THE CAUSAL RELATIONSHIP BETWEEN TOURISM AND ECONOMIC GROWTH IN MALAYSIA: EVIDENCE FROM MULTIVARIATE CAUSALITY TESTS

A RELAÇÃO CAUSAL ENTRE TURISMO E CRESCIMENTO ECONÓMICO NA MALÁSIA: A EVIDÊNCIA DOS TESTES DE CAUSALIDADE MULTIVARIADA

NORSIAH KADIR

Department of Economics,
Faculty of Business and Management, Universiti Teknologi MARA Malaysia
norsiahkadir6699@yahoo.com

SABRI NAYAN

Department of Economics,
Faculty of Business and Management, Universiti Teknologi MARA Malaysia
sabrinayan@perlis.uitm.edu.my

MAT SAAD ABDULLAH

Department of Finance,
Faculty of Business and Management, Universiti Teknologi MARA Malaysia
matsaad@perlis.uitm.edu.my

ABSTRACT

Tourism industry and economic growth of a particular country are to some extent, interrelated. The aim of this study is to investigate the presence as well as direction of (significant) causal relationship between the Malaysian international tourism receipts and real growth in its national economy. Based on the sample period of 1994 through 2004, the data are examined from the perspective of multivariate causality procedure. Major finding of the study is twofold: First, international tourism receipts and real economic growth are found to be significantly cointegrated. Secondly, multivariate causality test based on the error correction model reveals that the Granger causality between international tourism receipts and real economic growth is unidirectional - running from real economic growth to international tourism receipts. The practical implication that could be conceived from this 'growth-led tourism' finding is that, as the Malaysian economy is growing, accelerated growth of socio-economic activities as well as business opportunities in its tourism-related sectors could be expected.

KEYWORDS

Tourism, economic growth, multivariate causality tests, Malaysia.

RESUMO

A indústria turística e o crescimento económico de um país estão até certo ponto inter-relacionados. O objectivo deste estudo é investigar a presença assim como também a direcção da relação causal (significante) entre as receitas do turismo internacional na Malásia e o crescimento real na sua economia. Com base numa amostra do período de 1994 a 2004, os dados são analisados na perspectiva do método da causalidade multivariada. São dois os principais resultados do estudo: em primeiro lugar, as receitas do turismo internacional e o crescimento económico real estão significativamente inter-relacionados. Em Segundo lugar, o teste de causalidade multivariada baseado no modelo de correcção do erro revela que a causalidade de Granger entre as receitas do turismo internacional e o crescimento económico real é unidireccional – movendo-se a partir do crescimento económico real em direcção às receitas do turismo internacional. A implicação prática que pode ser derivada destes resultados é que, dado que a economia da Malásia está crescendo, deve ser esperado um crescimento acelerado das actividades socioeconómicas, assim como oportunidades de negócio nos sectores relacionados com o turismo.

PALAVRAS-CHAVE

Turismo, Crescimento Económico, Testes de Causalidade Multivariada, Malásia.

1. INTRODUCTION

Tourism industry and economic development are to some extent, interrelated. Furthermore, during the present era of globalization, information and communications technology, it is reasonable to believe to be a global phenomenon that tourism - as an industry or a socio-economic activity - has become increasingly important. Appropriately, tourism continues to be a growing focus of economic development policy in many regions and nations (Malecki, 1997).

Given the aforementioned scenario, the pertinent question is, has growth in tourism industry in a particular country in recent years brought a significantly positive impact on real growth of its national economy? Alternatively, would real growth of an economy significantly cause an accelerated growth in its tourism industry? Actually, the activity of tourism to support economic growth and to make an increasingly significant contribution to the gross domestic product (GDP) is still a subject of intense discussion (Sharpley & Telfer, 2002).

The present paper attempts to investigate the presence as well as direction of (significant) causal relationship between the growth in Malaysian international tourism receipts and real growth in its national economy. The data are analyzed from the multivariate causality perspective.

The remainder of this paper is structured as follows: The study begins in Section 2.0 by reviewing the literature related to tourism industry. Section 3.0 is devoted to explaining the data as well as sketching the methodology to be employed. Our empirical results are presented and discussed in Section 4.0. The paper is then concluded in Section 5.0.

2. REVIEW OF LITERATURE

Development theory and tourism have evolved along similar time lines since the Second World War, yet there has been little work connecting the two fields of study (Sharpley &Telfer, 2002).

Notwithstanding that in recent years there has been a growing interest in analyzing the relationship between tourism and economic growth [see among others, Balaguer and Cantavella-Jordà (2002); Eugenio-Martin *et al.* (2003); Oh (2005) and Narayan *et al.* (2007)], most of such studies involve analysing the data from the bivariate perspective. Additionally, only a small number of them have

arrived at evidence of long run causality from tourism to economic growth (Dritsakis, 2004).

In 2002, Balaguer and Cantavella-Jordà (2002) initiated a study to examine the **tourism-led growth hypothesis (TLGH)** – a hypothesis directly derived from **export-led growth hypothesis (ELGH)**. Studying the role of tourism in the long run economic development of Spain, Balaguer and Cantavella-Jordà (2002) have detected that economic growth is sensitive to persistent expansion in international tourism. More precisely, evidence of their study suggests that international tourism in Spain has produced multiplier effects over time.

As in the ELGH, the TLGH postulates the existence of channel where tourism would influence overall long-run economic growth. In a more traditional sense, it should be argued that tourism brings in foreign exchange, which can be used to import capital goods in order to produce goods and services leading in turn to economic growth (Mckinnon, 1964). Diamond (1974) however, has a different view, claiming that not only can tourism relieve the shortage of foreign exchange constraining industrial expansion and alleviate the growing problem of urban unemployment, but in the long run it will provide a price and income elastic substitute for staple exports facing less favorable demand conditions.

Eugenio-Martin *et al.* (2004) in studying the relationship between tourism and economic growth in Latin American countries by using a panel data approach and the Arellano-Bond estimator for dynamic panels found that tourism sector is necessary for the economic growth of medium or low-income countries. The study also provides evidence suggesting that low-income countries need adequate levels of infrastructures, education as well as development to attract tourists. Medium-income countries on the contrary, need high levels of social development like health services and high GDP per capita levels.

Another study investigating the causal relationship between tourism development and economic growth is the one by Oh (2005). Using Engel and Granger two-stage approach and the bivariate Vector Auto-regression (VAR) model to analyse the Korean data, two principal results have emerged from the study. Firstly, there is no long-run relationship between the two series. Secondly, the causal relationship between economic growth and tourism development in Korea is one way in nature; it runs from economic

growth to tourism development. The author then concluded that in Korea, the hypothesis of tourism led-economic growth had to be rejected.

To study tourism as a factor in Greece's long-run economic growth, Dritsakis (2004) used multivariate causality analysis. The study has come up with evidence of common trend or long-run relationships among international tourism earnings, real exchange rate and economic growth. Interestingly, based on causality analysis the study has detected that international tourism earnings and real exchange rate cause economic growth with a "strong causal relationship", whereas economic growth and real exchange rate cause international tourism earnings with a "simply causal relationship".

In their study to test the relationship between tourism and economic growth for the Pacific Island countries (i.e., the Fiji Islands, the Solomon Islands, Papua New Guinea and Tonga) by using panel data analysis, Narayan *et al.* (2007) found that tourism industry is a significant contributor to the gross domestic product (GDP) in all of the four Pacific Island countries. Findings of the study also justify the necessity of public intervention in providing tourism infrastructure and facilities.

Regarding the Malaysian data, convincing evidence on causal relationship between international tourism receipts and real growth in the national economy is still lacking. Such a phenomenon could be explained by the fact that published papers discussing the role of tourism in economic growth are, by and large, based on descriptive studies [see e.g., Oppermann (1992); Khalifah & Tahir (1997); Musa (2000); and Teo (2003)]. Besides, most of the relatively few econometric studies on tourism, in Malaysia have focused on analyzing tourism from the demand perspective [see *inter alios*, Tan *et al.* (2002); Anaman & Aminah Ismail (2002); Mohd Salleh *et al.* (2008)].

3. DATA AND METHODOLOGY

This study is based on the **quarterly time-series data** consisting of international tourism receipts, real GDP, real effective exchange rates and consumer price indices from nine selected ASEAN and non-ASEAN countries; namely, Thailand, Singapore, Indonesia, the Philippines, the U.S, the U.K, Germany, Japan and Australia. Covering a sample period of 1994 through 2004, the data are

obtained from the Malaysian Tourism Promotion Board (Planning and Research Division), *Key Performance Indicator of Tourism in Malaysia*; Annual report of Bank Negara Malaysia (the Central Bank of Malaysia); *Economic Report 2005-2006* and the *IMF International Financial Statistics Yearbook* (various issues).

In analyzing the data, the following econometric tests are utilized:

i Unit root tests [Augmented Dickey-Fuller (1979,1981) test as well as Phillips and Perron (1988) test];

ii Cointegration test [Johansen (1988,1991) as well as Johansen and Juselius (1990) tests]; and

iii Granger causality test [Engle and Granger (1987)]

3.1. UNIT ROOT TESTS

Before testing for cointegration, the data need to be tested for stationarity, to ensure that the mean and variance of the series are constant through time and the autocovariance of the series is not time varying (Enders, 2004). Therefore, the first step in unit root testing is to test for the order of integration (I) of the variables.

Integration means that past shocks remaining undiluted affects the realisations of the series forever and a series has theoretically infinite variance and a time-dependent mean. For this purpose, tests proposed by Dickey and Fuller (1979, 1981) (hereafter, ADF test) and Phillips and Perron (1988) (hereafter PP test) are used. These tests will ensure the properties of unit root in all variables.

If all of the series are non-stationary in the levels, it should be stationary in first difference with the same level of lags. To determine the appropriate lag lengths, the Akaike Information Criterion (AIC) and Schwartz Bayesian Criterion (SBC) are used.

3.2. COINTEGRATION TEST

After identifying the order of intergration, the Johansen (1988, 1991), and Johansen and Juselius (1990) Full Information Maximum Likelihood (ML) technique (hereafter JJ) is used to detect the occurrence of long-run relationships (cointegration)

between the various series [MacKinnon (1991); Maddala (1988); Maddala (2001); Maddala & Kim (2002)]. The JJ cointegration procedure possesses several advantages over the residual-based Engle-Granger two-stage approach in testing for cointegration. Phillips (1991) underlined the desirability of this technique in terms of symmetry, unbiasedness, and efficiency. The procedure also does not suffer from problems associated with normalisation. It is robust to departures from normality [Cheung & Lai (1993); Gonzalo (1994)] when conditional heteroskedasticity is present (Lee & Tse, 1996).

The JJ test utilises two likelihood ratio (LR) test statistics for the number of cointegration vectors: The maximum eigenvalue [T ln(1 - $\hat{\lambda}_{i+1}$)] and trace

$$[-T \sum_{i}^{\rho} \ln (1- \hat{\lambda}_{i})]$$ statistics. The maximum

eigenvalue test (λ-max) is based on the comparison of H_0 (r-1) against the alternative H_1 (r), where r stands for number of cointegrating vectors. In general the null hypothesis (H_0: r = 0) is tested against an alternative (H_1: r = 1), against (H_1: r = 2), and so on. In the trace test, the null hypothesis (H_0) is that there is at most r cointegrating relationships (for example, r = 0, 1, 2, 3) is tested against a general alternative.

Critical values for both the maximum eigenvalue and trace tests are tabulated in Osterwald-Lenum (1992). If two variables are found to be cointegrated, there exists a long-run effect that prevents them from drifting away from each other and this will force the series to converge into long-run equilibrium.

The presence of a long-run relationship between variables, would mean that they are cointegrated. Given that it is possible to have multiple long-run equilibrium relationships between variables, the techniques developed by Johansen (1988, 1991), and Johansen and Juselius (1990) allow us to determine the number of statistically significant long-run relationships.

The Johansen approach to cointegration is based on Vector Autoregression (VAR). Consider the unrestricted VAR model represented by the following equation:

$$Y_t = \alpha + \sum_{K=i}^{\rho} \Pi_{\kappa} Y_{t-k} + \varepsilon_t, \quad t=1, ..., T \qquad (1)$$

where εt is a i.i.d. P-dimensional Gaussian error with mean zero and variance matrix Λ, Y_t is an (nx1) vector of I(1) variables, and α is an (nx1) vector of constants. Given that Y_t is assumed to be non-stationary, it can be specified that $\Delta Y = Y_t - Y_{t-1}$. Equation (1) then, can be expressed in error correction form as follows,

$$\Delta Y_t = \alpha + \sum_{K=i}^{P-1} \Gamma_{\kappa} \Delta Y_{t-k} + \Pi_{\kappa} Y_{t-k} + \varepsilon_t \qquad (2)$$

where Y_t is a column vector of m variables, Γ and Π represent coefficient matrices, Δ is the first difference operator, and P represents the lag length. There exists no stationary linear combination of variables if Π has zero rank. If, however, the rank r of Π is greater than zero, then there will exist r possible stationary linear combinations. Here, Π may be decomposed into two matrices a and β, such that Π = aβ. The cointegration vector, β, has the property that βY is stationary even though Y is non-stationary. The cointegration rank, r, can be formally tested using the maximum eigenvalue (λ$_{max}$) test and the trace test (λ$_{tr}$). The asymptotic critical values are provided in Johansen and Juselius (1990).

3.3. GRANGER CAUSALITY TEST

The multivariate causality tests based on Vector Error Correction Model (VECM) is used to test for the presence of short run and long run relationship among the variables of our interest. These variables are the Malaysian international tourism receipts, real GDP, prices of tourism as well as the Malaysian real exchange rates, ranging from 1994 to 2004.

In investigating the occurrence of causal relationship between the Malaysian real economic growth and its tourism receipts, the nature of (causal) relationship between variables are tested based on the following pairs:

- International tourism receipts (LREC) and real economic growth (LGDP);
- Real effective exchange rate (LER) and international tourism receipts (LREC);
- Real economic growth (LGDP) and real effective exchange rate (LER);
- Tourism price (LPm) and international tourism receipts (LREC).

These multivariate causality tests involve estimating the following regression equations:

$$\Delta LGDP_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1j} \Delta LREC_{t-j} + \sum_{i=1}^{p} \alpha_{2j} \Delta LPm_{t-j} + \sum_{i=1}^{p} \alpha_{3j} \Delta LER_{t-j} + \varepsilon_{1t} \quad (3)$$

$$\Delta LREC_t = \alpha_0 + \sum_{i=1}^{p} \alpha_{1j} \Delta LGDP_{t-j} + \sum_{i=1}^{p} \alpha_{2j} \Delta LPm_{t-j} + \sum_{i=1}^{p} \alpha_{3j} \Delta LER_{t-j} + \varepsilon_{2t} \quad (4)$$

where $\Delta LGDP_t$ and $\Delta LREC_t$ are the differenced stationary and cointegrated variables; t stands for time; ε_{1t} and ε_{2t} are white noise error terms following the classical linear regression model assumptions; and a_1, a_2 and a_3 are parameters of interest.

The Granger-causality test is implemented by calculating the F-statistic (Wald test) based on the null hypothesis that the set of coefficients (a_1, a_2 and a_3) on the lagged values of independent variables are not statistically different from zero. If the null hypothesis is not rejected, then it can be concluded that the independent variables do not cause the dependent variable.

4. EMPIRICAL RESULTS AND DISCUSSION

Since the data are analysed in three stages, findings of the study are also discussed in three stages or sub-sections:

Table 1: Augmented Dickey Fuller (ADF) Test

Variable	Constant			Trend		
	Level	First-Difference	Conclusion	Level	First-Difference	Conclusion
lnREC	-1.435	-7.759**	I(1)	-3.045	-7.723**	I(1)
lnGDP	-1.124	-7.588**	I(1)	-3.024	-7.508**	I(1)
lnPr	-0.372	-6.415**	I(1)	-1.508	-6.539**	I(1)
lnER	-1.751	-5.287**	I(1)	-1.666	-5.242**	I(1)

Note: ** and * denote rejection of a unit root hypothesis based on Mackinnon critical values at 1% and 5% respectively

Table 2: Phillip-Perron (PP) Test

Variable	Constant			Trend		
	Level	First-Difference	Conclusion	Level	First-Difference	Conclusion
lnREC	-1.256	-9.578**	I(1)	-2.944	-10.969**	I(1)
lnGDP	-0.832	-10.671**	I(1)	-3.001	-11.066**	I(1)
lnPr	-0.449	-6.415**	I(1)	-1.508	-6.539**	I(1)
lnER	-1.869	-5.259**	I(1)	-1.804	-5.211**	I(1)

Note: ** and * denote rejection of a unit root hypothesis based on Mackinnon critical values at 1% and 5%, respectively.

Table 3: Multivariate Cointegration Tests Based on the Johansen and Johansen and Juselius (JJ) Approach

H_o	Trace test	5% CV	1% CV	Max-Eigen test	5% CV	1% CV
H_0: r = 0	52.350**	39.890	45.580	33.950**	23.800	28.820
H_0: r ≤ 1	18.390	24.310	29.750	9.980	17.890	22.990
H_0: r ≤ 2	8.410	12.530	16.310	7.380	11.440	15.690
H_0: r ≤ 3	1.030	3.840	6.510	1.030	3.840	6.510

Notes:

1. r stands for number of cointegrating vectors

2. Column 1 lists the null hypothesis of zero, at least one, two, three cointegrating vector; column 2 lists the trace statistics; column 3 and 4 list the critical values for trace statistics at 5% and 1% significant levels; column 5 lists the maximum Eigenvalue statistics; column 6 and 7 list the critical value for maximum Eigenvalue statistics at 5% and 1% significant levels.

3. ** and * indicate statistical significance at 1% and 5% levels, respectively.

4.1. RESULTS FROM UNIT ROOT TESTS

Tables 1 and 2 present the stationarity test results of international tourism receipts, real GDP, real exchange rate and prices of tourism in level as well as first differences (using ADF and PP tests).

The results of unit root tests (in level) indicate that the null hypothesis of the unit root cannot be rejected at 1 per cent and 5 per cent critical values. However, the null hypothesis is rejected at 1 per cent and 5 per cent critical values when the test is based on the first-difference. This suggests that the data are stationary (or integrated) at first-difference but not in level.

4.2. RESULTS FROM COINTEGRATION TEST

After confirming that all series are integrated of the same order, we proceed with the multivariate cointegration test [Johansen (1988, 1991), and Johansen and Juselius (1990)] to determine the presence of common trend or long-run relationship among the series; namely, international tourism receipts, real GDP, prices of tourism and real exchange rate. The results of the multivariate cointegration test, as summarized in Table 3, reveal that the series are cointegrated. Simply put, our results suggest the presence of common trend or long-run relationships among the series.

4.3. RESULTS FROM MULTIVARIATE CAUSALITY TEST

Given the results provided by the Johansen multivariate cointegration test that the series are cointegrated, the study then proceeds with the multivariate error-correction model. The results of the multivariate causality test (based on the error-correction model) as reported in Table 4 indicate that the coefficient, δ, is statistically significant only in the case when international tourism receipts (REC) is used as an endogenous variable. This refers to channel two, which means in the long-run, real GDP, relative price of tourism and exchange rate Granger cause international tourism receipts. However, the coefficients of lagged variables are significant only in the case where international tourism receipts and real GDP are used as dependent variable (channel 1). This implies that in the short-run relative price of tourism Granger causes international tourism receipts and real GDP.

Lastly, it is noteworthy that seasonal patterns in international tourist arrivals in a particular country are a common phenomenon. Correspondingly, in tourism literature seasonal variations in tourism demand is a well-documented phenomenon. However, in the present paper, since we are more interested in the relationship between tourism and economic growth, this seasonality issue is only examined briefly. The results of our analysis of seasonality patterns of tourism demand in Malaysia are displayed in Figures A1 and A2 (see Appendix). As shown in Figure A2, our international tourism receipts declined seriously in 1997 and 2002 due to Asian Financial Crisis and the Severe Acute Respiratory Syndrome (SARS), respectively. On the other hand, the sharp increase in tourism receipts in 2003 could be attributed to the success of the Malaysian Government 'Malaysia Truly Asia' promotional campaign.

5. CONCLUSION

In examining the presence as well as direction of causality between international tourism receipts and real economic growth in Malaysia, cointegration tests based on Johansen (1988,1991) and Johansen and Juselius (1990) are utilised. Findings of the study indicate that there is a long run relationship between tourism and economic growth in Malaysia.

Further, results from the multivariate causality test reveal that the relationship between real economic growth and international tourism receipts is unidirectional: It runs from real economic growth to international tourism receipts.

In closing, whereas the relationship between tourism industry and economic growth might be bidirectional, our result indicates that, for Malaysia, it is growth in the national economy that has been significantly leading growth in its tourism industry. Such a finding might imply that a growth in the Malaysian economy would be followed by improvements in the quality (as well as quantity) of its tourism products, facilities and services. Besides, the practical implication that could be conjectured from this 'growth-led tourism' finding is that as the Malaysian economy is growing, accelerated growth in socio-economic activities as well as business opportunities in the tourism related sectors could be expected. However, our evidence of seasonality suggests that in planning and implementing activities, services and even promotional campaign pertaining to tourism industry in Malaysia, the fact

that the arrival of international tourists are seasonal in nature need to be taken into consideration.

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APPENDIX

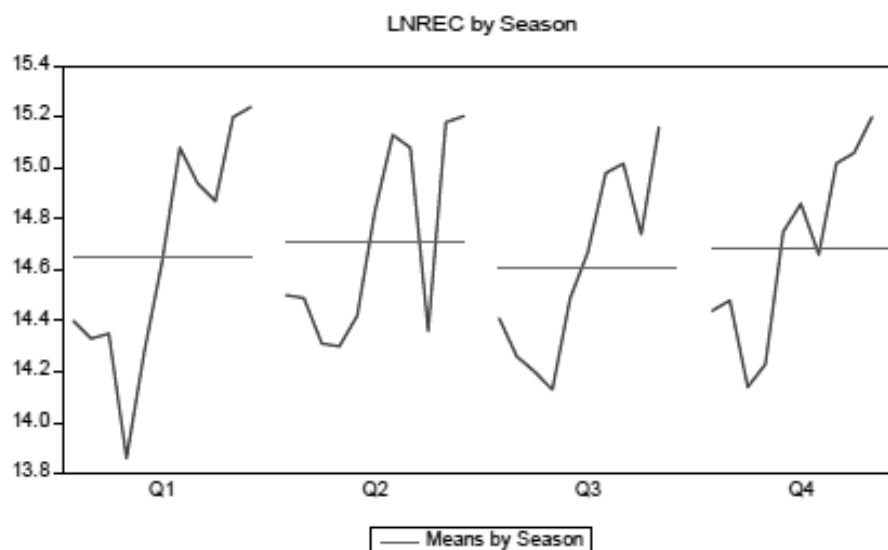## Figure A1. International Tourism Receipts (means by Season)

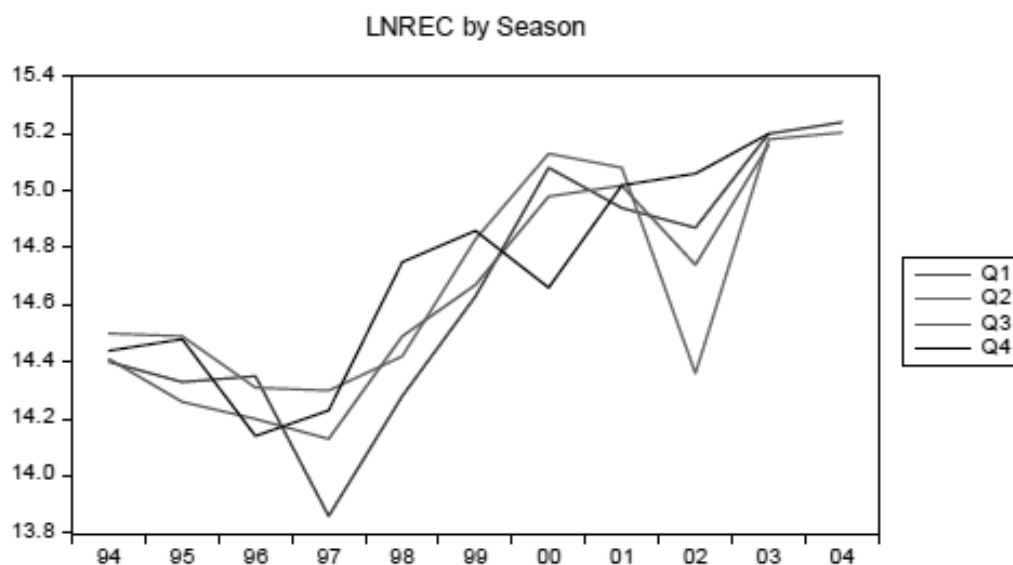## Figure A2. International Tourism Receipts (by Season)

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Table 1. Diagnostic Tests

Type of Test	Purpose	Result
R^2		0.8447
Adjusted R^2	A goodness-of-fit measure in multiple regression analysis that penalizes additional explanatory variables	0.8181
Durbin-Watson	Test for autocorrelation	2.3950
Breusch-Pagan	Test for heterocedasticity (BP λ)	10.1938
Jarque-Bera	Test for Normality	4.0294(0.1333)