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The Relationship among FDI, GDP and International Tourist Arrivals for Sri Lanka: An Analysis of Granger Causality

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Abstract: Tourism is regarded as a dynamic economic industry in the world, specifically for developing countries like Sri Lanka. Studies of the causality between three variables are rare and to bridge that gap, this research examines the causal relationship among International Tourist Arrivals (ITA), Foreign Direct Investment (FDI) and Gross Domestic Product (GDP) for Sri Lanka. Unit root test, Co-integration test, optimal lag length, Vector Auto-Regression (VAR) and Granger causality are employed to investigate the relationship between GDP, FDI and ITA. Annual data from 1985 to 2014 compiled by the Central Bank of Sri Lanka and World Bank was used in this study. GDP is measured by US$ millions, ITA by the amount of tourism visitors, million people, and FDI by FDI inward, US$ millions'. The results reveal that there is no co-integration among GDP, ITA and FDI. Correspondently, Granger causality analysis finds out the short-run influence of GDP on FDI and ITA.

Keywords: Foreign Direct Investment, International Tourist Arrivals, Economic Growth, Granger Causality, Vector Auto Regression.

JEL: F3, F21, E61, E20 M10, M38

1. Introduction

FDI is defined as investment of assets from a foreign country to a host country. The flow of capital from the foreign country is invested in assets such as land business or construction of new facilities which is different from investing in the stock market of another country, as in times of economic uncertainty; the investments in stocks can be easily withdrawn. FDI signifies a more lasting relationship between the foreign country and the host country as new facilities land and buildings cannot be easily abandoned or removed. Hence FDI is considered as a better source of financing for the tourism sector.

Although agriculture and production were considered as the most significant sources for generating jobs and income from the export of products or promoting development in rural areas, many countries, now consider tourism as an important factor for socio-economic development. Tourism is a collection of activities that provide similar and unique goods and services such as transport, accommodation, food and beverages, entertainment and cultural activities, sports and recreation.

Construction, agriculture, telecommunications, financial services, health services and other services such as electricity, water, sewage, security and operation of law are activities which affect the production as well as consumption of tourism. These can be converted into opportunities for investment and employment. Tourism has many sectors, which can make a high contribution to the socio-economic development of developing countries. Investments can be in any of these areas and can be carried out by various companies, domestic or international. New opportunities in employment can be created for semiskilled staff, particularly women, which mean the development of tourism in developing countries results in positive effects that promote economic growth, while reducing unemployment and poverty Lea, 1988 [1]. Pioneering studies have highlighted its potential effects in promoting growth, creating jobs and generating revenue for the government [2] (Sinclair, 1998).

However, tourism is an industry that requires capital, infrastructure, knowledge and access to global marketing and distribution chains. Hence, access to financial resources is significantly important for achieving tourism development and economic growth. FDI would play an important role in developing the tourism industry, particularly in developing countries, by providing the required capital and infrastructure such as international airports, expressways, hotels and modern technologies which are the keystones to tourism development.

Hence, most governments in developing countries place the highest precedence on attracting FDI for further tourism arrivals and economic growth (Zhang and Chong, 1999; Andergassen and Candela, 2009)

[3,4]. and, a causal relationship between FDI and tourist arrivals can be observed, with FDI improving the quantum and quality of service, then the international tourist arrival numbers increase (Selvanathan *et al.*, 2012) [5]. A further indirect link from FDI to tourism is through business tourists which creates a reverse causality that links tourism to FDI, ie. via entrepreneurs and managers from other countries who, while looking for opportunities to invest in a country as well as to promote and sustain business. However FDI in tourism is still rather low – in both developed and developing countries – compared to the levels of FDI in other economic activities, including other services industries[6] (UNCTAD (2007))But it does not mean that tourism-related FDIs are not significant. FDI is definitely used as an important tool for expanding the tourism industry in developing countries. On the other hand, there is a causal relationship between tourism and FDI in that tourists usually demand goods and services such as accommodation, food, transportation facilities and entertainment in the host country. In most developing countries, to satisfy this increasing demand, the current level of production needs to increase. Since there is a shortage of facilities and infrastructure in developing countries, FDI is considered an effective channel for transferring the trade, knowledge and technologies leading to economic growth. Thus, governments prefer to attract further FDI to expand domestic products.
The nature of FDI involvement is diverse. It is wrong to assume that the relationship is bi-lateral, that the relationship is just between the foreign and host countries. It is better to think about the relationship as a web that spans several countries. Understanding the causality helps in formulating appropriate economic policies.

This study explores empirical evidence for a causal relationship between International Tourist Arrivals (ITA), Foreign Direct Investment (FDI) and Economic Growth (GDP). Although tourism has been regarded as one of the most dynamic economic industries in the world, the previous studies of the causality between three variables are exceptionally rare.

2. Literature Review

There is a large volume of literature on this topic and as a result, there are many publications treating the contribution of tourism to GDP, where the absolute value of tourism GDP, the share of tourism in GDP and their changes over time are tested [7]. [Archer & Fletcher, 1996, Sharpley, 2003 [8] and Biçak & Altinary, 1996[9] It is generally seen that unidirectional relationship between tourism and GDP was observed by many researchers. There is only an unidirectional relationship running from tourism towards growth for OECD countries whereas a bidirectional causality relationship exists for non-OECD countries (Lee & Chang, 2008[10]). Zortuk (2009)[11], found that economic force of tourism on Turkey's economy by applying co-integration method using quarterly data over the period 1990-2008, in which the research shows the long-run equilibrium relationship between GDP and tourist arrivals. There is a unidirectional causality running from tourist arrivals to economic growth. Yıldırım & Ocal, (2004)[12] and Gunduz & Hatemi-J, (2005)[13] found that there existed unidirectional causality running from tourism towards the GDP in relation to Turkey. Long-term correlation among foreign tourist arrival, trade and economic growth for ASEAN countries was found by Salleh, (2011)[14]. Kim, Chen, & Jang, (2006)[15] A causality test deploying co-integration method for Taiwan concluded that causality between tourism development and economic growth and results indicated existence of a long-term equilibrium relationship between tourism and economic growth. Oh, (2005)[16], Neves Sequeira & Campos, (2005)[17] implied no causality between tourism growth and economic growth. Wan-Chen Po and Bwo-Nung Hung (2008) [18] implemented a non-linear model using annual data during the period 1995-2005 in eighty eight countries and confirmed the relationship between tourism and economic growth for some countries in their sample. (Salleh, 2011)[14] found that growth in total trade (import and export) and foreign tourist arrival to Malaysia has unidirectional Granger causality with real income and statistically proved that international trade brings in foreign tourist arrival in the short term. It is further indicated that there are unidirectional and bidirectional interactions among the three variables in Malaysia and four Asian countries namely Indonesia, Singapore, Thailand and Brunei. Tang et.al (2007)[19] found a one-way causality link from foreign direct investment to tourism in India.

Literature related to Sri Lanka reveals that the results indicated that FDI is a key determinant of Sri Lankan economic growth after the 1977 period. The empirical results suggest that one long-run equilibrium relationship exists between GDP, FDI, Domestic Investment and Trade policy. The Engle and Granger error correction approach used to investigate the direction of causality flow in the short-run and long-run, reveals that FDI inflows exert an independent influence on economic growth and direction of Granger causation is towards FDI to GDP growth and GDP growth to FDI and hence there is bidirectional Granger causality between FDI and economic growth. (Balamurali & Bogahawaththa 2004)[20].Vijayanathan and Chellakumar (2014)[21] found that FDI inflows do not exert an independent

influence on economic growth. And also the direction of causation is not towards from FDI to GDP growth but GDP growth to FDI. Rajapakse (2015)[22] found that foreign direct investment in tourism(FDIT) has a causal effect on the number of foreign tourist arrivals and Foreign Exchange Earnings in Sri Lanka and vice versa.

Phi Phung and Huyen Trang (2012)[23] found that there is an impact of FDI and GDP on ITA for some selected countries in Europe. Similar studies for Asian economies were not found and in order to narrow the gap in the literature, this research intends to examine the causal relationship among ITA, FDI and GDP for Sri Lanka.

3. Methodology

Unit root test, Co-integration test, optimal lag length, Vector Auto-Regression (VAR) and Granger causality will be employed in this research in order to investigate the relationship between GDP, FDI and ITA. All variables will be operated on econometric software EVIEWS. Annual time series data from 1985 to 2014 compiled by the Central Bank of Sri Lanka and World Bank are used and the data length was limited by the availability of data. GDP is measured by million US$, ITA by the amount of tourism visitors, million people; and FDI by FDI net, million US$.

3.1. Unit Root Test

To investigate whether the time series data contain unit root or not, Augmented Dickey-Fuller (ADF) (Dickey & Fuller, 1979)[24] and Phillips-Perron (PP) (Phillips & Perron, 1988)[25] unit root tests which are generally used in most researches will be used here.

3.2. Optimal Lag Length Test

The number of lagged terms is chosen to ensure that the errors are uncorrelated. To determine the suitable optimal lag length, two most popular methods are the Akaike's information criterion (AIC), and Schwarz information criterion (SC) for Vector Auto regression (VAR).

3.3. Co-integration Test

Co-integration implies that causality exists between the two variables, but it does not indicate the direction of the causal relationship. This paper applies multivariate co-integration approach to examine whether GDP, FDI and Tourist Arrivals have long run equilibrium interaction.

3.4. Granger Causality

Can be used to verify whether one time series is capable of forecasting another (Granger, 1969)[26]. As mentioned earlier, if the variables have one unit root and are co integrated, then the bivariate VECM is specified and estimated. The Granger causality test is then conducted in the context of the VECM. If the two series have one unit root and are not co integrated, then the bivariate VAR is specified and estimated. However, in this study, only short run causal relationship was detected, hence, VECM will not be estimated. This analysis will reveal whether there is causality relationship between FDI, ITA and GDP or no causality between these variables for Sri Lanka. Findings of this study would convey empirical implications.

4. Data Analysis

4.1. Data sources

Annual data from 1985 to 2014 compiled by the Central Bank of Sri Lanka [27] and World Bank are used in this study. GDP is measured by US$ millions, ITA by the amount of tourism visitors, million people, and FDI by net FDI, US$ millions.

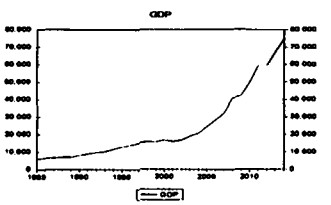

Figure 1. GDP for the period 1985-2014

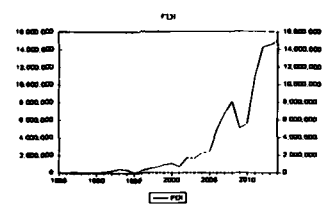

Figure 2. FDI for the period 1985-2014

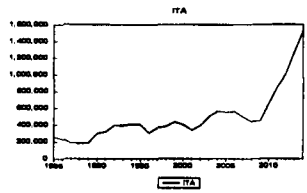

Figure 3. International Tourist Arrivals 1985-2014

Figure 1, 2, and 3 depicts the raw data for the three variables in our study. The nature of the graphs indicates that there is trend effect in the variables.

4.2. Unit Root Test

This study starts with investigating whether the time series data contain unit root or not. If they do, they are non-stationary. Number of tests has been suggested to perform in order to assess whether the data series contains unit root or not. The Augmented Dickey-Fuller (ADF) (Dickey & Fuller, 1979)[24] and Phillips-Perron (PP) (Phillips & Perron, 1988)[25] unit root tests are generally used by many researchers. According to Greene (2003), [28] the hypothesis to be examined with unit root test is as follows:

H0: There is a unit root (data series are non-stationary)

H1: There is no unit root (data series are stationary)

The unit root hypothesis for non-stationarity was checked using ADF test which both depend on the structure of model (with or without trend and drift). If the H0 is accepted, the series contain unit root and are non-stationary. Converting non-stationary data to a stationary one could be done by taking difference of the data from the first lag. If a series in level form is non-stationary and its first difference is stationary, this series has integration order of 1, I (1), the difference would be I (0). The integration order informs how many times the data need to be differenced to become stationary. Once the data are differenced, and become stationary, the data are ready to proceed with regression analysis. By observing the pattern of data (depicted in Figure 1, 2, and 3) it was decided that both trend and drift must be considered this calculation.

Table 1. Unit root using ADF level/tend and drift

	Level/Trend and Drift	1st Difference
FDI		
ADF Stat	2.429348	-4.988684
Critical value at 10%	-3.254671	-3.233456
GDP		
ADF Stat	1.426320	3.330021
Critical value at 10%	-3.254671	3.229230
ITA		
ADF Stat	0.023030	3.679619
Critical value at 10%	-3.225334	3.254671

Source: author's calculations

The statistics FDI, GDP and ITA demonstrate stationary feature at first difference which were non stationary at level order.

4.3. Optimal lag length

Table 2. Lag order selection criteria

Lag	Log L	LR	FPE	AIC	SC
0	-1036.607	NA	1.08e+31	79.96976	80.11493
1	-960.1842	129.3307	6.08e+28	74.78340	75.36406
2	-935.3021	36.36628*	1.85e+28	73.56170	74.57785*
3	-928.6290	8.212968	2.41e+28	73.74069	75.19234
4	-911.7220	16.90705	1.56e+28*	73.13246*	75.01960

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: author's calculations

In order to determine the suitable optimal lag length: the Akaike's information criterion (AIC), Schwarz information criterion (SC), log-likelihood ratio test (LR) Criterion, and the Hannan-Quinn information criterion (HQ) are being used. However, most popular methods are AIC and SC. VAR or VECM with the optimal lag length will make the estimated model have higher explanatory power than using the other lag lengths. The smallest AIC / SC can be applied for choosing the most efficient and accurate optimal lag length. In the Table 2 above it is observed that the LR and SC suggest a lag length of 2 while AIC suggests a lag length of 4. Hence this study determines and uses a lag length of 2 in estimating the VAR or VECM.

4.4. Co integration:

Table 3 depicts the co-integration test carried out in order to assess whether there is long run association among the variables FDI, GDP and ITA. The test results indicate that there is no co-integration among the three variables which means

that there is no long run association between the variables and that in turn enabled the estimation of VAR model instead of a VECM model.

Table 3. Unrestricted co-integration rank test (trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.594652	40.79187	29.79707	0.0018
At most 1 *	0.308405	16.41060	15.49471	0.0363
At most 2 *	0.212620	6.454201	3.841466	0.0111

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values.

Source: author's calculations

4.5. Vector Auto regression

Traditional regression model assumes that dependent variable is affected by independent variables, but independent variables may be not affected by a dependent variable (Sims, 1994). However, it is sometimes difficult to point out that one variable in the model is dependent or independent. The main feature of VAR model is to assume all the economic variables to be endogenous variables. By choosing optimal lag length of explanatory variables based on data, the explanatory variables with appropriate lag length in the model will cover all the related information and better explain the endogenous variable.

4.6. Granger Causality

Table 4 depicts the summary of the Granger Causality Test. The first dependent variable considered is GDP. To check whether FDI /ITA causes GDP a hypothesis test can be carried out with the following sets.

FDI	
NULL:	FDI doesn't cause GDP
ALT:	FDI cause GDP
ITA	
NULL:	ITA doesn't cause GDP
ALT:	ITA cause GDP

It can be observed from the probabilities that we can reject neither hypothesis, which suggests that neither FDI nor ITA causes GDP.

Table 4. VAR granger causality

Dependent variable: GDP			
Excluded	Chi-sq	df	Prob.
FDI	3.580210	2	0.1669
ITA	0.037893	2	0.9812
All	3.723434	4	0.4447
Dependent variable: FDI			
Excluded	Chi-sq	df	Prob.
GDP	18.34874	2	0.0001
ITA	1.662889	2	0.4354
All	26.67344	4	0.0000
Dependent variable: ITA			
Excluded	Chi-sq	df	Prob.
GDP	8.338064	2	0.0155
FDI	1.522367	2	0.4671
All	24.19361	4	0.0001

For the dependent variable FDI a separate set of hypotheses can be developed.

GDP
NULL: GDP doesn't cause FDI
ALT: GDP cause FDI
ITA
NULL: ITA doesn't cause FDI
ALT: ITA cause FDI

It can be observed from the probabilities that we can reject the hypothesis "GDP does not Cause FDI and accept "GDP causes FDI. In the case of ITA we cannot reject the hypothesis "ITA does not cause FDI" and rather accept it.

For the dependent variable ITA also a separate set of hypotheses can be developed.

GDP	
NULL:	GDP doesn't cause ITA
ALT:	GDP cause ITA
FDI	
NULL:	FDI doesn't cause ITA
ALT:	FDI cause ITA

It can be observed from the probabilities that we can reject the hypothesis "GDP does not Cause ITA" and accept "GDP causes ITA. In the case of FDI we cannot reject the hypothesis "FDI does not cause ITA" and rather accept it.

5. Conclusion

5.1. The Granger causality

As per the data and the analysis suggests GDP has a unidirectional influence on both FDI and ITA. This finding is in agreement with the previous studies done by Vijayanathan and Chellakumar (2014)[21] as regards the relationship between GDP and FDI. This study also finds that FDI has unidirectional influence over ITA.

5.2. Policy Implications

Many studies have found a positive link between FDI and GDP. But this study result shows that FDI inflows do not exert an influence on GDP. And also the direction of causation is not towards from FDI to

GDP growth but GDP growth to FDI. Which means the direct growth impact of FDI on the Sri Lankan economy is not created so far. Net attitude of the civil society and foreign firm towards FDI in the country is positive. But net attitude reveals that the investment climate has not improved in Sri Lanka due to many reasons. Possible reasons could be political instability, war against terrorism that existed until 2009, poor law and order situation existed, direct and indirect regulatory barriers, inadequately developed infrastructure facilities, under developed human capital, lack of transparency in the trade policy, neglecting non- export oriented sectors like plantations, and high lending rates prevailed until the recent past.

The importance of FDI cannot be ignored. The investment environment in the country must be upgraded through appropriate measures such as de-regulation in economic activity, developing the port facilities, road network, railways and telecommunication facilities, achieving clarity in trade policy and flexibility in labor markets and setting a suitable regulatory framework and tariff structure. Although the country provides an attractive investment climate at present the response from the investor has not been very encouraging. If the aim of the country is to attract FDI for development, poverty reduction and growth, then an appropriate policy mix is necessary to achieve these. This is also emphasized by the unidirectional relationship from GDP to ITA. If the country needs to attract more tourists, the country must grow in terms of better facilities and infrastructure for tourists.

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