IS EXCHANGE RATE AN IMPERATIVE TO OUTBREAKS OF FOREIGN TOURIST ARRIVALS IN POST WAR SRI LANKA?

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Abstract

Tourist arrivals contribute to attracting foreign exchange earnings in a country like Sri Lanka. Hence, the study attempts to find the answer for the question that "*Is Exchange Rate an imperative to Outbreaks of Foreign Tourist arrivals in Post War Sri Lanka*?". For the study, monthly tourist arrivals and real effective exchange rate from January 2010 to December 2017 were obtained from the data library of Central Bank of Sri Lanka. The stationarity property of the series has been checked by using the Augmented Dickey-Fuller (ADF). The study applies Engle & Granger co-integration, Johansen co-integration, error correction model and Granger causality test for vector autoregressive model to test the relationship between the tourist arrivals and real exchange rate in post-war Sri Lanka. The both Johansson co-integration and Engel & Granger co-integration explicate that there was a long-run equilibrium relationship between the tourist arrivals and real exchange rate in Sri Lanka. The Error Correction Model revealed that 20% of adjustment for equilibrium is taken place in tourist arrivals for each month. The Granger Causality test for Vector Autoregressive model illustrated the causality only from real effective exchange rate to tourist arrivals. Hence, the study concludes that real exchange rate is an imperative factor to outbreak of foreign tourist arrivals in post-war Sri Lanka.

Keywords: Real Effective Exchange Rate, Tourists Arrivals, Co-integration and Causality.

1. Introduction

The tourism sector is one of the main sources of foreign exchange earnings as well as economic growth in the world in the 21st century.Most of the empirical studies show the Tourism sector is significantly contributing to expands the GDP and employment level of a country. Tourism development has a greater impact on Gross Domestic Product (GDP) in non-OECD countries than in OECD countries and in Sub-Sahara African countries(Lee and Chang, 2008). However, despite the almost universal adoption of tourism as a developmental option, the extent to which economic and social development inevitably follows the introduction and promotion of a tourism sector remains the subject of intense debate(Telfer and Sharpley, 2007).

The tourism visitor of Sri Lanka consists the both domestic and foreign. The 65% of the tourism earnings havebeen contributed by foreign tourist visitor in Sri Lanka (World Travel & Tourism Council, 2017). The foreign tourist receipts were increased from 2.8% in 1994 to 5.6% in 2017 as a percentage of GDP in Sri Lanka. Further, as a percentage of total export revenue, the receipts from foreign tourist was rapidly increased from 5.8% in 1996to 26.3% in 2016 (World Bank, 2018).

Based on the literature, the tourism sector is an inevitable source of economic growth in Sri Lanka. It is important to study the factors affecting tourism arrivals especially foreign tourist arrivals since it has a vital contribution to GDP and employment of a country. The knowledge of the causal relationship between tourist arrivals and the real exchange rate is vital to

policymakers, as tourism policies becoming major concerns in Sri Lanka. Therefore, the study attempts to focus only on the relationship between the tourist arrivals and exchange rate.

2. Review of Literature

The real exchange rate is animportant factor to affect the international tourism, and less flexible exchange rates promote tourism earnings (Santana-Gallego, Ledesma-Rodríguez and Érez-Rodríguez, 2010). Webber (2001) stated that the variance of the exchange rate was found to be a significant determinant of long-run tourism demand in 50% of estimates. Further, Indonesia was the only country to find that the exchange rate has a significantly different impact on tourism than relative price.

Agiomirgianakis, Serenis, & Tsounis (2015) examined the effect of exchange rate volatility for Iceland, on tourist arrivals exports during the period a 1990-2014. This study found that there was a negative effect of volatility on tourists' arrivals for Iceland by using co-integration and error correction model. There was a negative relationship between exchange rate volatility and tourist inflows into Turkey during the period of 1994-2012(Agiomirgianakis et al, 2014).

Akay, Cifter, & Teke (2017) studied the effects of the exchange rate and income on Turkish tourism trade balance using quarterly data for the period 1998-2011 by using Johansen's maximum likelihood technique and error correction model. The empirical results of this study found that the exchange rate and foreign income positively affected the tourism trade balances in Turkey.

Chang & McAleer (2009) examined the relationship between the daily tourist arrivals and exchange rate during the period of 1990-2008. It shows that both variables had sensible interpretation among their self. Yap (2011) investigates to what extent exchange rates could adversely affect Australia's inbound tourism and whether volatility in exchange rates could increase the uncertainty in international tourist arrivals to Australia. The study is considered tourist arrival from nine countries of China, India, Japan, Malaysia, New Zealand, Singapore, South Korea, the UK, and the USA for the period January 1991 to January 2011. The study indicated that tourists from Malaysia and New Zealand are relatively more sensitive to currency shocks than the others and sudden appreciation of Australian dollar will not have long-term negative impacts on Australia's inbound tourism.

There is a negative relationship between exchange rate volatility and tourist flows into the two countries of UK and Sweden (Agiomirgianakis et al, 2015). Further, a country which relies heavily on its tourism industry should avoid using exchange rate policies to correct its international competitiveness, as these policies may end up to an exchange rate volatility that could reduce the tourism inflows (Agiomirgianakis et al, 2015).

The literature found that there are few studies were done on the exchange rate and tourist arrivals. No study found a causal relationship between exchange rate and tourist arrivals in Sri Lanka. Therefore, the study attempts to find the answer for the question that "*Is exchange rate an imperative to outbreaks foreign tourist arrivals in Post War Sri Lanka?*".

3. Methodology

The study applies the time series techniques to analyze the relationship between exchange rate and tourist arrivals such as Augmented Dickey-Fuller (ADF), Engle & Granger(1987)Co-integration and Error Correction Model, Johansen (1988)Co-integration and Engel and Granger causality test. The study considered the monthly tourist arrivals and real effective exchange rate from January 2010 to December 2017 gathered from Economic Data Library of Central Bank of Sri Lanka

3.1 Augmented Unit Root Test

The stationarity property of the series has been checked by using the ADF as follows;

$$\Delta Y_t = \alpha_0\gamma + Y_{t-1} + \sum_{i=1}^{p}\beta_i\Delta Y_{t-i} + u_t \qquad \text{Eq.1.1}$$

$$\Delta Y_t = \alpha_0\gamma + Y_{t-1} + a_2 t + \sum_{i=1}^{p}\beta_i\Delta Y_{t-i} + u_t \qquad \text{Eq.1.2}$$

Where Y_t is the series of variables. Eq.1.1 represents the ADF model with constant and Eq.1. 2 represents the ADF model with constant and time trends.

3.2 Co-integration

The Engel and Granger co-integration and Johannsson Co-integration method have been used to identify the long-run equilibrium relationship between exchange rate and tourist arrivals in Sri Lanka. If there exists a co-integration between the variables, then it ensures the existence of an equilibrium relationship between the variables in the long-run.

3.2.1 Engel and Granger Co-integration

To apply the Engel and Granger Co-integration, the series of both variables should be in the integrated order one, i.e., I (1). The ADF unit root test ensured that the series of tourist arrivals and real effective exchange rate have integrated order one. Therefore, the study incorporated the Engel and Granger co-integration methods. The linear combination of both series should be the stationary at a level to ensure the co-integration between the tourist arrivals and real effective exchange rate in Sri Lanka during the post-war period.

3.2.1 Johansson Co-integration

The Johansson Co-integration method also used to explain the co-integration since the ADF test revealed that both series have the same order of integration. The maximum Eigen-value and Trace statistics of Johannsson co-integration is used to decide the existence of co-integration.

3.3 Error Correction Model (ECM)

The Error correction model was applied to identify the short-run dis-equilibrium among both variables because both variables are co-integrated. The ECM explore how much disequilibrium should be corrected in each period. The specification of the ECM is given as;

$$\Delta Y_t = \mu + \sum_{i=1}^{n-1} a_i\Delta Y_{t-i} + \sum_{i=1}^{p}\delta_i\Delta X_{t-i} - \pi\hat{e}_{t-1} + \varepsilon_t \qquad (3)$$

Where Y_t represents tourist arrivals (TA) and X_t represents the real effect of the exchange rate (REER). The coefficient of error correction is denoted by π which reveals how much of the adjustment to equilibrium had taken place for each period.

3.4 Vector Autoregressive Model (VAR)

The study applied following VAR model is given below;

$$\Delta Y_t = a_1 + \sum_{i=1}^{n}\beta_i\Delta X_{t-i} + \sum_{j=1}^{m}\delta_j\Delta Y_{t-j} + e_{1t} \qquad (4.1)$$

$$\Delta X_t = a_2 + \sum_{i=1}^{n}\theta_i\Delta X_{t-i} + \sum_{j=1}^{m}\rho_j\Delta Y_{t-j} + e_{2t} \qquad (4.2)$$

Where Y_t represents tourist arrivals and X_t represents the real effective exchange rate. The series of both variables are non-stationary at the level of the series but stationary at the first difference of the series (ΔY_t and ΔX_t) which ensured by ADF unit root test. Further, this study applied the Granger Causality test to the above VAR model. The null hypothesises of Granger Causality test are given as follows;

1. $H_o: \sum_{i=1}^{n} \beta_i = 0$; i.e., Change in the real effective exchange rate does not granger cause the changes in the tourist arrivals
2. $H_o: \sum_{j=1}^{m} \rho_j = 0$; i.e., change in the tourist arrivals does not granger cause the changes in the real effective exchange rate.

4. Results and Discussions

Table.1 Results of Augmented Dickey-Fuller (ADF)

Variables	At level		At first difference	
	Constant	Constant and trend	Constant	Constant and trend
Exchange Rate	-2.1108 (-2.892)	-2.4539 (-3.464)	-8.6299 (-2.892)	-8.5749 (-3.458)
Tourist Arrivals	-0.8237 (-2.896)	-0.2161 (-3.464)	-16.756 (-2.896)	-16.694 (-3.464)

The results of the ADF unit root test are presented in the above Table.1. The bothmodel suggests that the series of the real exchange rate and tourist arrivals are non-stationary, but in the first difference, these series are stationary. The stationery for these both variables in the first difference level leads to analyze the existence of a long-run relationship. Therefore, both series have the order of integration one.

Table.2 Engel and Granger Co-integration

Dependent Variable	Tau-statistic	Probability
Tourist Arrivals	-3.4221	0.0476

Table.2 displays the results of Engel and Granger co-integration. The p-value of Tau-statistic, 0.0476, proves that both variables are co-integrated at 5% significant level which reveals the presence of a long-run equilibrium relationship between both variables.

Table3 presents the results of trace and maximum Eigenvalue statistics for Johansson Co-integration. Both test statistics revealed that there was two co-integration equation exist at the 5% significant level. Overall, the results of this study show that there is a strong long-run relationship between tourist arrivals and the exchange rate in Sri Lanka.

Table.3 Johansson Co-integration

Number of co-integration Equation	Trace Statistics	Max-Eigen Statistics
None	97.7154 (15.4947)	66.3842 (14.2646)
At most 1	31.3317 (3.8414)	31.3317 (3.8414)

Note: The 5% critical values are given in parenthesis of the above table.

Table.4 The Results of the Error Correction Model

Variables	Coefficient	t-statistics
Constant	1.1817	0.5578
$\Delta TA(-1)$	0.0567	0.53815
$\Delta REER(-1)$	4.2915	2.7586
$\pi(Error\ Correction)$	-0.2020	-2.6155

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The estimated results of ECM are displayed in Table.4. It revealed that 20% of adjustment for equilibrium is taken place in tourist arrivals for each month.

Table.5 Order of Lag Selection for the VAR model

Lags	AIC	HQ	SC
0	29.6306	29.6530	29.6862
1	27.0007	27.0679	27.1674*
2	26.9576	27.0697	27.2354
3	26.8668	27.0236	27.2556
4	26.8215*	27.0232*	27.3215
5	26.8495	27.0959	27.4606
6	26.8798	27.1710	27.6019

Note: AIC: Akaike Information Criteria; SC: Schwarz Information Criteria; HQ: Hannan-Quinn Information Criteria

Table.5 shows AIC, HQ and SC criteria for choosing the order of the VAR model. The both AIC and HQ criteria suggest that optimum lag length is four and SC criteria suggest that optimum lag is one because the values are minimum at these lag orders. Therefore, the Granger Causality Test was applied at the lag order 1, and 4 since the study have enough observation to run a model at the higher order of lag.

Table.6 Granger causality test

Null Hypothesis	p-value at lag order 1	p-value at lag order 4
The real exchange rate does not Granger cause tourist arrivals	0.0241	0.0050
Tourist arrivals do not Granger cause the real exchange rate	0.6241	0.1996

Table.6 shows the p-values of Granger causality test for VAR (1) and VAR (4). The first null was rejected since the p-value is less than 0.05 but the second null hypothesis was not rejected at 5% significant level because the p-value is greater than 0.05. It means that real exchange rate does cause the tourist arrival, but tourist arrivals did not cause the real exchange rate in Sri Lanka from January 2010 to December 2017. Therefore, the study concludes that the real effective exchange rate is an imperative factor to outbreak the tourist arrivals in Sri Lanka.

Conclusion

The both Johansson co-integration and Engel &Granger co-integration explicate that there was a long-run equilibrium relationship between the tourist arrivals and real exchange rate in Sri Lanka. The Error Correction Model revealed that 20% of adjustment for equilibrium is taken place in tourist arrivals for each month. The Granger Causality test for Vector Autoregressive model illustrated that real effective exchange rate does cause the tourist arrivals of Sri Lanka, but the tourist arrivals did not cause the real effective exchange rate at 5% significant level. Therefore, the study concludes that real exchange rate is an imperative factor to outbreak foreign tourist arrivals in Sri Lanka. The results are important for policymakers to take attractive changes in the exchange rate to induce the tourist arrivals as well as tourism earning.

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