Dynamic impact of exchange rate on tourism demand in Sri Lanka

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Abstract

The objective of this study is to test the dynamic impact of exchange rate on tourism demand in Sri Lanka over the period of 1970-2015. In this study, the unit root test and bivariate cointegration test were employed. The unit root test result indicates that the variables used in this study are non- stationary at their level, become stationary at their 1st difference. The bivariate cointegration test indicates that the exchange rate in Sri Lanka has a long-run relationship with tourism demand. Bothe the long-run and short estimated model of this study indicate that the key independent variable of the exchange rate has a positive and significant relationship with tourism demand in Sri Lanka under the study period. Further, the Durbin-Watson test statistics of both estimated long-run and short-run model confirm that they are not suffering from the autocorrelation issue.

Keywords: Tourism demand, Exchange rate, bivariate cointegration, Sri Lanka

Introduction

Over the past few decade, there was a considerable growth in international tourism demand in Sri Lanka from various countries. Much estimation surrounds the factors affecting these trends and, in particular, the role of exchange rate volatility which have seen the changes over the periods. The Sri Lankan tourism industry achieved a multitude of success during 2015. Tourism demand recorded 1,798,380 arrivals, almost achieving the revised target of 1.8 million arrivals set for the year. Significant increase in investment in the tourism industry, tourism related infrastructure development, introduction of new tourist attractions and strategic promotional campaigns conducted by the private sector and the government in order to attract more tourists in to the country, helped achieve this success. Tourism demand from all major regions, except Eastern Europe, increased in 2015. Western Europe continued to be the largest tourist origin for Sri Lanka with the number of tourism demand increasing by 15.3% to 552,442. However, continuing the trend observed since 2012, tourism demand from Western Europe, as a share of total arrivals, fell further to 30.7% in 2015, from 37.1 per cent in 2012, reflecting the growth in tourism demand from non-traditional sources. The share of tourism demand from East Asia increased continuously since 2010, mainly due to the impact of China dominating the region at an impressive growth rate.

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In terms of individual country basis, India remained as the leading country of tourist origin with 316,247 number of demands in 2015, whereas China surpassed the UK to come second, followed by Germany, Maldives and France. These six countries together reported for 54.8% of tourism demand to Sri Lanka in 2015. The highest growth rate of 67.6% to 214,783 of tourism demand was recorded from China, followed by both Netherlands and Denmark, recording a growth rate of 35.3%, to 32,742 and 15,203 of tourism demand, respectively. Based on the purpose of visit, nearly 67% of tourism demand was the purpose of holiday, in 2015.Tourism demand for business purposes recorded a marginal level of 1%, whereas the share of tourism demand for other purposes: visiting friends and relatives, religious and cultural purposes, health, education and sports, was about 32% of total tourism demand in 2015.

The Sri Lankan rupee remained broadly stable during the first eight months of 2015, but depreciated considerably thereafter, as a result of the Central Bank decision to allow greater flexibility in the determination of the exchange rate. The lower than expected foreign exchange inflows, coupled with high levels of outflows, exerted significant pressure on the exchange rate during the year. This was mainly due to the reversal of foreign investments in the government rupee securities market, in anticipation of, and the subsequent hike in interest rates in the US, and the high level of demand for foreign exchange, due to increased expenditure for non-oil imports and foreign debt service payments. The subsequent persistent depreciation pressure on the Sri Lankan rupee against the US dollar necessitated the continuous intervention of the Central Bank in the domestic foreign exchange market, in order to reduce volatility. Supported by the supply of US dollars 1.9 billion by the

Central Bank, on a net basis, the rupee recorded a marginal depreciation of 2.42% against the US dollar, during the first eight months of the year. However, on 03 September 2015, the Central Bank decided to limit its intervention in the domestic foreign exchange market and allowed the exchange rate to be largely determined by the demand and supply conditions of the market. This resulted in the Sri Lankan rupee depreciating by 6.64% against the US dollar, during the period from 04 September to end 2015. Overall, the rupee depreciated against the US dollar by 9.03percent to Rs. 144.06 as of end 2015. The annual average exchange rate of the rupee against the US dollar also depreciated to Rs. 135.94 in 2015 from Rs. 130.56 in 2014.

There is a hypothesis in the mind of tourism-related researchers whether exchange rate against the US dollar affects the tourism demand in Sri Lanka. Therefore, it is a good time to examine the relationship between exchange rate and tourism demand. For that, this study seeks the answer to the research question of whether the exchange rate against the US dollar in Sri Lanka determine the tourism demand. In order to answer this research question, this study establishes the following objective. The objective of this study is to test the dynamic impact of exchange rate on tourism demand in Sri Lanka.

This study is structured as follows: 1st section is introduction, literature review is given in 2nd section, 3rd section presents the research method, results and discussion is illustrated in 4th section, the final section concludes this study.

Literature review

Even if tourism related researches are not new one, some specific areas of tourism have been examined well. However, the relationship between exchange rate and tourism demand was not investigated in-depth. This situation even seems in Sri Lanka. However, in this section, this study reviews some existing previous studies to identify the research gap. Webber (2001) investigates the relationship between the exchange rate and tourism demand in Australia over the period 1983-1997. This study concludes that the exchange rate promotes the tourism demand in Australia. De Vita (2014) concludes the exchange rate positively influence on tourism demand. Quadri, & Zheng (2010) examine the relationship between exchange rate and tourism demand based on the Italian data. They finalized that the exchange rate positively affects the tourism demand in such country. Meanwhile, Santana-Gallego et al. (2010) conclude the exchange rate is a determinant factor of tourism demand. Chadeeand, & Mieczkowski (1987) investigate the impact of exchange rate on tourism demand in Canada and conclude that the exchange rate positively influences the tourism demand in Canada. Crouch (1993) finds that tourism demand is determined by exchange rate. All of the literature reviewed in this section take a concrete decision that the exchange rate positively affects the tourism demand. However, in the case of Sri Lanka, as this relationship is not so far studied in-depth, it is a researchable issue in Sri Lanka. Thus, this situation needs a research on the relationship between the exchange rate and tourism demand in Sri Lanka in-depth.

Research method

Data and empirical model

This study considered annual time series data of total tourism demand (TD) and exchange rate (EXR) against the US dollars over the period 1970-2015. The data for the variable of tourism demand were collected from the annual statistical reports of Sri Lanka tourism development authority published in various years and the data for the variable of exchange rate were gathered from the annual report of the Central Bank of Sri Lanka published in various years. All the data for both variables used in this study were transformed into natural logarithms. In this study the variable of exchange rate is independent variable and the variable of tourism demand is dependent variable. Based on the knowledge of literature reviewed in this study, the empirical model of this study by including the variables of exchange rate and total tourism demand can be written as follows:

(1)

$$TTD_t = \beta_0 + \beta_1 EXR_t + \varepsilon_t$$

where: TTD_t is total tourism demand, EXR_t is exchange rate, β_0 is intercept, β_1 is coefficient of exchange rate and ε_t is error term.

Analytical technique

Due to the fact that the time series variables are used in this study it is necessary to test the stationary of the variables used in this study. In order to do that, the study employs the Augmented Dickey-Fuller test to confirm the order of integration of the variables. If the

variables used in this study are stationary at their 1st difference, the Engel- Granger test will be applied to test the long-run relationship between the variables used in this study which is called the cointegrating ordinary least square method. Having estimated the equation (1), the error term (ε_t) was found based on the following equation.

(2)

$$\varepsilon_t = TTD_t - (\beta_0 + \beta_1 EXR_t)$$

If the estimated error term (ε_t) given in equation (2) is $I(0)$, it will be conclude that there is a long-run relationship between the variables used in this study. On the other hand, If the estimated error term (ε_t) given in equation (2) is non-stationary at its level, the conclusion is that there will be no long-run relationship between the variables used in this study.

Once confirmed the long-run relationship between the variables used in this study, this moved to test the short-run behaviour of tourism demand to its long-run value. In order to test the short-run behaviour of tourism demand, this study used the error correction model (ECM) introduced by Engel and Granger (1987). Therefore, the ECM specification of this study can be written as follows:

(3)

$$\Delta TTD_t = \beta_0 + \beta_1 \Delta EXR_t + \beta_2 \hat{\varepsilon}_{t-1} + u_t$$

where Δ is the 1st difference notation, $\hat{\varepsilon}_{t-1}$ is the one period lag value of the residual from the regression (1) u_t is the error term of the ECM of this study.

Results and Discussion

Shown in Figure 1 is the relationship between exchange rate and tourism demand in Sri Lanka. It explains that the exchange rate in Sri Lanka has a positive relationship with tourism demand which means when increasing exchange rate against US dollar international tourists think that the tourism-related actives in Sri Lanka may be inexpensive comparted to other countries that follows tourism industry. This thought of tourists helps to tourism demand in Sri Lanka. However, by this statement, it cannot be confirmed that the exchange rate has a long-run relationship with tourism demand. In order to do that, this study as stated in the research methods employs the Engel-Granger bivariate cointegration test.
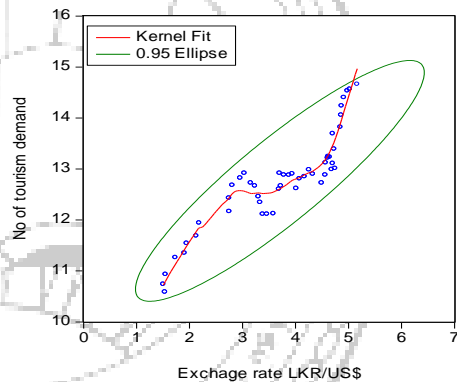

Figure 1. Relationship between exchange rate and tourism demand in Sri Lanka
Source: E-views software

Table 1 illustrates the test results of Augmented Dickey-Fuller unit root test, which indicates the variables used in this study are non-stationary at their level, becoming stationary at their 1st difference.

Table 1. ADF unit root test results

Variable	Augmented Dickey-Fuller (ADF) test		Decision
	I(0)	I(1)	
$lnEXR_t$	-1.625 (0.768)	-8.971 (0.000)	$I(1)$
$lnTD_t$	-0.896 (0.781)	-4.816 (0.000)	$I(1)$

Source: E-views software

Given in Table 2 is the long-run relationship between the exchange rate and tourism demand in Sri Lanka, which indicates that the ADF unit root test result of residual given in equation 2 is stationary at 5% significance level. The reason of taking the stationary decision is that the estimated t-statistic of ε_t is grater than the t-statistic of the ADF unit root test at 5% significance level. Therefore, it can, based on the Engel and Granger cointegration test, be concluded that the exchange rate of LKR/US$ has a long-run relationship with tourism demand in Sri Lanka.

Table 2. Bivariate Cointegration test result

Variable	Augmented Dickey-Fuller (ADF) test	Decision
	At level	
ε_t	-1.809 (0.047)	$I(0)$

Source: E-views software

The estimated equation given in below indicates the details of the long-run relationship between the exchange rate and tourism demand which was estimated based on the equation given in equation 1 of this study. The estimated coefficient of exchange rate indicates that 1% increases in the exchange rate in Sri Lanka occurs the total tourism demand in Sri Lanka by 0.8%.

$$ln\widehat{TTD}_t = 9.879 + 0.78lnEXR_t$$
$$t = 46.38 \quad\quad 14.106$$
$$R^2 = 0.8048 \quad d = 0.2091$$

Further, the validation of the estimated model given in this study is essential in the econometric analysis. In that respect, as this study uses bivariate analysis, Granger and Newbold (1974) recommend the Durbin-Watson d test to validate the bivariate model. In that respect, the null hypothesis that there is no first-order serial correlation in the disturbances (ε_t) should not be rejected when the Durbin-Watson d statistic is less than the R^2 of estimated model. In the case of this study, the estimated the Durbin-Watson d statistic is 0.2091 which is less than value of R^2. Therefore, the decision is that the estimated long-run (cointegration) model of this study does not suffer form the serial correlation which explain that the estimated model is robust.

Given in the below equation is details of the short-run behaviour of the variables used in this study. This test results indicates that short-run changes in exchange rate have significant positive effect on tourism demand. Further, the estimated coefficient of error correction term indicates that it is negative, less than one and statistically significant. Thus, it can be concluded that the response variable of this study moves towards the long-run equilibrium path. Furthermore, the coefficient of error correction term is 0.03, which addresses that about 3% of the discrepancy or equilibrium between the actual and the long-run value of tourism demand is eliminated each year.

$$\Delta ln\widehat{TTD}_t = 0.074 + 0.081nEXR_t - 0.03\varepsilon_{t-1}$$
$$t = (2.289) \quad (3.075) \quad (-5.69)$$
$$R^2 = 0.7851 \quad d = 0.2638$$

Conclusion

This study has examined the dynamic impact of exchange rate on tourism demand in Sri Lanka using the Engel- Granger cointegration technique over the period 1970-2015. The unit root test result indicates that the variable used in this study are stationary at their 1st difference. The test result of cointegration confirms that the exchange rate in Sri Lanka has a long-run relationship with tourism demand. The long-run and short-run coefficient of exchange rate point out that the exchange rate promotes the tourism demand in Sri Lanka. The Durbin- Watson d statistic for long-run and short-run estimated model indicate that the estimated models in the study are robust. Therefore, this study recommends that the policymakers should consider the exchange rate volatility when establishing the tourism policy in Sri Lanka.

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