesses, etc.) (Andereck, 1995), due to the lack of infrastructure, destruction of the natural environment for tourist activities (Rosenow&Pulsipher, 1979), damage of historical and cultural sites by tourists, protests from local communities against high levels of tourism or corruption of local cultures, increased criminal activities and vandalism in tourists destinations (Brunt & Courtney, 1999), and heavier traffic and tourism-led migration (Salonia, 2016). There are even media reports of local communities in certain European countries protesting against tourists due to the negative environmental impacts they have.

There is a tendency in academic studies that tourism has a contribution on economic growth in the context of the tourism-led growth hypothesis. But can we still call it a contribution of tourism when it comes to sustainable development? The study tries to find empirical evidence to answer this question. The concept of sustainable development first came up in the "Our Common Future" Brundtland Report published by the United Nations World Commission on Environment and Development (UNWCED, 1987). This document defines sustainable development as "meeting today's needs without compromising the possibilities and capabilities of future generations". Sustainable development, focusing on the long-term use of a limited capacity for the continuation of the global ecosystem and quality of life for society as a whole, has a wider

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context than the classical economic growth theory and models based on quantitative increase in production capacities. The main determinants of economic growth are the quantitative increase in capital and labour factors, productivity increase in production factors, technological development, or price system applications (Mankiw, 2016). The classical understanding of economic growth, which revolves around production and consumption circulation, has now been replaced by the concept of sustainable development, which acknowledges that production takes place within a constrained ecosystem and emphasizes the importance of protecting the environment (Pezzey, 1992). Accordingly, the United Nations World Tourism Organization (UNWTO) announced that they had adopted the principles of the "Transforming Our World: The 2030 Agenda for Sustainable Development" adopted by the United Nations General Assembly (UNGA, 2015). It is stated that the targets of "Decent work and inclusive and sustainable economic growth (Goal 8)", "Ensure sustainable consumption and production (Goal 12)" and "Underwater life (Goal 14)" in the agenda are related directly to the tourism sector.

Sustainable development is human-centred and prioritizes social participation in its methodology. Preserving natural resources, preventing their deterioration and acknowledging their potential for running out are key components of sustainable development (Sharply, 2009). It is difficult to say if tourism contributes to sustainable development or not. More discussion and empirical analyses are needed to ensure that discussions in this field are based on sound foundations. Is there a relationship between sustainable development and tourism? If there is, is it a long-term relationship? Is growth becoming unsustainable in the future due to negative externalities in tourism? This study aims to find an answer to these questions by investigating the relationship between sustainable development and tourism.

The area in which panel data analysis was applied empirically for the period 2000-2015 covers the selected Asian and Pacific countries (Australia, China, Japan, Korea, New Zealand, Singapore, Thailand, Indonesia, Malaysia, India). The Asia-Pacific region includes both developed and developing economies of differing sizes and income levels. Japan, Australia and South Korea are industrialized countries with high GDPs per capita and generally low growth rates. China and India are large emerging economies with strong economic growth rates that stimulate global growth (World Bank, 2014). According to the World Bank's (WB) statistics, the real economic growth rate of the region in 2016 was around 6.3% (retrieved from http://databank.worldbank.org/data). Rapid economic growth in the region, increasing market openness, airway links and ease of travel have resulted in significant increases in international tourist flows towards the Asia-Pacific region, as well as in domestic tourism (UNWTO GTERC, 2016). At the same time, with its cultural, historical and natural heritage, the Asia-Pacific region is the main source market for many destinations. Another aim of the study in this context is to obtain empirical evidence on the relationship between sustainable development and tourism in the Asia-Pacific region, which has made great progress in terms of both economic growth and the global tourism sector. In this sense, empirical analysis is expected to contribute to the creation of new policies and strategies for the potential sustainable development of public and private sector enterprises in the tourism sector.

2.LITERATURE REVIEW

For a long time the concepts of economic growth and development were used interchangeably. For this reason, the academic literature mostly consists of studies that examine the relationship between economic growth and tourism as a representative of quantitative increases in a country. Due to the increasing importance of the tourist industry to the general economy across the world, discussions and studies in the literature have also increased. Ghali (1976) was the first researcher to empirically examine the relationship between tourism and growth. By using the Ordinary Least Squares method, he reached the conclusion that personal income would have been 17% lower if there was no tourism in Hawaii between 1953-70. Meanwhile, Balaguer & Cantavella-Jordà (2002) were the first researchers to analyze the tourism-led growth hypothesis. They used the real gross national product, international tourism revenues and effective real exchange rate variables in order to do this. They concluded that for the years 1975-1997 there was a stable and one-sided relationship between tourism and economic growth in Spain. This hypothesis was later tested on other countries. For economic growth, the variables of gross national product, per capita income, and economic growth rates were used, while the variables of tourist arrivals or tourism revenues were often used for tourism. Dritsakis (2004), Greece; Demiröz & Ongan (2005) and Gündüz & Hatemi-J (2005), Turkey; Oh (2005), Korea; Risso & Brida(2000), Chile; Chen & Chiou-Wei (2009), Taiwan and South Korea; Mishra, Rout & Mohapatra (2011), India; Jin (2011), Hong Kong; Tang & Abosedra (2014), Lebanon; and Hatemi-J (2016), United Arab Emirates are some examples of studies analyzing the tourism-led economic growth hypothesis using time series.

Since 2000, the relationship between economic growth and tourism has been investigated using the panel data method, which enables one to work with a wider data set. Lanza, Temple & Urga (2003) were the first researchers to examine the relationship between tourism and economic growth using panel data for thirteen countries of the Organisation for Economic Co-operation and Development (OECD). They used variables such as 1977-1992 annual data and gross national product, tourist arrivals, total expenditure, and tourism prices, and found that there was a causality relationship between economic growth and income. Eugenio-Martín, Morales & Scarpa (2004) worked with data from 21 Latin American countries for the period 1985-1998. The data showed that the tourism sector was sufficient for encouraging economic growth in middle and low-income countries, but that the same thing may not apply to advanced economies. Fayissa, Nsiah & Tadasse (2008) reached the conclusion that tourism revenues in the 42 sub-Saharan African countries in the period of 1995-2004 had a significant impact on both gross national product and economic growth, as well as positively affecting physical and human capital investments. In their analysis of 94 countries, Sequeira & Nunes (2008) showed that tourism is a positive determinant of economic growth, applying both to large countries and poor countries. Holzner (2011) examined the long-term relationship between tourism and economic growth for 143 countries with data from the 1970-2007 period. He found that tourism-dependent economies were not adversely affected by fluctuations in foreign exchange rates and were industrialized, but that tourism in itself was not enough to generate high growth levels. Apergis & Payne (2012) conducted a panel cointegration test for the period 1995-2007 covering the Caribbean countries, revealing a long-term balance between real gross domestic product (GDP) per capita, real effective exchange rates and international tourist arrivals per capita. By applying the panel error correction model, they found a two-way causality between tourism and economic growth both in the short and the long term.

The vast majority of empirical surveys conducted with both time series and panel data methods have shown that tourism contributes to economic growth. Empirical studies that analyze the relationship between sustainable development and tourism on the other hand are quite new. In fact, as Sharply (2000) points out, the theory of sustainable development is a parental paradigm. For this reason, the applicability of sustainable development in a tourism-specific context is seldom questioned. On the other hand, the analyses are scattered and varied because both the scope of sustainable development is very broad and the different sectors in the tourism industry have intense and intricate networks of interrelations. In addition to this, it is not possible to find one or more basic variables that directly represent sustainable development in the same way as the variables used as economic growth indicators in empirical surveys. Analyses are generally carried out within the spectrum of ecology, climate change and green economy. To assess the impact of environmental degradation or climate change, variables representing consumption of energy sources such as electricity, oil, natural gas, greenhouse gas emission rates, the climate change performance index, the environmental performance index, or renewable energy sources have been used. There have also been attempts to indirectly examine the relationship between development and tourism within the framework of sustainable tourism (Garrod & Fyall, 1998: 200), a concept derived from sustainable development. In addition, some theoretical or conceptual studies have discussed sustainability by analyzing the relationships between local development, rural development, education, migration and tourism. Examples in the literature related to the relationship between tourism and development that do not directly deal with sustainable development and tourism, but which emphasize sustainable development in accordance with the concept of sustainable development, are as follows:

Gössling (2002) identified five areas in which tourism has contributed to major global environmental changes. These include changes in vegetation cover and land use, energy use, biotic changes and the extinction of wild species, mutation and spread of diseases, and changes in environmental perception and understanding through travel. He reaches the conclusion that one of the ultimate goals of sustainable development is to develop responsible environmental behavior and that travel can increase environmental awareness, but that this may not necessarily lead to an eventual positive change in attitude, awareness or environmental behavior. He also states that the fossil energy sources used in the tourism sector have a negative impact on the environment. In an analysis covering Central and Eastern Europe, Hall (2000) mentioned that environmental protests were mounting against the encroaching impacts of tourism, while Lee, Verances & Song (2009) found that tourism in South Korea had a statistically significant impact on the environment, but that environmental variables did not affect tourism. Citing examples, Burak, Doğan & Gazioğlu (2004) discussed the rapid and uncontrolled urbanization of Turkey's coastlines culminating in their capacities being exceeded, even though they are still highly popular tourist attractions. They offered alternative approaches and plans for strengthening the capacity according to the principle of sustainability. Bahar (2007) investigated the importance of tourism in regional development. He provided a statistical

assessment of tourism supply and demand for each geographical region of Turkey, the incentives given to the tourism sector, as well as the human development, education, average life and income indices. From this he concluded that tourism contributed significantly to the economic growth of backward and underdeveloped regions and the restructuring of the economy. Katırcıoğlu (2014) examined the effect of the variables of the number of tourists arriving and staying in Turkey, energy use and gross domestic product (GDP) on climate change in Turkey during the period 1960-2010. Climate change was defined as a dependent variable and carbon dioxide emission rates were used. The results of the empirical survey indicated that tourism had a statistically significant and positive effect on carbon dioxide (CO2) emissions in Turkey in the long and short-term. It has also been found that tourism has significantly increased CO2 emissions and energy consumption over long periods of time, and that some of its effects will become more pronounced over time. Eusébio, Kastenholz & Breda (2014) studied tourism and its impact on sustainable development in the Portuguese village of Janeiro de Cima. They found that tourist agencies and local procurement agencies were the main driving forces of local development in tourism. Al- Mulali, Fereidouni & Mohammed (2015) applied the panel data analysis to a selected 48 countries in the period from 1995-2009 and discovered that tourist arrivals had a significant impact on the CO2 emission rates through the transportation sector. Granger causality test results showed that tourism was the most important factor causing increased levels of CO2 emissions in Africa, Asia and the Pacific, the Americas and the Middle East. Leitao & Shahbaz (2016) investigated the relationship between economic growth, tourist arrivals and climate change in 27 European Union countries for the period of 1990-2009 with static and dynamic panel data methods. They used the variable gross national product for studying economic growth and CO2 emissions for climate change. They found that tourist arrivals increased the CO2 emission volumes and created negative externalities and that income per capita, energy consumption and commercial openness had a positive impact on tourist arrivals. Zhang & Gao (2016) reviewed the impact of international tourism on China's economic growth, energy consumption and environmental pollution using panel data analysis with data from 1995-2011. They revealed that the tourism-led growth hypothesis did not apply in the central part of China, that there was very weak evidence from the eastern and western regions supporting the hypothesis, and that tourism in the eastern region had a negative effect on CO2 emission rates. Sharif, Afshan & Nisha (2017) examined the relationship between CO2 emission rates, tourist arrivals and economic growth in Pakistan during the period 1972-2013. Estimate results indicated a one-way causality between CO2 emission rates and tourist arrivals.

In the empirical analysis of this study, the use of a single variable as a sign of sustainable development makes the study original. Thus, under the constant assumption of all other things (ceteris paribus), the findings of the study may provide grounds for a clearer discussion of the relationship between tourism and sustainable development.

3. ECONOMETRIC ANALYSIS

Empirical analysis was used to see whether there is a relationship between sustainable development and tourism. To test the existence of this relationship, forecasts were generated using the adjusted net savings, tourist arrival and tourism revenue data for 10 Asia-Pacific countries with high levels of tourism income for the period 2000-2015. The data was obtained from the World Bank World Development Indicator[1] (WDI) data set. Within this framework, panel data analysis was used and panel unit root, panel cointegration and Panel Dynamic Ordinary Least Square (PDOLS) tests were applied. After the econometric model and the variables of the study were introduced, the tests used with panel data analysis were briefly explained.

3.1. Econometric Model And Data Set

In the empirical analysis, ten Asian-Pacific countries were selected as the sample group. According to the data of the World Bank, the countries that make up the sample group are the countries that have the highest tourism income in Asia and their economic growth rates are not affected even in the global economic crisis period of 2007-2008. The data used in the model is annual and covers the period of 2000-2015.

[1] Retrieved from http://databank.worldbank.org/data/views/variableselection/selectvariables.aspx?source=wor ld-development-indicators.

Table 1: List of variables.

Variables	Measurment	symbol	Expected sign	Data source
Sustainable developement	Current US $	LnANS		WDI
International tourism, number of arrivals	numbers	LnTA	negative	WDI
International tourism, receipts	Current US $	LnTR	Positive/negative	WDI

Notes: The symbol "Ln" indicates that the logarithm of the variables is received.

In this study, adjusted net saving data, also referred to as "genuine saving" in the literatüre (Pearce & Atkinson, 1993), was used to represent the sustainable development variable. Adjusted net saving is a sustainable development indicator preferred by researchers (Aidt, 2011) that aims to measure the capital stock of an economy and calculates manufacturing industry, human, social and natural capital variables using their current prices. Defined and calculated by the World Bank (WB), the data was found by deducting public education expenditures, the reduced income from natural capital resulting from the use of natural capital, and the damage from carbon dioxide emissions from national net savings. In the study, the independent variables of tourist arrivals and tourism revenues were used as indicators of a developing tourism sector. The variables used in the models and the sources where they were obtained are given in Table 1. In order to analyze the relationship between sustainable development and tourism, the study used the Eviews 8 econometric package program for empirical analysis defined in a logarithmic form. "ANS" shows the sustainable development, "TA" the tourist arrivals, "TR" the tourism revenues, while "μ" refers to the error term. "I" and "t" sub-indices in the model show cross-sections and time, respectively.

ANSit = f (TAit, TRit) (ceteris paribus)

LnANSit = β1 + β2 LnTA it + β3 LnTRit + μit (1)

In the estimation of the model in Equation 1, a panel unit root analysis will be primarily carried out for each variable. Panel cointegration tests will then be performed to obtain the cointegration parameters, and finally the PDOLS test will be used to predict long-term parameters.

3.2. Econometric Method

Panel data analysis is a method used to estimate economic relations by bringing together the horizontal cross-sectional observations of units such as countries, individuals, firms and households that have a time dimension. The panel data consists of an N number of units and a T number of observations corresponding to each unit. The valuation of both sections in panel data analysis provides the researcher with more data to work with, which in turn increases the number of observations and the degree of freedom. Thus, the degree of the multiple linear link between the explanatory variables decreases and the efficiency and reliability of the econometric estimates increases. In general, the basic panel data model is as follows (Baltagi, 2008; Tatoğlu, 2013).

$Yit = ait + \beta kit Xkit + uit$ i=1….., N (unit); t=1,.....,T (time) (2)

In Equation 2, Y is the dependent variable, Xk is the independent variable, α is the constant parameter, β is the slope parameter, and μ is the error term. i represents the sub-index units (individuals, firms, countries) and the t sub-index represents time (day, month, year, etc.). The fact that variables and parameters and the error term have the i and t sub-indices indicates that they have a panel data set. In this model, constant and slope parameters adopt values according to both units and time.

Before analysing the existence of a relationship between variables in the panel data analysis method, it is necessary to test the stability of the variables. According to Granger & Newbold (1974), the relationship between the variables studied is not reliable when one works with non-stationary data. For this reason, the stability must be checked before the regression analysis. Fisher ADF (Maddala & Wu, 1999), Breitung (1999), Fisher PP (Choi, 2001) Levin, Lin & Chu (LLC, 2002), and Im, Peseran & Shin (IPS, 2003) are the most well-known examples of panel unit root tests. These tests assume that there is no correlation between the units and are based on the dynamic fixed effect model, which is generally similar to the Augmented Dickey Fuller (ADF). In Equation 2, the μi and τi parameters are used to show the fixed effects and trend parameters, respectively. The existence of stability can be examined by testing ρ with the appropriate methods.

Yit = μi + τit +ρYit-1 +δiθt + εit (3)

There are two kinds of assumptions about ρ. The first of these assumes that ρ does not change from unit to unit, that is, that there is a general unit root process. This is known as the First Group Panel Unit Root Test. LLC (2002) and Breitung's (2000) tests take on this assumption. In these tests, the basic hypothesis is "there is at least one unit root".

In the Second Group Panel Unit Root Test, ρ is assumed to change from unit to unit. IPS (2003), Fisher ADF (Maddala & Wu, 1999) and Fisher PP (Choi, 2001) are examples of these tests. Here, each unit is allowed to have its own auto-correlation coefficient. In these tests, the basic hypothesis of "no unit is stable" is tested against the alternative hypothesis that "at least one of the units is stable". The linear combinations of these series can be stable if the series belonging to the variables contain a unit root as a result of the applied unit root tests. In such cases, the existence of a long-term relationship can be investigated through panel cointegration tests.

Kao (1999) and Pedroni's (1999, 2004) cointegration tests are commonly used for panel cointegration analysis in the literature. These two tests have also been used in the empirical application of the study. The Kao Panel Cointegration Tests are Dickey Fuller (DF) and Augmented Dickey - Fuller (ADF) based tests. The basic hypothesis of "there is no cointegration" is tested. The tests developed by Pedroni are based on remnants (error term) obtained from an equation as follows. For this reason, the first step is to calculate the remnants from the cointegration regression (Pedroni, 1999):

$$Y_{i,t} = \alpha_i + \delta_{i,t} + \beta_{1i} X_{1i,t} + \beta_{2i} X_{2i,t} + \ldots\ldots + \beta_{mi} x\, m_{i,t} + \varepsilon_{i,t} \quad (4)$$

t=1,...,T; i=1,...,N; m=1,…M

Pedroni (1999, 2004) suggested seven different tests (Panel-v, Panel- ρ, Panel-PP, Panel-ADF, Group-ρ, Group–PP, Group-ADF) whose hypothesis is "there is no cointegration" (H0 : Φi = 0). Heterogeneity is allowed under an alternative hypothesis.

The rejection of the basic hypothesis implies that a sufficient number of units have statistics that diverge from their average value. The first four of these are panel cointegration tests within sections, and the other three are panel cointegration statistics between sections. The comparative advantages of these statistics vary greatly depending on the data generation process. The significance of the panel-v statistic is an important indicator of cointegration as the group- ρ statistical sample size begins to grow in small samples.

Long-term parameters can be estimated using the PDOLS (Stock & Watson, 1993) method if there is a long-term relationship between the series of variables. The PDOLS estimator (Kao & Chiang, 2000) is obtained by estimating the regression in Equation 5 using the values of the primary and lagged variables of the differentiated I (1) variables.

$$LnYit = \beta 0i + \beta 1i\ LnK1i + \beta 2i\ LnX1i + \sum_{k=-Kii}^{Kii} \alpha ik\ \Delta LnKit + \sum_{k=-Kii}^{Kii} \lambda ik\ \Delta Xit + \varepsilon it \quad (5)$$

The -Ki and Ki represent the primary and lagged variables. The PDOLS method is a method that is capable of removing deviations in the static regression by incorporating dynamic elements into the model.

4.EMPIRICAL RESULT

In order to determine the relationship between sustainable development and tourism in Asian countries, firstly it was investigated whether variables were stationary using panel unit root tests. LLC, Breitung, IPS, Fisher - ADF and Fisher - PP model unit root tests were used in the study.

Table 2: Panel unit root test results.

Test	LLC	Breitung	IPS	ADF	PP
Variable	Constant and Trend	Constant and Trend	Constant and Trend	Constant and Trend	Constant and Trend
ANS	0.353 (0.638)	-0.001 (0.499)	1.014 (0.844)	8.596 (0.987)	39.459 (0.005)
TA	-1.201 (0.114)	1.253 (0.894)	0.6969 (0.757)	13.707 (0.845)	22.696 (0.303)
TR	-3.011 (0.001)	-0.878 (0.189)	-0.234 (0.407)	19.262 (0.504)	30.355 (0.064)
ΔANS	-10.054*** (0.000)	-6.358*** (0.000)	-6.093*** (0.000)	72.430*** (0.000)	151.926*** (0.000)
ΔTA	-5.461*** (0.000)	-2.246)** (0.012)	-2.196** (0.014)	37.715*** (0.009)	105.995*** (0.000)
ΔTR	-9.742)*** (0.000)	-3.937*** (0.000)	-5.0517*** (0.000)	62.978*** (0.000)	107.573*** (0.000)

Notes: : * (**) *** indicate significance at 10% (5%) and 1% levels, respectively. Paranthesis ( ) indicates the p-values. Δ is first difference operator. The AIC was used to determine the lag lengths.

Table 2 shows the results from applying the unit root tests of the variables on stationary and trend panel data, as well as the t-statistic and probability values in the first difference. According to the results of LLC, Breitung, IPS, ADP and PP tests, the null hypothesis is accepted, which argues that the level values of

the series contain unit roots. In other words, the series are not stationary between levels. As the presence of series unit roots in the levels is insufficient for the cointegration test, a stationary and trend unit root test was applied after performing a difference operation. It was understood that all variables are stationary (1) in the first degree.

The null hypothesis that there is no cointegration between panel variables was tested with the Pedroni (1999) and Kao (1999) cointegration tests. Statistical values other than panel-v, panels-rho, group-rho, which are shown in Table 3, confirm that the variables used in the Pedroni cointegration test are cointegrated in the long run. Pedroni (1999) shows that panel-ADF and group-ADF tests will yield more meaningful results, especially for small samples. As the probability value turned out to be meaningful as a result of the Kao (1999) cointegration test (Engle-Granger dependent), which was applied secondarily, the basic hypothesis of "there is no cointegration" was rejected in favor of the alternative hypothesis "there is cointegration". After determining the cointegration between the variables, the cointegration parameters were then collected and shown in Table 3.

Table 3. Panel Cointegration Test Results.

Statistic	Constant and Trend
Panel-v	0.6460 (0.2591)
Panel-rho	1.2841 (0.9005)
Panel-PP	-7.5536*** (0.0000)
Panel-ADF	-6.2218*** (0.0000)
Group-rho	2.7119 (0.9967)
Group-PP	-6.4176*** (0.0000)
Group-ADF	-5.6115*** (0.0000)
Kao test statistic	Constant
ADF	1.3864* (0.0828)

Notes: * (**) *** indicate significance at 10% (5%) and 1% levels, respectively.
Paranthesis ( ) indicates the p-values

According to the findings obtained as a result of the analysis of the panel DOLS model in Table 4, the coefficients of the independent variables in the model across the panel are statistically significant. When the coefficients are examined, it is seen that the coefficient of the variable tourist arrivals (LnTA) is negative and the coefficient of the variable tourism revenues (LnTR) is positive across the panel. Empirical estimates indicate a long-term and statistically significant relationship between the variables.

According to the long-term forecasts, a 1% increase in tourist arrivals to Asia-Pacific countries chosen to represent the panel will result in a 0.6% decrease in sustainable development, while a 1% increase in tourist revenues will result in a 0.4% increase in sustainable development. This provides evidence that tourist arrivals in the selected Asian countries have adverse effects on sustainable development. Tourism revenues, on the other hand, have a positive impact on sustainable development.

Tablo 4: Panel DOLS long-run elasticities (ANS as dependent variable)

	LnANS is	**dependent variable**
	LnTA	**LnTR**
Country		
Australia	-0.665*** (-8.009)	0.098*** (7.230)
China	-0.787*** (-2.815)	0.0492** (4.373)
Japan	-0.584** (-2.546)	0.358** (2.841)
Korea, Rep.	-0.171*** (3.682)	0.259** (-3.368)
New Zealand	0.374* (2.060)	0.357** (-3.292)
Singapore	-0.411**	0.178*

	(-0.137)	(0.083)
Thailand	0.094*** (10.191)	0.7169** (-2.885)
Indonesia	0.156 (0.883)	0.298* (-2.119)
Malaysia	0.362 *** (4.0564)	0.621*** (-3.540)
India	-0.265* (0.703)	0.358* (0.114)
Panel	-0.658*** (-3.028)	0.482** (3.622)
Diagnostik istatistikler	R-squared 0.90	Mean dependent var 2.686592

Notes: * (**) *** indicate significance at 10% (5%) and 1% levels, respectively. Paranthesis ( ) indicates the t-statistic.

When the forecasting results are evaluated on a country-by-country basis, it is seen that high numbers of tourist arrivals have a negative impact on sustainable development for Australia, China, Japan, South Korea, Singapore and India, while it positively contributes to sustainable development in New Zealand, Thailand and Malaysia. In Indonesia, on the other hand, the parameter of the variable tourist arrivals is not statistically significant. It can be inferred that tourism revenues in all the selected countries can create a positive impact on sustainable development. Moreover, when the coefficients relating to different countries are examined, the highest coefficient belongs to China in terms of the negative effect of tourists on sustainable development.

5. CONCLUSION

With its social, cultural, environmental, holistic, egalitarian and future-oriented aspects, sustainable development differs from economic growth, which represents a periodical increase in gross national product. The contributions of the tourism industry to the real economy are widely accepted. The majority of empirical studies confirm the tourism-led growth hypothesis. But, although studies contain references to environmental pollution, damage to cultural and social values and historical monuments, and increased costs caused by tourism, the issue of whether or not tourism contributes to sustainable development is quite new in the literature. Based on that, the main purpose of the study was to empirically examine the relationship between sustainable development and tourism. Countries in the Asia-Pacific Region, which have been enjoying high rates of economic growth and a vibrant tourist industry since the 1980s, have become significant production bases for the global economy. For this reason, the 10 most favored tourist destinations in the Asia-Pacific Region were chosen as the empirical field of study for evaluating the relationship between sustainable development and tourism. The relationship was assessed using annual data for the period 2000-2015 and the panel cointegration method, and long-term coefficients were forecast with the PDOLS method.

The empirical estimates confirm a long-term relationship between variables made up of data from a selection of countries in the Asia-Pacific region. Long-term forecasts show that a 1% increase in tourist arrivals to the Asia-Pacific countries chosen to represent the panel will result in a 0.6% decrease in sustainable development, while a 1% increase in tourist revenues will result in a 0.4% increase in sustainable development. We also found that tourist revenues contribute positively to sustainable development for countries across the panel. Estimation results indicate that the negative impact of tourism on sustainable development is proportionally higher than the contribution made.

The negative coefficient with regards to tourist arrivals can be interpreted as the negative impact of ever-increasing tourism activities on universal values and the preservation of natural resources. In other words, it can be assumed on the basis of these findings that the ever-increasing number of tourist arrivals has a negative environmental impact and plays a role in the proliferation of social conflicts, poses a threat to public health and personal security, and causes excessive consumption of natural resources, thereby negatively affecting sustainable development. For this reason, this study suggests that the implementation of two measures should be made policy priorities in the tourism sector. One is social capital and the other is the low social discount rate. The cost increases caused by the negative externalities created by tourists (such as the need to allocate more resources for keeping the environment clean during the high season, or locals finding life more difficult due to increased traffic and population) can be reflected on tourists by introducing different tax schemes or more stringent visa procedures. However, after a certain period of time, such practices may lead to a decrease in the number of tourist arrivals and tourist revenues. For this reason, social capital, which is stated to be effective in preventing costs and reducing negative environmental externalities,

should play a more significant role in tourism plans (Witheley, 2000). Putnam (1995) found that social capital has an impact on every aspect of human life, contributing to the efficient functioning of governments. It is therefore important to check whether there is a vertical and horizontal communication network based on mutual trust that promotes participation between all stakeholders (public, private sector and residents) affected by tourism activities and, where necessary, improvements should be made. In addition, supporting these networks with a viable technological infrastructure and making discussion forums more widespread can provide an opportunity to tackle problems faced by popular tourist destinations with a holistic approach.

Another proposal for ensuring sustainable development is to take into account the reduced social discount rate practices in the tourism sector. Weitzman (1998, 2001) suggests a reduced social discount rate for inter-generational activities. Gollier (2002) showed that reduced social discount rates should be used for potential utility functions. For this reason, it should be debated whether a reduced social discount rate should be used when benefit-cost analyses are carried out for projects and schemes involving the tourism sector and the businesses involved in it. Furthermore, another option would be to examine the policies of countries whose estimation results show a positive coefficient for the variables. If these countries have policies in place that promote sustainable development, these can be proposed to other countries as benchmarking.

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