The nexus between tourism demand and output per capita with the relative importance of trade openness and financial development: A study of Malaysia

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Abstract

This article revisits the tourism-growth nexus in Malaysia using time series quarterly data over the period 1975–2013. The authors examine the impact of tourism using two separate indicators – tourism receipts per capita and visitor arrivals per capita. Using the augmented Solow production function and the autoregressive distributed lag bounds procedure, they also incorporate trade openness and financial development and account for structural breaks in series. The results show the evidence of cointegration between the variables. Assessing the long-run results using both indicators of tourism demand, it is noted that the elasticity coefficient of tourism is 0.13 and 0.10 when considering visitor arrivals and tourism receipts (in per capita terms), respectively. Notably, the impact of tourism demand is marginally higher with visitor arrivals. The elasticity of trade openness is 0.19, that of financial development is 0.09 and that of capital share is 0.15. In the short run, the coefficient of tourism is marginally negative, and for financial development and trade openness, it is 0.01 and 0.18, respectively. The Granger causality tests show bidirectional causation between tourism and output per capita, financial development and tourism and trade openness and tourism demand, duly indicating the feedback or mutually reinforcing impact between the variables and providing evidence that tourism is central to enhancing the key sectors and the overall income level.

Introduction

Malaysia is one of the top 10 tourist destinations in the Asian region and the tourism sector is a key driver for the economic development of the country. In 2013 alone, tourism industry generated 20 billion USD in foreign exchange earnings from over 25.7 million tourist arrivals (Tourism Malaysia, 2014). To give recognition and also magnify the economic benefits of tourism, the Government of Malaysia has included the sector in its Third Industrial Master Plan 2006–2020 and is included as part of the National Key Economic Areas. Moreover, through the Tenth Malaysia Plan 2010, tourism sector has been declared as one of the main sector driving the economic performance with the potential to achieve the nation’s Vision 2020. Since the first announcement of ‘Visit Malaysia Year Programme’ in 1990 up to the recent ‘Visit Malaysia Year 2014 Programme’, tourism sector has driven Malaysia’s economic growth by an average of 4–5% growth rate. More specifically, tourism contributed a total of 16.1% to gross domestic product (GDP), 14.1% to employment and 7.7% to total investment in 2013 (World Travel & Tourism Council, 2014).

The sector is included as a high-yield industry by 2020 in the Malaysia’s Economic Transformation Programme 2010. A number of initiatives have been put in place to harness the benefits of tourism sector such as a reduction and in some instances removal of foreign equity restriction and provision of tax incentives and loans at low interest rates to priority sectors like accommodation establishments. The government launched tourism development infrastructure fund (TDIF) in 2001, which aimed to encourage more investment from various sources. The major projects under TDIF are resorts development, upgrading tourism infrastructures and restoration of historical building and sites (Ministry of Tourism and Culture Malaysia, 2015). Furthermore, various tourism and events developments in the last two decades have contributed to strengthening tourism development in Malaysia: the Monsoon Cup Tournament (established in 2011), the Formula 1 PETRONAS Malaysia Grand Prix (established in 1999), International Maritime and Aerospace or LIMA (established in 1991), Le Tour deLangkawi (established in 1996) and Langkawi and LEGOLAND (established in 2012).

Given the importance of tourism sector in Malaysia, this article aims to measure the contribution of tourism to the per capita output in Malaysia while considering the relative importance of trade openness and financial development. In this regard, the contributions of the article are as follows: (1) examine the importance of tourism whist controlling for trade openness and financial development; (2) examine the nexus within an extended Cobb–Douglas model with insights from Solow (1956) and (3) discuss the connection between trade openness, financial development and tourism, in the context of Malaysia.

The article is organized as follows. In section ‘Literature review’, we provide a literature review, followed by section ‘Modelling strategy’ on method and modelling strategy. In section ‘Results’, we present the results and finally, in section ‘Conclusion and policy recommendations’, conclusion follows.

Literature review

Tourism-growth nexus in the world

The link between tourism (demand)and economic growth has been widely researched (Akinboade and Braimoh, 2010; Balaguer and Cantavella-Jordà, 2002; Belloumi, 2010; Brida and Risso, 2009; Brida et al. 2008, 2009, 2010; Cortes-Jimenez and Pulina, 2006, 2010; Dritsakis, 2004; Gunduz and Hatemi, 2005; Ivanov and Webster, 2007, 2013a, 2013b; Louca, 2006; Narayan et al. 2010; Seetanah, 2011; Tang, 2013; Tang and Abosedra, 2014; Vanegas and Croes, 2003). Nevertheless, studies focussing on the multidimensional impact of tourism remain of much interest, at least in part because of the benefits tourism sector unleashes on the overall economic activities (Ivanov and Webster, 2013a; Tang and Tan, 2015a; Webster and Ivanov, 2014). It has been argued that tourism and economic growth can have unidirectional and/or bidirectional effects (Payne and Merver, 2010). First, the economic growth-led tourism hypothesis states that as a result of effective government policies and institutions, adequate investment in both physical and human capital, and stability in international tourism is likely to boost the tourism sector. Second, the tourism-led growth hypothesis asserts that tourism is the driving force of economic growth and that tourism is expected to create positive externalities in the economy.

The number of studies that examine the two streams of effects within a country-context and/or regional level has grown. For instance, Durbarry (2004) looks at the tourism-economic growth nexus for Mauritius where he used real gross domestic investment, human capital proxies by secondary school enrolment, and disaggregated exports such as sugar, manufactured exports and tourism receipts, and finds that tourism contributes about 0.8% to growth in the long run. Nowak et al. (2007) study the Spanish economy and show that tourism exports when used to finance imports of capital goods have a growth enhancing-effect. The study by Brida and Risso (2009) investigates the impact of tourism on the long-run growth of Chile using the Johansen cointegration method and annual data from 1988 to 2008. The authors find a unidirectional Granger cause from tourism and real exchange rate to real GDP.

Lee and Chang (2008) focus on organization for economic co-operation and development (OECD) and non-OECD countries using heterogeneous panel cointegration method and find that tourism impact on GDP is greater in non-OECD than in the OECD countries. Brida et al. (2008) examine the tourism-growth nexus in Mexico using Johansen cointegration technique and show the unidirectional causation running from tourism to real GDP. Fayissa et al. (2008) use the conventional neoclassical framework and examine 42 African countries. They find that tourism receipts contribute positively to economic growth. Payne and Mervar (2010) investigate the tourism-growth nexus in Croatia using quarterly data from 2000 to 2008 to examine the causality nexus between tourism receipts, real GDP and real exchange rate, and come to the conclusion that the unidirectional causality from GDP to tourism receipts, and from GDP to real effective exchange rate exists in the economy. Arslanturk et al. (2011) examine the causal link between tourism receipts and GDP for Turkey using annual time series data from 1968 to 2006 and find that tourism receipts have positive effect on GDP in early 1980s. On other hand, Kumar (2014a) uses augmented Solow framework and finds the unidirectional causation from output per worker to tourism receipts for Kenya, hence supporting economic growth-led tourism hypothesis. Hye and Khan (2013) study tourism demand for Pakistan using the autoregressive distributed lag (ARDL) approach and rolling windows bounds testing approach using annual time series data from 1971 to 2008 and confirm the presence of long-run relationship between income from tourism and growth. Eeckels et al. (2012) examine the relationship between cyclical components of GDP and international tourism demand using annual data from 1976 to 2004 and show that tourism causes growth in Greece.

Furthermore, Holzner (2010) attempts to explore the Dutch disease effect of tourism and finds no significant danger of beach (Dutch) disease effect and that tourism dependent countries benefit from higher growth as a result of tourism. Seetanah (2011) examines 19 island economies using the generalized method of moments technique within the conventional augmented Solow growth framework and his results show bidirectional causality. Seetanah et al. (2011) examine 40 African countries over the period 1990–2006 and find, inter alia, a bi-causal and reinforcing relationship between tourism and output. Chang et al. (2012) use instrument variable estimation in a panel threshold model to investigate the importance of tourism specialization in economic development for 159 countries. They found the positive relationship between growth and tourism.

On the contrary, while most of the studies unequivocally support the tourism-led growth (TLG) hypothesis or that growth causes tourism demand, there are few studies, which have noted contrary views. For instance, Oh (2005) examines the causal relationship between tourism growth and growth for Korea by using the Engle and Granger two-stage approach and a bivariate vector autoregression model. The empirical results show that there is no long-run equilibrium relationship between tourism and output, but the unidirectional causality runs from output to tourism. Katircioglu (2009) investigates the TLG hypothesis in Turkey and reports the absence of any cointegration relationship between international tourism and growth. Similarly, Kumar et al. (2011) examine the impact of tourism (measured by the number of annual visitor arrivals) and remittances on per worker output in a small island economy of Vanuatu using the ARDL bounds testing. They find that the effect although positive (0.02%) was not statistically significant. A detailed summary of the results of prior publications on the tourism growth-led hypothesis is provided by Tang (2011).

Tourism-growth nexus in Malaysia

A number of studies focusing on Malaysia have emerged over the recent years. Tang and Tan (2013) evaluated 12 different tourism markets for Malaysia using monthly datasets from 1995 (January) until 2009 (February), of which only eight contributed significantly to Malaysian growth (Japan, Singapore, United Kingdom, Taiwan, United States, Thailand, Australia and Germany) while the other four (Korea, Indonesia, Brunei and China) had lower impact despite the fact that Brunei Darussalam, Indonesia, China and Korea are among the top tourism market for Malaysia. Ivanov and Webster (2013a) consider 174 countries over the periods 2000–2010 and find that the average contribution of tourism to long-run per capita growth in Malaysia is about 0.20%. Kumar et al. (2015) examine the short-run and long-run contributions and causality nexus of tourism receipts (percent of GDP) on per worker output. They find that tourism contributes about 0.26% to long-run growth, a marginal negative effect exists in the short run, and there is a bidirectional causation between tourism and capital per worker thus indicating tourism and investment are mutually reinforcing each other. According to Kadir et al. (2010) and Lau et al. (2009), tourism can play an important role to stimulate Malaysia’s economic stability. Both studies proved that tourism has direct cause on growth and consistent with tourism-led growth theory. A recent study by Tang and Tan (2015a) using the Solow growth theory framework suggests that tourism has positive impact on Malaysia’s economy in the short run and long run. This article contributes to the study of the tourism-growth nexus in Malaysia by measuring the effects of trade openness and financial development on the relationship between the tourism and growth.

Modelling strategy

Framework and model

The model follows the extended Cobb–Douglas production function and the intuition of the Solow (1956). The extended model is often used to explore the contributions of various potential factors, including tourism, to growth. In the augmented model, factors, other than capital and labour stocks, are entered in the model as shift variables (Rao, 2010). Our model is:

$$y_t = A_t k_t^a \mathrm{tour}_t^{\phi} x_{t_i}^{\gamma_i},$$

where yt is the output per worker, A is the stock of technology, k is the capital per capita, tourt∈(trt, tat) is a measure of tourism demand which can take the form of either tourism receipts per capita, trt, or number of visitor arrivals per capita, tat, and xti refers to other explanatory variables in per capita terms. For the purpose of estimation, the above can be formulated as:

$$\ln y_t = C + \pi T + \phi \ln \mathrm{tour}_t + \sum_{i=1}^{n} \gamma_i \ln + x_{t_i} + a \ln k_t + \mu_i,$$

where C is a constant and π is the trend coefficient. In what follows, we define other explanatory variables, xti as: real domestic credit to private sector per capita (crt) and real trade openness (real exports + real imports) per capita (opt). All variables are transformed into natural logarithm in order to estimate the elasticity coefficients.

Data

This study covers the period of 1975Q1–2013Q4. Tourism demand is measured by visitor arrivals and real tourism receipts. Consumer price index and population series are used to convert all the variables in real per capita terms, that is, tourists arrival per capita, real tourism receipts per capita, real GDP per capita, real capital per capita, real domestic credit to private sector per capita, real exports per capita and real imports per capita. Visitor arrivals and tourism receipts data were collected from Tourism Malaysia (http://corporate.tourism.gov.my/research.asp?page=facts_figures). The capital stock data is measured by real gross fixed capital formation per capita, financial development by domestic credit to private sector per capita and trade openness by real exports per capita plus real imports per capita. The data on real GDP, gross fixed capital formation, domestic credit to private sector, exports and imports were extracted from the World Development Indicators for 2014 (CD-ROM).

Unit root

The conventional tests used for unit root are ADF (Dickey and Fuller, 1981), PP (Phillips and Perron, 1988), Dickey-Fuller test statistic using generalized least squares (DF-GLS) (Elliot et al. 1996) and Ng–Perron (Ng and Perron, 2001). However, the results from these tests can be unreliable in small size (DeJong et al., 1992) because these tests may tend to over-reject the true null hypothesis or accept the null when it is false. Moreover, Ng–Perron (Ng and Perron, 2001) is not suitable in the presence of structural breaks in the series. Hence, other tests such as Perron and Volgelsang (1992) and Zivot and Andrews (1992) can be used to account for single break in series. Alternatively, the Clemente et al. (1998) can be used for two structural breaks in the mean. In this test, the null hypothesis H0 and the alternative hypothesis Ha are given as follows:

$$H_0 : x_t = x_{t-1} + a_1 \mathrm{DTB}_{1t} + a_2 \mathrm{DTB}_{2t} + \mu_t,$$
$$H_a : x_t = u + b_1 DU_{1t} + b_2 \mathrm{DTB}_{2t} + \mu_t,$$

where DTB1t is the pulse variable which is set to 1 if t=TBi+1 and zero elsewhere. DUit=1 if TBi<t(i=1,2) and zero elsewhere. TB1 and TB2 time periods represents the modification of mean. We also assume TBi=δiT(i=1,2) where 1>δi>0 while δ1<δ2 (Clemente et al., 1998). In case where two structural breaks are contained by innovative outlier, then unit root hypothesis is investigated by equation (3) with the following specification:

$$x_t = u + \rho x_{t-1} + d_1 \mathrm{DTB}_{1t} + a_2 \mathrm{DTB}_{2t} + d_3 \mathrm{DU}_{1t} + d_4 \mathrm{DU}_{2t} + \sum_{i=1}^{k} c_j \Delta x_{t-1} + \mu_t.$$

To derive the asymptotic distribution of the estimate, we assume δ2>δ1>0, 1>δ2−1>δ0 where δ1 and δ2 obtain the values in interval, that is, [(t+2)/T,(T−1)/T] by applying the largest window size. The assumption, that is, δ1<δ2+1 is used to show that cases where break points exist in repeated periods are purged (see Clemente et al., 1998). We test for the unit root hypothesis using a two-step approach. The first step requires the removal of the deterministic trend using the following equation:

$$x_t = u + d_5 \mathrm{DU}_{1t} + d_6 \mathrm{DU}_{2t} + \widehat{x}.$$

In the second step, we search for the minimum t-ratio to test the hypothesis that ρ = 1 using the equation:

$$\widehat{x}_t = \sum_{i=1}^{k} \phi_{1i} \mathrm{DTB}_{1t-1} + \sum_{i=1}^{k} \phi_{2i} \mathrm{DTB}_{2t-1} + \rho \widehat{x}_{t-1} + \sum_{i=1}^{k} c_i \Delta \widehat{x}_{t-1} + \mu_t.$$

To ensure that the $\min t_{\rho}^{\mathrm{IO}} \quad _t (\delta_1, \delta_2)$ converges in distribution, we include a dummy variable in estimated equation such that:

$$\min t_{\rho}^{\mathrm{IO}} \quad _t (\delta_1, \delta_2) \rightarrow \inf_{\gamma} = \geq \frac{H}{[\delta_1(\delta_2 - \delta_1)]^{1/2} K^{1/2}}.$$

Cointegration

Hence to overcome the differences in cointegration methods (Banerjee et al., 1998; Boswijk, 1994; Engle and Granger, 1987; Johansen, 1991; Phillips and Ouliaris, 1990) and enhance the power of cointegration tests, we deploy the Bayer and Hank (2013) a combined test for cointegration. Following the Bayer and Hanck (2013), the combination of the computed significance level (p value) of individual cointegration test is as follows:

$$\text{EG-JOH} = -2[\ln(P_{\text{EG}}) + \ln(P_{\text{JOH}})],$$
$$\text{EG-JOH - BO - BDM} = -2[\ln(P_{\text{EG}}) + \ln(P_{\text{JOH}}) + \ln(P_{\text{BO}}) + \ln(P_{\text{BDM}})],$$

where PEG, PJOH, PBO and PBDM are the p values of various individual cointegration tests, respectively (Bayer and Hanck, 2013). If the estimated Fisher statistics exceed the critical values of Bayer and Hanck (2013), the null hypothesis of no cointegration is rejected. Following the examination of the long-run association, we apply the Granger causality test to examine the direction of causality. If cointegration exists, then the vector error correction method (VECM) can be developed as follows:

$$(1-L)\begin{bmatrix} \ln y_t \\ \ln tour_t \\ \ln x_t \\ \ln k_t \\ \ln cr_t \\ \ln op_t \end{bmatrix} = \begin{bmatrix} a_1 \\ a_2 \\ a_3 \\ a_4 \\ a_5 \\ a_6 \end{bmatrix} + \begin{bmatrix} b_{11,i} & b_{12,i} & b_{13,i} & b_{14,i} & b_{15,i} & b_{16,i} \\ b_{21,i} & b_{22,i} & b_{23,i} & b_{24,i} & b_{25,i} & b_{26,i} \\ b_{31,i} & b_{32,i} & b_{33,i} & b_{34,i} & b_{35,i} & b_{36,i} \\ b_{41,i} & b_{42,i} & b_{43,i} & b_{44,i} & b_{45,i} & b_{46,i} \\ b_{51,i} & b_{52,i} & b_{53,i} & b_{54,i} & b_{55,i} & b_{56,i} \\ b_{61,i} & b_{62,i} & b_{63,i} & b_{64,i} & b_{65,i} & b_{66,i} \end{bmatrix} \times \begin{bmatrix} \ln y_t \\ \ln tour_t \\ \ln x_t \\ \ln k_t \\ \ln cr_t \\ \ln op_t \end{bmatrix} + \cdots$$

$$+ \begin{bmatrix} b_{11,i} & b_{12,i} & b_{13,i} & b_{14,i} & b_{15,i} & b_{16,i} \\ b_{21,i} & b_{22,i} & b_{23,i} & b_{24,i} & b_{25,i} & b_{26,i} \\ b_{31,i} & b_{32,i} & b_{33,i} & b_{34,i} & b_{35,i} & b_{36,i} \\ b_{41,i} & b_{42,i} & b_{43,i} & b_{44,i} & b_{45,i} & b_{46,i} \\ b_{51,i} & b_{52,i} & b_{53,i} & b_{54,i} & b_{55,i} & b_{56,i} \\ b_{61,i} & b_{62,i} & b_{63,i} & b_{64,i} & b_{65,i} & b_{66,i} \end{bmatrix} \times \begin{bmatrix} \ln y_t \\ \ln tour_t \\ \ln x_t \\ \ln k_t \\ \ln cr_t \\ \ln op_t \end{bmatrix} + \begin{bmatrix} \alpha \\ \phi \\ \delta \\ \phi \\ \vartheta \\ \theta \end{bmatrix} \times (\text{ECM}_{t-1}) + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \\ \varepsilon_{4t} \\ \varepsilon_{5t} \\ \varepsilon_{6t} \end{bmatrix}$$

where difference operator is (1−L) and ECMt−1 is the lagged error correction term. The long-run causality is determined if the coefficient of lagged error correction term using t-test statistic is significant, and the short-run causality is noted through the existence of a significant relationship in first differences. Moreover, the joint χ2 statistic of the first differenced lagged independent variables is used to test the direction of short-run causality between the variables. For example, b12,i≠0∀i implies that tourism Granger causes economic and vice versa.

Results

Descriptive statistics and bivariate correlations

The descriptive statistics and correlation matrix are provided in Table 1. The results of Jarque–Bera test indicate that per capita income, tourist arrivals, tourist receipts, financial development, capital and trade openness have normal distribution. The correlation analysis shows that tourist arrivals (tourist receipts) and per capita income are positively correlated. Financial development, capital and trade openness are correlated positively with per capita output. However, we note that the correlation between financial development and tourist arrivals (tourist receipts) is negative. The correlation between financial development and capital (trade openness and capital) is positive. Trade openness is inversely correlated with capital.

Table 1: Descriptive statistics and correlation matrix.

Unit root

We have applied Ng–Perron unit root test to test the stationary properties of the variables. Table 2 represents the results and we find that all the variables are non-stationary at level with intercept and trend. The per capita output, tourist arrivals, tourist receipts, financial development, capital and trade openness are stationary at first difference. To accommodate for structural break in series, we apply the Clemente et al. (1998) unit root test (Table 3). The structural breaks in 2000Q3, 2006Q2, 2006Q4, 2006Q3, 2002Q4 and 1999Q4 are found for per capita output, tourist arrivals, tourist receipts, financial development, capital and trade openness, respectively. The structural break between the period of 2000 and 2006 was caused by the following: first, the recovery of the countries' trade account after the Asian Financial Crisis, which preceded the economic condition and increases dramatically intra-ASEAN (Association of Southeast Asian Nations) tourism demand. Secondly, the establishment of AirAsia low cost air transportation in 1996 with a slogan of 'Everyone Can Fly' has encouraged massive tourist movement in the region connected with major ASEAN cities in Indonesia, Thailand, Singapore and Philippines. In 2006, AirAsia introduced international route connection with China, India and Vietnam, which contributes more access international tourist to Malaysia. Moreover, Malaysia is considered as a prominent tourist destination, holding 70–80% share of Asian tourist arrivals in that particular period (Tourism Malaysia, 2014). Thirdly, the global oil prices shock has prompted a prolonged slowdown in Malaysia's tourism growth. Finally, severe acute respiratory syndrome pandemic in 2003 brought an unstable tourism demand in the region. The Tourism Malaysia Board also restructured public transportation and facilities and carry out international promotion in this particular period to attract foreign tourists, mainly from ASEAN region (Loganathan et al., 2012). The variables are stationary at first difference. With double structural break, variables have unit root problem but stationary at first difference. This confirms that all the variables have unique order of integration.

Table 2. Unit root analysis without structural breaks.

Table 3. Clemente–Montanes–Reyes detrended structural break unit root test.

Cointegration

Table 4 presents the combined cointegration test results for Malaysia including E-JOH and EG-JOH-BO-BDM. We find that Fisher statistics for EG-JOH and EG-JOH-BO-BDM tests exceed the critical values at 1% level of significance when we use output per capita, tourist arrivals (tourist receipts), financial development and trade openness as dependent variables for Malaysia. On the basis of this, they reject the null hypothesis of no cointegration among the variables. As a result, this confirms the presence of cointegration among the variables. Hence, one can conclude that there is long-run relationship between per capita output, tourism demand (tourist arrivals, tourist receipts), financial development, capital and trade openness in Malaysia. It is again interesting to note that Fisher statistics for EG-JOH and EG-JOH-BO-BDM tests do not exceed the critical values at 1% level of significance when we use capital as dependent variable for Malaysia showing the absence of cointegration between tourism demand and per capita output plus other variables.

Table 4. The results of Bayer and Hanck cointegration analysis.

The Bayer and Hanck (2013) combined cointegration approach is also known to provide efficient parameter estimates but fails to accommodate for structural breaks embodied in the macroeconomic time series data. This issue is overcome by applying the ARDL bounds testing approach to cointegration in the presence of structural breaks. The ARDL bounds testing approach is known to be sensitive to lag length selection and therefore we have employed the Akaike information criterion criteria to select the appropriate lag length order. Further, the dynamic link between the series can be well captured with an appropriate selection of the lag length (Lütkepohl, 2006). The optimal lag length results are reported in column 2 of Table 5. We use the critical bounds from Pesaran et al. (2001) to examine the existence of cointegration in different models. The calculated F-statistic is higher than the upper bounds critical values for when we use per capita output, tourism demand (tourist arrivals and tourist receipts), trade openness and financial development as dependent variables. Overall, the results indicate the presence of a long-run association between the level variables for the Malaysian economy.

Table 5. Results of ARDL cointegration test.

The existence of long-run relationships among the variables allows us to examine the long-run growth impacts of tourism demand, financial development, capital and trade openness on per capita output in Malaysia. The long-run results reported in Table 6 show that tourism demand (tourist arrivals and tourism receipts) is positively associated with per capita output. Hence, 1% increases in visitor arrivals and tourism receipts results in 0.13% and 0.10% increase in per capita output, respectively, holding all other things constant.

Table 6. Long-run results.

Moreover, a positive and statistically significant impact of financial development on per capita output is noted. Hence, a 1% increase in financial development is expected to increase economic growth within the range of 0.07–0.11%. Further, the long-run capital share is between 0.15 and 0.16, which nevertheless, is below the stylized value of one-third. The trade openness variable has a positive and statistically significant association with per capita output. Notably, a 1% increase in trade openness leads to 0.16–0.22% increase in output. This finding is consistent with Sarmidi and Salleh (2011). The structural break dummy variable has positive and statistically significant impact on the output level, which can be explained by the recovery in current account deficit which in turn has stimulated economic activities.

In the short run, Table 7 reveals that the coefficient is marginally negative implying that the tourism demand is inversely linked with output per capita at 5% level of statistical significance. Although, financial development impacts output positively, it is not statistically significant. The impact of capital stock (per capita) is positive and statistically significant. The relationship between trade openness and output is positive and statistically significant at 1% level. The estimated lagged error term ECMt−1 is statistically significant at 1% level of significance and has the desired negative sign. The error term indicates the speed of adjustment from the short-run to the log-run equilibrium path. It means that any change in output per capita from short run to long run is corrected by 1.02–2.49% annually. The low coefficient of error correction term, however, indicates a relatively slow adjustment process. Usually, with high frequency data, the error term is low. Moreover, the significance and appropriate sign of the error term further confirm the established long-run relationship between the variables. As noted from the results, the short-run model passes all the tests which imply rejection of biasness due to normality, serial correlation, autoregressive conditional heteroskedasticity, White heteroskedasticity and specification of model.

Table 7. Short-run results.

Moreover, the stability of ARDL parameters is investigated by employing cumulative sum (CUSUM) of recursive residuals and the CUSUM of square (CUSUMQ) suggested by Brown et al. (1975). It is important to note that model specifications can also lead to biased coefficients estimates that might influence the explanatory power of the results. Both CUSUM and CUSUMQ are widely used to test the constancy of parameters. Furthermore, Brown et al. (1975) pointed out that these tests help in testing the dynamics of parameters. Hence, the expected value of recursive residual is zero leading to accept the null hypotheses of parameters constancy. The plots of both CUSUM and CUSUMQ are shown for in Figures 1 and 2 at 5% level of significance and indicate that the parameters are stable in the model examined.

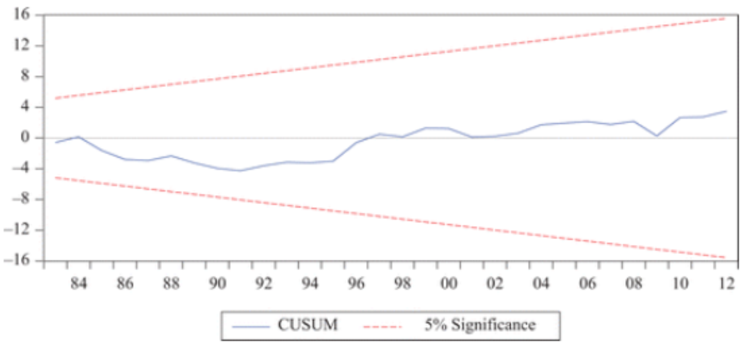

Figure 1. Plot of CUSUM of recursive residuals. The straight lines represent critical bounds at 5% significance level. CUSUM: cumulative sum.

Figure 2. Plot of CUSUMQ of recursive residuals. The straight lines represent critical bounds at 5% significance level. CUSUMQ: cumulative sum of squares.

Further, we used the Granger causality test within the VECM framework to provide the directional relationship between tourism demand (tourist arrivals and tourism receipts), trade openness, financial development and per capita output. Table 8 presents the empirical findings of the VECM Granger causality analysis. It is noted that the estimates of ECMt−1 are statistically significant with negative signs in all the VECMs except for the capital stock per capita in both the models. In the long run, a feedback effect exists between tourism demand (tourist arrivals and tourist receipts) and per capita output. A bidirectional causation is noted between tourism and trade openness, tourism and financial development and tourism and per capita output and a unidirectional causation from capital accumulation to per capita output, tourism, financial development and trade openness.

Table 8. The VECM granger causality analysis.

In the short run, per capita output Granger causes tourist arrivals. The feedback effect is noted between capital stock and output, trade openness and output, tourism demand (tourist arrivals and tourism receipts) and financial development, financial development and trade openness and tourism and capital stock. The unidirectional causality running from trade openness to tourist arrivals is also noted, indicating trade openness causes tourist arrivals in the short run.

Conclusion and policy recommendations

This article re-examines the linkages between tourism demand and per capita output by incorporating the role of financial development and trade openness within the augmented Solow (1956) production function. The study uses time series data over the period of 1975Q1–2013Q4 and applies unit root tests with breaks in the series to control of structural events. The combined cointegration tests confirmed the presence of long-run association among the variables. In what follows, we present the magnitude effects of and the causality nexus between tourism, financial development, trade openness vis-à-vis output per capita. The elasticity coefficient of tourism is 0.13 and 0.10 with visitor arrival and tourism receipts (in per capita terms), respectively (close to Tang and Tan, 2015a), of financial development is between 0.07% and 0.11% and of trade openness is between 0.16% and 0.22%.

The direction of causality is examined by applying the VECM Granger causality approach. The results further confirm the presence of long-run relationship between the variables. The causality results indicate a bidirectional (mutually reinforcing) effect between tourism demand and output, tourism demand and financial development and trade openness and tourism demand. In addition to the findings of the tourism-led growth hypothesis (Tang and Tan, 2015a, 2015b) and contrary to the neutrality hypothesis (Kumar et al., 2015), our results show a mutually reinforcing effect of tourism and output in Malaysia. Other countries where feedback effect is noted include Greece (Dritsakis, 2004), Mauritius (Durbarry, 2004), Italy (Cortez-Jimenez and Paulina, 2006), Spain (Nowak et al., 2007), Taiwan (Kim et al., 2006), non-OECD countries (Lee and Chang, 2008), 19 island economies (Seetanah, 2011) and Vietnam (Kumar, 2014b).

While highlighting the impact of tourism demand using two measures and accounting for trade openness and financial development, some caveats are in order. Admittedly, the two measures of tourism demand and the model specification have influenced the coefficients of financial development, trade openness and capital stock. At best, we can contend that the elasticity coefficients are within the range of the two respective values. While the model treats tourism demand, financial development and trade openness as independent variables, we agree that there plausible endogeneity biasness. If nothing else, the results derived from the Granger causality tests points to this fact. In this regard, the results need to be interpreted with care. It is possible that a well-developed financial sector and growing trade activities can spur tourism demand. In this sense, the former two variables are not strictly independent.1 Further, the long-run capital share is below the stylized value of one-third. As noted (Kumar et al., 2015), the estimated capital share can be influenced by a number of factors: (a) when capital and labour inputs grow at relatively similar rates; (b) when an economy has a large number of self-employed persons earning income from both capital and their own labour (Gollin, 2002), making it difficult to obtain meaningful measures of income shares; (c) data and the sample size used to compute capital stock (Bosworth and Collins, 2008) and (d) when the arbitrary choice of depreciation rate used in estimating the capital stock is not accurately identified, thus making it difficult to estimate the capital share that is close to the stylized value of one-third.

Amidst these limitations and the estimated results, the findings can be useful for policymakers and have several implications for tourism demand. We contend that (1) greater trade liberalization is likely to boost tourism sector; (2) ensuring and maintaining efficient financial services, including provision of loans to small and medium enterprises, primarily focused in developing tourism products and services would be beneficial for the economy as a whole and (3) infrastructure development and expansion, and new investment, both domestically initiated private and public investments as well as foreign direct investment geared towards the development of tourism, financial services and exports will have a bidirectional gains for the economy. Besides these direct policy intervention, other initiatives to ensure sustainable tourism management include best practices in tourism and transportation sector and inclusion of (smart) technologies in tourism logistics and management (Neuhofer et al., 2015). Notably, the economy is benefiting from the green (forest and monsoon environment tourism), blue (nature and wildlife adventure, beach, sea and island tourism) and pink (shopping and entertainment) tourism. Additionally, alternative tourism packages such as gastronomy, heritage, medical, education, religious, conference and business tourism and sport and entertainment tourism are some areas that can be aggressively tapped into.

Another area where tourism can focus on is the migrants. A good example is the new tourism promotion strategies focusing on home and rural, and the ‘Malaysia My Second Home’ (MM2H). The MM2H programme is promoted by the Malaysian government to allow foreigners under certain conditions to stay in Malaysia on a multi-entry social visit pass for a period of 10 years initially and which may be reissued (Tourism Malaysia, 2014). This programme is open to citizens of all countries recognized by the government regardless of race, religion, gender or age and is part of the government’s initiative to attract foreign (diaspora) tourists.

Further research may benefit from the use of nonlinear approach and the inclusion of other key structural variables like information and communication technologies (Kumar and Kumar, 2012) to obtain interesting and policy-targeted results. Another possible extension of the study can be to examine the impact of tourism sector on standard of living and overall welfare at community level, which may be in the form of in-depth survey study. Last but not least, tourism generates investment opportunities which lead employment opportunities. In such situation, demand both for skilled and unskilled labour is increased, and, in result, the income distribution is improved. This area of research has potential to examine the impact of tourism development on income distribution in ASEAN countries or top 10 tourist destination in Asia as well as in the world.

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Tables

Table 1. Descriptive statistics and correlation matrix.

Variables	ln y_t	ln ta_t	ln tr_t	ln cr_t	ln k_t	ln op_t
Mean	9.5581	−1.1074	5.7067	9.6353	8.1283	9.9430
Median	9.6406	−1.1086	5.9501	9.7559	8.3117	0.2271
Maximum	0.1852	−0.1165	7.6968	10.498	8.8703	10.695
Minimum	8.7870	−2.1202	3.0837	8.2308	7.0950	8.6311
Standard deviation	0.4142	0.6365	1.4312	0.6859	0.5138	0.6946
Skewness	−0.1788	0.0817	−0.1928	−0.6963	−0.4770	−0.4273
Kurtosis	1.7145	1.8087	1.7593	2.2487	2.1089	1.6240
Jarque–Bera	2.8931	2.3493	2.7428	4.0688	2.7698	4.2638
Probability	0.2353	0.3089	0.2537	0.1307	0.2503	0.1186
ln y_t	1.0000					
ln ta_t	0.4971	1.0000				
ln tr_t	0.3355	0.6938	1.0000			
ln cr_t	0.0764	−0.4118	−0.1718	1.0000		
ln k_t	0.4468	0.1870	0.3300	0.0778	1.0000	
ln op_t	0.2189	0.1192	0.1539	−0.1770	0.4668	1.0000

Table 2. Unit root analysis without structural breaks.

Variables	MZa	MZt	MSB	MPT
ln y_t	−11.3154 (2)	−2.3130	0.2044	8.3984
ln ta_t	−12.9177 (3)	−2.5405	0.1966	7.0595
ln tr_t	−5.34747 (5)	−1.5953	0.2983	16.914
ln cr_t	−4.07184 (4)	−1.3516	0.3319	21.5609
ln k_t	−6.59492 (2)	−1.8067	0.2739	13.8234
ln op_t	−0.86379 (1)	−0.3866	0.4475	45.9282
Δ ln y_t	−23.6594 (2)**	−3.4337	0.1451	3.8862
Δ ln ta_t	−68.7864 (2)*	−5.8645	0.0852	1.3249
Δ ln tr_t	−19.5058 (4)**	−3.0916	0.1585	4.8657
Δ ln cr_t	−57.0001 (3)**	−5.3374	0.0936	1.6038
Δ ln k_t	−33.0443 (1)*	−4.0619	0.1229	2.7739
Δ ln op_t	−25.8060 (2)*	−3.5896	0.1391	3.5457

*Significant at 1% level.
**Significant at 5% level.

Table 3. Clemente–Montanes–Reyes detrended structural break unit root test.

Variable	Innovative outliers				Additive outlier			
	T-statistic	TB1	TB2	Decision	*T*-statistic	TB1	TB2	Decision
ln y_t	−3.490 (2)	2000Q_3	–	Unit root	−5.926 (4)*	2006Q3	–	Stationary
	−2.834 (3)	1999Q_4	2006Q_4	Unit root	−6.391 (3)*	1995Q_4	2006Q_3	Stationary
ln ta_t	−3.328 (2)	2006Q_2	–	Unit root	−6.286 (5)*	2005Q3	–	Stationary
	−3.441 (2)	2001Q_2	2006Q_1	Unit root	−7.385 (3)*	2005Q_1	2006Q_4	Stationary
ln tr_t	−2.851 (3)	2006Q_4	–	Unit root	−6.407 (1)*	2013Q_1	–	Stationary
	−4.351 (2)	2001Q_4	2006Q_3	Unit root	−6.551 (3)*	2003Q_3	2008Q_2	Stationary
ln cr_t	−4.069 (2)	2005Q_3	–	Unit root	−5.088 (4)*	1987Q3	–	Stationary
	−2.231 (1)	1984Q_4	2005Q_3	Unit root	−8.626 (1)*	2005Q_3	2009Q_3	Stationary
ln k_t	−3.484 (1)	2002Q_4	–	Unit root	−5.716 (2)*	2006Q_4	–	Stationary
	−3.585 (2)	2004Q_4	2004Q_3	Unit root	−9.128 (5)*	2004Q_1	2006Q_4	Stationary
ln op_t	−3.989 (3)	1999Q_4	–	Unit root	−5.226 (3)**	2013Q_1	–	Stationary
	−4.628 (2)	2000Q_4	2009Q_1	Unit root	−5.590 (3)**	1995Q_3	2003Q_4	Stationary

Note: Lag length of variables is shown in small parentheses.
*Significant at 1% level.
**Significant at 5% level.

Table 4. The results of Bayer and Hanck cointegration analysis.

Estimated models	EG-JOH	EG-JOH-BO-BDM	Cointegration
Tourist arrivals			
$y_t = f(ta_t, cr_t, k_t, op_t)$	22.960*	36.418*	✓
$ta_t = f(y_t, cr_t, k_t, op_t)$	16.501*	30.808*	✓
$cr_t = f(y_t, ta_t, k_t, op_t)$	20.182*	38.596*	✓
$k_t = f(y_t, ta_t, cr_t, op_t)$	10.570	15.422	None
$op_t = f(y_t, ta_t, cr_t, k_t)$	20.250*	32.210*	✓
Tourists Receipts			
$y_t = f(tr_t, cr_t, k_t, op_t)$	55.427*	65.925*	✓
$tr = f(y_t, cr_t, k_t, op_t)$	56.616*	124.410*	✓
$cr_t = f(y_t, tr_t, k_t, op_t)$	55.644*	65.998*	✓
$k_t = f(y_t, tr_t, cr_t, op_t)$	5.781	7.679	None
$op_t = f(y_t, tr_t, cr_t, k_t)$	55.271*	70.947*	✓

Note: Critical values at 5% level are 10.637 (EG-JOH) and 20.486 (EG-JOH-BO-BDM), respectively.
*Significant at 1% level.
**Significant at 5% level.

Table 5. Results of ARDL cointegration test.

	Cointegration			Diagnostic tests		
Estimated models	Lag length	Break year	*F*-statistics	χ^2_{Normal}	χ^2_{ARCH}	χ^2_{RESET}
Tourist arrivals						
$y_t = f(ta_t, cr_t, k_t, op_t)$	4, 4, 4, 4, 4	2000Q3	7.761*	0.2920	[1]: 0.0512	[2]: 1.1019
$ta_t = f(y_t, cr_t, k_t, op_t)$	4, 3, 4, 3, 4	2006Q2	5.510*	0.1474	[2]: 0.0371	[2]: 2.9585
$cr_t = f(y_t, ta_t, k_t, op_t)$	4, 3, 4, 4, 3	2005Q3	5.737*	0.2671	[1]: 0.8472	[1]: 2.1842
$k_t = f(y_t, ta_t, cr_t, op_t)$	4, 4, 4, 4, 4	2002Q4	1.267	0.9306	[1]: 0.1714	[1]: 2.8997
$op_t = f(y_t, ta_t, cr_t, k_t)$	4, 4, 3, 3, 4	1999Q4	5.215**	0.1291	[2]: 0.0930	[3]: 0.0294
Tourist receipts						
$y_t = f(tra_t, cr_t, k_t, op_t)$	4, 4, 4, 4, 4	2000Q3	7.905*	0.3257	[1]: 0.0077	[2]: 1.1235
$tr_t = f(y_t, cr_t, k_t, op_t)$	4, 3, 4, 3, 4	2006Q2	5.824*	0.3038	[2]: 0.0167	[2]: 2.9345
$cr_t = f(y_t, tr_t, k_t, op_t)$	4, 3, 4, 4, 3	2005Q3	4.683**	0.3037	[1]: 1.5944	[1]: 2.7017
$k_t = f(y_t, tr_t, cr_t, op_t)$	4, 4, 4, 4, 4	2002Q4	2.400	0.0676	[1]: 0.2215	[1]: 3.4000
$op_t = f(y_t, tr_t, cr_t, k_t)$	4, 4, 3, 3, 4	1999Q4	4.848**	0.1502	[2]: 0.0249	[3]: 0.0056

	Critical bounds	
Level of significance	Lower bounds *I*(0)	Upper bounds *I*(1)
1%	3.93	5.23
5%	3.47	4.57
10%	3.03	4.06

Note: ARDL: autoregressive distributed lag. Critical values are collected from Pesaran et al. (2001).
*Significant at 1% level.
**Significant at 5% level.

Table 6. Long-run results.

	Dependent variable: $\ln y_t$			
	Tourist arrivals		Tourism receipts	
Variable	Coefficient	*T*-statistics	Coefficient	*T*-statistics
C	1.3123*	35.4945	1.3601*	30.1108
$\ln ta_t$	0.1257*	6.9305	–	–
$\ln tr_t$	–	–	0.0994*	6.6229
$\ln cr_t$	0.1099*	7.8461	0.0662*	4.2156
$\ln k_t$	0.1482*	8.3218	0.1558*	8.7864
$\ln op_t$	0.2155*	11.0163	0.1615*	6.7616
$strcdum_t$	0.0321*	9.0565	0.0302*	7.7537
R^2	0.9909		0.9908	
$Adj - R^2$	0.9906		0.9904	

Diagnostic test

Test	*F*-statistic	Probability value	*F*-statistic	Probability value
χ^2_{Normal}	2.5473	0.3343	2.3289	0.2899
χ^2_{SERIAL}	1.0760	0.1978	2.4040	0.2121
χ^2_{ARCH}	2.9587	0.4356	2.9116	0.4436
χ^2_{WHITE}	1.2638	0.2234	2.2345	0.3367
χ^2_{REMSAY}	1.4669	0.1918	1.4567	0.2020

*Significant at 1% level.
**Significant at 5% level.

Table 7. Short-run results.

	Dependent variable: $\Delta \ln y_t$			
	Tourist arrivals		Tourism receipts	
Variable	Coefficient	*T*-statistic	Coefficient	*T*-statistic
Constant	0.0010*	5.2523	0.0012*	6.2033
$\Delta \ln ta_t$	−0.0020*	−4.2048	–	–
$\Delta \ln tr_t$	–	–	−0.0194**	−2.6522
$\Delta \ln cr_t$	0.0167	1.4548	0.0127	1.2647
$\Delta \ln k_t$	0.1681*	13.0997	0.1798*	14.5238
$\Delta \ln op_t$	0.1819*	6.9394	0.1699*	6.7758
$strcdum_t$	0.0003	1.3067	0.0003	1.1417
ECM_{t-1}	−0.0102*	−2.9788	−0.0249**	−2.4844
R^2	0.7609		0.7842	
$Adj - R^2$	0.7513		0.7755	
F-statistic	78.5380*		89.6716*	

Diagnostic test

Test	*F*-statistic	Probability value	*F*-statistic	Probability value
χ^2_{Normal}	0.8662	0.7876	0.1669	0.9877
χ^2_{SERIAL}	0.4151	0.4821	0.6637	0.5051
χ^2_{ARCH}	4.6160	0.1019	0.4906	0.4847
χ^2_{WHITE}	2.3227	0.1123	1.5678	0.2133
χ^2_{REMSAY}	0.4251	0.9876	0.4061	0.9880

*Significant at 1% level.
** Significant at 5% level.

Table 8. The VECM granger causality analysis.

	Direction of causality									
	Short run					Long run	Diagnostic tests			
Dependent variable	$\Delta \ln y_{t-1}$	$\Delta \ln ta_{t-1}$	$\Delta \ln cr_{t-1}$	$\Delta \ln k_{t-1}$	$\Delta \ln op_{t-1}$	ECM_{t-1}	Break year	χ^2_{Normal}	χ^2_{ARCH}	χ^2_{REMSAY}
Tourist arrivals										
$\Delta \ln y_t$	–	1.2745	1.1548	10.7231*	24.7883*	−0.0176**	2000Q3	0.1419	0.9096	2.0163
		(0.2827)	(0.3181)	(0.0000)	(0.0000)	(−2.17321)		(0.8762)	(0.3418)	(0.2123)
$\Delta \ln ta_t$	1.8079*	–	11.1548*	1.6285	2.5786***	−0.0823*	2001Q3	0.8287	0.9180	1.6648
	(0.1676)		(0.0000)	(0.1999)	(0.0794)	(−3.5966)		(0.5672)	(0.3395)	(0.1991)
$\Delta \ln cr_t$	0.5163	10.1449*	–	0.5397	4.7565*	−0.1972*	2005Q3	0.3061	1.5789	0.0363
	(0.5978)	(0.0001)		(0.5841)	(0.0100)	(−3.9795)		(0.6571)	(0.2109)	(0.8490)
$\Delta \ln k_t$	11.1211*	1.3558	0.5274	–	1.0876	–	2002Q2	0.4699	1.4065	5.7659
	(0.0000)	(0.2610)	(0.5912)		(0.3398)			(0.5978)	(0.2375)	(0.0176)
$\Delta \ln op_t$	24.9311*	1.6843	5.3656*	1.0917	–	−0.0158***	1999Q4	0.1304	1.3983	0.0450
	(0.0000)	(0.1892)	(0.0035)	(0.3384)		(−1.9042)		(8800)	(0.2389)	(0.8323)
Tourism receipts										
Variable	$\Delta \ln y_{t-1}$	$\Delta \ln tr_{t-1}$	$\Delta \ln cr_{t-1}$	$\Delta \ln k_{t-1}$	$\Delta \ln op_{t-1}$	ECM_{t-1}	Break year	χ^2_{Normal}	χ^2_{ARCH}	χ^2_{REMSAY}
$\Delta \ln y_t$	–	1.0971	1.0483	10.7914*	24.4115*	−0.0235*	2000Q3	0.1606	0.2811	0.2178
		(0.3366)	(0.3532)	(0.0000)	(0.0000)	(−2.8458)		(0.8545)	(0.5967)	(0.8573)
$\Delta \ln tr_t$	1.7494	–	3.3316**	3.3141**	1.8148	−0.0938*	2006Q4	0.2129	0.1141	0.9383
	(0.1776)		(0.0385)	(0.0392)	(0.1666)	(−4.3955)		(0.8123)	(0.7359)	(0.3344)
$\Delta \ln cr_t$	0.2278	2.4151***	–	0.5908	3.4724**	−0.0456*	2005Q3	0.5177	1.8677	0.8870
	(0.7966)	(0.0930)		(0.5552)	(0.0337)	(−2.9561)		(0.5571)	(0.1738)	(0.3479)
$\Delta \ln k_t$	10.8412*	3.1136**	0.8078	–	0.7976	–	2002Q2	0.6211	0.5799	5.7763
	(0.0000)	(0.0475)	(0.4478)		(0.4524)			(0.5120)	(0.4475)	(0.0175)
$\Delta \ln op_t$	7.5530*	0.1468	1.5433	0.2244	–	−0.0125***	1999Q4	0.9936	1.4878	0.0020
	(0.0008)	(0.8635)	(0.2172)	(0.7992)		(−1.8484)		(0.3346)	(0.2245)	(0.9635)

Note: VECM: vector error correction method.
*Significant at 1% level.
** Significant at 5% level.
*** Significant at 10% level