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Abstract

This study empirically investigates the comovements and the causality relationship between tourist arrivals and economic growth in Sarawak during the period of 1972 to 2004. The empirical evidence clearly shows that the long run causality running from tourist arrivals to economic growth in the estimation period. As one of the income generator for Sarawak, the findings are consistent with economic theory and proffer important policy conclusions.

Keywords: Tourist arrivals; Economic growth; Sarawak; causality.

1. INTRODUCTION

Tourism is one of the fastest growing sectors in an economy and the major source of income for most of the developing countries. According to the World Tourism Organization (2007) (http://www.unwto.org)[1] the tourists expenditure on goods and services represented about 8 percent of total world export receipts and 5 percent of the world GDP. Numerous studies have been conducted dealing with the impact of tourism toward the economic growth in developing countries. Many of these studies have focused on testing whether tourism sector leads to improvement in economic growth performance of a particular country (see for

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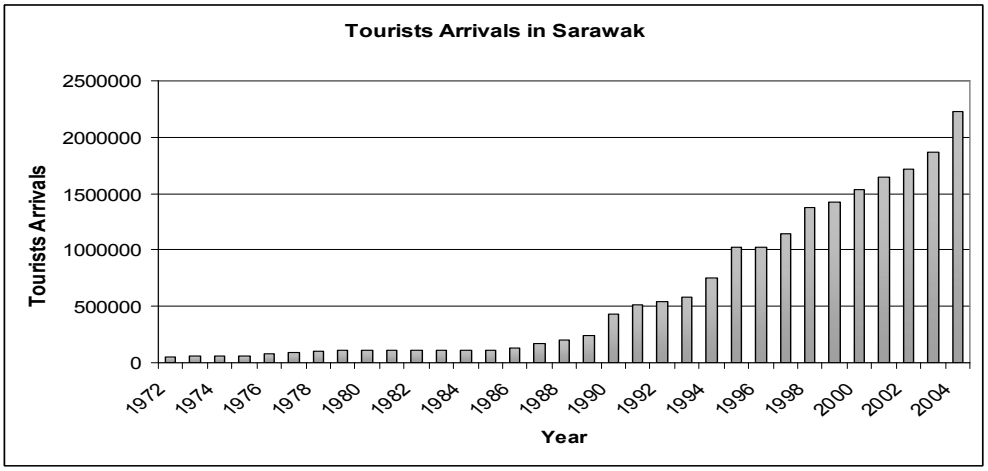
[1] WTO is the central body that plays a vital role in promoting the development of responsible, sustainable and universal accessible tourism and pays particular attention to the interest of developing countries. This organization encourages the implementation of Global Codes of Ethics for tourism with the view that member states maximize positive economic, social and cultural affects of tourism and fully reap its benefits and minimize the negative social and environmental impacts. As of 2007, WTO's membership includes 150 countries, seven territories and 350 affiliate members, which represent the private sectors, educational institutions, tourism associations and local tourism authorities in the world.

example, Lea, 1988; Akis, 1998; Sinclair, 1998; Lanza et al., 2003; Durbarry, 2004; Narayan, 2004, 2006; Lee and Chien, 2008 and Lee and Chang, 2008). Empirically these authors argued that that tourism has promotes high economic performance, job creation and generating revenue for the government. In addition, Nath (1998) found that tourism is the leading source of foreign exchange in Mauritius.

As one of the income earner, it attracts great interest from a policy perspective for continuous economic growth in a country/state. With this motivation, this study intends to investigate the relationship between tourist arrival and economic growth within the scope of Sarawak during the period 1972 to 2004. In Sarawak, the tourism industry is one of economic sector that contributes greatly to the state's Gross Domestic Product (GDP)[2]. With its colorful and multiracial cultures with diverse festivals have attracted tourists from different countries to Sarawak where the attractions were the cultural festival and celebrations of the different races and religions. For example, Cultural Village and the Sarawak Museum provide a different experience the multi-ethnic tribes lifestyle in Sarawak. Besides the natural heritage, Sarawak has a treasure trove of flora and fauna and the largest rainforest than any states in Malaysia.

[2] The Sarawak Tourism Board that establishes in July 1995 with the aim to promote Sarawak as a natural tourism destination. They work closely with the Tourism Malaysia and State Ministry of Tourism in making Sarawak as main destinations for tourists worldwide.

Figure 1: Number of Tourist Arrivals to Sarawak from year 1972-2004



Source: Immigration Department of Sarawak

Figure 1 plots the tourist arrivals to Sarawak from 1972 until 2004. By looking at the figure, one can identify that for the most part of the time frame, the arrival of tourists is in increasing manner except for the year 1980, 1983 and 1984. For example, tourist increased from 54223 in 1972 to 97881 in 1978, an increase about 44 percent. Over the decades of 1980s, the amount increased from 108048 to 238723 in 1989. In 1990s, when government launch the first and second Visit Malaysia Year campaign, the arrival of tourists to Sarawak increase from 434024 to 1423324 peoples. With the success of the earlier Visit Malaysia Year campaign, the figures of tourists keep increasing throughout the years. The introduction of third Visit Malaysia campaign in 2007 aimed to attract the foreign tourists to all the states in Malaysia including Sarawak. Also, the government provides monetary incentives in the yearly budgets especially in promoting the growth and development of the tourism sector in Malaysia.

The paper is organized as follows. Section 2 provides the empirical approach adopted in the paper. Section 3 reports the empirical findings while concluding remarks is in Section 4.

2. ECONOMETRIC APPROACH

2.1 Univariate Unit Root Testing Procedures

The standard ADF (see Said and Dickey, 1984) and DFGLS (see, Elliott *et al*., 1996) testing principles share the same null hypothesis of a unit root. Their difference however centered on the way the latter specified the alternative hypothesis and treats the presence of the deterministic components in a variable's data generating process (DGP). Specifically the DFGLS procedure relies on locally demeaning and/or detrending a series prior to the implementation of the usual auxiliary ADF regression. The use of the DFGLS tests statistics is likely to minimize the danger of erroneous inferences emerging when the series under investigation has a mean and/or linear trend in its DGP. This is so because these statistics have been shown to achieve a significant gain in power over their conventional ADF counterparts (Elliott *et al*., 1996). The DFGLS mean (μ) and trend (τ) stationarity under a local alternative will be denoted by τ_μ and τ_τ respectively where they are constructed by estimating the following auxiliary regression of

$$\Delta x_1^m = \beta_0 x_{t-1}^m + \sum_{j=1}^{n} \beta_j \Delta x_{t-j}^m + \varepsilon_t \qquad (1)$$

where x_1^m is the locally demeaned and/or detrended process obtained from $x_t^m = x_t - \overline{\beta}' z_t$. Under this condition, $z_t = 1$ for the case of τ_μ while $z_t = (1 \quad t)$ for the case of τ_τ and $\overline{\beta}'$ is the regression coefficient of $\tilde{x}_t$ on $\tilde{z}_t$ for which $(\tilde{x}_1, \tilde{x}_2, ..., \tilde{x}_T) = [x_1 (1 - \overline{\rho} L) x_2), ..., (1 - \overline{\rho} L) x_T)]$, $(\tilde{z}_1, \tilde{z}_2, ..., \tilde{z}_T) = [z_1, (1 - \overline{\rho} L) z_2, ... (1 - \overline{\rho} L) z_T]$ under the local alternative of $\overline{\rho} = 1 + (\overline{c} / T)$. The $\tau_\mu (\tau_\tau)$ test statistic is given by the usual t statistic for testing $\beta_0 = 0$ in the associated ADF type auxiliary regression for the appropriate x_t^m variables shown in Equation (5). In addition, this

procedure requires the choice of the local to unity parameter $\bar{c}$ through $\bar{\rho} = 1 + (\bar{c}/T)$ are set to -7 in the case of τ_μ and –13.5 in the case of τ_τ (see Elliott *et al*., 1996 for details).

In contrast, the KPSS (Kwiatkowski *et al*., 1992) semi-parametric procedure tests for level (η_μ) or trend stationarity (η_τ) against the alternative of a unit root. The KPSS test statistic for level (trend) stationary is

$$\eta_\mu(\eta_\tau) = \frac{1}{s^2(k)T^2}\sum_{t=1}^{T} S_t^2 \tag{2}$$

where $S_t = \sum_{i=1}^{t} u_i, u_t$ are the residuals from the regression of X_t on a constant (a constant and trend) for the level (trend) stationarity, $s^2(k)$ is the non-parametric estimate of the 'long run variance' of u_t while k stands for the lag truncation parameter. In this sense, the KPSS principles involve different maintained hypothesis from the ADF and DFGLS unit root tests.

2.2 Cointegration Procedure

The system-based cointegration procedure developed by Johansen and Juselius (1990) to test the absence or presence of long run equilibrium is adopted in this paper. One advantage of this approach is that the estimation procedure does not depend on the choice of normalization and it is much more robust than Engle-Granger test (see Gonzalo, 1994). Phillips (1991) also documented the desirability of this technique in terms of symmetry, unbiasedness and efficiency. Their test utilizes two likelihood ratio (LR) test statistics for the number of cointegrating vectors: namely the trace test and the maximum eigenvalue test. The Johansen procedure is well known in the time series literature and the detail explanation are not presented here.

2.3 Granger Causality Tests

If cointegration is detected, then the Granger causality must be conducted in vector error correction model (VECM) to avoid problems of misspecification (see Granger, 1988). Otherwise, the analyses may be conducted as a standard first difference vector autoregressive (VAR) model. VECM is a special case of VAR that imposes cointegration on its variables where it allows us to distinguish between short run and long run Granger causality. The relevant error correction terms (ECTs) must be included in the VAR to avoid misspecification and omission of the important constraints. The existence of a cointegrated relationship in the long run indicates that the residuals from the cointegration equation can be used as an ECT as follows:

$$\Delta GDP_t = \alpha_0 + \sum_{i=1}^{m} \beta_{1,i} \Delta GDP_{t-i} + \sum_{i=1}^{n} \beta_{2,i} \Delta TOUR_{t-i} + \mu_1 ECT_{t-1} + \zeta_{1t} \quad (3)$$

$$\Delta TOUR_t = \delta_0 + \sum_{i=1}^{n} \phi_{1,i} \Delta GDP_{t-i} + \sum_{i=1}^{m} \phi_{2,i} \Delta GDP_{t-i} + \mu_2 ECT_{t-1} + \zeta_{2t} \quad (4)$$

where Δ is the lag operator, α_0, δ_0, β's and ϕ's are the estimated coefficients, m and n are the optimal lags of the series Gross Domestic Product (GDP) and tourist arrivals (TOUR), ζ_{it}'s are the serially uncorrelated random error terms while μ_1 and μ_2 measure a single period response of the GDP (TOUR) to a departure from equilibrium. To test whether TOUR does not Granger cause movement in GDP, H_0: $\phi_{2,i} = 0$ for all i and μ_2=0 in Equation (3)[3]. The rejection implies that TOUR causes GDP. Similar analogous restrictions and testing procedure can be applied in testing the hypothesis that GDP does not Granger cause movement in TOUR where the null hypothesis H_0: $\beta_{2,i} = 0$ for all i and $\mu_1 = 0$ in Equation (4). In the case where cointegration is absence, the standard first difference vector

[3] The F-test or Wald χ^2 of the explanatory variables (in first differences) indicates the short run causal effects ($\phi_{2,i} = 0$ for all i) while the long run causal (μ_2 =0) relationship is implied through the significance of the lagged ECT which contains the long run information.

autoregressive (VAR) model is adopted. This simpler alternative of causality is feasible through the elimination of ECT from both equations above. In other words, it only contains the short run causality information.

3. EMPIRICAL RESULTS

3.1 Data Sources

Annual data of tourist arrivals and nominal Gross Domestic Product over the period 1972-2004 for Sarawak were obtained from Immigration Department of Sarawak and Federal Accounting Unit Sarawak, Department Statistic of Sarawak respectively.

3.2 Non-stationary and Stationary Test

Overwhelmingly, the ADF, DFGLS and KPSS tests suggest the existence of unit root or nonstationarity in level or *I(1)* for the two variables during the period of 1972 – 2004. The findings that all the variables have the same order of integration allowed us to proceed with the Johansen cointegration analysis[4].

3.3 Cointegration Results

Based on the maximum eigenvalue and trace statistics, the results imply the existence of one cointegrating vector (see Table 1). On the basis of these test results, we can interpret that a unique cointegrating relationship emerged for GDP and arrival of tourists in Sarawak. Rejecting the null hypothesis of no cointegration implies that the two variables do not drift apart and share at least a common stochastic trend in the long run.

[4] The results are not presented here to conserve space.

Table 1: Cointegration Test Results

		k=2 r=1			
Null	Alternative	Trace	95%C.V	λ max	95%C.V
r = 0	r = 1	22.248*	19.96	19.008*	15.67
r ≤ 1	r = 2	3.239	9.24	3.239	9.24

Notes: The k is the lag length and the r is the cointergrating vector(s). Chosen r: number of cointergrating vectors that are significant under both tests. Asterisk (*) denotes statistically significant at 5 percent level.

3.4 Granger Causality Analysis

With cointegration detected in sample period (Table 1), we precede the causality analysis in the environment of Vector Error Correction Model (VECM). Results in Table 2 may be summarized as follow. First, both GDP and TOUR do not cause each other in the short run. This is clearly shown with the insignificant x^2-statistic and the p-values. Second, the error-correction term (ECT) is significant and the burden of short run adjustment is beared by GDP carries the correct sign (negative). The adjustment measured by ECT stands at 20 per cent in a year which requires an estimate of 5 years to derive towards long run equilibrium due to the short run adjustments. In this sense, any disequilibrium to the system, Sarawak needs approximately 5 years to reach long run equilibrium or the impact are fully absorbed in the economy. Third, the significance of the ECT indicates the long run causality from TOUR → GDP.

Table 2: Granger Causality

Dependent Variables	**ΔGDP**	**ΔTOUR**	**ECT**	
	x^2-statistic (p-value)		**Coefficient**	**t-ratio**
ΔGDP	-	1.1293 (0.568)	-0.2024	-2.8196*
ΔTOUR	2.1468 (0.341)	-	-0.0025	-0.0257

The x^2-statistic tests the joint significant of the lagged values of the independent variables while one error correction term in included in the analysis. Asterisk (*) indicates statistically significant at 5 percent level.

4. CONCLUSION

General consensus from the vast amount of research has emerged that tourism development it not only increases foreign exchange income, but also creates employment opportunities, stimulates the growth of the tourism industry and by virtue of this, triggers overall economic growth (Lee and Chang, 2008). As such, tourism development has become an important target for most governments worldwide. In this regard, this study was conducted to contribute to the body of literature in respect to Sarawak, also known as the land of Hornbills or 'Bumi Kenyalang'; largest state in Malaysia covering the land size of 124,450 sq. km. As in Figure 1, the number of arrivals has increased significantly since 1970s into Sarawak.

The empirical results indicate that long run comovement relationship exists between tourist arrival and economic growth in Sarawak. Causality experiment point out that a continuous tourism development leads to expansion in the economic growth for Sarawak. This supports the general consensus that tourism development acts as an engine of economic growth for Sarawak during the estimation period. Therefore, tourism-led economic growth in Sarawak. Besides that, the development of tourism sector will also lead to the development of other related industries. With the encouragement and financial support from the government agency, the arrival of tourists (domestic and foreign) into Sarawak would increase in a consistent manner each year. On the local front, Sarawak Tourism Board work closely with players of the tourism industry to intensify their promotions as well as development of their products and services in meeting the expected influx of tourists into Sarawak.

REFERENCES

Akis, S. (1998) A compact econometric model of tourism demand for Turkey. *Tourism Management, 19*, 99-102.

Durbarry, R. (2004) Tourism and economic growth: The case of Mauritius. *Tourism Economics, 10*, 389-401.

Elliott, G., Rothenberg, T.J. and Stock, J.H. (1996) Efficient tests for an autoregressive unit root. Econometrica, 64, pp.813-836.

Federal Accounting Unit Sarawak, Department Statistic of Sarawak, various issues, Kuching, Sarawak.

Gonzalo, J. (1994) Five Alternative Methods of Estimating Long Run Equilibrium Relationships. *Journal of Econometrics,* 60, 203-233.

Immigration Department of Sarawak, various issues, Kuching, Sarawak.

Johansen, S. and Juselius, K. (1990) Maximum likelihood estimation and inference on cointegrating with applications for the demand for money. *Oxford Bulletin of Economics and Statistics*, 52, pp. 169-210.

Kwiatkowski, D., Phillips, P.C.B., Schmidt, P. and Shin, Y. (1992) Testing the null hypothesis of stationarity against the alternative of a unit root. How sure are we that economic time series have a unit root? *Journal of Econometrics,* 54, pp. 159-178.

Lanza, A., Temple, P. and Urga, G. (2003) The implications of tourism specialization in the long run: An econometric analysis for 13 OECD economies. *Tourism Management, 24*, 315-321.

Lea, J. (1988) *Tourism and Development in the Third World*, London: Routledge.

Lee, C. C. and Chang, C. P. (2008) Tourism development and economic growth: A closer look at panels. *Tourism Management, 29*, 180-192.

Lee, C. C. and Chien, M. S. (2008) Structure breaks, tourism development, and economic growth: Evidence from Taiwan. *Mathematics and Computers in Simulation, 77*, 358-368.

Narayan, P. K. (2004) Economic impact of tourism on Fiji's economy: Empirical evidence from the computable general equilibrium model. *Tourism Economics, 10*, 419-433.

Narayan, P. K. (2006) Are Australia's tourism markets converging? *Applied Economics, 38*, 1153-1162.

Nath, S. (1998) Environment resources, international tourism and taxation: The case of Mauritius. *Social Science & Humanities and Law & Management Research Journal, 1*, 83-110.

Phillips, P. C.B. (1991) Optimal Inference in Cointegrated Systems, *Econometrica,* 59, 283-306.

Said, E.S. and Dickey, D.A. (1984) Testing for unit roots in autoregressive-moving average models of unknown order. *Biometrika,* 71, pp. 599-607.

Sinclair, T. (1998) Tourism and economic development: A survey. *Journal of Development Studies, 34*, 1-51.

World Tourism Organization. (2007). About United Nation World Trade Organization. *Tourism.* World Wide Web: http://www.unwto.org.