Tourism, Selected Macroeconomics Variables and Economic Growth: An Econometrics of Long Run and Short Run Relationship

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ABSTRACT

Economic growth plays an important role in any country as it leads to increase in standard of living, income per capital, business opportunities, employment level, economic stability, etc. With the great outburst of world tourism in recent years, it is now one of the largest and fastest growing industries in the world which is a potential factor for economic growth. Nevertheless, the yields from this economic activity are different across geographical regions. Since tourism in Malaysia has become the second largest income contributor of foreign exchange after manufacturing, this study attempts to determine whether tourism (in terms of tourism receipts and government tourism expenditure) is crucial for enhancing economic growth in Malaysia from 1974-2010, given production function framework and exports are the control variables. The empirical analysis will be based on Johansen Cointegration for long run relationship and Error Correction Model (ECM) for short run dynamic. Results of long run relationship show all the variables are statistically significant and positively related to economic growth except exports and government tourism expenditure. Error correction model (ECM) for short run dynamic reveals only tourism receipts and government tourism expenditure are significant and positively related to economic growth.

Keywords: Economic growth, neoclassical model, Johansen Cointegration, ECM, Malaysia

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INTRODUCTION

Economic growth plays an important role in any country including Malaysia as it leads to increase in the standard of living, income per capital, business opportunities, employment level, economic stability, etc. From 1957 to 2005, Malaysia's real GDP grew by an average of 6.5 per cent per annum. The economic performance improved in the early 1980s to the mid 1990s where the rapid growth was sustained close to an average of 8 per cent per year. Previously, attentions have been given to traditional exports such as primary and manufacturing to determine growth. Today Malaysia is an emerging multi-sector economy based on services and manufacturing, from raw materials producers of rubber and tin in the 1970s. Malaysia has an eminent goal at present that is to achieve high-income status by 2020 as well as to promote domestic demand and to reduce the economy's exports dependency. As an effort to diversify Malaysia's economy and to be less dependent on exported goods, tourism has been promoted in the mid 1970s. Tourism income since then has improved tremendously as a result of the great outburst of this industry worldwide where it has become the second largest income contributor of foreign exchange after manufacturing, one of the world largest semiconductor devices exporters in Malaysia (refer Table 1).

Table 1 Major foreign earnings in Malaysia (RM billion)

	2004	2005	2006	2007	2008	2009	2010
Manufactured goods	390.4	435.7	473.2	474.7	491.9	430.6	486.7
Tourism	30.7	32.0	37.6	47.5	50.2	55.0	56.5
Palm oil	20.1	19.4	21.6	32.0	46.0	36.4	45.6
Crude oil	21.3	29.4	30.8	31.9	43.0	25.4	30.8
LNG	17.1	20.8	23.3	26.2	40.7	31.2	38.1
Rubber	5.2	5.8	8.2	7.3	8.1	4.5	9.2
Sawn timber	*5.3	*5.9	4.3	4.1	3.5	3.0	-
Saw logs			2.3	2.1	2.1	2.0	-

source: MOTOUR-Tourism Malaysia, various reports
Note: 1) * sawn timber & saw logs
      2) figures in parenthesis show annual growth rate of each sector

The incomes generated by international tourism through tourist expenditures are important earnings to the country. This is because they do not only manage to generate earnings for the public and private sectors in the economy through inter-industrial linkages, but also provide employment opportunities to the locals. The whole process will in turn successively boost up the economic activities in the host economy through the multiplier process and thus generating economic

growth. There is even a possibility of tourism led growth (TLG) visibility due to the multiplying process (Bini and Masini, 2008) based on the cumulative of direct, indirect and induced expenditures. This makes tourism the potential strategic factor for economic growth (Cortes-Jimenez et al., 2009). Nevertheless, whether countries should promote tourism to achieve long run economic growth is debatable (Cortes-Jimenez et al., 2009). The empirical results are mixed (Gunduz and Hatami-J, 2005; Kim, Chen and Jang, 2006; Tang and Jang, 2009) and it is uncertain whether tourism receipts act as engine of economic growth in Malaysia. In addition, the empirical studies between government expenditure and economic growth are controversial (Jiranyakul & Brahmasrene, 2007). Physical and human capitals are also considered in the model because according to neoclassical growth advocators Mankiw, Romer and Weil, (MRW) (1992), inclusion of these provide excellent data description. This is confirmed by Nketiah-Amponsah (2009) and Govindaraju, Rao and Anwar (2010) that by considering physical and human capital as control variables, it helps to reduce the problem of serious misspecification and omitted variables bias. Since Export Led Growth concept is almost similar to Tourism Led Growth, following Feder's (1982) model, the study add export as another control variable as it has potential important correlation to economic growth.

Thus, the general objective of this study is to determine the role of tourism receipts, government tourism expenditure and the selected macroeconomic variables namely physical capital, education, health and exports as control variables in the model to measure economic growth in Malaysia from 1974-2010. It is hope that the research will add to the understanding of variables that are positive and significant to economic growth in the country.

The study is organized in such a way that section 2 reviews the relevant literature pertaining to the topic, section 3 discusses the models and variables for empirical analysis, section 4 briefly discuss methodology procedures, section 5 reveal the empirical findings for long run and short run equilibrium and section 6 concludes by providing suggestions on policy recommendations.

LITERATURE REVIEW

Tourism can generate effects to the macro and micro economic (Akal, 2010). The macroeconomic contributions are to provide jobs (Al-Ma'yta, 1991; Al-Ta'amna, 2001; Abu Aliqah and Al-rfou, 2010) and income to the local residents (Gulcan, Kustepeli and Akgungor, 2009). Besides, tourism also provides amenities for the local residents (Burkart and Medlik, 1981). With the increases of the number of tourists, the local residents can enjoy a better standard of infrastructures (Abu Aliqah and Al-rfou, 2010) such as transportation, shopping and entertainment,

and also other public facilities. Besides, tourism also benefit from microeconomic effect such as improve quality of employment, utilize resources efficiently from the business competition and enjoy economies of scale (Akal, 2010).

Tourism's contribution to the economic growth of the host country in term of the correlation between tourism earning and the economic growth is affirmed by IMF (2009), ceteris paribus, an increase of 1 per cent in tourism revenues from total exports yields a 0.5 per cent increase in per annum GDP growth. This is supported by Brau, Lanza and Pigilaru (2003) where their findings from a sample of 143 countries show the countries that have the highest GDP growth (more than 10 percent) are the ones most accessible to tourism. In other words, even if a state is small, it would results in higher growth if its prime business is tourism in the economy.

Thus, researchers, academicians as well as tourism operators are unanimous that tourism is a tool for economic growth (Eadington and Redman, 1991; Sinclair & Stabler, 1998; Surugiu, Frent and Surugiu, 2009). This is supported by Eugenio-Martin, Morales and Scarpa (2004), Katirclioglu (2007), Fayissa et al. (2007, 2009), Chang, et al. (2010), Seetanah et al. (2011), Seetanah (2011), etc. Nevertheless, there are also studies finding specialization in tourism may not be a panacea to solve problems of development and growth (Figini and Vici, 2010) and could not confirm such relationship in the long run (Jin, 2011).

The relationship between government fiscal policy on tourism expenditure and economic growth has drawn much attention from economic researchers (Louca, 2006). In economic research, the attention towards the long run relationship between government tourism expenditure and economic growth has increased especially pertaining to infrastructure (Louca, 2006). Sinclair (1998) claims that increasing expenditures on tourism can provide potential benefits to the countries. Keynesian supports the view that expenditure from both public and private sectors in tourism is crucial to ascertain a wise level of economic activity. To address issue of tourism expenditure's ability to promote economic growth, Louca (2006) examines three major categories of expenditure on tourism in Cyprus financed by the government between 1960 -2001 by employing Johansen cointegration and VECM. The results suggest a two way pattern between tourism income and the categories of expenditure.

In addition, the control variable such as physical capital (Creel and Poilon, 2008), education (Al-Yousif, 2008) show inconclusive results to economic growth while health promote growth in the short run (Nketiah-Amponsah, 2009) and exports contribute to growth in both long run (Cortes-Jimenez and Pulina, 2009; Jiranyakul, 2010) and short run (Kogid et al. 2010)

MODEL AND VARIABLES

This study adopts the neoclassical model by Solow (1956-1957) which is extended by Mankiw, Romer and Weil (1992) to include human capital, Feder (1982) to include exports and non-exports sector, Ram (1986) and Grossman (1988) has extended it to include government. Considering a linear logarithmic form in the model, it gives:

$$LY_t = \omega_0 + \omega_1 LTR_t + \omega_2 LGT_t + \omega_3 LK_t + \omega_4 LHe_t + \omega_5 LHh_t + \omega_6 LX + v_t \qquad (1)$$

Equation (1) above assumes that economic growth in Malaysia is influenced by TR, GT, K, He, Hh and X where Y = Real economic growth per capita, TR = Real tourism receipts, GT = Real government tourism expenditure, K = Real physical capital per labour, He = Real education per labour, Hh = Real health per labour, X = Real exports of goods, $_t$ = time, ω_0= intercept terms, $\omega_1, \omega_2, \omega_3, \omega_4, \omega_5, \omega_6$= coefficient and v = error terms. The above variables are evaluated in Malaysian currency i.e. Ringgit Malaysia (RM) at constant year 2005 prices.

METHODOLOGY

To run time series macroeconomics data and avoid spurious results, techniques such as 1) unit root test for each of the series, 2) test of Johansen cointegration and 3) Error Correction Mechanism (ECM) are carried out to determine the long and short run dynamics among economic growth, tourism and the selected macroeconomic variables.

The econometrics technique starts with detecting the presence of unit root for individual variables. If the data is confirmed to be stationary at the same order, the second step is to test Johansen cointegration. This is to estimate the long run relationship between nonstationary variables for the number of cointegration relationship as well as to estimate the parameters of those cointegration relationship (a brief explanation is discussed next). The third step is test for ECM. Based on Granger (1986), it is able to produce better short run forecasts and produce the short run dynamics required to obtain long run equilibrium.

Johansen-Juselius technique is as follows:
Let,

$$\Delta X_t = \alpha + \Gamma_1 \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2} + ... + \Gamma_{k-1} \Delta X_{t-k-1} + \Pi_k X_{t-k} + \omega_t \qquad (2)$$

where X_t and ω_t are (n*1) vectors and Π is an (n*n) matrix of parameters.

Johansen (1988)'s methodology is required to calculate equation (2) and matrix rank of Π_k. If rank (Π_k) = zero, the X_t linear combination of variables are non-stationary. In other words, the variables are not cointegrated. But since the matrix rank is non-zero eigenvalues (p), where p > 0, two likelihood ratio (LR) tests are used to perform this test as the value of p shows cointegrating vectors among the variables.

$$L_{trace} = -\sum_{i=r+1}^{p} \ln(1 - \lambda_i) \tag{3}$$

The null hypothesis of distinct cointegarting vectors which is less or equal to r tested against a general alternative.

$$L_{max} = -T\ln(1 - \lambda_{r+1}) \tag{4}$$

The null hypothesis of r cointegrating vectors tested against the alternative of r+1 cointegrating vector.

Where λ_r = estimated eigenvalues
         T = number of valid observations.
Both the tests refer to Osterwald-Lenum (1992) critical values.

EMPIRICAL FINDINGS

In this study, ADF and PP are examined for stationary test. The p-lag is based on user specified starting from 0 to 4. Table 2 shows the results.

The first panel shows all variable namely Y, TR, GT, K, He, Hh, and X are not stationary at level at 1 per cent significant level for ADF tests. PP test is then followed and confirmed that all the variables are failed to reject null hypothesis at 1 per cent significant level. 1st difference test is carried out and the results can be found in the second panel. Both ADF and PP tests show that Y, TR, GT, K, He, Hh, and X are stationary after first differencing at order one, $I(1)$ and that cointegrating relationships may exist among the variables.

Once the unit root is confirmed for the time series data, the next step is to find whether there exists some long run equilibrium relationship among the variables that are non stationary in levels but stationary at the first differences. To answer this question, cointegration test developed by Johansen (1988) and Johansen & Juselius (1990) is employed as this procedure is known to be the most reliable test for cointegration.

Table 2 ADF and PP tests for unit root

Level	ADF	PP
LY	-0.473640 (0)	-0.473640 (0)
LTR	-0.254592 (0)	-0.254592 (0)
LGT	-1.350032 (0)	-1.350032 (0)
LK	-1.561389 (0)	-1.561389 (0)
LHe	0.303126 (0)	0.303126 (0)
LHh	0.610238 (0)	0.610238 (0)
LX	-1.283759 (0)	-1.283759 (0)
1st Difference	ADF	PP
LY	-6.631141* (0)	-6.631141* (0)
LTR	-6.230403* (0)	-6.230403* (0)
LGT	-10.60353* (0)	-10.60353* (0)
LK	-4.227144* (0)	-4.227144* (0)
LHe	-5.169450* (0)	-5.169450* (0)
LHh	-5.620934* (0)	-5.620934* (0)
LX	-9.583193* (0)	-9.583193* (0)

1. * and ** denote rejection of the null hypothesis at the 1 and 5 per cent level of confidence respectively for ADF and PP.
2. The values in parentheses represent number of lag

Prior to Johansen cointegration test, the study first examines optimum lag length selection. It is based on a VAR model where it takes into consideration the dynamic time series properties. The optimal lag length is determined by several criteria such as likelihood ration test (LR), final predication error (FPE), Akaike information criterion (AIC), Schwarz Bayasian criterian (SBIC), and Hannan and Quinn criterian (HQ). They are treated as endogenous variables in VAR with a constant as exogenous. The results reveal that majority of the tests favour optimal lag length of 1 at 5 per cent level of significance. Thus 1 lag is chosen in the study to test the cointegration among Y, TR, GT, K, He, Hh, and X.

The outcomes of the Johansen cointegration rank test for Y, TR, GT, K, He, Hh, and X are summarized in Table 3. Based on trace statistic values, the null hypothesis of no cointegration (r=0) between the variables is rejected because the trace statistic value, 146.04 is greater than the critical value of 125.62 at 5 per cent level of significance, indicating the presence of one cointegrating relationship among Y, TR, GT, K, He, Hh, and X. This is confirmed by maximum eigenvalue statistic tests where the null hypothesis of no cointegration (r=0) between the variables is rejected because the maximum eigenvalue statistics of 57.95 is greater than the critical values of 46.23 at 5 per cent level of significance.

Table 3 Johansen's Test for the number of cointegration vectors

Null	Trace			Maximum eigenvalue		
N	Statistics	0.05 critical value	Prob.	Statistics	0.05 critical value	Prob.
r=0	146.0420*	125.6154	0.0016	57.94525*	46.23142	0.0019
r≤1	88.09672	95.75366	0.1497	36.40537	40.07757	0.1224
r≤2	51.69135	69.81889	0.5631	28.92735	33.87687	0.1739
r≤3	22.76401	47.85613	0.9647	11.34397	27.58434	0.9558
r≤4	11.42004	29.79707	0.9502	7.874073	21.13162	0.9112
r≤5	3.545971	15.49471	0.9367	3.349747	14.26460	0.9208
r≤6	0.196224	3.841466	0.6578	0.196224	3.841466	0.6578

Trace and max-eigenvalue tests both indicate 1 cointegrating equations at 5 per cent level of significance
* Denotes rejection of the hypothesis at 5 per cent level of significance
** MacKinnon-Haug-Michelis (1999) p-values

The above trace and maximum eigenvalue tests outcomes lead to the results in Table 4 which reveals one cointegrating equation in the series obtained by normalizing cointegrated vector.

Table 4 Estimated cointegrating equation

Variables	Normalized cointegrating coefficients	Standard error	t-tests
LY	1.000000		
LTR	-0.128914*	0.03442	-3.74490
LGT	0.041741	0.02998	1.39223
LK	-0.196953*	0.02245	-8.77188
LHe	-0.351896*	0.07618	-4.61902
LHh	-0.316371*	0.06295	-5.02597
LX	0.040377	0.02645	1.52631

Notes:
1. *Denote statistical significance at 1 per cent.
2. The signs for LTR, LGT, LK, LHe, LHh and LX are reversed since they are located on the left hand side of the structural equation.

When normalized for a unit coefficient on Y, the cointegrating regression of economic growth in Malaysia can be written as follows:

$$LY_t = 0.128914*LTR_t - 0.041741LGT_t + 0.196953*LK_t + 0.351896*LHet + 0.316371*LHht - 0.040377LXt \qquad (3)$$

This normalized equation describes the signs on the variables whether they are consistent with a priori expectation. The results show that four variables namely TR, K, He and Hh are positive and statistically significant at 1 per cent level. This means that tourism receipts, physical capital, education and health are statistically significant contributing to economic growth in the long run. In terms of degree of impact, it indicates that 1 per cent change in TR, K, He and Hh will lead to 0.129 per cent, 0.197 per cent, 0.352 per cent and 0.316 per cent increase in Y respectively. They are in line with a priori expectations whereby:

When disaggregating exports into services exports, the result shows that tourism receipts (TR) have contribute significantly to economic growth. This is supported by Balaguer & Cantavella-Jorda (2002), Kasman & Kirbas (2004), Gunduz & Hetami-J (2005), Cortes-Jimenez (2008), Kareem (2008), Lau et al. (2008), Fayissa et al (2007, 2009), Chen & Song Zan (2009), Ka (2009), Brida et al. (2010, 2008), Lee & Hung (2010) and Kreishan (2010).

The physical capital (K) result is consistent with Choong, Zulkornain & Liew (2003), Tan et al. (2007), Creel & Poilon (2008), Alexiou (2009), Sulaiman and Saad (2009), Zhao & Du (2009), Ka (2009), Oluwatobi & Ogunrinola (2011), Iqbal et al (2011) and Odit et al. (2010)'s findings that the increases in capital does led to economic growth. This is also consistent with the neoclassical growth theory.

Education (He) is consistent with the findings from Ogujiuba & Adeniyi (2005) and Oluwatobi & Ogunrinola (2011) where there is a positive relationship between recurrent expenditure on education and economic growth. This is supported by Barro & Sala-i-Martin (1995), Tang (2009), Cooray (2009), Govindaraju et al. (2010) and Odit et al. (2010). Bose et al. (2007) also find total expenditure in education are significantly related to growth, but the decisions should be favourable to current expenditure versus capital expenditure in developing countries.

Health (Hh) is aligned with the findings from Bloom & Canning (2000), World Health Organization (2001), Cooray (2009) and Oluwatobi & Ogunrinola (2011), that it has a positive and significant impact on economic growth.

However, government tourism expenditure (GT) and exports (X) are reported to have negative relationship with economic growth, which are contradictory with a priori expectations. The degree of impact shows that 1 per cent change in GT and X results in the opposite changes in Y by 0.042 per cent and 0.04 per cent respectively and these two variables are not significant at 5 per cent level. An explanation for insignificant variables may be due to the limited sample size in the estimation. However, the negative sign is consistent with Engen & Skinner (1992) and Folster & Herekson (2001) for government expenditure and growth, while Dodaro (1993) for exports and growth.

Short Run Dynamics

The Short Run Dynamics model is estimated under the specification of VECM where the equation is regressed with difference of Y as a dependent variable against the lagged differences of the independent variables such as TR, GT, K, He, Hh and X. Due to limited sample size, a 1-lag structure is employed. The results of short run Error Correction Model for economic growth is presented in Table 5.

Table 5 Results of ECM for short run dynamic

Dependent variable ΔLY		
Independent variable	**Coefficient**	**t-statistic**
ΔLY_{t-1}	0.845406**	2.66832
ΔLTR_{t-1}	0.126460***	1.76779
ΔLGT_{t-1}	0.072065**	2.43298
ΔLK_{t-1}	-0.307132**	-2.42443
ΔLHe_{t-1}	-0.692946**	-2.78334
ΔLHh_{t-1}	0.267067	1.55607
ΔLX_{t-1}	0.039307	1.22571
ECT_{t-1}	-0.812645*	-3.80410
c	0.012305	0.64922

*, ** and *** denote statistical significance at 1 per cent, 5 per cent, and 10 per cent respectively

Table 5 relates lag difference of Y to lag differences of TR, GT, K, He, Hh and X. It shows that in the short run, changes in TR, GT, Hh and X affect positively the changes in Y indicating the independent variables are positively affecting economic growth. A 1 per cent increase in ΔTR_{t-1}, ΔGT_{t-1}, ΔHh_{t-1} and ΔX_{t-1} will lead to the expansion of ΔLY_{t-1} by 0.13 per cent, 0.07 per cent, 0.27 per cent and 0.04 per cent respectively. In terms of significance level, while ΔTR_{t-1} and ΔGT_{t-1} are statistically significant at 10 and 5 level of confidence respectively, ΔHh_{t-1} and ΔX_{t-1} are statistically insignificant and again this may be due to the small sample size.

On the other hand, changes in K and He affect changes in Y negatively and the effects are statistically significant at 5 per cent level. The investment in K and He may slow down the economic growth. For instance, 1 per cent increases in ΔK_{t-1} and ΔHe_{t-1} leads to the decline of ΔLY_{t-1} by 0.31 per cent and 0.70 per cent respectively in the short run.

The positive relationship of tourism receipts (TR) to economic growth is consistence with the authors mentioned earlier in the long run relationship. The positive relationship between economic growth (Y) and government tourism expenditure (GT) is in line with Lau et al. (2008), Dwyer & Kulendran (2008),

Gulcan et al. (2009), Ishikawa and Fukushige (2009). In other words, the results reveal that tourism receipts and government spending on tourism has translated to meaningful growth in the short run.

The unexpected negative effect on economic growth for physical capital (K) is in line with Otto and Voss (2002) between public capital and indicator of economic growth, and Devarajan et al. (1996) between capital component of public investment and economic growth. The negative result for education (He) is congruent to the previous studies based on data either from a large group of countries (e.g. Barro & Sala-i-Martin, 1995, 1999), developing countries (Landau, 1986; Devarajan et al., 1996) or a single country (Nurudeen and Usman, 2010).

DISCUSSION AND CONCLUSION

The use of Johansen cointegration technique to analyze the growth experience of Malaysia from 1974-2010 has shown that all variables are statistically significant and positively related to economic growth except exports and government tourism expenditure in the long run.

1) The long run negative sign in exports may be due to the country's too depending on exports of goods that makes the country vulnerable to external shocks such as The Asian Financial Crisis in 1997 and The World Economic Crisis in 2009. Another possible reason may be due to the sector relying heavily on imported raw materials and equipment (Khalaffalla &Webb, 2001). It is further suggested that Malaysia should focus not only in domestic demands but also diversify its economic activities to other booming sectors such as tourism;

2) The negative signs of government tourism expenditure in the long run may be due to mismanagement and diversion of government funds by officials and political appointees. It may also be due to the spending on government tourism expenditure that has no immediate effect on economic growth. Transparency on the utilization of government funds in this area is highly recommended.

A broad policy implication may be drawn from the study that Malaysia can improve its economic performance not only by investing in traditional main sources of growth such as physical capital, human capital in education and health. The findings also signal to the policy makers that the tourism industry also plays a very important role in Malaysia. Hence, more funds are strategically encouraged to be channelled to potential tourism industry to further encourage prosperity (in terms of optimum output and full employment) and formulating strategies to gain comparative advantage in Malaysia.

Apart from that, error correction model (ECM) for short run dynamic reveals only tourism receipts and government tourism expenditure are significant and

positively related to economic growth, while physical capital and government expenditure on education are statistically significant to slowdown the economic growth in Malaysia.

1) Physical capital is proven to be of little help to the economic growth in the short run. This may be due to resource misallocation and economic inefficiency according to Devarajan et al. (1996). It is suggested that partnership between the private and public sectors be encouraged. This would call for greater transparency and accountability for disbursement and utilization of government funds for capital projects;

2) The negative short run relationship between economic growth and education may be due to two possible reasons. First, it might be due to brain drain of highly skilled labour force, and second, there might be the mismatch between existing of human capital in Malaysia and required human capital to produce and enhance economic growth. To overcome these possible problems in the short run, government should design a new policy to discourage brain drain among the professional groups and to create new productive jobs for the miss match between jobs among the skilled labour force. It is suggested that universities should link with industries so that the former could offer appropriate courses for the undergraduates to meet the market demand from the latter.

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