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The Tourism-Led Growth Hypothesis in Indonesia

This study investigates the relationship between economic growth and tourism in Indonesia for the period of 1995 to 2015. This study uses the Toda-Yamamoto causality test along with its prerequisite test. The results show that tourism causes economic growth and supports the unidirectional causal relationship. This finding is also in line with the tourism-led growth hypothesis. As a consequence, the government should pay attention on the resources allocation for the development of the tourism industry, specifically by supporting infrastructure development and promoting tourism in Indonesia through more advertisements, removal of visa restrictions, and implementation of a discount program for tourist groups. Thus, an intensive government policy is required to increase the international demand for Indonesian tourism and to stimulate the development of either private or public tourism infrastructure.

Keywords: Economic Growth; Tourism Expenditures; Tourism-led Growth; Toda-Yamamoto Causality, Indonesia

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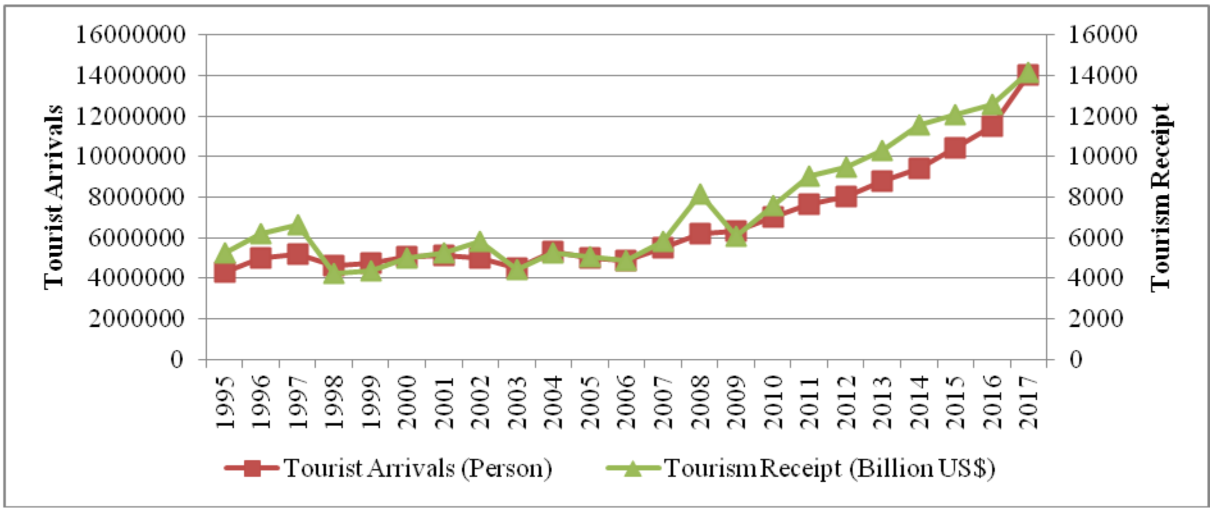
Introduction

Tourism is one of the fastest growing sectors and a major source of income for developed and developing countries. International tourist arrivals have increased from 25 million globally in 1950 to 0.27 billion in 1980, 0.67 billion in 2000, 1.19 billion in 2015, 1.24 billion in 2016 and 1.4 billion in 2017 (UNWTO, 2018). By UNWTO region, Europe was the most popular destination in 2017, receiving approximately 50 percent of the world's tourist arrivals. Asia-Pacific received 25 percent of tourist arrivals, while the Americas received 16 percent of world tourist arrivals. Less popular tourism destinations include Africa, with 5 percent of global tourist arrivals and the Middle East, with 4 percent of global tourist arrivals (UNWTO, 2018).

Figure 1. Tourist Arrivals and Tourism Receipt in Indonesia 1995 - 2017



Source: World Bank (2018)

Figure 1 shows the statistics of international tourist arrivals and tourism receipt in Indonesia from 1995 to 2017. Along with the development of Indonesian tourism, the number of international tourist arrivals increased from 1995 to 2017, although this number has tended to fluctuate in recent years. In 1995, the number of international tourist arrivals was approximately 4.3 million and increased by 14.04 million in 2017. In line with the international tourist arrivals, the receipt from the tourism sector also increased in the period of 1995 to 2017. In 1995, tourism receipt were US$5,229 billion, and then it reached US$14,177 billion in 2017 (World Bank, 2018). From the Figure 1, we see that the number of international tourist arrivals and tourism revenues in Indonesia tend to increase annually.

Empirically, the positive effect of tourism on economic growth is influenced by various indicators both at the global and national levels. However, the question remains whether tourism encourages economic growth, or vice versa. In general, to prove the relationship between tourism and economic growth, several approaches can be implemented, i.e., the tourism-led growth hypothesis, the economic-driven tourism development hypothesis, and causality hypothesis between tourism and economic growth (Oh, 2005).

Numerous studies on the relationship between tourism and economic growth have different results and conclusions. Balaguer and Cantavella-Jordá (2002) and Dritsakis (2004), show the evidence of one-direction causality from tourism to economic growth. Meanwhile, another studies such as Brau et al. (2003), Durbarry (2004), and Kim et al. (2006) show two-way causality between tourism and economic growth. The study of tourism and economic growth in Indonesia also show various results. Sugiyarto et al. (2003), use a computable general equilibrium model of the Indonesia economy, find that tourism growth leads to greater positive effects. Nizar (2011) find the growth of tourism and economic growth have reciprocal causal relationship.

The difference in empirical findings indicates that each country has a unique experience in supporting tourism development. More specifically, it relates to tourism as a driver of economic growth. Whether one-way or two-way causality exists between tourism and economic growth, tourism has been proven to have a significant influence on economic growth. The precise methodology used is important, but solely due to the need of an appropriate policy recommendation for the government.

The difference in the empirical findings is in line with the important role of tourism in economic development, which requires not only further research, but also other methodologies to test the relationship between tourism and economic growth. The purpose of this paper is to prove the direction of long-term causality between tourism and economic growth in Indonesia during 1995–2015 using the standard Johansen cointegration test and a modified version of the Granger causality test proposed by Toda and Yamamoto (1995).

The difference of this research from the previous studies is in the addition to the scope, time period and the method used. This study uses the Toda-Yamamoto causality test method to accommodate the weaknesses of the Granger causality test when data has integration. Furthermore, Toda-Yamamoto causality test method overcomes the problem of model specification bias.

Literature Review

Several studies have investigated the relationship between tourism and economic growth from theoretical and empirical perspectives. From a theoretical perspective, the relationship between tourism and economic growth has been developed in three dimensions:

(1) Short-run analysis based on the Keynesian income multiplier, or the so-called tourism multiplier (Cooper, 2008);

(2) The input–output model or the computable general equilibrium model, which studies the interrelationship between tourism and other sectors (Dwyer et al. 2004, 2006; Blake et al. 2006; Sinclair et al. 2010);

(3) The long-run perspective rooted in either exogenous or endogenous growth models (Bharat R. Hazari & Sgro 1995; Lanza & Pigliaru 2000; Candela & Cellini 1997; Lozano et al. 2008).

Balaguer and Cantavella-Jordá (2002) first investigated tourism-led growth hypothesis for Spain by using data from 1975 to 1997. The results support the tourism-led growth hypothesis. Brau et al. (2003) examined the ratio of tourism spending to total consumption expenditure and the ratio of relative prices of goods and services bundles to consumer price deflators for 13 OECD countries. By using cointegration and Granger causality tests between 1977 and 1992, this study validated the hypothesis that tourism is a driver of economic growth. Durbarry (2004) examined real exports and real gross domestic product (GDP) for Mauritius by using the vector error correction model (VECM) and Granger causality tests between 1952 and 1999. The authors found that tourism development led to economic growth. Gunduz and Hatemi-J (2005) used a leveraged bootstrap causality test for Turkey from 1963–2002. The study confirmed the flow of causality from tourism to economic growth.

Brida et al. (2008) examined the contribution of tourism to economic growth in Chile using the Johansen cointegration test and modified version of the Granger causality test. The results show that economic growth in Chile was caused by the expansion of international tourism, thus supporting the hypothesis that tourism is a driver of economic growth. Brida et al. (2008) analyzed tourist spending, real exchange rates, and real GDP in Mexico between 1980 and 2007 using the Granger causality test. This study found a direct causal relationship from tourism development to economic growth. Chen and Chiou-Wei (2009) also confirmed that tourism is a driver of economic growth in Taiwan and South Korea. This study used the EGARCH-M model with uncertainty factor to test the causal relationship between tourism expansion and economic growth. Akinboade and Braimoh (2010) examined the relationship between international tourism revenue and long-term economic growth in South Africa by using the Granger causality test. The results show that international tourism revenue causes real GDP in the short and long term.

Mishra et al. (2011) used annual time series data to examine the relationship between tourism and economic growth in India by using the Granger causality test. This study found evidence of long-term causal relationships from tourism activities to economic growth. Kibara et al. (2012) used time series data from Kenya and the autoregressive distributed lag (ARDL)-bound testing approach to test the relationship between tourism and economic growth in a multivariate setting with trade as an intermittent variable. This study supports the tourism-led growth hypothesis in the long and short term. Jalil et al. (2013) used the ARDL model in Pakistan during the period of 1972 to 2011 and found that causality runs from tourism to economic growth. Hye and Khan (2013) used a rolling window boundary test approach in the case of Pakistan and observed the long-term relationship between tourism and economic growth as well as the long-term causal flow of tourism revenues to economic growth. Tang and Tan (2013) proved that the tourism-led growth hypothesis in Malaysia validates the foresight of twelve tourism markets after applying the recursive Granger causality test.

Kreishan (2015) investigated the tourism-led growth hypothesis for Bahrain by using the ARDL from 1990 to 2014 and found that tourism can encourage economic growth. Bento (2016) used the quarterly series cointegration method for the period of 1995 to 2015 to assess the temporal causal relationship between tourism and economic growth in Portugal. This study separated domestic and foreign tourists and found that long-term tourism development precedes economic growth, thereby confirming the tourism-led growth hypothesis. Brida et al. (2016) explored the identity of nonlinearities in the relationship between tourism and economic growth for Argentina and Brazil. Their study added a way to specify nonlinear formats in the case of Brazil, but no model correctly specifies nonlinear models in the case of Argentina. However, in terms of causality, the results of this paper are consistent with the previous ones. Chiu and Yeh (2016) examined the threshold effects of tourism-led growth hypotheses based on cross-sectional data from 84 countries. This study investigated the development of tourism and the relation of economic growth and found a positive linear impact of international tourism's acceptance of economic growth, thereby confirming the tourism-led growth hypothesis. Vita and Kyaw (2016) examined the relationship between tourism specialization and economic growth while taking into account the absorption rate of host countries (tourist destinations), which are defined in the form of financial system development. This study uses the methodology of estimation of current methods to investigate this relationship for 129 countries during the period 1995–2011. The results indicate that the relationship between tourism specialization and economic growth is positive and significant for middle- and high-income countries because it appears to benefit more from tourism specialization than low-income countries do. In addition, the effect of increasing the level of tourism specialization increases in countries with more advanced financial systems that are able to support the absorption of these countries from inbound tourism. However, at a high level of specialization, its influence on GDP growth begins to decline.

Methodology

Data and Descriptive Statistics

To examine the causal relationship between economic growth and tourism, this study employs annual data from 1995 to 2015. GDP constant 2010 and tourism expenditures are used as a proxy of economic growth and tourism.

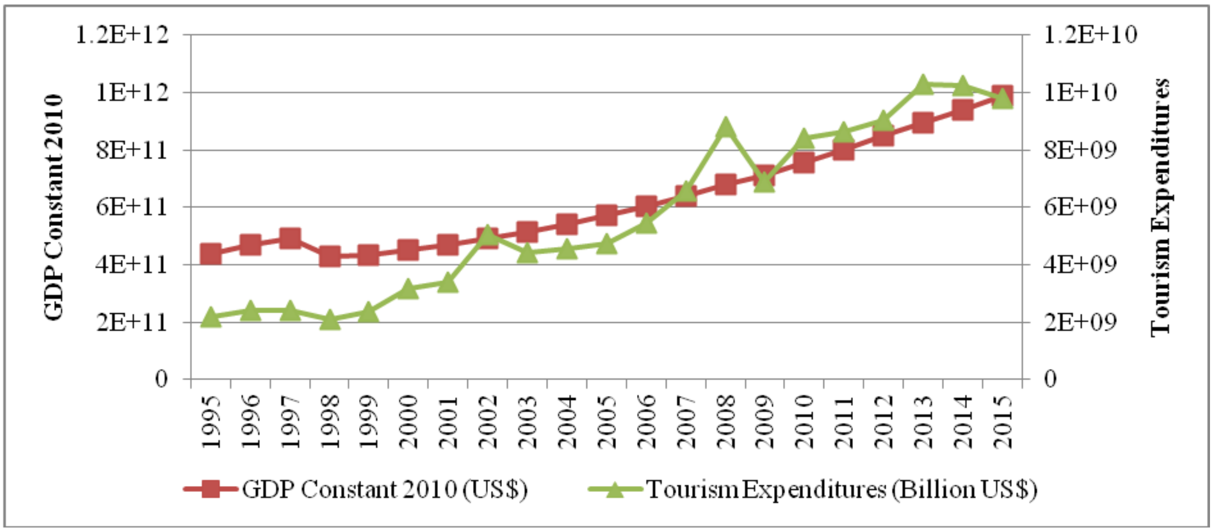
GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2010 U.S. dollars.

Dollar figures for GDP are converted from domestic currencies using 2010 official exchange rates. For a few countries where the official exchange rate does not reflect the rate effectively applied to actual foreign exchange transactions, an alternative conversion factor is used (World Bank, 2018).

International tourism expenditures are expenditures of international outbound visitors in other countries, including payments to foreign carriers for international transport. These expenditures may include those by residents traveling abroad as same-day visitors, except in cases where these are important enough to justify separate classification. For some countries they do not include expenditures for passenger transport items. Data are in current U.S. dollars (World Bank, 2018).

The data are obtained from the Central Bureau of Statistics, the Ministry of Culture and Tourism of Indonesia, and the World Bank.

Figure 2. GDP Constant 2010 and Tourism Expenditures in Indonesia 1995 - 2015



Source: World Bank (2018)

The descriptive statistics are shown in Table 1. Twenty-one observations are presented. The average of real GDP was US$5.7 trillion, while the average of international tourist expenditures was US$5.76 billion.

Table 1 Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
EG	21	5704874	1663982	3897611	9032793
TE	21	5.76E+09	2.93E+09	2.10E+09	1.03E+10

Note: EG = economic growth, TA = tourism expenditures

The causality test is an analysis method that aims to determine whether a variable is capable of causing another variable. As explained by Gujarati (2003), Diebold (1998) stated that a variable contains information that is useful for predicting another variable in the system in the future. In general, the causality test can be performed with the Granger method. However, this method has several weaknesses. Granger causality test results are too sensitive to the selection of appropriate number of lag. If the selected lag is much shorter than the actual lag, then it will be biased. If the lag selection is too long, then the estimate will be inefficient. The Granger causality test model is determined by a required prerequisite test, such as the unit root test and cointegration test. However, both prerequisite tests tend to be weak on small samples. Therefore, the resulting model is dubious.

Moreover, a non-Granger causality test can be applied to investigate the causal relationship between economic growth and tourism, such as error correction model and VECM. Unfortunately, these methods are impractical and rather complicated to use given their sensitivity to parameter values when the sample numbers are limited. As a consequence, the estimation results cannot be trusted (Toda & Yamamoto, 1995).

On the basis of the above information, this study used the causal test of Toda and Yamamoto (1995), which is a valid method for both integration and cointegration variables. According to Toda and Yamamoto (1995), this test requires no integration or cointegration terms. In addition, the causality test in this study does not require a classical assumption test with the consideration that only two variables and observations have more than 30 observations. To use the Toda-Yamamoto method, the first step is to determine the maximum order (d_{max}), and then the optimal lag k is determined. Afterwards, the vector autoregressive augmented (VAR) model is estimated. The final step is to test the hypothesis by using Wald's test by comparing the p-value with degrees of freedom.

The analysis used the VAR model, which emphasizes the causality test developed by Toda and Yamamoto (1995). The Toda-Yamamoto causality test requires the estimation of the VAR model to obtain the optimum lag (k) used in the subsequent tests. The general equation of the VAR bi-variate model is expressed as follows:

$$EG_t = \sum_{i=1}^{k+d_{max}} \propto_{1i} EG_{t-1} + \sum_{i=1}^{k+d_{max}} \beta_{1i} TE_{t-1} + \varepsilon_t$$

$$TE_t = \sum_{i=1}^{k+d_{max}} \propto_{2i} TE_{t-1} + \sum_{i=1}^{k+d_{max}} \beta_{2i} EG_{t-1} + \varepsilon_t$$

where EG is the economic growth, and TE is international tourist expenditures. In addition, $\propto_1, \propto_2, \beta_1, \beta_2$ are the model parameters to be estimated. d_{max} is the maximum order

of integration. Two steps are involved in implementing the procedure. The first step includes the determination of optimal lag (k), and the second step is the selection of the maximum order of integration (d_{max}) for the variables in the system.

Unit Root Test

The Toda-Yamamoto causality test starts with a stationary test of data, which aims to know the order of integration or the level where the time series data become stationary. Thus, the d_{max} value (maximum integration time series data) is an important component for the time interval of the Toda-Yamamoto method. The time series data have d_{max} = 0, if the data are stationary at the level, and d_{max} = 1, if the time series data are stationary on first difference. A set of data is stationary if the average value and variance of the time series data do not change over time systematically or the data have a consistent average and variance. According to

Books (2008), time series stationary data have a constant mean, variance, and autocovariance at all time intervals (lag).

Generally, economic time series data are often not stationary at the level. If this condition happens, then stationary conditions can be achieved by differentiating one or more times. If the data have been stationary at the level, then the data is said to be integrated in the order of zero or denoted by [I (0)]. If the stationary data are at first difference, then the data is integrated in the order of one or denoted by [I (1)]. This study uses the augmented Dickey Fuller (ADF) test for the unit root test. If the probability value of ADF is smaller than the significance level, then this test rejects H_0, which means that the data do not contain the unit root and are stationary.

Optimal Lag Length

Optimum lag determination is one of the important procedures that must be applied in the model, because VAR basically analyzes the relationship between several variables in a certain time interval (lag). Lag selection is useful in tests on the VAR model and the cointegration test given that the cointegration test results are sensitive to lag selection. Several parameters are used to determine the optimal lag length, such as final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SIC), and Hannan–Quinn information criterion (HQ).

VAR System with Toda-Yamamoto Approach

In this study, the Toda-Yamamoto causality test is preceded by the formation of a VAR model with the optimum time interval (lag). The lag values are obtained from the optimal lag length test denoted by k, added with the maximum order of integration, which is obtained from the unit root test denoted by d_{max}. Thus, the optimal lag length for the new VAR model is $p = k + d_{max}$.

Modified Wald Test (MWald)

The modified Wald test (Mwald), which is the core method of the Toda-Yamamoto causality test, distinguishes the Toda-Yamamoto causality test from the ordinary Granger causality test. If the probability value of the Wald test is less than the significance level, then H_0 is rejected, thereby indicating that a causality exists between variables.

Empirical Results

Unit Root Test

The stationary test results show that tourism and economic growth are not stationary at the level. The ADF test statistic for the test criteria is smaller than the critical value at either 1%, 5%, or 10%. Therefore, testing at the first difference should be performed.

The ADF unit root test is used to check stationarity variables. Tables 2 and 3 explain the result of the stationarity test at the level and the first difference, respectively. Table 1 reports that the null hypothesis of the no unit root cannot be rejected at the level for economic growth (EG) and tourism expenditures (TE) when it is stated in the first difference, irrespective of the test used. All the variables are stationary in their first difference.

Table 2 Stationarity Test Results at Level

Variable	ADF test statistic	Test Critical Values			
		1%	5%	10%	
EG	1.104208 (0.9960)	−3.808546	−3.020686	−2.650413	Constant
	−28.91838 (0.0001)	−4.571559	−3.690814	−3.286909	Constant, Linear Trend
TE	−0.790827 (0.7988)	−3.831511	−3.029970	−2.655194	Constant
	−2.654510 (0.2629)	−4.498307	−3.658446	−3.268973	Constant, Linear Trend

Table 3 Stationarity Test Results at First Difference

Variable	ADF test statistic	Test Critical Values 1%	5%	10%	
EG	−2.980733 (0.0559)	−3.857386	−3.040391	−2.660551	Constant
	−4.715977 (0.0076)	−4.571559	−3.690814	−3.286909	Constant, Linear Trend
TE	−5.438413 (0.0003)	−3.831511	−3.029970	−2.655194	Constant
	−5.326450 (0.0038)	−4.728363	−3.759743	−3.324976	Constant, Linear Trend

In addition, to determine the stationarity level of a time series data, the stationary test is performed to determine the $d_{\max}$ required to test the Toda-Yamamoto causality. In other words, this test is a prerequisite for the causality test.

In addition, at the first difference level, the test found that the two variables, international tourist expenditures and economic growth, are stationary. The test results on various criteria and critical values prove that the majority shows significant results. Thus, we can conclude that the two stationary variables at the first difference and $d_{\max}$ levels used for the Toda-Yamamoto causality test are 1.

Cointegration Test

The cointegration test by using the Johansen cointegration approach is conducted to examine the long-run relationship between economic growth and tourism. Table 4 presents the results of the cointegration test in question. Evidence supporting cointegration cannot be found, with no cointegration null hypothesis being rejected at the 5% significance level for both maximum eigenvalue and trace statistics.

The results of the Johansen cointegration test are shown in Table 4.

Table 4 Cointegration Tests Results

Null	Alternative	Trace Statistic	5% Critical Value
Unrestricted Cointegration Rank Test (Trace Test)			
$r = 0$	$r = 1$	11.08957	15.49471
Unrestricted Cointegration Rank Test (Maximal Eigenvalue Test)			
$r = 0$	$r = 1$	10.77681	14.26460

The maximal eigenvalue and trace statistic test results show the existence of a cointegrating vector. Thus, the Johansen cointegration test shows that no long-term relationship exists between tourism and economic growth. Thus, we can conclude that the relationship between economic growth and tourism is not cointegrated. This finding means that no long-term causality exists between economic growth and tourism. The next step is the causality test performed by following the Toda-Yamamoto method.

Optimal Lag Length

After the stationarity test, which shows the order of how time series data are integrated, the VAR system is established to obtain optimum lag (k), which will then be used in the Toda-Yamamoto causality test.

To perform the Toda-Yamamoto causality analysis by using augmented VAR or $k + d_{max}$, the optimal lag length needs to be determined in addition to the maximum order of the variables under study. In general, several methods are used to determined lag lengths, including FPE, AIC, SIC, and HQ.

Table 5 Lag Length Criteria

Lag	Metode Pengujian				
	LR	FPE	AIC	SC	HQ
0	NA	0.062546	2.903808	3.001980	2.929853
1	120.6357	0.000280	−2.507414	−2.212900*	−2.429279
2	4.756702	0.000307	−2.424433	−1.933578	−2.294209
3	9.932857	0.000245	−2.675386	−1.988188	−2.493072
4	1.898754	0.000314	−2.468636	−1.585096	−2.234232
5	12.20502*	0.000184*	−3.074150*	−1.994267	−2.787657*
6	1.110327	0.000259	−2.841756	−1.565531	−2.503173
7	3.513232	0.000291	−2.898781	−1.426214	−2.508109
8	2.028511	0.000398	−2.855235	−1.186326	−2.412473
9	0.518503	0.000774	−2.625603	−0.760351	−2.130751

Results show that lag 5 is the most optimal lag on the basis of the consideration that lag 5 is recommended by LR, FPE, AIC, and HQ.

Toda-Yamamoto Causality Test

After the stationarity test and optimal lag determination, the $k + d_{max}$ used for the test of this causality is 6. The next stage is the test of the coefficient variable of tourism and economic growth by using Wald's test to determine the causality relationship between two variables. The causality relationship is determined by using Wald's test through a comparison of the value of p-value with the degree of confidence of 1%, 5%, and 10%. If the p-value is less than the degree of trust, then the null hypothesis is rejected. Otherwise, the null hypothesis is accepted.

Table 6 Toda-Yamamoto Causality (Modified Wald) Test Results

H_0	χ^2	*p*-value
TE → EG	225.7456	0.0000
EG → TE	6.042018	0.3022

Table 6 reports the obtained χ^2-test statistic, together with the estimated *p*-value and the results for causality tests. The results confirm the existence of a tourism–economic growth nexus given the positive causal relationship between tourism and economic growth.

The results show that tourism causes a change in economic growth, and they support the unidirectional causal relationship. This finding suggests that the results support the hypothesis that tourism can encourage economic growth and are in line with the tourism-led growth hypothesis.

Conclusion

This paper investigates the relationship between tourism and economic growth in Indonesia and aims to extend the tourism-led growth hypothesis applied in 1995 to 2016. We use Johansen cointegration approach and the Toda-Yamamoto causality test. The results of the unit root tests (ADF tests) indicate that the variables were I (1). The cointegration results show that no long-term relationship exists between tourism and economic growth. The empirical results for Indonesia support the unidirectional relationship from tourism to economic growth. This finding suggests that the results support the tourism-led growth hypothesis, which states that tourism can encourage economic growth. Thus, given that the results support the tourism-led growth hypothesis, the government should allocate more resources to the tourism industry. Therefore, using measures to develop the tourism sector in Indonesia and increase tourism demand and supply may be appropriate. The government can support infrastructure development in the tourism industry and promote tourism in Indonesia through additional advertisements, reduced visa restrictions, and discounts for tourist groups. Thus, an expansive government policy is needed to promote and increase the demand for international tourism and stimulate the development of private and public infrastructure that can facilitate the increased demand.

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