THE CONTRIBUTION OF TOURISM DEVELOPMENT TO ECONOMIC GROWTH IN THE SRI LANKAN ECONOMY: A TIME SERIES APPROACH

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Abstract

This study investigates the causal relations between tourism development and economic growth for the Sri Lankan economy by using Engle and Granger two-phase approach and a bivariate Vector Autoregression (VAR) model. Two standard results arise from this study. First, the results of a cointegration test designate that there is no long-run equilibrium association between two sequence. Next, the results of Granger causality test suggest the uni-directional causal relationship of economic-determined tourism development. The hypothesis of tourism-directed economic development is not detained in the Sri Lankan economy. This consequence is sustained by analyzing the sensitivity of causality test under distinct lag selections beside with the optimal lag.

Keywords: Sri Lankan Economy, Cointegration, Tourism development, Causality

Introduction

Over the past numerous eras, worldwide tourism has been progressively increasing, as well as the reputation of the tourism field for the economy of several countries. As stated by World Tourism Organization (2002), costs by 693 million global travelers traveling in 2001 made US $ 462 billion, approximately US $ 1.3 billion every day around the world. Furthermore, tourist expenditure has assisted as an alternate form of exports, contributing to a perfected balance of payments over foreign exchange incomes in several countries. As such, tourism-produced profits have originated to denote a significant revenue source, growing employment, domestic income and government income in countries worldwide. Specified the above-mentioned reasons, Sri Lanka has been especially keen to encourage tourism. Although Sri Lanka's prompt economic growth has been a significance of an export-oriented economy, the tourism industry has also been considered a foremost causative factor. Consistent with McGahey (1995), when incoming tourism was developing rapidly in the last half of the mid-1980s and the Sri Lankan government organized outbound tourism, tourism incomes made significant profit in the trade stability. Similarly, the straight contribution of travel and tourism to gross domestic product (GDP) in 2016 was 5.1% of gross domestic product (GDP) and this was forecasted to rise by 5.1% in 2017.This mainly reflects the monetary movement engendered by industries such as hotels, travel mediators, airlines and other passenger transport services. But it also comprises, for example, the activities of the restaurant and holiday industries directly supported by tourists. Therefore, the expansion of tourism has regularly been considered an optimistic contribution to economic growth (Khan, Phang, & Toh, 1995; Lee & Kwon, 1995). Though, there is an unconfirmed question of whether tourism growth truly initiated the economic upsurge or, otherwise, did economic development strongly subsidize to tourism growth instead. Some previous studies of Kulendran and Wilson (2000) and Shan and Wilson (2001) validates throughout their experimental investigates that a strong mutual relationship between international business and international tourism is observed between Australia and China respectively. Since economic growth in Sri Lanka also captivates much commercial travel, inductive judgement proposes that economic growth leads to tourism development.

Additionally, even with uncertainty as to a causality association between international trade and economic development, frequent studies (e.g., Bahmani-Oskooee ,1993; Jin, 1995; Marin, 1992; Shan; Chow, 1987 & Sun, 1998; Xu, 1996) similarly designate that there is a robust correlation between international trade and economic expansion. Also, export raise and economic growing have markedly strengthened each other in the progression of economic growth over the trials with many developing

republics in South American, African and Asia (Bahmani-Oskooee & Alse, 1993; Chow, 1987). Accordingly, it is restructured that the export-determined economic evolution in the Sri Lankan economy can be one of the strong causal factor of tourism development, conflicting the belief that tourism drives economic development. Tourism-led development inclines to arise when tourism validates an inspiring impact through the general economy in the arrangement of spread and other external elements (Marin, 1992). On the other hand, observed studies of the correlation between tourism and economic evolution have been fewer demanding in tourism based literature. Although, the part of tourism in the long-term economic growth in Spain was examined by Balaguer and Cantavella-Jorda (2002), it is indeterminate whether their suggestion of tourism-led economic development is appropriate to other nations. In this frame, three hypotheses are inspected with respect to the association between tourism and economic growth in Sri Lanka: (1) the tourism-led economic development hypothesis; (2) the economic-determined tourism development hypothesis and (3) the two-directional causal hypothesis which merges (1) and (2), where the causality among tourism and economic development may run in either or mutually directions. Identification of a causal relationship among international tourism and economic development will have significant inferences for the expansion of diverse tourism marketing and policy judgements. For example, if there is a definitely uni-directional causality from tourism development to economic growth, then tourism-led economic growth is feasible. If consequences show the conflicting causality, then the economic growth may be essential for the development of the tourism industry. Following, if the contributing process is bi-directional, and tourism development and economic development have a mutual causal relationship, then an impulsion in both extents would be advantageous. Lastly, if there is no causality relation between tourism growth and economic expansion, then tactics such as keen tourism-promotion may not be as effective as tourism administrators and decision-makers presently have faith in. This study pursues to subsidize to determine the above-mentioned queries on the tourism-led growth hypothesis by testing a cointegration, building a bivariate Vector Auto Regression (VAR) model and subsequently, setting up a long-run effect of these two variables for the Sri Lankan economy. Section 2 labels the data, methodology, and results from this empirical analysis, which contains a unit root test for stationarity of time series and a test for cointegration for a long-run relationship. Lastly, Section 3 illustrates the final discussion and further explanations.

Methodologies and results

The VAR model and cointegration model were evaluated using annual data over the period of 1970 to 2017. On account of its easiness, a bivariate analysis was applied in this study. The model variables were obtained from real aggregate tourism receipts (named 'Tour') which is adjusted by the consumer price index as a substitution of tourism development and real GDP for economic growth. Meanwhile there is a concern of eliminating significant information whereas adjusting for seasonality, unadjusted data were used from website and Central Bank of Sri Lanka. Because of various measures of international tourism requirements, it may not be generally decided to pick a variable of tourism demand with a quantity of tourism receipts. For instance, the periodic unpredictability between the most generally used measures of tourist arrivals and tourism receipts prevents in the direction of a distinct larger measure. In spite of these specifics, because of a universally dignified reliable index collected by the countrywide and worldwide organizations and a financial transaction values agreeing with GDP, the tourism receipts were used. The variables are then converted over the use of natural logarithm to simplify understanding of coefficients.

Unit root test for stationarity

Before specifying and estimating cointegration and VAR, it is obligatory to inspect the stationarity of the variables. Briefly, stationarity means that the mean and the variance of a series are constant over time and the auto covariance of the series is not time fluctuating (Enders, 1995). Since an incorrect option of conversion of the data provides biased outcomes and has consequences for wrong interpretation, a test of stationarity is significant to set up the requirement and estimation of the accurate model (Engle & Granger, 1987). So, the first stage is to examine the order of integration of the variables. Integration means that previous shocks remaining undiluted disturbs the recognitions of the series persistently and a series has hypothetically endless variance and a mean of time-reliant. Dickey–Fuller (DF), Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) tests were engaged to check the non-stationarity of the variables.

Table 5: Tests of hypotheses of non-stationarity and stationarity on tourism receipts and GDP

Variables	Dickey–Fuller Null of non-stationarity	Augmented Dickey–Fuller Null of non-stationarity	Phillip–Perron Null of non-stationarity
$ln(Tourism)$	0.042705	-1.976688	-1.478594
$\Delta\, ln(Tourism)$	-3.843869 ***	-4.063154***	-4.155154 ***
$ln(GDP)$	1.634789	0.487156	0.542434
$\Delta\, ln(GDP)$	-4.121859***	-7.381398***	-7.353502***

Note: Δ indicates the first differencing of the variables. The Dickey–Fuller, Augmented Dickey–Fuller, and Phillips–Perron tests should be compared to the critical values which are -1.95, -2.926, and -2.926 for the original series and the differenced series at the 5% significance level. To reject the null hypothesis which is less than the critical value means that a variable is stationary or do not include a unit-root.

The tests intensively supported the null hypothesis of non-stationarity before differencing the variables and the first differenced series of GDP and Tour were stationary founded on the unit root tests. Consequently, the variables were stated to be I (1). Specified the outcomes of a unit root in variables, cointegration was inspected between tourism receipts and GDP using Engle–Granger two-step method. Since seasonal-unadjusted data series was employed, a seasonal dummy was added (Eq. (1)). Agreeing to Granger (1981), cointegration means that the non-stationary variables are integrated in the same order with the stationarity of residuals. If there exists cointegration between two variables, there is a long-run influence that stops the two series from drifting away from each other and there is a potential to diverge into long-run equilibrium. The Engle–Granger two-step technique is done by two comparisons distinctly:

$$Tour_t = \beta_0 + \beta_1 GDP_t + \beta_2 D_{t-l} + e_t \text{ or}$$
$$GDP_t = \delta_0 + \delta_1 Tour_t + \delta_2 D_{t-l} + e_t \quad (1)$$

$$\Delta\hat{e}_t = a_1 \hat{e}_{t-1} + \varepsilon_t \text{ or}$$
$$\Delta\hat{e}_t = a_1 \hat{e}_{t-1} + \sum_i a_{i+1}\, \hat{e}_{t-i} + \varepsilon_t \quad (2)$$

Table 6: Test results of cointegration between two time-series

Cointegration	Tour	GDP
Augmented Dickey–Fuller	-3.107697	-2.521509
Dickey–Fuller	-1.409308	-1.560307

Two different equations, Tour and GDP as a dependent variable, correspondingly, were tested for cointegration. The Dickey–Fuller and Augmented Dickey–Fuller test the null hypothesis of non-stationarity and should be compared to the critical value, -3.37 (Engle & Yoo1987). For Augmented Dickey–Fuller test, 2 lags were used to deliver white noise in residuals. The hypothesis of cointegration is tested for both equations in (1). To reject the null hypothesis which is less than the critical value means that there is a cointegration relation between those two variables

Grounded on DF and ADF tests on the residual sequence, the null hypothesis of non-stationarity was not rejected. Non-stationarity in the residuals means that the two series are not cointegrated in the long-run based on the critical value, -3.37 provided by Engle and Yoo (1987). Therefore, contrary to the general belief, long-run equilibrium did not exist between tourism receipts and the GDP series. This indicates that a linear combination of two variables is not cointegrated in the long-run. Consequently, VAR model needs to include first differenced series and no error correction terms are contained in the model.

1.1.VAR model and Granger causality test

When there is no confidence that certain variables are exogenous, the single equation method with an assumption of exogeneity of independent variables is not valid (Sims, 1980). According to Sims (1980), the VAR model was established in which all variables are endogenous. Meanwhile long-run equilibrium did not occur among the two time-series, a short-run dynamic association can be explored over the VAR estimation. Since the linear combination of the series was not stationary, first differencing is appropriate and error correction terms are not appropriate in the VAR model.

Table 7:VAR optimal Lag Selection

Lag	AIC	SBC	FPE	LR
0	4.288038	4.369138	0.249649	NA
1	-1.848792	-1.605493*	0.000540	259.0646
2	-2.003326*	-1.597829	0.000463*	13.11774*
3	-1.943350	-1.375653	0.000494	4.508139
4	-1.892355	-1.162460	0.000523	4.578840

The number of lags is determined by Akaike Information Criteria (AIC), Schwartz Bayesian Criteria (SBC), Final prediction error(FPE) and Likelihood Ratio (LR) test. The optimal lag is carefully chosen with the lowest values of AIC and SBC criteria and with the rejection of the null hypothesis in LR test that parameter values at lag k are equal to zero (Enders, 1995). The results of lag selection are offered in Table 3. All test results indicated lag 2 (*) as an optimal lag selection for the VAR model except for FPE statistics. So the lag 2 is selected as the optimal choice lag.

Granger causality hypotheses

The following hypotheses were tested using the Granger causality approach.

H_{01}: Tourism growth affects economic expansion

H_{02}: Economic expansion affects tourism growth

H_{03}: Both (tourism growth and economic expansion) demonstrate a reciprocal relationship

In order to test the mentioned three hypotheses, a two-variable VAR system can be expressed as follows with the optimal lag:

$$\begin{bmatrix}\Delta GDP_t \\ \Delta Tour_t\end{bmatrix} = \alpha_0 + \alpha_1 \begin{bmatrix}\Delta GDP_{t-1} \\ \Delta Tour_{t-1}\end{bmatrix} + \alpha_2 \begin{bmatrix}\Delta GDP_{t-2} \\ \Delta Tour_{t-2}\end{bmatrix} + \ldots\ldots\ldots + \alpha_p \begin{bmatrix}\Delta GDP_{t-p} \\ \Delta Tour_{t-p}\end{bmatrix} + \alpha_{p+1} \begin{bmatrix}D_{t-2} \\ D_{t-2}\end{bmatrix} + U_t \quad (3)$$

Where α_0 is vector of constant term, α_i is the matrix of parameters and U_t is the innovation term.

This method is best suited to conclude whether the lags of one variable enter into the equation for another variable (Enders, 1995). Granger causality checks the constraint that all lags of the variable do not arrive significantly into VAR model requirement. This is done by a conservative F test.

Consider equation system (3) in a different way as follows

$$\Delta GDP_t = \alpha_1 + \sum_{p=1}^{2} \beta_{1p}\, \Delta Tour_{t-p} + \sum_{p-1}^{2} \delta_{1p}\, \Delta GDP_{t-p} + \gamma_1\, D_{t-2} + \varepsilon_{1t} \quad (4)$$

$$\Delta Tour_t = \alpha_2 + \sum_{p=1}^{2} \beta_{2p}\ \Delta Tour_{t-p} + \sum_{p-1}^{2} \delta_{2p}\ \Delta GDP_{t-p} + \gamma_2\ D_{t-2} + \varepsilon_{2t} \quad (5)$$

In other words, to examine whether tourism development Granger causes GDP development in the above structure, the joint significance of the coefficients, $\beta_{11} = \beta_{12} = 0$ in (4) was verified with F-statistic. A similar testing procedure was applied to test the hypothesis of GDP determined tourism development, Ho : $\delta_{21} = \delta_{22} = 0$ in (5). Earlier, three different criteria indicated 2 as the optimal lag selection was engaged for the Granger causality test for the first differenced series.

Table 8: Causality tests for tourism and GDP

	ΔTOUR does not Granger Cause ΔGDP		ΔGDP does not Granger Cause ΔTOUR	
Optimal Lag	2		2	
F-statistics	0.17806		7.40624	
P-value	0.8375		0.0018	
VAR order	F-statistic	p-value	F-statistic	p-value
1	0.00209	0.9638	6.35000	0.0154*
3	0.11111	0.9531	4.60960	0.0076*
4	1.13202	0.3574	2.75906	0.0429*
5	0.60223	0.6985	3.02294	0.0240*

Note: Optimal lag is determined by AIC, SBC, and LR test in Table 3. Different lag structures were tested for the examination of result sensitivity. * Indicates that the null hypothesis is rejected at the 5% significance level.

The hypothesis of tourism-led economic development was not accepted grounded on the failure to find causation of tourism development to economic expansion. The results were reliable with different lag selections. The F-statistics for the second hypothesis of economic-driven tourism growth designated that the null hypothesis was rejected. The results were robust to different lag selections. That is, economic growth leads to international tourism and an upsurge in tourism development.

VAR Model - Substituted with Coefficients:

ΔGDP = 0.8827*LGDP(-1) + 0.1326*LGDP(-2) + 0.0314*LTOUR(-1) - 0.0369*LTOUR(-2) - 0.1779

Δ}TOUR = - 0.1716*LGDP(-1) + 0.4145*LGDP(-2) + 1.2397*LTOUR(-1) - 0.4393*LTOUR(-2) - 2.2048

However, this relationship was sustained only in the short run. Since tourism development did not impact rises in the economy in the short run, there was no reciprocal reaction between two series. The mixture of results pointed to a uni-directional causality for economic-determined tourism development in the Sri Lankan economy.

Conclusive remarks

It is normally believed that tourism has contributed positively to economic development as exports have powerfully induced economic growth. Though, in spite of the robust confirmation of the hypothesis of exports-directed economic development from many studies, there have also been a number of experimental studies that miscarried to support this hypothesis (Darrat, 1986 & Dodaro, 1993). Since tourism may have a comparable part on the economy of each republic, it is valuable to inspect whether tourism has contributed positively to the economy as it is normally believed.

Furthermore, the systematically confirmed statistics is vital for the private, public and governmental segments to manage the tourism processes and scheduling in order to exploit the tourism incomes. So, this study was planned to help observe the question of causality among tourism and economic development. It used the time series methods of causality test for the hypotheses of tourism-directed development for the Sri Lankan economy. By means of the perceptions and methods of the cointegration and Granger causality test, this study discovered the short-term dynamic relations as well as long-run equilibrium conditions. A cointegration between tourism and economic growth did not exist in Sri Lanka and hence the long-run equilibrium relation was established to be unacceptable. In addition, causality tests did not support the hypothesis of tourism-driven economic growth in the short run. As a result, the testing results suggest that the quick economic growth in Sri Lanka inclines to attract more worldwide tourism only in the short run. Since it is well known that global trade is thoroughly secured to economic growth, it is balanced to be certain of that tourism is strongly exaggerated by economic upsurges though there are unexpectedly no long-run effects. These consequences point to several research instructions in the future. Initially, a simple bivariate VAR model was employed in this study. Significant variables such as exchange rates which composite a critical part in model specifications might not be fully considered. This can be developed to implement a multivariate approach of multivariate cointegration important variables such as income, exchange rates and international trade. Next, in place of a series of tourism receipts was used, the more accurate measure of tourism growth generated from economic impact data will yield the more precise causal relations. Finally, it is essential to examine the hypotheses in many destination countries for the simplification. In conclusion, grounded on the outcomes in this study, keen tourist-attracting strategies as a means of economic expansion may not be fully in effect in that economic growth leads to tourism growth, rather than the other way around. This may further propose redirecting suitable tourism policies towards meeting the demand made by the increase in holidaymakers for tourism-related trades.

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