Asia-Pacific Social Science Review (2017) 16(3): 135–140

RESEARCH BRIEF

The Role of Tourism, Real Exchange Rate, and Economic Growth in Malaysia: Further Evidence From Disaggregated Data

Hanafiah Harvey
Pennsylvania State University at Mont Alto, USA
hhh10@psu.edu

Fumitaka Furuoka
University of Malaya, Malaysia

Qaiser Munir
Universiti Malaysia Sabah

Malaysia is one of the top tourist destinations in the world and the best tourist destination in the Southeast Asian region (Sarmidi & Salleh, 2011). During the past decades, with the support from Malaysian government tourism campaigns, its tourism's sector has grown by an average of 10% annually. Indeed, the tourism sector has emerged as an important alternative source of national income. Malaysia has successfully diversified its economic base from an agricultural to manufacturing and currently a service-oriented economy. For example, the agriculture sector's contribution to Malaysian economy was less than one-tenth of its income while the manufacturing sector's contribution decreased to less than one-third of its GDP. However, the services sectors have grown to more than 50% of national income. As such, the tourism sector is the biggest contributor of the Malaysian economic growth within the service sectors (Tang, 2013).

There have been numerous empirical studies on the tourism-led growth (TLG) hypothesis in Malaysia. The hypothesis states that tourism generates economic growth (see Brida, Cortes-Jimenez, & Pulina, 2014). The empirical results, however, have been mixed. For example, Li, Mahmood, Abdullah, and Chuan (2013) utilized the Granger causality in vector error correction model (VECM) using annual data 1974–2010. They investigated the long-run triangular relationship for economic growth, tourism receipts, and other variables (physical capital, education, health, exports, and government tourism expenditure). They found evidence between tourism and economic growth. Tang and Tan (2013) re-tested the TLG hypothesis in Malaysia by using the recursive Granger causality test. They pointed out that there are long-run cointegration relationships between the international tourist arrivals and industrial production index in all of 12 countries. By contrast, the recursive Granger causality test detected the unilateral causality from tourism development to economic growth in eight countries out of the 12 countries. These economists concluded that the TLG hypothesis was valid in Malaysia. In addition, Tang (2011), using Malaysia as a case study applying Granger causality test, examined using monthly data (1995 to 2009) the relationship between economic growth with Industrial production index and tourist arrivals. He found that the results are mixed.

Other researchers, however, failed to provide empirical proof to support the hypothesis (Lean & Tang, 2009; Kadir & Jusoff, 2010; Harvey, Furuoka, & Qaiser, 2013). For example, Lean and Tang (2009) tested the TLG hypothesis in Malaysia by using international tourist arrival as the proxy for the tourism development and industrial production index as the proxy for the economic growth from January 1989 to February 2009. They used the Toda-Yamamoto version of the causality test for their analysis. They detected the bidirectional causality between the tourism development and economic growth in Malaysia. Kadir and Jusoff (2010) also examined the relationship between international tourism receipt and international trade in Malaysia using quarterly aggregate data (1995 to 2006). They applied the Granger causality test and pointed out that there was unidirectional causality from international trade to tourism. Harvey et al. (2013) also examined the TLG hypothesis by evaluating the East ASEAN Growth Area (BIMP-EAGA). BIMB-EAGA is a sub-regional economic cooperation initiative in Southeast Asia among member nations. This paper focused on Indonesia, Malaysia, and the Philippines using aggregate data for the period of 1995-2010 using aggregate data and applying the autoregressive distributed lag (ARDL) approach. They did not find any evidence of long-run relationship between tourist arrivals and economic growth.

The main purpose of this paper is to extend the literature by examining Malaysia's tourist arrivals from Asia Pacific and North America using disaggregated annual data. This methodology may overcome the problems of biasness, that is, not necessarily all tourism markets will lead to economic growth. Besides analyzing real GDP and tourist arrivals, our paper further introduces real exchange rates analysis. This paper consists of four sections. Following introductory section, Section Two discussed the data, model, and methodology, while Section Three reported empirical results and the final section is conclusion.

Data, Models, and Methodology

Our empirical paper employed quarterly data 2000(I)-2012(IV) from the World Bank and the International Financial Statistics of IMF. The selected countries of our analysis are Australia, Canada, Indonesia, Japan, South Korea, New Zealand, Philippines, Singapore, Thailand, and USA.

We specify our variables are follows: Y_{MY} = measure Malaysia's GDP; Y_i = Country's i real income; TOU_i = Tourist arrivals from country i; REX_i = Real bilateral exchange rate between Malaysian Ringgit and country's i currency. It is defined as $(P_i \bullet NEX_i / P_{MY})$, where P_i is country's *i* CPI, P_{MY} is Malaysia's CPI, and NEX is the nominal bilateral exchange rate defined as the number of ringgit per unit of country's *i* currency. Thus, an increase in REX is a reflection of real depreciation of the ringgit.

Following similar approach to Katircioglu (2011), our model is specified using the following log linear form as in equation (1):

$$LnY_{MY,t} = \alpha + b\,LnY_{j,t} + c\,LnTou_{j,t} + d\,Ln\,REX_{j,t} + \varepsilon_t \quad (1)$$

As specified in equation (1), Y_{MY} is measure of Malaysia's real economic growth, Y_j *is* the tourist arrivals nations' income, Tou_j is the tourist arrivals from country *j*, and REX_j is the real exchange rate.

We would expect both *b* and *c* to be positive. Since an increase in country's *j* GDP (Y_j) will promote Malaysia's export. As an example will be Australia. Since both Malaysia and Australia are located in Asia-Pacific region, there is a close inter-dependency between these two nations. As such, there is a possibility of co-movement of economic fluctuation between Malaysia and Australia. In addition, devaluation or depreciation of real exchange rate will promote Malaysia's economic growth. As such, we expect *d* to be positive.

It is recognized that equation (1) outlines the variables of long-run relationship among economic growth. To evaluate the impact in the short-run, we follow a modeling from Pesaran, Shin, and Smith (2001), error-correction model version of autoregressive distributed lag (ARDL), replaced equation (1) with equation (2). ARDL is also known as the bound testing approach. It is a single equation procedure which provides both short-run and long-run coefficient estimates simultaneously. The error-correction version of the ARDL in relation to (1) is as follows:

$$\Delta LnY_{MY,t} = \alpha + \sum_{i=1}^{n} \beta_j \, \Delta \, Ln \, Y_{MY,t-k} \quad \sum_{i=1}^{n} \lambda_j \, \Delta \, Ln \, Y_{j,t-k} + \sum_{i=0}^{n} \chi_j \Delta \, Ln \, TOU_{j,t-k}$$
$$+ \sum_{i=0}^{n} \phi_j \, \Delta \, Ln \, REX_{j,t-k} + \sigma_1 LnY_{MY,t-1} + \sigma_2 \, Ln \, Yj_{,t-1} + \sigma_3 \, LnTOUj_{,t-1}$$
$$+ \sigma_4 \, Ln \; REX_{j,t-1} + \gamma_t \qquad (2)$$

where n stands for the lag length.

This approach uses a set of critical values, calculated by Pesaran et al. (2001). They proposed using F-test with their tabulated critical F-values. If the F-statistic is above the upper-bound critical value, then there exists a long-run relationship among the variables. In addition, they show that the upper bound critical value could be used even if some variables are stationary and some non-stationary. It is the main advantage of this method over the other cointegration techniques that require all variables to be integrated of the same order As such, the main benefit of using Pesaran et al. (2001) model is that, despite these variables are I(1), I(0), or combination of both, there is no pre testing for unit roots. If it is below the critical value, then we conclude that the variables are not cointegrated. If F-statistics is in between the two critical values, then these results are not definite. As such, as recommended by Kremers, Ericsson, and Dolado (1992) we will apply an auxiliary test, that is, the error correction model (ECM). For example, short-run effects of exchange rate changes are based from the estimates of ϕ_i's and its long-run effects by the estimate of σ_4 normalized on σ_1. Refer to Bahmani-Oskooee, Economidou, and Goswami (2006), Narayan, Narayan, Prasad, and Prasad (2007), Wong and Tang (2008) and Mohammadi, Cak, and Cak (2008) for detailed explanation. A similar approach applies to both income and tourist receipts' variables.

Empirical Results

We estimated equation (2) using quarterly data 2000(I)-2012(IV) while appendix A provides a detailed explanation of the data and variables. Following previous literature, we imposed a maximum of two lags on each first differenced variable and use the Akaike Information Criterion (AIC) to select the optimum lags. After which, F-test is conducted at the optimal lags, the results of F-test is shown in Table 1. With the exceptions of Japan, all of the nine cases are supported for cointegration. However, we will proceed with an alternative test for cointegration, that is, error correction term. We exclude Japan from our analysis since the alternative test does not support cointegration.

Table 1
F-test

Australia	7.81
Canada	10.55
Indonesia	14.8
Japan	0.47
Korea	13.12
New Zealand	4.23
Philippines	5.38
Singapore	9.79
Thailand	9.02
USA	7.46

Note: The upper bound critical value of the F-test for co-integration at the 10% level of significance is 4.14 from Pesaran et al. (2001, Table C1, p.300).

Table 2 is an empirical short run result for the three variables of interest, that is, a nation's income, tourist receipts, and real exchange rate. At 10% significance, at least one of the coefficients is significant. For example, in the case of real exchange rate, depreciation or devaluation of Malaysian ringgit in the short-run improves Malaysia's GDP with Canada, Indonesia, Korea, Singapore, and USA. As for the nation's income, all countries are significant with the exceptions of New Zealand and USA. However, in the case of tourist receipts, none of these countries are significant.

Do these short-run effects lead to long run effects? We can need to evaluate the long run coefficient estimates in Table 3.

The results from real exchange rate are, as expected, positive and significant in two models which are Indonesia and Singapore. As for GDP, all these countries lead to a long run effects. As specified earlier, we still retain the lagged variables even if there is no cointegration, due to additional support from error correction term (ECM_{t-1}). We then replace the linear combination of lagged level variables by ECM_{t-1} and re-estimate each model at the same optimum lags. A significantly negative coefficient obtained for ECM_{t-1} will support convergence toward long run equilibrium or cointegration. Indeed, in majority of the cases are negative and significant. Kremer et al. (1992) recommended error correction model (*ECM*) as a method to establish cointegration.

As Table 4 showed, we further performed diagnostic tests with most of the models, using LM test, which are free from serial correlation. In addition, the Ramsey

Table 2
Short-run Coefficient Estimates

	Australia	**Canada**	**Indonesia**	**Korea**	**New Zealand**
Δ Log Y_i	0.40(0.81)	2.43(4.52)	0.55(4.05)	0.43(5.06)	–0.10(0.23)
Δ Log $Y_{i,t-1}$	–0.83(1.74)	–0.95(2.25)	0.76(5.87)		–0.74(1.63)
Δ Log $Y_{i,t-2}$					
Δ Log T_i	0.01(0.35)	0.002(0.09)	0.03(1.59)	0.01(0.96)	0.06(1.50)
Δ Log $T_{i,t-1}$					
Δ Log $T_{i,t-2}$					
Δ Log REX_i	0.07(0.69)	0.25(1.68)	0.19(4.02)	0.34(3.09)	0.11(1.50)
Δ Log $REX_{i,t-1}$		0.37(2.49)			
Δ Log $REX_{i,t-2}$					

	Philippines	**Singapore**	**Thailand**	**USA**
Δ Log Y_i	–0.03(0.27)	0.37(2.51)	–0.04(0.29)	0.57(1.39)
Δ Log $Y_{i,t-1}$	–0.41(3.20)	–0.71(4.19)	–0.59(4.80)	
Δ Log $Y_{i,t-2}$				
Δ Log T_i	–0.02(0.64)	0.04(0.72)	0.02(1.00)	–0.01(0.32)
Δ Log $T_{i,t-1}$				
Δ Log $T_{i,t-2}$				
Δ Log REX_i	–0.14(0.64)	0.47(2.68)	0.04(0.19)	0.43(0.49)
Δ Log $REX_{i,t-1}$	0.32(1.62)			3.46(4.74)
Δ Log $REX_{i,t-2}$				

Note. Numbers inside parentheses are absolute values of t-ratios

RESET test (specification test) is correctly specified. Next, we perform Cumulative Sum (CUSUM) and Cumulative Sum of Squared (CUSUMSQ) tests for stability of estimated short-run and long-run coefficients. For detail discussions refer to Bahmani-Oskooee and Bohl (2000), Bahmani-Oskooee and Goswami (2004), and Harvey et al. (2013). We summarize the outcome as "S" indicating stable coefficients and "US" indicating unstable coefficients. As can be seen clearly, most estimated coefficients are stable for both tests. In addition, the size of adjusted R^2 in most cases is reasonable, signifying a good fit.

Table 3
Long-run Coefficient Estimates

	Australia	**Canada**	**Indonesia**	**Korea**	**New Zealand**
Constant	–6.95(1.84)	–45.72(11.89)	13.18(3.15)	–21.68(1.84)	–10.60(0.73)
Log Y_i	1.22(7.80)	2.53(3.66)	0.51(4.18)	1.48(3.79)	1.42(2.29)
Log T_i	0.01(0.35)	0.06(3.66)	–0.06(0.02)	0.08(1.09)	0.16(2.68)
Log Rex_i	0.37(4.24)	0.04(0.38)	0.64(4.47)	0.42(1.42)	0.29(1.28)

	Philippines	**Singapore**	**Thailand**	**USA**
Constant	0.62(0.06)	4.32(4.11)	–7.77(1.62)	–139.86(2.72)
Log Y_i	0.86(2.31)	0.81(12.07)	1.21(8.36)	5.52(3.09)
Log T_i	0.12(1.18)	0.05(0.71)	0.04(0.98)	–0.08(0.29)
Log Rex_i	0.09(0.19)	0.64(3.30)	0.54(1.72)	–0.52(0.08)

Note: Numbers inside parentheses are absolute values of t-ratios

Table 4
Diagnostics

	Australia	**Canada**	**Indonesia**	**Korea**	**New Zealand**
$ECM_{(t-1)}$	–0.74(5.23)	–0.95(5.51)	–0.29(4.68)	–0.18(1.96)	–0.38(3.94)
Adj. R^2	0.39	0.53	0.60	0.51	0.31
LM(χ^2,4)	7.08	21.86	5.79	9.27	9.08
RESET (χ^2,1)	14.26	2.69	1.49	2.65	10.98
CUSUM	S	S	S	S	S
CUSUMSQ	S	S	S	S	S

	Philippines	**Singapore**	**Thailand**	**USA**
$ECM_{(t-1)}$	–0.26(1.84)	–0.73(5.64)	–0.57(5.39)	–0.10(1.19)
Adj. R^2	0.59	0.36	0.28	0.30
LM(χ^2,4)	14.87	4.34	7.71	11.70
RESET (χ^2,1)	3.79	3.54	5.39	0.01
CUSUM	S	S	S	S
CUSUMSQ	S	US	S	S

Note: Figures inside the parenthesis represent absolute value of t-statistics. (a) LM is the Lagrange Multiplier test for serial correlation distributed as χ^2 with 4 degrees of freedom. The critical value is 9.49 at the 5% level of significance; (b) RESET is the Ramsey's test (χ^2 with 1 degree of freedom) for functional misspecification. Its critical value at 5% level of significance is 3.84.

Conclusion

There has been long interest among economist on the relationship between economic growth and international tourism. Our paper investigates disaggregated data on nation's income, nation's tourist receipts, and real exchange rates in promoting economic growth. Using quarterly data 2000(I)–2012(IV), we employed the Autoregressive Distributive Lags (ARDL) among these countries of interest. Evidence shows that the countries of interest real income and exchange rate plays significant role in promoting Malaysia's economic growth. For example, a 1% increase in Australia's real income will promote economic growth in Malaysia by 1.2%. Similarly in the case of real exchange rate, 1% depreciation in Malaysian's ringgit will promote growth by 0.37%. We can infer that economic growth from its neighboring countries indirectly has a spill-over effect on Malaysia's economic growth. We did not find any evidence of tourism receipt's promoting growth. Our results provide insight to Malaysia's tourism policy. Malaysia may need to identify and elevate its promotion to neighboring South East Asian nations, the Asia–Pacific nations, and North American market.

References

Bahmani-Oskooee, M., & Bohl, M. T. (2000). German monetary unification and stability of the German M3 money demand function. *Economic Letters, 66*, 203-208.

Bahmani-Oskooee, M., & Goswami, G. (2004). Exchange rate sensitivity of Japan's bilateral trade flows. *Japan and the World Economy*, *16,* 1–15.

Bahmani-Oskooee, M., Economidou, C., & Goswami, G. (2006). Bilateral j-curve between U.K. vis-à-vis her major trading partners, *Applied Economics*, *38*(8), 879-888.

Brida, J. G., Cortes-Jimenez, I., & Pulina, M. (2014). Has the tourism-led growth hypothesis been validated? A literature review. *Current Issues in Tourism*, *19*(5), 1-37. Advance online publication. doi: http://dx.doi.org/ 10.1 080/13683500.2013.868414/2014.

Harvey, H., Furuoka, F., & Qaiser, M. (2013). The role of tourism and exchange rate on economic growth: Evidence from the BIMP-EAGA countries. *Economics Bulletin*, *33*(4), 2756-2762.

Kadir, N., & Jusoff, K. (2011). Cointegration and causality tests for tourism and trade in Malaysia. *International Journal of Economics and Finance*, *2*, 138-143.

Katircioglu, S. (2011). Tourism and growth in Singapore: New extension from bounds test to level relationship and conditional Granger causality tests. *Singapore Economic Review*, *56*(3), 441–453.

Kremers, J. J. M, Ericsson, N. R., & Dolado, J. J. (1992). The power of cointegration tests. *Oxford Bulletin of Economics and Statistics*, *54*, 325-347.

Li, C. C., Mahmood, R., Abdullah, H., & Chuan, O. S. (2013). Economic growth, tourism and selected macroeconomic variables: A triangular causal relationship in Malaysia. *Margin: The Journal of Applied Economic Research, 7*(2), 185–120.

Lean, H. H., & Tang, C. F. (2009). Is the tourism-led growth hypothesis stable for Malaysia? A note. *International Journal of Tourism Research, 12*, 375-378.

Mohammadi, H., Cak, M., & Cak, D. (2008). Wagner's hypothesis: New evidence from Turkey using the bounds testing approach. *Journal of Economic Studies*, *35*, 94–106.

Narayan, P. K., Narayan, S., Prasad, B. C., & Prasad, A. (2007). Export-led growth hypothesis: Evidence from Papua New Guinea and Fiji. *Journal of Economic Studies*, *34*, 341–351.

Pesaran, M., Shin, Y., & Smith, R. (2001). Bound testing approaches to the analysis of level relationship. *Journal of Applied Econometrics*, *16*, 289-326.

Sarmidi, T., & Salleh, N. (2011). Dynamic inter-relationship between trade, economic growth and tourism in Malaysia. *International Journal of Economics and Management 5*, 38-52.

Tang, C. F., & Tan, E. C. (2013). How stable is the tourism-led growth hypothesis in Malaysia? Evidence from disaggregated tourism markets. *Tourism Management*, *37*, 52-57.

Tang, C. F. (2011). Is the tourism-led growth hypothesis valid for Malaysia? A view from disaggregated tourism markets. *International Journal of Tourism Research, 13*, 97-101.

Tang, C. F. (2013). Temporal Granger causality and the dynamics relationship between real tourism receipts, real income and real exchange rates in Malaysia. *International Journal of Tourism Research, 15*, 272-284.

Wong, K. N., & Tang, T. C. (2008). The effects of exchange rate variability on Malaysia's disaggregated electrical exports. *Journal of Economic Studies*, *35*, 154–169.