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The impact of tourism on economic growth in Sri Lanka: an ARDL bound test approach

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Abstract

The tourism is most appropriate industry for sustainable development and growth. It creates economic returns through the intangible values of a country's nature and cultures. Similarly, Sri Lankan tourism industry also is being as a major foreign currency earner in the economy, continued its growth momentum until now. Therefore, the objective of the study is to examine the impact of tourism on economic growth in Sri Lanka using the Autoregressive Distributed Lag Bound test approach. The analysis was carried out for the period from 1977 to 2016. The results found that the tourism industry impacts positively on economic growth in Sri Lanka. Henceforth, it is essential to accelerate tourism development activities towards high value sector in order to enhance economic growth through attracting more high spending tourists and pushing up tourism receipts. Additionally, macroeconomic policies must to be taken into act to stimulate tourism development through utilize untapped tourism resources in Sri Lanka.

Keywords: Tourism industry, economic growth, ARDL Bound test, tourist receipts.

Introduction

Tourism is one of the strongest drivers of global trade and prosperity as tourism has been functioning as an engine for development through foreign exchange earnings and the creation of both direct and indirect employment opportunities in many countries[1].Thus, tourism has been a fastest emergent sector in the World and drives to pursuing economic growth and development as well. According to the World Bank data, the Number of arrivals of international tourist was recorded as 524,005,938.61 in 1995 and it was expanded to 1.245billion in 2016 in the world. Similarly, receipts of international tourism (current US$) was enhanced to 1.392 trillion in 2016, it was registered as 486.749 billion in 1995 in the world.

The Sri Lankan tourism industry, being one of the fastest growing industries of the post conflict economy. Traditionally, the natural attractiveness, calm climate, historical and cultural heritage and religious multiplicity are considered as areas of growth potentials in the tourism industry of Sri Lanka[2]. Since independence, Sri Lanka has continued to attract tourists and foreign investors to the island. The country's important destinations also enable it to attract international tourists into the island[3]. Furthermore, prevailing peaceful environment also being as a key aspect to attracting international tourist as security and safety of the country influence tourists′ decision making on country selection.

Consequently, high potential has been existing in niche segments of tourism comprising MICK tourism, health tourism, eco-tourism, village and urban tourism, adventure tourism, agro tourism, cruise and marine tourism, leisure tourism, cultural tourism and recreational tourism in Sri Lanka[2].

According to the World Bank Development indicators[4], international tourist arrivals have been increased progressively by 2,051,000 million in 2016 in comparison to 403,000 million in 1995 in Sri Lanka. In particular, tourist arrivals from all major regions including, Western Europe, East Asia have increased significantly and above regions contributed by the impressive growth recorded in tourist arrivals to earn foreign exchange earnings. In which, India remained the largest country of tourist origin followed by the China, UK, Germany and France[2]. Correspondingly, receipts of international tourism also have been emerged from 367.00 million US dollar to 4591 million in 1995 and 2016 respectively[4].

Thus, Sri Lankan tourism industry being as a major foreign currency earner in the economy, continued its growth momentum until now. Therefore, developing tourism related developments will also benefit the Sri Lankan economy through increasing value addition, expanding employment opportunity and emerging foreign exchange earnings. Since independence, the government has been sustaining to attract tourists and foreign investors in various ways. Presently, importance of tourism promotion is highlighted by the numerous activities in order to initiate new developments and overcome prevailing challenges in the tourism sector. In this case accelerated promotion activates encompassing tourism related infrastructure development, increase in investment in the tourism industry, introduction of new tourist attractions, strategic promotional campaigns, improvement of the standards of Sri Lanka's

tourism industry and attention on in the Eastern and Northern provinces of the country have been facilitated to achieve the impressive growth in tourism sector. Thus, the government of Sri Lanka has been contributing to tourism sector in order to accelerate economic growth through tourism development.

However, tourism is a one of the vital industry in driving economic growth and development as it has also been identified as driver ingenerating foreign exchange income and creates employment opportunities[5]. In addition, tourism provides positive externalities, creates added value for the real sector, persuades capital accumulation and creates of new investment activities[6].

Subsequently, tourism developments are one of the essential causes in economic growth of a country. Meanwhile, tourism industries of Sri Lanka show that tourism sector possess increasing tendency not only number of arrivals of international tourists but also receipts of tourism (Figure-1). The growing trend in the performance of the tourism sector, may stimulates economy of Sri Lanka. Further the economy of Sri Lanka tends to be increasing per capita GDP (Figure-2). Authors[7] pointed out that the Sri Lankan government has expected tourism to be an important growth mechanism, as it provides an important source of foreign exchange earnings. In this context, there is a need to examine that whether tourism drives to economic growth in Sri Lanka. Therefore, the main objective of this study is to examine the impact of tourism on economic growth in Sri Lanka.

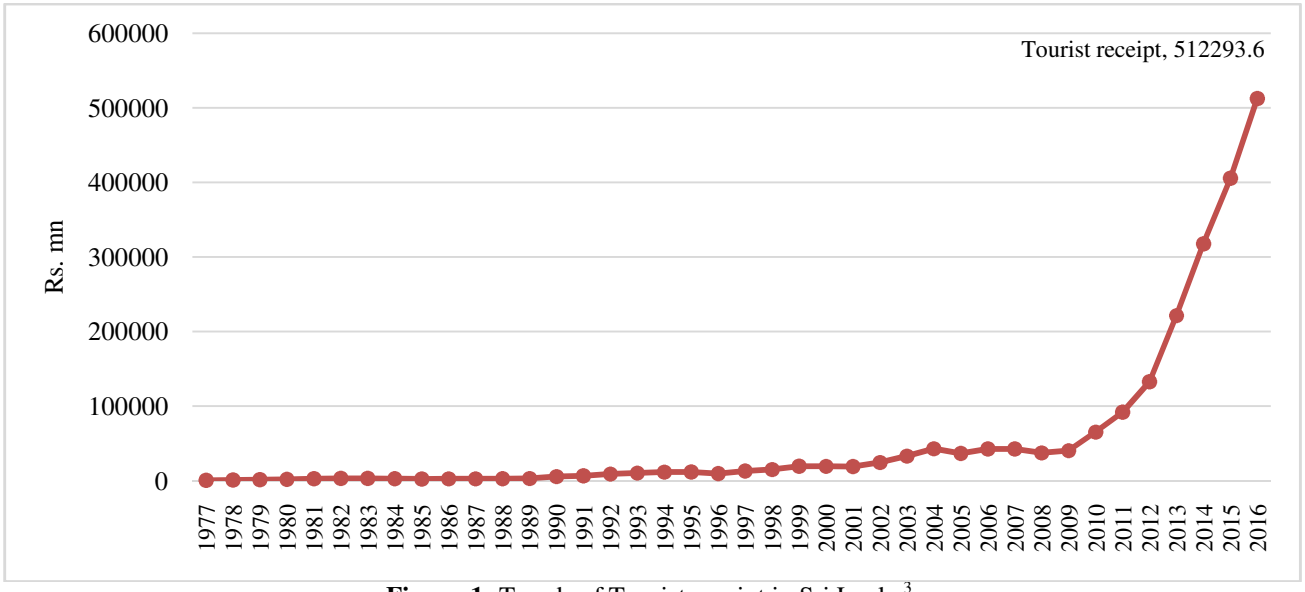

Figure-1: Trends of Tourist receipt in Sri Lanka[3].

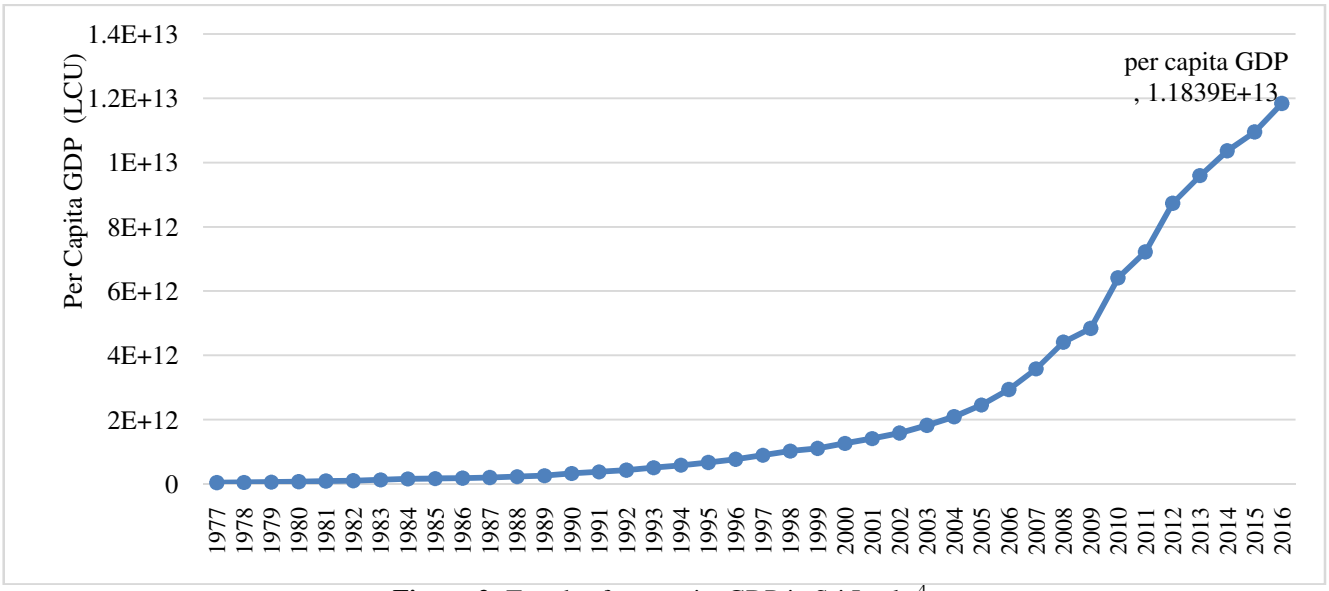

Figure-2: Trends of per capita GDP in Sri Lanka[4].

Methodology

The study is based on annual time series data, which was obtained from both World bank development indicators and annual statistical report of Sri Lanka tourism development authority over the period 1977-2016.The duration of the data has been selected as Sri Lanka's economy was liberalized in 1977.

Variables namely per capita gross domestic product, tourist receipts, exchange rate, foreign direct investment and inflation were employed and those have been widely utilized in the forgoing empirical studies to examine whether the tourism industry causes economic growth. In this investigation tourist receipts are regarded as tourism growth measure and also per capita GDP (constant LCU) is employed as an indicator of economic growth.

For the econometric analysis, time series variables are to be converted into natural logarithms before the analysis in order to interpreting the elasticity of the variables. The null hypothesis is that the variable contains a unit root, and the alternative is that the variables are to be generated by using a stationary process. Therefore, unit root analysis is to be employed in order to avoid specious model due to trending variables since the use of non stationary variables in the time series analysis leads to misleading inferences. Thus, Augmented Dickey fuller unit root test is to be utilized to establish the order of integration of the variables employed in this study.

Accordingly, if the all variables are not being integrated in the same order, Auto Regressive Distributed Lag (ARDL) Bound test co-integration analysis is to be employed to investigate the impact of tourism on economic growth in Sri Lanka as the estimation of ARDL bound test technique is relatively appropriate alternative to other co-integration techniques.

Result of Unit root analysis: The results of ADF unit roots test are presented in the Table-1 showing all variables incorporated in the study are stationary at their level since unit roots test statistics of selected variables are found to be higher negative values and MacKinnon p-value also established to be significant at one percent significant level as well. Nonetheless, variables engaging in this study are not integrated in the same order, instead of same order those variables tend to be with the integrated of order either one I (1) and zero I (0).

In this context, the ARDL co-integration approach is relatively more appropriate than other traditional co-integration methods as the model does not has the precondition that all the variables under study must be integrated of the same order and it can be applied when the under-lying variable are integrated of order one, order zero or fractionally integrated. Another advantage of the ARDL model is that comparatively more efficient in the case of small and finite sample data size. Furthermore, by engaging the ARDL technique we will have unbiased estimation of the long-run model[8].

Table-1: Augmented Dickey Fuller Test Results.

Variables	Test statistics	Order of Integration	MacKinnon p-value
lnGDP	-4.594	I(1) ***	0.0001
lnTR	-4.849	I(1) ***	0.0000
lnEX	-3.498	I(0) **	0.0080
lnFDI	-5.056	I(0) ***	0.0000
lnINF	-5.383	I(0) ***	0.0000

*** and ** indicate one percent and five percent significant level respectively.

Beyond that, the model also employs to estimate short-run model incorporated with the non stationary time series variables. Noteworthy benefit of ARDL is that it tolerates to identifying co-integrating vector and simultaneously which is reparametrized into Error Correction Method (ECM). Accordingly, Error Correction Method estimates short-run model to examine the short-run relationship of employed variables. Besides, the Bound F-statistic allows to ensure the existence of the long-run relationship between the selected time series variables[9].

The present study therefore, utilizes the ARDL technique to estimate efficient result using the selected variables namely tourist receipts, gross domestic product and exchange rate, foreign direct investment and inflation.

Model specification: The ARDL technique engaged in the model is expressed as follows:

$$yt = c_0 + c_1t + \sum_{i=1}^{p} \varphi_i y_{t-1} + \sum_{i=0}^{q} \beta'_i x_{t-1} + ut,$$

Where, t = max(p,q)…,T, for simplicity assuming that the lag order q is the same for all variable in the K × 1 vector x_t. Whereas the variable in $(y_t, x'_t)'$ are allowed to be purely I(0), purely I(1), or cointergrated. The optimal lag orders p and q are possibly different across variables. Even though those can be obtained by minimizing a model selection criterion using the Akaike information criterion (AIC) or the Bayesian information criterion[9].

Reparameterization into conditional Error Correction form as follows:

$$yt = c_0 + c_1t - \alpha(y_{t-1} - \theta x_{t-1}) + \sum_{i=1}^{p-1} \psi y_i \Delta y_{t-1} + \omega' \Delta x_t + \sum_{i=1}^{q-1} \psi'_{xi} \Delta x_{t-1} + ut,$$

with the speed of adjustment coefficient $\alpha = 1\sum_{j=1}^{p} \varphi_i$ and the long run coefficient $\theta = \frac{\sum_{j=0}^{q} \beta j}{\alpha}$.

Similarly, alternative EC parameterization as expressed in follows:

$\Delta yt = c_0 + c_1t - \alpha(\ y_{t-1} - \theta x_t) + \sum_{i=1}^{p-1} \psi y_i \Delta y_{t-1} + \sum_{i=0}^{q-1} \psi'_{xi} \Delta x_{t-1} + ut.$

In the study, at first AIC has been utilized for automatic optimal lag selection using Akike Information Criterion Method. Secondly, in order to obtain the long-run and short-run coefficients, the study is based on the estimation of an Unrestricted Error Correction Model (UECM).

For that the study has the following form as expressed in Equation (1)

$$\Delta \ln GDPPC_{t=} \alpha_0 + \alpha_1 TR_t + \alpha_2 EX_{t+} \alpha_3 FDI_t + \alpha_4 INF_t + \varepsilon_t \quad (1)$$

Where: GDPPC is gross domestic product per capita (constant LCU) which denotes the dependent variable. Further, TR represents tourism receipts, EX denotes exchange rate, FDI is foreign direct investment, INF indicates inflation and $\varepsilon_{t\ is}$ a white noise error term.

Further the following model is utilized whereas Unrestricted Error Correction Model of ARDL is amalgamated to analyze the long-run and short-run relationship between economic growth and tourism receipts. Thus, an ARDL representation of Equation (2) is formulated as follows:

$$\Delta \ln GDPPC_{t=}\delta_0 + \Upsilon_1 \ln GDPPC_{t\ -i} + \Upsilon_2 TR_{t-1} + \Upsilon_3\ EX_{t-1} + \Upsilon_4\ FDI_{t-1} + \Upsilon_4\ INF_{t-1} + \sum_{i=1}^{p} \nu_i \Delta TR_{t-1} + \sum_{i=0}^{q1} \Delta EX_{t-1} + \sum_{i=0}^{q2} \partial i \Delta FDI_{t-1} + \sum_{i=0}^{q3} \vartheta_i \Delta INF_{t-1} + \varepsilon_t \quad (2)$$

As a third step an Error Correction Model (ECM) is used to be estimated the short-term effect adjustment speed of explained variable to explanatory variables. The model for ECM can be expressedas:

$$\Delta \ln GDPPC_t = c_0 + \sum_{i=1}^{p} \omega_1 \Delta TR_{t-1,j} + \sum_{i=0}^{q1} \omega 2 \Delta EX_{t-1,\ j} + \sum_{i=0}^{q2} \omega 3 \Delta FDI_{t-1,\ j} + \sum_{i=0}^{q3} \omega 4_i \Delta INF_{t-1,\ j} + \lambda ECT_{t-1j} + \nu t \quad (3)$$

As a stage of ARDL techniques, error correction model estimation by which short – run coefficient are to be estimated to specify dynamic adjustment of all selected variables in this study. In addition to that ECM also estimates error correction term (ECT) which allows to ensure the speed of adjustment whereby short-run dynamics converge to the long-run equilibrium path in the model. The speed of adjustment is measured by estimating the coefficient of adjustment λ[10]. The estimated ECT can be ideal when the calculated value is between 0 and -1 and it should at least be negative and significant as well. Aforementioned conditions imply indirectly that there is a significant long run relationship in the model.

At last ARDL bounds testing approach is to be estimated F-test for the joint significance of the coefficients of the lagged level variable, employing Equation (1) by ordinary least squares (OLS) in order to test for existence of a long-run relationship among the variables. Where, if the computed F-test value exceeds the upper bound critical value then the null hypothesis is can be rejected. Accordingly, it can be concluded that there are long-run cointegration relationship amongst the selected variables in the study. If the Wald F-statistic lies below the lower bound critical value implying that there are no long-run cointegration relationship amongst the selected variables. Similarly, If the Wald F-statistic fall between the lower bound and upper bound critical value indicating inconclusive of the results[11].

Results and discussion

The Results of Long - Run Estimates of ARDL: The ARDL modeling for the univariate cointegration test that estimated the long-run coefficients of the model. The ARDL (3,3,3,4,1) estimates of long-run coefficients are represented in the Table-2.

The long run model corresponding to ARDL (3,3,3,4,1) for the relationship between per capita GDP and the tourist receipts and other explanatory variables can be written as:

$$GDPPC_t = -0.0881238 + 0.4906616TR_t + 0.5106569EX_t + 0.9968261FDI_t + 1.090167INF_t$$

Table-2: Long run estimates of ARDL.

Variables	Coefficients (AIC: 3,3,3,4,1)	T statistics (Prob.)
lnTR	0.4906616**	2.33 (0.032)
lnEX	0.5106569	0.96 (0.349)
lnFDI	0.9968261	1.48 (0.158)
lnINF	1.090167*	1.89 (0.076)

R-square: 0.85103, Adjusted R-square : 0.6932. *, ** indicate 10% and 5% significant levels, respectively.

The computed coefficients of the long run relationship are significant for the variables namely tourist receipts and inflation and are not significant for both exchange rate and foreign direct investment. The estimated coefficients for tourist receipts implies that tourist receipts have a positive and statistically significant impact on per capita GDP at five percent level whereas inflation have a positive and significant impact on per capita GDP at ten percent level. Although, other explanatory variables namely exchange rate and foreign direct investment are not significant implies that both exchange rate and foreign direct investment have no long run relationship on per capita GDP.

Error Correction Model (ECM) Estimates for short-run dynamics: The short run coefficients for tourism receipts is statistically significant at 10 percent level and other rest of the variables are not showing the positive significant despite those repressors have significant coefficient value.

Table-3: Error correction representation of ARDL model.

Variables	Coefficients (AIC: 3,3,3,4,1)	Standard Error	T statistics (pro)
ΔlnGDPPC	-0.2210977	.1868377	-1.18 (0.253)
ΔlnGDPPC (-1)	0.331392**	0.1212189	2.73 (0.014)
ΔlnTR	0.1135585*	0.0396536	2.86 (0.11)
ΔlnTR (-1)	0.0434229	0.0443388	0.98 (0.341)
ΔlnTR (-2)	-0.0549403	0.0426638	-1.29 (0.215)
ΔlnEX	-0.3285375**	0.1555622	-2.11 (0.050)
ΔlnEX (-1)	-0.2895824*	0.151458	-1.91 (0.073)
ΔlnEX (-2)	-0.5074113***	0.1733803	-2.93 (0.009)
ΔlnFDI	-0.1073006***	0.0336488	-3.19 (0.005)
ΔlnFDI (-1)	-0.0916772***	0.0276094	-3.32 (0.004)
ΔlnFDI (-2)	-0.0674457***	0.0219001	-3.08 (0.007)
ΔlnFDI (-3)	-0.0301749**	0.0118219	-2.55 (0.021)
ΔlnINF	-0.343659*	0.0170259	-2.02 (0.060)
ECT (-1)	-0.0881238	0.0407319	-2.16 (0.045)
Constant - 1.794672			

*, **, *** indicate 10%, 5% and 1% significant levels, respectively.

According to the results of ECM, the coefficient of error correction term is -0.0881238 and the coefficient value being between 0-1 and as negatively significant at 5 percent level. Accordingly, error correction term (ECT) is as low as -0.088 indicating speed of adjustment is slow and implying that in every year 8.8 percent of the divergence between the short-run economic growth from its long-run path is eliminated.

ARDL Bound Test: In the last stage of ARDL modeling that shows the relationship between per capita GDP and tourism receipts and other selected explanatory variables, the existence of long run cointegration relationship for the variables is investigated by computing the F test statistic using ARDL Bound Test.

The results of ARDL bound test approach as presented in Table-4 ensures the existence of the long-run relationship between the selected variables. According to the results of ARDL Bound Test, the estimated F-statistic is 7.5. The relevant critical value bounds for this test as computed by Pesaran, Shin, and Smith[11] at the 1% level of is given by 3.74 and 5.06. Since the F statistic above the upper bound of the critical value reject that the null hypothesis of no long run relationship between the selected variables and implies there exists a long-run relationship between per capita GDP, tourism receipts, FDI, exchange rate and inflation.

Table-4: The results of ARDL Bound Test.

F-Statistic	10% Critical Value		5% Critical Value		1% Critical Value	
	1(0)	1(1)	1(0)	1(1)	1(0)	1(1)
7.5 (k-4)	2.45	3.52	2.81	4.01	3.74	5.06

The findings also similar to the results of previous studies[7,12-14]. General believe that tourism contributes to economic growth positively as exports have strongly generated economic expansion. Nevertheless, few of studies found that there is no long run relationship between tourism industry and economic growth[15].

On the whole, the empirical results indicate that there exists both a long-term relationship and short-term relationship between tourist receipts and per capita GDP in Sri Lanka. Therefore, the study can be concluded that the case of Sri Lanka shows that the tourism industry impacts enormously on economic growth of the country. The study supports the existence of the tourism-led growth hypothesis which is in line with general expectation that tourism impacts to economic growth.

Hence, the government of Sri Lanka has to be concern of the development of tourism industry to meet future demand of higher spending tourists in order to enhance tourist receipt by improving their tourism experience. Further macroeconomic policies must to be taken into act to promote tourism development which will directly stimulate economic growth and this is expected to occur that untapped tourism resources to be utilized to expand tourism industry in Sri Lanka.

Conclusion

The present study carried out to examine the impact of tourism industry on economic growth in Sri Lanka over the period of 1977–2016. To analyze the objective of the study, ARDL Bound test analysis has been employed with Long run estimates, Error correction method and ARDL bound test.

The study found that there is a long run relationship between tourism receipt and economic growth in Sri Lanka due to the fact that tourism receipt has positive impact on economic growth in the long run. Further, among the selected variables inflation only positively impact economic growth in the long run and other variables namely exchange rate, foreign direct investment are not significant with economic growth. Similar to that, tourist receipt has positive impact on economic growth in the short run despite other selected variables are having negative impact on economic growth.

Hence, the study suggests that in order to achieve stable economic growth with enormous development of tourism industry, the government of Sri Lanka should have potential to attract not only huge number of tourist but also attract higher spending tourist thereby push up tourist receipts. Additionally, macroeconomic policies must to be taken into act to stimulate tourism development through utilize untapped tourism resources in Sri Lanka.

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