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Economic Growth Led Tourism: with Special Reference to State Sikkim

Pema Choden Bhutia
M.Phil. Scholar, Department of Economics, Loyola College, Chennai, India
T. Eugine
Professor, Head of Department of Economics, Loyola College, Chennai, India

Abstract:
This study is an attempt to analyse tourism leading to economic development in the state of Sikkim. This study has obtained time series data of foreign tourist arrivals to Sikkim for the time period 1994-2014. The focal point of the study is to find out the causality between income and tourists visits to Sikkim. To discern the causality, this study uses statistical tools like unit root, Johansson's Co integration test, Vector error correction modelling and impulse response function. Results from this study suggest that there is unidirectional causation where economic growth leads to tourism and not the other way round.

Keywords: *Tourism industry, economic growth, Granger causality*

1. Introduction

Travel and tourism is an important economic activity and a major driver to economic growth globally. In 1990, an estimated 425 million international travelers spent $230 billion. It is purported to be the fastest growing industry on earth, experiencing a 9 percent annual growth rate (Eadington and Smith 1992). While the total contribution of travel and tourism to GDP was US$ 6,990.3bn or 9.5 percent of GDP in the year 2013, the total contribution to employment was about 265.86 million jobs that are 8.9 percent of total employment in the same year (WTTC 2014, 3-4).As such tourism development has become an important target for most governments, especially for developing countries (Jafari, et.al. 2011). Sikkim falls among the category of state that is less developed and has been working her way towards economic growth.

Sikkim a small state in India, has now become one of the popular tourist destination known for attracting visitors, both national and international.

The objective of the study is very much evident in the title itself. However, specific areas into which considerable amounts of attention that are channelized are listed below:

1) to analyse the trend of growth in Tourism,
2) to analyse the causality between Tourism and economic growth.

2. Data and Methodology

Data used in this paper is the time series data covering the period 1994-2014 and variables of the study are gross state domestic product (SGDP), exchange rate and foreign tourist's arrival. This study has used statistical tools like unit root, Johansson's cointegration test, vector error correction modelling and impulse response function.

2.1. The Econometric Model: Econometric Modelling and Database

Tourism contributes to economic growth both in small economies and in large economies of the world. The reason is that the environmental tourism can be a source of hard currencies and the drivers of employment in the host countries (Katircioglu, 2009:331). There has been a large volume of growth of literature which has become the source of hypothesis testing related to tourism and economic growth (Ging, 2008). The Tourism Led Economic Growth (TLEG) is directly derived from export led Growth (ELG) Hypothesis. Tourism led Economic Growth (TLEG) has grounded three views: The first view maintains that the tourism is a major driver to economic growth which is referred as Tourism led Growth Hypothesis. The second view focuses on the role of economic growth, which facilitates the growth of tourism. This view is referred as growth led tourism hypothesis and facial view rest on feedback hypothesis which means to that both tourism and economic growth Granger cause each other.

Many studies have examined the casual relationship between Tourism and economic growth. Tourism confers several benefits to the host country. The increased activity of tourism industry generates several benefits. It includes provision of foreign exchange which enable the country to impart capital and intermediate goods, stimulates utilisation of resources with available factor endowments,

stimulate the availability of better infrastructures in the host country, and provide an avenue for transferring new technology and managerial skills. (Ridderstoat et al.2014). Therefore, tourism generates and confers several benefits to host countries. This study examines the impact of tourism on economic growth in the state of Sikkim. Due to short span time series data, the researcher wishes to examine short run and long causality among the variables taken for the country. The econometric framework of the impact of tourism can be examined in the following way.

$$LNY_t = \alpha_0 + \alpha_1 LNT_t + \alpha_2 LNER_t + \varepsilon_{it} \text{.....(1)}$$

Where,LNY = Natural Logarithm of State Domestic Product of Sikkim, LNT = Natural Logarithm at constant price and LNER = Natural Logarithm of Exchange rate.'t' denotes periods from 1st..nth year. This study examines whether there is a positive relation between Foreign Tourist arrivals and Gross State Domestic Product as well as the long run elasticities between the independent and dependent variables.

Application of the Ordinary Least Square method (OLS) to estimate elasticities of time series variables will generate unreliable estimates and such results are considered to be spurious. The reason cited for this kind of statistic is the presence of unitroot in time series variables (Gujarathi and Sangeetha, 2007:811). The presence of unit root renders the time series data non stationary. That is, mean, variance and co-variance of the series are not constant over the period. (Akinlo et al., 2010 and Asari et al. 2011). Thus, the variables are differenced until the time series data become stationary. To determine the optimal lag length and to identify whether the time series data are stationary in level or not, this study deploys the most widely used, Augmented Dickey Fuller (ADF) test (1979) and the Phillips-Perron (P-P) test (1988) to determine the stationarity of individual time series variables. This study estimates the following equation to test the unit root for the given series. This study first to determine the stationarity of time series data, it apply ADF test for the all time series which are used in the analysis. For example, to ascertain time series properties of DLNY, this study estimates the following equation for ADF test for stationarity of the series.

$$DLNY_t = \alpha_0 + \alpha_1 T + \alpha_2 LNY_{t-1} + \delta_3 \sum DLNY_{t-1} + \varepsilon_t \text{ ..... (2)}$$

Where, $\varepsilon_t$is error term.α_1 is constant, α_2T is the time trend. D is the differencing operator.'t' is the period.If LNY_t follows equation (1) and $DLNY_t$ follows a random walk, then $DLNY_t$-$DLNY_{t-1}$is stationary. α_2 and δ_3 are coefficients of one period lagged value of $LGDP_{t-1}$ and $DLGDP_{t-1}$ respectively. Engle and Yoo (1987) suggested to use the Schwarz information criterion for the purpose of selecting optimum number of lags for testing the variable for unit test. In ADF test, we have to test whether $\alpha_2 = 0$, therefore, the null and alternative hypotheses of unit root are given as follows:

- H_o:$\alpha_2 = 0$ (LNY_t is non stationary or there is a unit root)
- H_a :$\alpha_2 < 0$ (LNY_t is stationary or there is no unit root)

If α_2 (ADF test statistic) is significantly negative and is higher than MacKinnon critical value, the series does not have unit root, else, the series has unit root. (Gujarathi and Sangeetha, 2007: 833 and Upender, 2002: 257)

2.2. Johanson's Multivariate Cointegration Test

After establishing the stationarity of the variables by applying the Augmented Dickey Fuller Test, the next step is to ascertain whether there is any co-integrating equation(s) (vectors) among the time series variables. The co-integration test is based on maximum likelihood technique consisting of two statistics which are to be estimated viz, Trace statistic and Max Eigen statistic. To identify the presence of co integrating vector(s) requires both trace statistic and maximum Eigen statistic are expected to be greater than Mackinnan critical value. If the values are as expected by this decision rule, r=0 denoting no co integrating vector is rejected. The decision is taken based on number of cointegrating vector (s) i.e. r >0 based on trace and max Eigen statistic. The idea of long run equilibrium in the multivariate environment can very well be established based on Engle Granger representation (1987). As per the representation, if two or more non stationary time series variables are differenced by *d* times, i.e. by order of integration *I* (d), the residual obtained by regressing by one variable on the other or vice versa will be in order less than I (d). Then the residual obtained is stationary, i.e. in the order of *I* (0) which means to that the two or more variables are cointegrated and establishing a long run equilibrium between them (cited also in Sahoo, 2001:48). The following section discusses on formulation of error correction methodology in the multivariate environment.

2.3. Vector Error Correction Model

Besides, if the variables are differenced by an order of *I*(d), any historical information pertaining to the long run equilibrium will be lost. Therefore, as per the Engle Granger representation (1987), when two or more non stationary variables co integrated after differencing in the same order, the variables would be stationary. If such stationarity exist between the variables, it is said to be co integrated and long run equilibrium exist between the variables. The cointegrated variables should have an lagged error correction term (ECT_{t-1})as an additional regressor in the OLS model to capture the short run dynamics and long run equilibrium in the Vector Error Correction model under VAR framework (Upender, 2005:260, Sahoo, 2001:48, Behket, et al., 2009). In this study Granger causality is studied by applying a vector error correction model to determine the said equilibriums for India. The resulting specifications are given as follows:

$$\Delta LNY_t = \alpha_0 + \Sigma^K_{i=0} \beta_{1t} \Delta LNY_{t-i} + \Sigma^k_{i=0} \beta_{2t} \Delta LNT_{t-i} + \Sigma^k_{i=0} \beta_{3t} \Delta LNE_{t-i} + \lambda_{1t} ECM_{(t-1)} + \mu_{1t} \text{.....(3)}$$

$$\Delta LNT = \alpha_1 + \Sigma^k_{i=0} \beta_{4t} \Delta LNY_{t-i} + \Sigma^k_{i=0} \beta_{5t} \Delta LNT_{t-i} + \Sigma^k_{i=0} \beta_{6t} \Delta LNE_{t-i} + \lambda_{2t} ECM_{(t-1)} + \mu_{2t} \text{.....(4)}$$

$$\Delta LNE = \alpha_2 + \Sigma^k_{i=0} \beta_{7t} \Delta LNY_{t-i} + \Sigma^k_{i=0} \beta_{8t} \Delta LNT_{t-i} + \Sigma^k_{i=0} \beta_{9t} \Delta LNE_{t-i} + \lambda_{3t} ECM_{(t-1)} + \mu_{3t} \text{.....(5)}$$

Where, Δ refers to first difference operator. i= denotes the lag order, tth time, λ_s are co-efficients of error correction term which shows the speed of adjustment and μ's are random error terms which are assumed to be normally distributed with zero means.

Where, B_{2t}, B_{3t}, are parameters to be estimated in the equations. To estimate the regression equations, the study deploys VAR regression. λ_{it} is the coefficient estimates for error correction term (ECT_{t-1}). $\Delta$is the difference operator; μ_t is a random error term with mean of zero. The null and alternate hypothesis in the above said VECM specifications can be written as follows:

- Ho: B_{2t} and B_{3t} are equal to 0 (there is no causality)
- Ha: At least one of the coefficients of $B_{2t}$is not equal to 0 (there is causality)

$\lambda_t$is the coefficient of error correction term (ECT_{t-1}) is to be negative and statistically significant in order to restore the equilibrium in the long run (Behket, et al.,2009).The following section will discuss the application of impulse response function and FMOLS on the variablesused in the analysis.The study also uses impulse response function to study the impact of one standard deviation shock given to innovations (error term) and resulting changes in dependent variables.

2.4. Data Base and Descriptive Statistics

DESCRIPTIVE STATISTICS 1995-2004			
VARIABLES	**LNY**	**LNE**	**LNT**
Mean	23.18507	3.804365	9.541147
Median	22.77898	3.806662	9.612361
Std. Dev.	0.946282	0.153545	0.588378
Skewness	0.377139	-0.104725	0.306569
Kurtosis	1.605411	3.318556	2.201668
Jarque-Bera	2.094846	0.121122	0.844394
Probability	0.350841	0.941236	0.655605
Sum	463.7014	76.08730	190.8229
Sum Sq. Dev.	17.01354	0.447947	6.577590
Observations	20	20	20

Table 1

Note: Author's own computation.

All the variables are provided in logarithmic form. Figure 1 the trends of macro variables have shown an increasing trend, over the period.

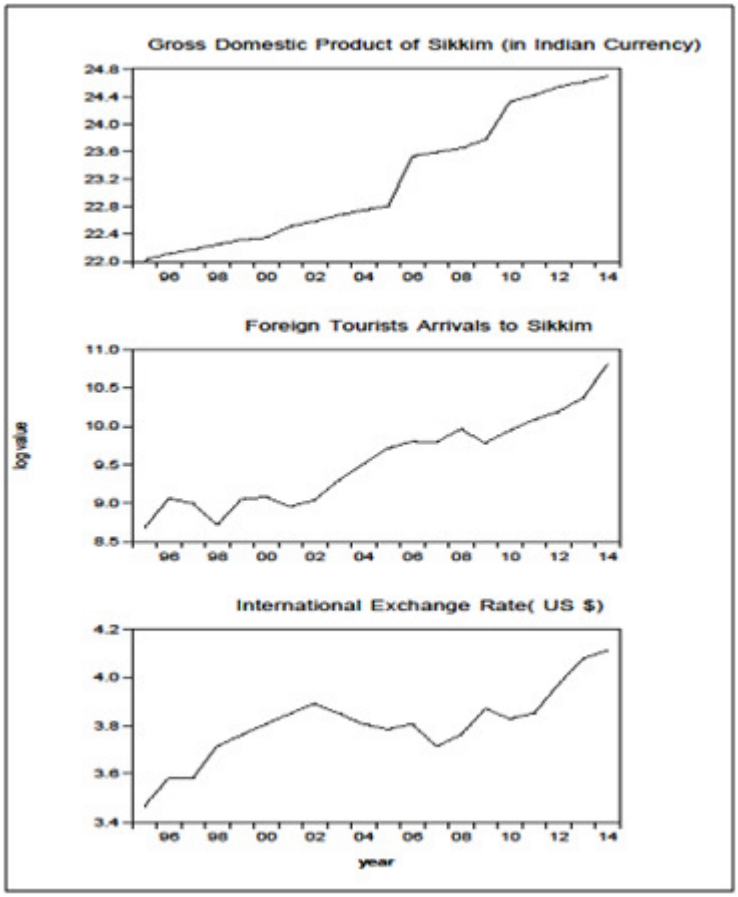

Figure 1: Trend of Growth of GDP, Foreign Tourists and Exchange rate

2.5. Empirical Estimates of Unitroot, Cointegration, Vector Error Correction Model and FMOLS.

Here results of theorder integration of variables, Johanson'smultivariate cointegration test and vector error correction model to determine short run and long run causality among tourists' arrivals, international exchange rate and state domestic product of Sikkim for the period 1990-2014. Besides, this study has also presented the estimates of long run elasticities of state domestic product to international tourists' visits and exchange rate by using Fully Modified Ordinary Least Squares (FMOLS) estimators. The following table presents the results of unit root analysis of this study.

	ADF TEST			**Phillips- Perron Test**		
VARIABLES	Level with intercept	First Difference	Result	Level with Intercept	First Difference	Result
LNY	0.012783 (0.263851)	-1.131112*** (-4.556812)	I (I)	0.012783 (0.550660)	-1.131112*** (-4.633342)	I (I)
LNT	0.026224 (0.301612)	-1.114313*** (-4.349556)	I (I)	0.026224 (0.301612)	-1.114313*** (-4.349556)	I (I)
LNE	-0.137013 (-1.286696)	-0.906111*** (-3.840325)	I (I)	-0.137013 (-1.337977)	-0.906111*** (-3837530)	I (I)

Table 2: The Estimates of ADF and P-P Tests for State Domestic Product, International Tourists arrivals and Exchange rate of Sikkim

Note: 't' values are given in parenthesis. '***' denotes 5% significance. The test is examined using Eviews.V8. The optional leg length is determined by the Schwartz information criterion

2.6. Results of the Unit root Analysis

The time series variables are not stationary due to the presence of unitroot in the series. Therefore, it is a must to employ the ADF and PP tests on all variables individually both in level and at first difference, i.e. by *I* (1) process. The resulting estimates of the ADF test are presented in Table 2. In level, estimates of ADF test are not stationary because of the presence of unitroot in all the variables and none of the variables are found to be stationary in level. Hence, H_0 is accepted that all the variables are non stationary. After converting all the variables into first difference by order of *I* (1), the variables become stationary. The estimates are presented both at level and constant with trend for all the variables included in the equations. All the variables are stationary both at constant with trend at 1% percent level of significance. (See in Appendices the ADF estimates for all variables) and which leads to rejection of H_0 and accepting the alternative hypothesis, i.e. H_a denotes the absence of unit root and stationarity of the variables. Thus, all the variables are co integrated in order of *I* (1) process.

After ascertaining the stationarity of data, the next step is to determine cointegrating vector(s) or equation(s) among the variables included in the equation. Application of Johanson's cointegration test to determine whether there is long run equilibrium between LNY, LNT and LNE included in the model.

2.7. Johanson's Cointegration Test

In order to determine the long run relationship among the variables, log of the state domestic product (LNY), log of foreign tourists arrivals (LNT) and log of an exchange rate (LNE) integration test. The study employs the maximum likelihood technique of Johanson's co integration test to discern the long run relationship among these macroeconomic variables. Table 3 presents the estimated results of Johanson's co-integration test identifying the presence of one co-integrating vector (equation) among the variables. It implies that the variables are co-integrated and have long run equilibrium among them. (See appendices for the estimates) The rejection of H_o automatically will end up in choosing H_a which implies $r > 0$, i.e., the test determines the presence of one co-integrating equation enables the study to formulate vector error correction modelling technique including state domestic product, foreign tourists' arrivals and international exchange rate.

H_O	λ Trace statistics	Critical value (0.05)	λ Max Eigen value	Critical value (0.05)
r= 0*	89.96849***	29.79707	75.03137***	21.13162
r=1	14.93712	15.49471	9.128435	14.26460

Table 3: Johanson's Co-Integration Test for Cointegrating Vector for Sikkim Variables included: LNY, LNT and LNE (Lag=2)

Note :(i). 'r' denotes presence of one co integrating vector
(ii). (*) indicates rejection of H_a at 1% statistical significance
(iii) Another has computed by Eviews v8.

2.8. Granger Causality Test: Empirical Estimates of VECM

Eviews v8 automatically generates three equations by keeping all the variables as dependent variables by default. Table 4 examines the empirical estimates

Sources of Causation				
Short run – chi square statistics				**Long Run**
Dependent Variable	ΔLNY	ΔLNT	ΔLE	$ECT_{(-1)}$
Eq I. Δ LNY	-	0.671999, (2) (0.7146)	0.584286,(2) (0.7467)	-0.120252 (-0.60475)
Eq II. ΔLNT	4.357071,(2)* (0.1032)	-	0.224015,(2) (0.8940)	-0.387721*** (-2.84969)
Eq III. ΔLNE	9.394558(2)*** (0.0091)	5.567271,(2)** (0.0618)	-	0.144943 (3.53041)

Table 4: Granger Causality Results based on VECM for Exchange Rate (LNE), Foreign Tourists Arrivals (LNT) and GDP of Sikkim.

NOTE: (i). Values given in ( )Probabilities of Chi square statistics

(ii). (2) denotes two lags provided for the chi square estimation.

(iii). ECT_{t-1} represents the co-efficient of error correction terms

(iv). Coefficient bears ***, ** and * indicate respectively that null hypothesis of no- causality is rejected at 1%, 5% and 10% level.

of causality between state domestic product (LNY), foreign tourists arrivals (LNT) and international exchange rate (LNE) in Sikkim for the year 1995-2014.

In equation. I, lagged independent variables of LNTand LNEdo not have causality with LNY during the short run. It means that there is no Granger causality exists between economic growth and tourists' arrival in Sikkim. The equation II provides evidence that there is weak causality between LNY and LNT in Sikkim. It is a weak causality because the coefficient of LNY is significant at 10 percent level. The empirical results of vector error correction model (VECM) suggest that there is only one cointegrating long run relationship, i.e. the coefficient of the error correction term (ECT) is highly significant. It means that, when there is an external shock provided to state gross domestic product (LNY), this macro variable has the tendency to move towards long run equilibrium about 39 percent faster after a change in foreign tourists' arrivals (LNT). There is a tendency on the part of these variables to move towards the long run Both the coefficients of LNY (lagged) and LNT (lagged) are statistically significant and have casual association with LNE during the short run. The coefficient of ECT of Eq.III.is statistically significant and positive. It means that there is no tendency to move towards the long run equilibrium after a shock given to the independent variables of the equation. In sum, the model strongly suggests that the state of Sikkim does not enjoy tourism led growth, but growth led tourism. The state of Sikkim is to allocate more resources to provide better infrastructure like better transports and hotels to attract the foreign tourist to earn invaluable foreign exchange as well as, trigger the growth of employment in the state. These findings are in line with previous results in a study carried out by Georgantopoulas, (2013) for India. In which, the study has failed to establish short run equilibrium between tourism expenditure and real GDP of India. The present study shares the similar consensus, although the previous one used total tourism expenditure as proxy for tourists' arrivals.

The strength of association of variables can be studied by applying FMOLS and OLS estimators in the following section.

Variable	OLS	FMOLS
Constant	7.691180*** (4.144173)	5.730435** (2.436341)
LNE	0.505890 (0.711309)	0.564228 (0.670091)
LNT	1.422188*** (7.662652)	1.603027*** (8.008980)
R	0.895015	0.881488
Observations	20	20

Table 5: Empirical Estimates of FMOLS and OLS for the State of Sikkim: 1994-2014: Dependant: Natural Logarithm of State Domestic Product

Note:'t' values are given brackets. '**' and ***' denote 10 % and 1% significant respectively.

Table 5 provides evidence that foreign tourists' arrivals significantly influence the national income. On the other hand, International exchange rate (LNE) does not affect state income. Fully Modified Ordinary Least Squares (FMOLS) is the long run estimator which has provided estimates that are considered as long run elasticities. Similar to Ordinary Least Squares) OLS Estimate, the co-efficient of Foreign Tourist arrivals significantly positive and 1% Significant i.e.; one percent change in foreign tourists' arrivals increases the state domestic product by 1.60 percent and is elastic. It shows that there is long run equilibrium between the state GDP and foreign tourists' arrivals in the state. The coefficient of exchange rate is positive, but it is not significant.

We have examined the stationarity and cointegration of the variables to construct vector error correction model to determine short run and long run causality among the variables. The study has found that there is stationarity of the variables after the first difference. Both ADF and PP tests have provided evidence of stationarity among the variables. The application of Johansson's maximum likelihood technique of cointegration has determined evidence of long run equilibrium among the variables included in the model. The vector error correction model is applied to judge short run and long run equilibrium of the variables for Sikkim. There is evidence of short run causality running from foreign tourists' and state gross domestic product of Sikkim. Similarly, there is a long run equilibrium running from state gross domestic product to foreign tourists' arrival. This study has confirmed that there is 'growth led tourism' hypothesis in the case of Sikkim. The impulse response function also supports that the state should attract more foreign tourists by allocating more resources from the state product. In order to study the long run elasticity between the state product and foreign tourists' arrivals, this study has applied long run estimator like Fully Modified Ordinary Least Squares technique to discern the relationship between state income and tourists' arrivals. One percent rise in the number of tourists increases the state domestic product by 1.60 percent, it is considered to be highly elastic. Therefore, the state of Sikkim should provide enough facilities to attract more tourists from other countries. The following chapter provides a summary and conclusion of this study.

3. Summary and Conclusion

In equation I, lagged independent variables of LNTand LNE do not have causality with LNY during the short run. It means that there is no Granger causality exists between economic growth and tourists' arrival in Sikkim. The equation II provides evidence that there is weak causality between LNY and LNT in Sikkim. It is a weak causality because the coefficient of LNY is significant at 10 percent level. The empirical results of vector error correction model (VECM) suggest that there is only one co integrating long run relationship, i.e. the coefficient of the error correction term (ECT) is highly significant. It means to that when there is an external shock provided to state gross domestic product (LNY), this macro variable has the tendency to move towards long run equilibrium about 39 percent faster after a change in foreign tourists' arrivals (LNT). There is a tendency on the part of these variables to move towards the long run Both the coefficients of LNY (lagged) and LNY (lagged) are statistically significant and have casual association with LNE during the short run. The coefficient of ECT of Eq.III.is statistically significant and positive. It means that there is no tendency to move towards the long run equilibrium after a shock given to the independent variables of the equation. In sum, the model strongly suggests that the state of Sikkim does not enjoy tourism led growth, but growth led tourism. The state of Sikkim is to allocate more resources to provide better infrastructure like better transports and hotels to attract the foreign tourist to earn invaluable foreign exchange as well as, trigger the growth of employment in the state. These findings are in line with previous results in a study carried out by Georgantopoulas, (2013) for India. In which, the study has failed to establish short run equilibrium between tourism expenditure and real GDP of India. The present study shares the similar consensus, although the previous one used total tourism expenditure as proxy for tourists' arrivals.

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