Tourism Economics in Sri Lanka: An Econometric Analysis

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ABSTRACT

Sri Lanka aims to transform its tourism sector into one of the largest foreign exchange earners in 2016 by attracting 2.5 million high spending tourists. Tourism was ranked as the fifth largest source of foreign exchange earnings in 2012, and third largest in 2013 contributing 5.2 percent to total foreign earnings of the country. Further to this, the Sri Lankan government also identified tourism as a major hub of the country's economy. Given the multi-dimensional impact the sector has on the country's economy, it has to be examined systematically. This paper develops an econometric model based on the Cobb-Douglas function to analyze the relation between foreign exchange earnings, tourist arrivals, tourist prices, and tourist spending and direct employment in tourism. These variables of tourism are estimated utilizing model parameters such as R-Studio based on data from the sample period from 2002 to 2013. The formula presented in this study can be used by policy makers to calculate future foreign exchange earnings, employment, arrivals and prices related to tourism in Sri Lanka.

1.0   INTRODUCTION

Tourism could be treated as a key instrument of economic development as it generates foreign exchange earnings and direct and indirect employment opportunities along with a range of other economic activities. According to the World Tourism Organization (UNWTO, 2014), international tourist arrivals grew by 5 percent during the year 2014, despite geopolitical challenges and lingering economic recovery. Strongest growth was reported in the Americas (+8 percent) followed by Asia, the Pacific (+5 percent) and Europe (+4 percent). Looking at sub-regional growth figures, (UNWTO, 2014) calculated a 9 percent growth in North America and an 8 percent growth in South Asia, establishing these regions as star performers. Tourism's direct, indirect and induced contribution to the world's GDP is 9 per cent. It

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accounts for 6 percent of the world's exports, and creates 1 in 11 jobs according to UNWTO. After reaching the one billion mark in 2012 an2013, international arrivals grew by over 5 percent by reaching a record 1087 million. UNWTO forecasts 1.8 billion tourists for the year 2030. Among the South Asian countries, Sri Lanka maintained a soiled 27 percent growth in 2013 followed by Maldives (17 percent).India, which is the largest tourist destination in South Asia, managed to have a 4 percent growth (UNWTO, 2014). In 2013, Lonely Planet identified Sri Lanka as the first among the top 10 countries to visit. Other ranking agencies also ranked Sri Lanka among the top ten countries to travel. Tourism was the 3rd largest foreign exchange earner for the country in 2013. Tourist earnings have increased over the past, and the current figure shows over US$1.7 billion of foreign exchange earnings to Sri Lanka in 2013. The best contribution of US$ 6.4 billion is from overseas remittances and US$4.5 billion came from textiles and apparel exports in 2013.

Sri Lanka has earned US$1.8 billion revenue from tourism in 2013. Tourism sector's average contribution to the GDP during 2010-2012 is 2 percent. The Sri Lankan government plans to establish the tourism sector as an above 5 percent contributor of GDP by 2016. According to the (Central Bank of Sri Lanka, 2013), the total number of persons employed directly in the tourism sector was 270150 in 2013, compared to 124970 in 2009. Government of Sri Lanka targeted 1.5 million tourist arrivals in 2014 with a revenue target of $1.8 billion. The country also expects that the current 26,700 rooms will increase up to about 50,000 rooms by 2016 if the country is to accommodate the 2.5 million tourists that are targeted for 2016.

2.0   LITERATURE REVIEW

According to the UNWTO, tourism consists of activities of persons traveling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes[2]. This definition hints that tourism involves a journey to a different location and it is only a temporary movement from the usual place of residence. Set of activities related to tourism includes transportation, communication, hotel and food, shopping and entertainment. There is bidirectional causality between tourism and economic growth according to some empirical evidence, however the question of which causes which one is still inconclusive.

Tourism expenditures generate income to the host economy and stimulate the investment necessary to finance growth in other economic sectors. Some countries accelerate this growth by requiring visitors to bring in a certain amount of foreign currency for each day of their stay. An important indicator of the role of international tourism is its generation of foreign exchange earnings. Tourism is one of the top five export categories for as many as 83% of countries and is a main source of foreign exchange earnings for at least 38% of countries (Machel McCatty & Prudence Serju, 2006). Direct contributions are generated by taxes on income from tourism employment and tourism businesses, and by direct levies on tourists such as departure taxes. Indirect contributions come from taxes and duties levied on goods and services supplied to tourists.

The rapid expansion of international tourism has led to significant employment creation. Tourism can generate jobs directly through hotels, restaurants, nightclubs, taxis, and souvenir sales, and indirectly through the supply of goods and services needed by tourism related businesses. Tourism established itself as a large and dynamic industry, offering new and interesting careers to vast numbers of individuals from all walks of life, with many of them direct and the others as indirect beneficiaries. The Hospitality and Tourism Industry-hotels of different star categories, guest Houses, Rest Houses, Restaurants, bars, Club Houses, leisure centers, tour operators and travel agents- now employs well over three million people and is currently regarded as the industry which has the potential of being the number one foreign exchange earner in the country due to its ability to earn almost every rupee spent by a visitor.

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[2]   http://www.tugberkugurlu.com/archive/definintion-of-tourism-unwto-definition-of-tourism-what-is-tourism   (2   December 2014).

(Ranasinghe and Deshapriya, 2012) identifies tourism as "one of the key engines of growth and development in the Sri Lankan economy."They further assert that it "is a key focus of the Government's industrial strategy." (Caglayan, Sak and Karymshakov, 2012), investigated the causal relationship between tourism revenue and gross domestic product (GDP) using panel data of 135 countries for the period of 1995-2008. The result indicated that there was bidirectional causality in Europe between tourism revenue and GDP, unidirectional causality in America, Latin America and Caribbean countries. The reverse direction of causality was found in South Asia. (Aktar and others, 2014) applied Johansen's multivariate cointegration techniques to investigate the relationship between tourist arrivals and foreign exchange earnings. They have established the long run relationship between the above two variables. (Rasul and Mananshar, 2009) observed that the potential of tourism has remained largely unrealized in South Asia and tourism's contribution to regional national economies, employment generation, foreign exchange earnings and national revenue has remained minimal.

Available evidence suggests that many developing countries are able to raise a significant portion of government revenue from international tourism. In Sri Lanka in 1970 the receipts from the tourism sector were LKR 21.5 million and by the end of 2008 it has grown up to LKR 37,094 million. Further, (Sathiendrakumar and Tisdell, 1987) argue that, "if those imports are capital goods or basic inputs for producing goods in any area of the economy, then, it can be said that earnings from tourism is playing a fundamental role in economic development". For instance, the (World Trade Organization, 1998) claimed that countries (most of them are highly specialized tropical, tourist countries) raise 10 to 25 per cent of government revenue from the tourism sector. In some cases, more than 50 per cent of government revenue has been generated by the tourism sector (Sathiendrakumar and Tisdell, 1987). (Wanhill & Stephen R., 1983) investigated cointegration and causality between tourism and economic growth in Mauritius and found that tourism has contributed significantly to economic growth. Moreover, he claimed that tourism has a significant positive impact on Mauritian economic development. (Armstrong, Daniel & Francis, 1974) examined the impact of tourism in the economic growth of Greece in the longrun. He analyzed the causality of GDP, exchange rate and international tourism receipts and concluded that there is a strong Ganger causality relationship between international tourism receipts and economic growth, a strong causal relationship between exchange rate and economic growth, and moderate causal relationships between economic growth and international tourism receipts and between exchange rate and international tourism receipts.

According to the literature there is valuable growth potential in tourism and other related variables including economic, demographic, technological, psychological, social-political and cultural values. The expansion of tourism contributes to a range of other economic activities as well. It has backward linkages to transport, agriculture, arts and crafts and gem and jewellery industries. Increased tourism will provide an impetus to these industries as well as the construction of hotels of various sizes in varied locations generating numerous job opportunities.

3.0   OBJECTIVES OF THE PAPER

While it is impossible to quantify some of the variables and interrelationships among them, it is important to recognize interlinks between selected economically significant variables related to tourism to further understand and develop the sector. Therefore, this study attempts to quantify the relationship between tourism related foreign earnings and four other important variables for Sri Lanka. The main objective of this paper is to develop an econometric model based on the Cobb-Douglas function to analyze the relationship between foreign exchange earnings, tourist arrivals, tourist prices, tourist spending and direct employment in tourism. The importance of this research is in the outcome of this formula, which can be used to forecast future tourism related foreign earnings and four variables apart from establishing linear relationships among tourism related variables in Sri Lanka.

4.0   METHODOLOGY

This study applies annual time series data of total foreign exchange earnings from tourism, total arrivals of tourists, index of tourist prices for all items and income received per tourist per day in Sri Lanka for the period of 1999-2013. The above data were obtained from the Sri Lanka Tourism Development Authority (SLTDA) and the World Tourism Organization (UNWTO).
The key data include the following:

- Total foreign exchange earnings
- Total arrivals of tourists
- Index of tourist prices for all items
- Income per tourist per day
- Direct employment in the tourism industry

To examine the relationship between foreign exchange earnings and other independent variables of tourist arrivals, foreign tourist price, income received per tourist per day and employment in the tourism trade, the study used the following log-linear model of Cobb-Douglas function.

$$\ln Y = \alpha + \beta_1 \ln x_1 + \beta_2 \ln x_2 + \beta_3 \ln x_3 + \beta_4 \ln x_4 + \varepsilon$$

In the above model, Y denotes total foreign exchange earnings (Rs. million), α symbolizes the intercept, X_1 represents total arrivals of tourists, X_2 indicates the index of tourist prices for all items, X_3 stands for income per tourist per day (in Rs), X_4 shows employment in the tourism industry and finally ε denotes residual error. Since the current study focuses on establishing the relationships, it is important to examine the correlation between independent variables.

5.0   SRI LANKA'S TOURISM SECTOR: BACKGROUND

Tourism has emerged as a significant source of foreign exchange earnings for many developing countries. Tourism has become a major source of foreign exchange earnings for developing countries which were traditionally dependent upon primary products for export earnings. Many developing countries have experienced severe deficits, particularly in the current account of the balance of payments during the past few decades. In the resolution of these economic issues, tourism has played an important role. Furthermore, some countries model foreign supply of capital and the growth in export as dependent on tourism growth. Tourism in Sri Lanka has a tremendous potential, although the industry has experienced much volatility due to man-made and natural misfortunes.

For a country or a place to be an attractive tourist destination it has to be rich in land, water, vegetation and man-made creations. Islands like Seychelles, Maldives are rich in Sun, Sea and Sand while countries like Malaysia, Thailand and Kenya are rich in culture, nature and adventure to keep tourists attracted. In the case of Sri Lanka, its inherited culture, natural resources as well as the coastal line around the island are gifts for this particular industry to flourish. However, the civil war that started in July 1983 adversely affected tourism, with arrival figures reducing for 1982-3. Total arrivals were 230,106 in 1986, a 43% decrease from 1982. The Ceylon Tourist Board provided a range of concessions to the industry in order to help them survive the crisis. In 1987, tourist arrivals declined from 23 percent. In the mid-1980's, the declining security situation began to have an increasingly negative impact on the Sri Lankan economy, and in early 1988 economic prospects for the 1990s appeared to be linked in part to a resolution of the war. Political stability of Sri Lanka was questionable in particular, with reference to the international tourist arrivals. Certain war related events such as the bomb blasts in the commercial capital of Colombo, terrorist attacks at the Central Bank of Sri Lanka in 1996 and the attack on the international airport were particularly detrimental to the industry. The war ended after the Government of Sri Lanka militarily defeated the LTTE in 2009. Immediately after this, Sri Lanka's tourism sector started to flourish. Tourist arrivals to Sri Lanka during the recent past have set a record for reaching the 1 million mark by the year 2012. This is an increase of 17.5 percent compared to 2011 (Annual Report, Sri Lanka Tourism Development Authority). World Tourism Organization forecast the arrival of tourists to Sri

Lanka is 2000 million and the government of Sri Lanka targets 2.5 million high spending tourists by 2020. Figure 1 explains the arrivals of tourist to Sri Lanka from 1999-2013.

Figure 1: Tourist arrival during the Period of 1999-2013.
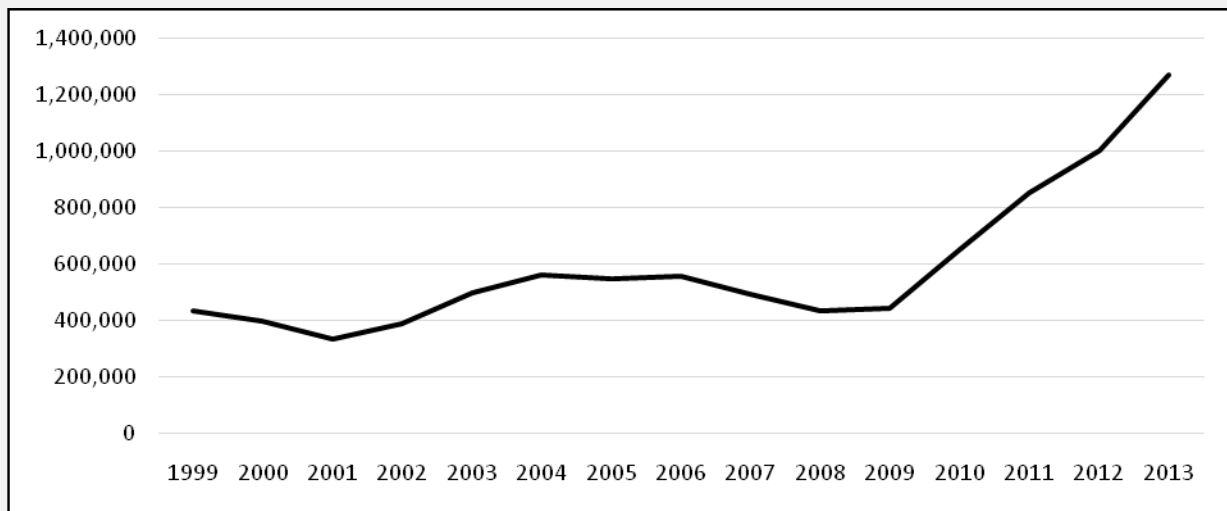
Sri Lanka recently carried out tourism promotional campaigns in India and China. The current pattern of tourist arrivals has changed dramatically moving from traditional western countries to Asian countries. Sri Lanka aims to attract 300000 Chinese tourists and 500000 Indian tourists by 2016. Table 1 presents the top 20 percent share of tourist arrivals to Sri Lanka by country of residence in 2013.

Table 1: Top 20 percent share of tourist arrivals to Sri Lanka in 2013

Rank	Country	Percentage	Rank	Country	Percentage
1	India	16.4	11	Japan	2.5
2	U.K.	10.8	12	Canada	2.4
3	Germany	6.7	13	Pakistan	2.0
4	Maldives	6.3	14	Saudi Arabia	1.9
5	France	5.1	15	Netherlands	1.8
6	China	4.3	16	Malaysia	1.5
7	Australia	4.3	17	Switzerland	1.5
8	Russia	4.0	18	Italy	1.4
9	Ukraine	3.0	19	Indonesia	1.4
10	U.S.A.	2.7	20	Singapore	1.2

Source: http://www.sltda.lk/sites/default/files/Tourist%20Arrivals%20by%20Country%20of%20Residence%202013.pdf

According to these statistics most of the tourists come to Sri Lanka from India. This is followed by United Kingdom, Germany, Maldives, France, China, Australia, Russia, Ukraine and the USA among other top 10 countries. Foreign exchange earnings increased significantly in post-war Sri Lanka with tourism increasing its position from being the 5th largest source of foreign exchange earnings in 2012 to 3rd largest contributor in 2013. It was recorded as US$ 838.9 million in 2011 and this increased to US$ 1038.3 million in 2012. The percentage of tourism's contribution to total foreign earnings in 2012 amounted to 5.2 percent. Foreign exchange receipts per tourist per day recorded an increase from US$ 98 in 2011 to US$ 156 in 2013. Sri Lanka's tourism development strategy plan was launched in 2011 with the following key objectives: (a) Promote tourism sector to achieve 2.5 million arrivals by 2016; (b) Double the hotel room capacity up to 45 000 by 2016; (c) Increase direct and indirect employment associated with the tourism industry to 5,000,000 by 2016; (d) Improve Sri Lanka's global image; and (e) Increase foreign exchange earnings to US$ 2.75 billion in 2016.

The Sri Lankan government expects the tourism sector to generate US$ 3.5 billion for the national economy by 2016 by attracting 2.5 million arrivals. 1 million Chinese tourists are expected to arrive in the country during this period. The government estimates that future spending by a tourist per day will rise

up to US$ 200 during the next ten years. The government of Sri Lanka incorporated the tourism sector to its 5 hubs of development, and promotes the industry through ecotourism, international shopping centers and other contemporary features. The current government recently relaxed restrictions on the casino industry to gather a critical mass of high spending tourists to the country. Figures 2-6 present in brief tourism related information for Sri Lanka.
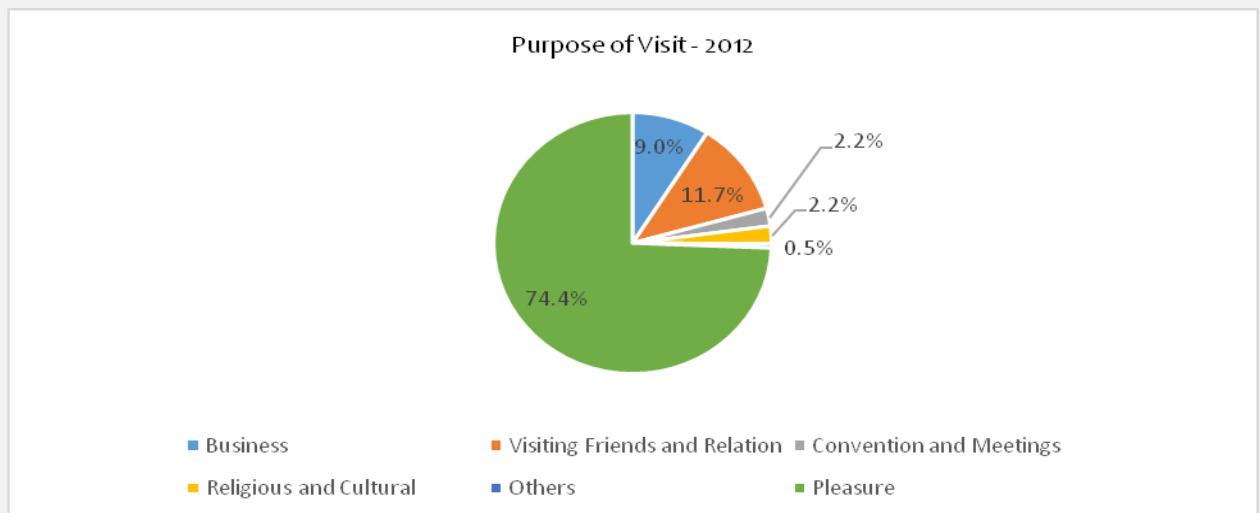
Figure 2: Purpose of visit to Sri Lanka.

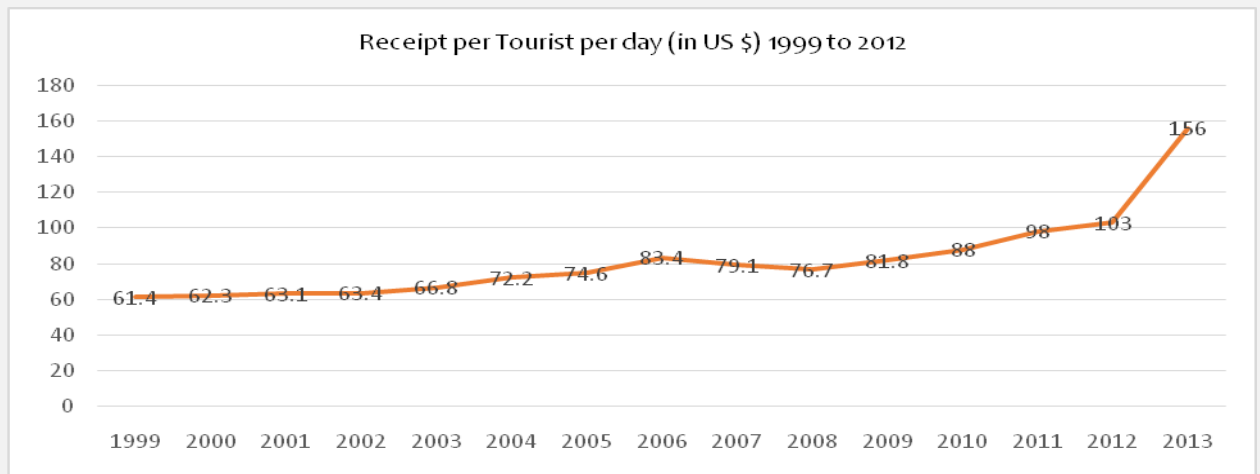Figure 3: Receipt per tourist per day (US$) from 1999 to 2013.

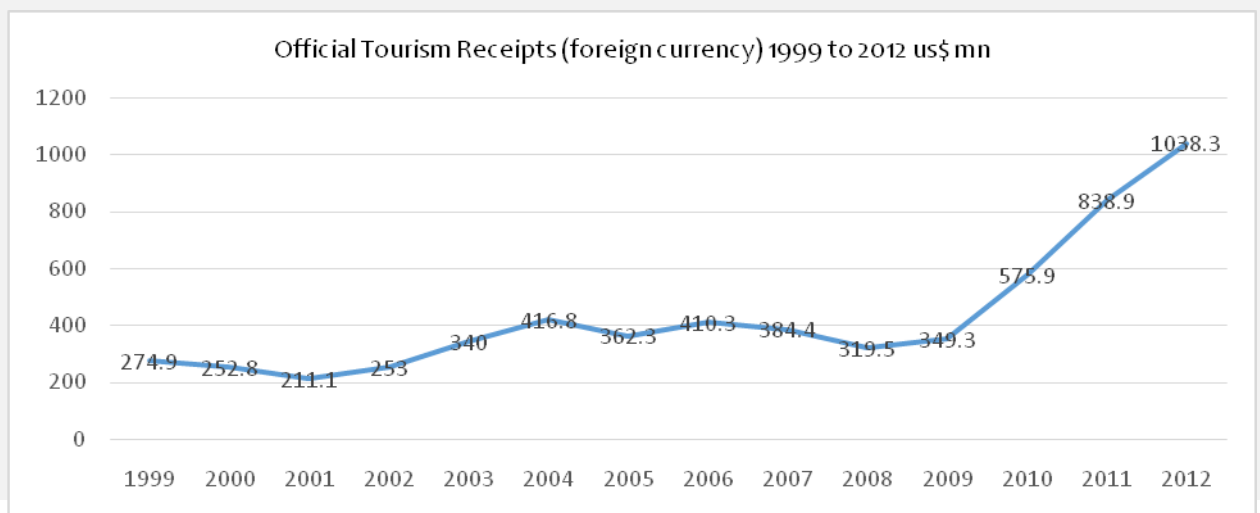Figure 4: Official tourism receipts from 1999 to 2012 (US$ million).

http://www.thejournalofbusiness.org/index.php/site

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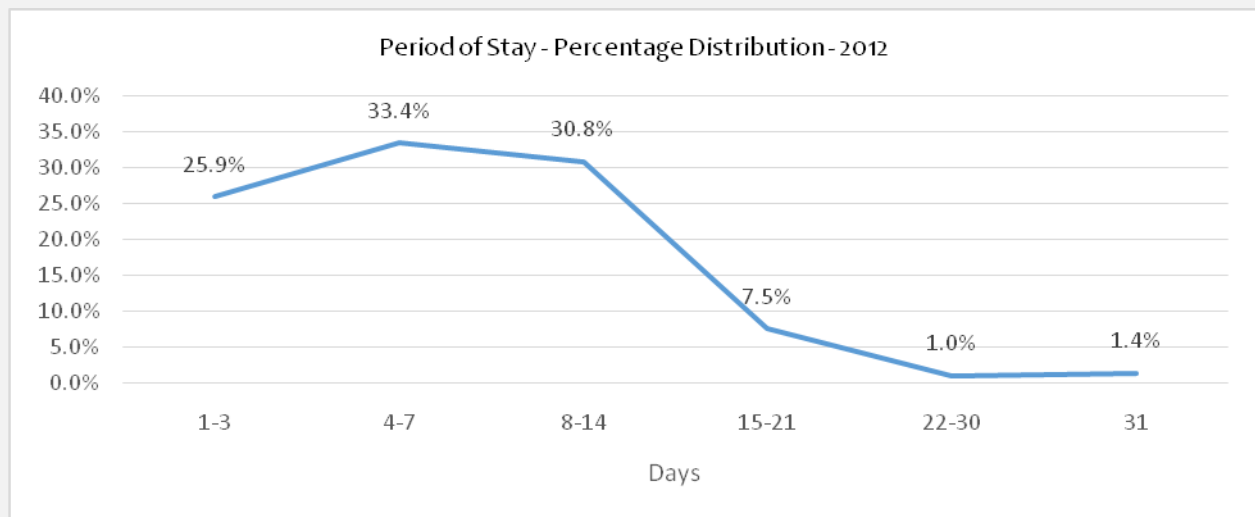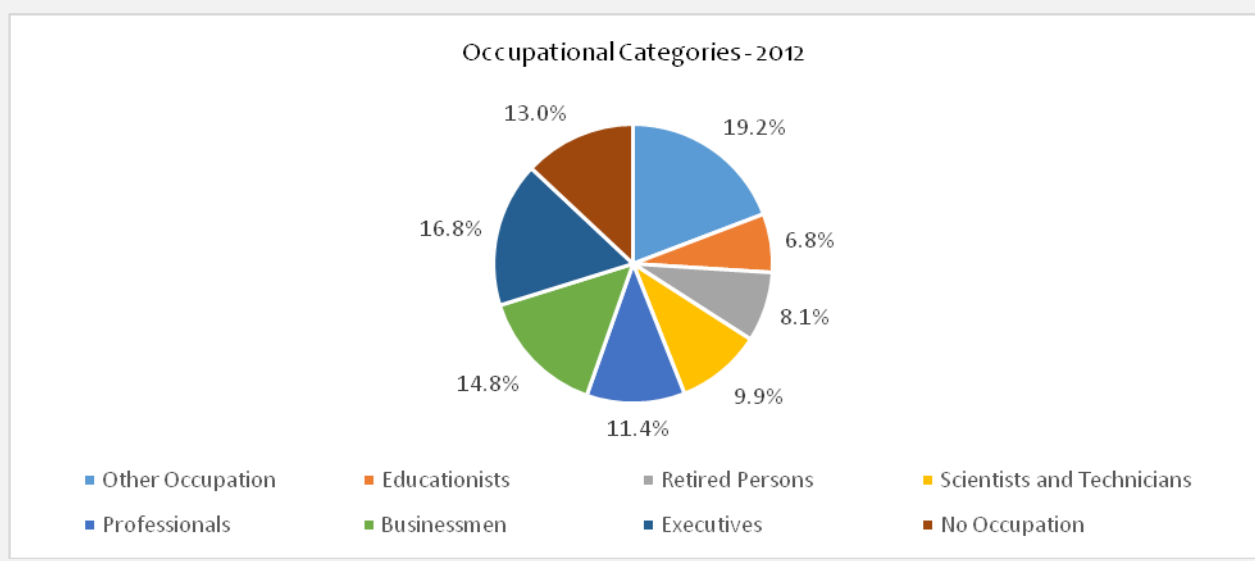Figure 5: Period of stay- percentage distribution 2012

Figure 6: Occupation categories of the tourism sector in Sri Lanka.

6.0   DATA ANALYSIS AND FINDINGS

6.01   REGRESSION RESULTS AND ANALYSIS

Table 2 presents the covariance matrix of the independent variables.

Table 2: Covariance matrix of the independent variables.

Variable	lnx1	lnx2	lnx3	lnx4
lnx1	1	0.728174	0.830392	0.826489
lnx2	0.728174	1	0.941833	0.6686
lnx3	0.830392	0.941833	1	0.736729
lnx4	0.826489	0.6686	0.736729	1

All independent variables are positively interrelated indicating a positive correlation. Positive correlation indicates significant interdependence between variables.

Table 3 presents the parameters estimates results obtained from R-Studio (Version-0.98.1091). This gives an estimated correlation of the regression model.

Table 3: Estimated coefficients of the regression model.

Coefficients	Estimate	Std. Error	t value	Pr(>|t|)	
(Intercept)	-12.6843	0.54239	-23.386	4.63E-10	***
lnx1	0.98183	0.08882	11.055	6.30E-07	***
lnx2	-0.20095	0.11896	-1.689	0.12207	
lnx3	1.08884	0.1639	6.643	5.76E-05	***
lnx4	0.19397	0.05231	3.708	0.00405	**

Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residuals:				
Min	1Q	Median	3Q	Max
-0.114676	-0.01277	0.006049	0.021429	0.059307

Residual standard error: 0.05415 on 10 degrees of freedom

Multiple R-squared: 0.9959, Adjusted R-squared: 0.9943

F-statistic: 611 on 4 and 10 DF, p-value: 6.719e-12

All the variables are significant at different confidence levels and the model is fitted with R-squired 99.5 percent, indicating that independent variables explain 99.5 percent of the variation in the dependent variable. Adjusted R squired is 99.4, and the model is more appropriate for correlation estimates that count for the presence of multiple independent variables.

Table 4 presents the estimated parameter's confidence level. This confirms that all the variables are significant at 95 percent confidence level. Thus the estimated value lies between lower bound 2.5 percent and upper bound 97.5 percent.

Table 4: Estimated parameters.

Variable	Estimate	2.50%	97.50%
(Intercept)	-12.6843	-13.8929	-11.4758
lnx1	0.981832	0.783936	1.179729
lnx2	-0.20095	-0.466	0.064111
lnx3	1.088837	0.72364	1.454033
lnx4	0.193971	0.077426	0.310516

The analysis of variance table (ANOVA) is presented in Table5. ANOVA table also confirms the significance of the model under different confidence levels.

Table 5: Analysis of variance table.

Response: lny			Analysis of Variance Table			
Source	of	Sum of squres	Mean of squres	F value	Pr(>F)	
lnx1	1	6.7271	6.7271	2294.239	3.80E-13	***
lnx2	1	0.2668	0.2668	90.98	2.45E-06	***
lnx3	1	0.1319	0.1319	44.997	5.31E-05	***
lnx4	1	0.0403	0.0403	13.752	0.004052	**
Residuals	10	0.0293	0.0029			

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

According to Table 4, F statistics for the hypothesis confirms that all the estimated coefficients are jointly zero. Combining with the coefficient estimates, this model suggests that foreign exchange earnings of Sri Lanka well described by the model.

6.02 RESIDUAL ANALYSIS AND REMEDIAL MEASURES

A residual analysis was employed to find out whether the estimated model has errors or not. According to the current study, there is a random trend pattern and the model has a constant variance of residuals, and therefore variables are independent. Figure 7, illustrates the residual behavior.

Figure 7: Residual behavior.
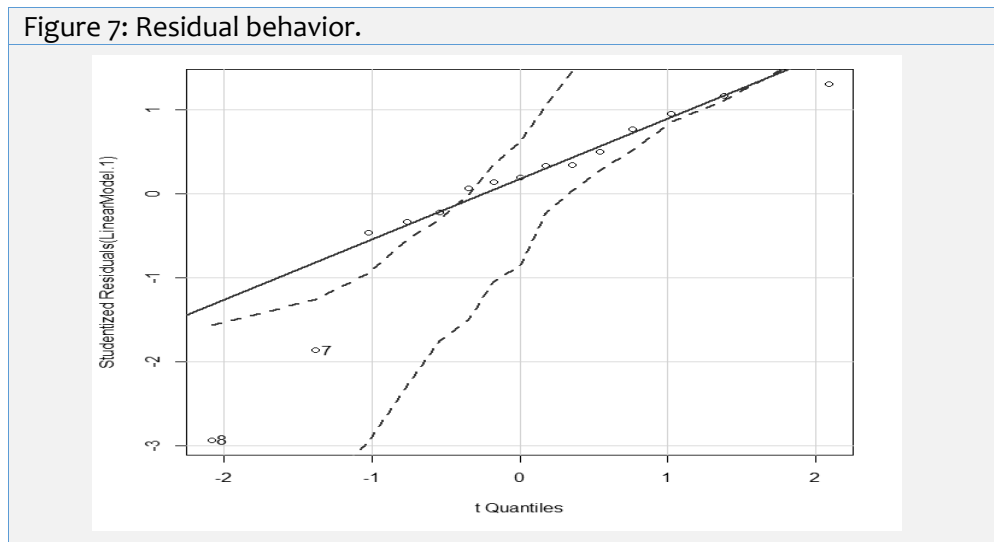
Durbin Watson statistics indicates correlation between error terms and violation of serial correlation. Table 6 shows the DW statistics of the current study.

Table 6: Test results of DW.

Durbin-Watson test
Data: lny ~ lnx1 + lnx2 + lnx3 + lnx4
DW = 1.4664, p-value = 0.03518
Alternative hypothesis: true autocorrelation is not 0

H_0 - No serial correlation (auto correlation)
Durbin-Watson statistic = 1.4664, p-value<0.05

This demonstrates there is serial correlation since the P value is calculated at 5 percent significance level. Critical values are DW lower level, dL=0.685 (rejection zone for positive serial correlation) and upper level, dU=1.977 (rejection zone for negative serial correlation). The Estimated DW value of the current study is then between: dl<DW<dL.

6.03 SELECTION OF THE BEST MODEL

This study employed backward/forward selection or the AIC-Akaike Information Criterion to select the best fitted model. This process provides an opportunity to get the best estimated model through the selection of backward-forward direction model. Table 7 presents the findings of the model.

Table 7: Basic findings of the model.

Start: AIC=-83.56				
lny ~ lnx1 + lnx2 + lnx3 + lnx4				
source	of	sum of sq	RSS	AIC
<none>			0.02932	-83.562

lnx2	1	0.00837	0.03769	-81.797
lnx4	1	0.04032	0.06965	-72.586
lnx3	1	0.1294	0.15872	-60.229
lnx1	1	0.35832	0.38764	-46.836

Call : lm(formula = lny ~ lnx1 + lnx2 + lnx3 + lnx4, data = data)				
				Coefficients
(Intercept)	lnx1	lnx2	lnx3	lnx4
-12.6843	0.9818	-0.2009	1.0888	0.194

Applying backward/forward Selection minimum of AIC value the best fitted estimated equation is:
$$\ln Y = -12.68434 + 0.98183\ln x_1 - 0.20095\ln x_2 + 1.08884\ln x_3 + 0.19397\ln x_4$$

In this model all the variables were initially applied and the first method was selected as the best estimator.

6.04   MODEL VALIDATION

The Model Validation technique is applied here to verify whether there is any difference between actual and estimated value of foreign exchange earnings. Figure 8 validates the results.

Figure 8: Predicted Y and the observed Y data from the validation.
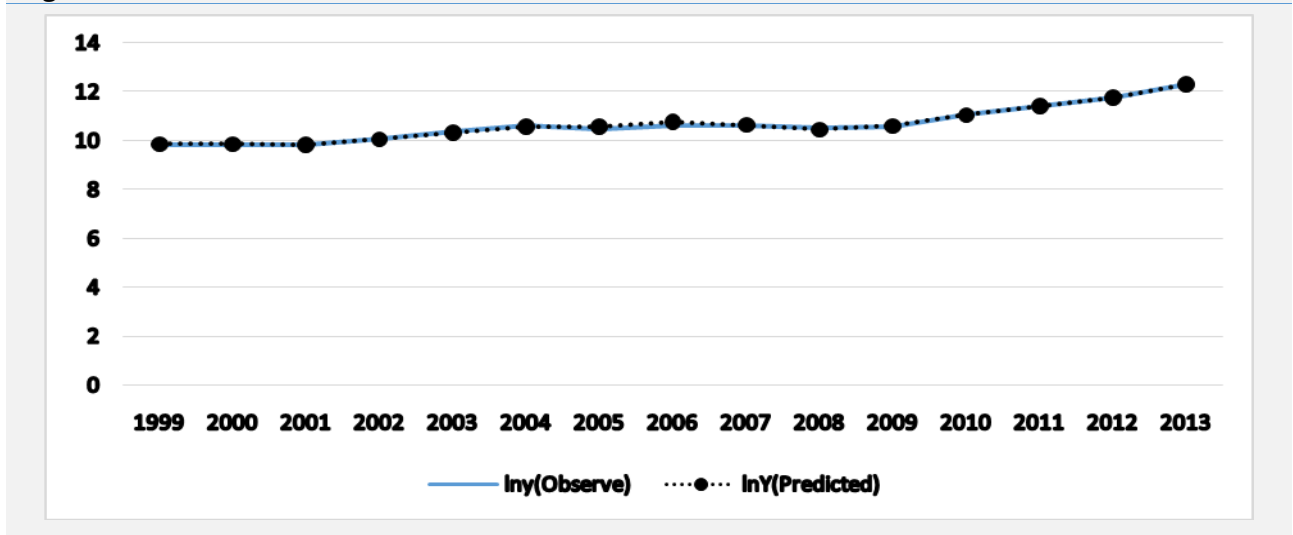
As indicated in the figure, the predicted foreign exchange earnings and the observed foreign exchange earnings are non-overlapping according to the current study. This reveals the estimated model matches the utilized sample.

Therefore, the best fitted model could take one of the following forms:
With log values:
a) $\ln Y = -12.68434 + 0.98183\ln x_1 - 0.20095\ln x_2 + 1.08884\ln x_3 + 0.19397\ln x_4$
Alternatively, without log values:

b) $Y_{X_1 X_2 X_3 X_4} = 3.099 \times 10^{-6} X_1^{0.9818} X_2^{-0.2001} X_3^{1.0888} X_4^{0.194}$

c) $Y_{X_1 X_2 X_3 X_4} = \dfrac{3.099 \times 10^{-6} X_1^{0.9818} X_3^{1.0888} X_4^{0.194}}{X_2^{0.2001}}$

According to the above equation, an increase in the percentage share of arrivals of tourists (X_1) will increase the foreign exchange earnings exponent by 0.98183 percent. A 1 percent increase in the

number of index of tourist prices (X_2) will decrease the foreign exchange earnings by the power of 0.20095percent. At a 1 percent increase in foreign receipt per tourist per day (X_3), the share of foreign exchange will increase the power of 1.08884percent. An Increase in one percentage of the employment in the tourism sector (X_3) will increase foreign exchange earnings by exponent 0.19397 percent.

7.0   CONCLUSION

This study developed the best-suited econometric model to understand the relationship between 5 important variables linked to the tourism sector in Sri Lanka explained in equations a, b and c. The model obtained in the study is well fitted (99.4 percent) during the examined period of 1999-2013 in Sri Lanka. There is a random pattern between variables according to the derived model. This model also satisfied constant variance of residuals and therefore variables of total foreign exchange earnings, total arrivals of tourist, index of tourist prices for all items, receipt per tourist per day and employment in the tourism industry are independent. Thus, the relationship between foreign exchange earnings and other key variables are established making to possible to conclude that foreign exchange earnings are significantly influenced by arrivals of tourists, index of tourist prices, receipt per tourist per day and employment in the tourism sector in Sri Lanka. This study could further be applied to establish a relationship of the future value of foreign exchange earnings if all other four variables are known. The tourist industry has faced severe setbacks and reversals in the past. These findings demonstrate how variables in the tourism sector hold tremendous potential to influence the economic progress of the country. The current trend of increasing tourist arrivals should not be taken for granted as there are several possible pitfalls. Several factors could result in a reversal of the tourist trends. Deterioration in the security situation due to ethnic or religious conflicts can deter tourists. Therefore, the government has to maintain a harmonious socio-political situation and provide related infrastructure development crucial for the sector to thrive.

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