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Asian Tourism Demand For Malaysia: A Bound Test Approach

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ABSTRACT

The objective of this paper is to investigate the long-run and short-run relationships among tourist arrivals to Malaysia and tourism price, substitute price, travelling cost, income and exchange rate for Asian7. The autoregressive distributed lag (ARDL) bounds test approach developed by Pesaran et al. (2001) is employed in the analysis, and the data cover the period 1970 to 2004. The empirical results show that in the long-run and short-run the tourism price, travelling cost, substitute price and income are the major determinants of Malaysia's tourism demand. The results also show that word-of mouth effect, world economic crisis (1997-98) and the outbreak of SARS (2002-03) significantly affected the demand for Malaysia's tourism in the short-run. The findings are consistent with the economic theory and the model passed all the diagnostic tests.

Keywords: Tourism Demand, Cointegration, ARDL Model, Bounds Test, Asian7

INTRODUCTION

The development of the tourism industry in Malaysia has a long history. Before its dependence in 1957 and a few decades after, the Malaysian economy was heavily dependent on primary commodities mainly tin, rubber, palm oil and petroleum products. In the 1970's, the government had seriously started to stimulate the development of the manufacturing industry in an effort to diversify the country's economy. These two sectors, however, were highly export-oriented and their performance was directly influenced by changes of the world economic climate. The severe economic recession that hit most of the Asian region in the mid 1980's had badly hurt the Malaysian economy and the government started to search for a more robust industry to broaden the country's economic base. Tourism was identified as a potential industry that could encourage and stimulate the socio-economic development of the country especially as a supplier of foreign exchange earnings, and employment opportunities. Tourism sector also contribute to regional development, encourage the development of supporting sectors and reduction in rural-urban migration.

After the severe recession in the mid 1980's the government has given a very high priority to the development of the tourism industry. The seriousness of the government in promoting the tourism industry was manifested by the establishment of the Ministry of Culture, Arts and Tourism in 1987. In 2004, this ministry was restructured into three ministries and one of them is the Ministry of Tourism which was assigned to take care of, coordinating and implementing government policies and strategies pertaining to tourism development. Various tourism-related agencies at the state level were also set up, besides having some promotional activities such as the declaration of Visit Malaysia Year' (VMY) in the 1990's, 2000, and 2007, and active participation of the private agencies.

As a consequence, total tourist arrivals increased dramatically especially in 1990 and thereafter. In 1990, there are 7.4 million of tourist arrivals compared to 4.8 million tourist arrivals in 1989. However, the following year (1991), due to lack of promotional programme tourist arrivals dropped to 5.8 million. Tourist arrivals continued to escalate to 7.5, 10.2 and 15.7 million in 1995, 2000 and 2004 respectively. In the 1990's (1991-2000), the annual average growth of tourism was quite high at about 11 per cent.

Most of the tourists in Malaysia till today come from the Asian countries. Asian tourists dominated more than 80 percent of tourist arrivals to Malaysia. Since Asian tourists comprise the prevalent proportion of visitors to Malaysia, this paper attempts

to study the long-run and short-run relationship between the demand for tourism to Malaysia from Asian countries namely Singapore, Indonesia, Thailand, Brunei, China, Japan and Hong Kong (hereafter will be referred to as the Asian7), and several macroeconomic variables. These variables include arrival of tourists from individual countries of the Asian7 to Malaysia, tourism price, traveling costs, tourism price at the alternative tourism destinations, their income and exchange rates, which will be utilized as determinants to explain the demand for tourism in the long-run. In the short-run, the word-of mouth effect and dummy variables are also included. Annual data will be used, covering the period from 1970-2004.

The main purpose of this study is to identify factors that influence tourist arrivals to Malaysia from the Asian7 markets. However, only the economic factors will be considered. This paper will direct the discussion on the literature review, the data and methodology, empirical results, and conclusion.

LITERATURE REVIEW

In the traditional tourism demand analysis, the most popular method of estimation is the Ordinary Least Square (OLS). Based on the studies by Crouch (1994) and Witt and Witt (1995), 73 out of 97 studies on demand for tourism are based on the OLS regression. OLS is a static analysis, thus it relies heavily on the basic assumptions in the Classical Linear Regression Model (CLRM), especially the assumptions related to the error term. Any violation of the assumptions would result in invalid regression estimation.

In order to overcome this problem, the data used in regression analysis should be stationary. If the data are stationary, then the error term should meet all the basic requirements under the CLRM assumptions. However, most tourism demand data are non-stationary, and the issue of stationarity has been ignored by many researchers in the field of tourism. Estimation based on non-stationary data is flawed (Philips, 1986). This can lead to a serious problem of spurious regression (Morley, 1998; Song and Witt, 2006). The consequence for ignoring data stationarity is that the estimated parameters are unreliable and the t-tests and F-tests produce misleading results.

In some cases, in order to make the data stationary, differenced variables are used in regression analysis. In other words, the Cochrane-orcutt (CO) procedures are applied, especially when there is a presence of autocorrelation (Uysal and Crompton, 1984; Hollender, 1982; Loeb, 1982; Martin and Witt, 1987 and 1988). This will lead to another serious problem with the traditional tourism model which is related to the forecasting performance. Differenced variables generate only the short-run estimation.

How could the long-run relationship among the variables be taken into account in the traditional tourism demand method?

To overcome this problem, the modern econometric methodologies are employed in recent studies on the demand for tourism. After the mid-1990's, most researchers apply the dynamic analysis since the static analysis suffers from the problem of spurious regression. Furthermore, the static analysis is associated with structural and forecasting problems (Song and Witt, 2000).

One of the most popular dynamic methodologies in the field of tourism at present is the cointegration method. Cointegration shows the long-run equilibrium relationship while accommodating the dynamic short-run relationship. Cointegration analysis requires the use of stationary data. Therefore, the regression is free from spurious results. To avoid the same problems, the cointegration method will be used in this study.

There are a few approaches of cointegration analysis, namely the Engle-Granger cointegration (1987) framework, Johansen and Juselius (1990) multivariate cointegration framework and Pesaran and Shin (1995, 1999); Pesaran et al. (1996); and Pesaran et al. (2001) framework, which is referred to the Autoregressive Distributed Lag (ARDL).

DATA AND METHODOLOGY

Dependent

The number of tourist arrivals has been used as a proxy of the demand for tourism by a majority of researchers (Witt and Martin, 1987; Crouch, 1994; and Li, 2004). This study uses the same variable. Data on tourist arrivals from Asian7 for the periods of 1970-2004 have been collected from the Tourism Malaysia (Annual Statistical Report).

Independent variables and dummy

The independent variables include the tourism price, traveling cost, prices of alternative tourism destinations, income, exchange rates, word-of mouth effect and the dummy variables.

In this study, tourism price refers to the price of all goods and services consumed by tourists at the destination. The calculation of tourism price is based on the consumer price index (CPI) of the visited country divided by the CPI of the country of

origin (Salman, 2003; Lim, 2004; Dritsakis, 2004; and Toh, Habibullah and Goh, 2006). Please refer to equation (1).

$$\frac{CPI_{\text{visited destination}}}{CPI_{\text{origin country}}} \quad (1)$$

In this study, tourism price proxies by the ratio of the cost of living in Malaysia relative to the individual country of the Asian7. It is expected that tourism price and arrivals will have a negative relationship.

Traveling cost can be measured by some variable such as air fares between the visited destination and the country of origin (Bechdolt, 1973; Gray, 1966; Kliman, 1981; Kulendran and Witt, 2001; Lim and McAleer, 2002; and Dritsakis, 2004); ferry fares and/or petrol costs for surface travel (Quayson and Turgut, 1982; and Witt and Martin, 1987); and price of crude oil (Munoz, 2006). In this study, the price of crude oil will be used. Similar to relative price, ceteris paribus, if the traveling cost rises, the cost of traveling becomes more expensive, and this will reduce the number of visitors to travel. It is hypothesized that traveling cost is inversely related to the demand for tourism.

Another important variable is tourism price at alternative tourism destinations. Tourism prices at alternative tourism destinations are a substitute price. Substitute price has also been proven to be an important determinant in some studies (Gray, 1966; Kliman, 1981; Witt and Martin, 1987; Witt, 1980a,b; and Song et. al., 2003). The calculation is similar to the estimating of tourism price, where the visiting destination now refers to the alternative tourism destination. In this study, the alternative tourism destinations are Singapore, Thailand and Indonesia. Thus, tourism price at an alternative tourism destination will be the cost of living for tourist in Singapore, Thailand or Indonesia relative to the individual country of the Asian7 (please refer to Equation 2). The relationship between the substitute price and the demand for tourism can be positive or negative. A positive sign of substitute price means that the country is a substitute destination for Malaysia, while a negative sign means that the country is a complementary destination to Malaysia.

$$\frac{CPI_{\text{substitute destination}}}{CPI_{\text{origin country}}} \quad (2)$$

The income variable refers to the real per capita income (RPI), please refer to Equation (3). Income is the most popular variable included in the tourism demand function (Lim and McAleer, 2002; Dritsakis, 2004; and Munoz, 2006). Normally, a higher income will increase total arrivals.

$$RPI_{origin\ country} = \frac{GDP_{origin\ country}}{POP_{origin\ country} * CPI_{origin\ country}} \quad (3)$$

Another important variable is the exchange rate. The exchange rate is the ratio of currency between the receiving country and the country of origin. The change in exchange rate will affect the currency value of the origin country, please refer to Equation (4). Any change in exchange rate will lead to the appreciation or depreciation of tourist currency (Salman, 2003; Lim, 2004; Dritsakis, 2004; and Toh, Habibullah and Goh, 2006). Any appreciation in tourist currency may encourage more people to travel.

$$ER = \frac{Cost\ of\ Malaysia\ ringgit}{The\ origin\ country\ dollar} \quad (4)$$

Word-of mouth (WoM) effect is also included in this study. WoM is proxied by the past year number of tourist arrivals (Salman, 2003; Dritsakis, 2004; Narayan, 2004; Toh, Habibullah and Goh, 2006; and Muňoz, 2006). Hence the knowledge about the destination will be spread out as people talk about their holidays, and thereby reducing the uncertainty for potential visitors. Thus, it will encourage more tourists to come to that destination.

In some studies, dummy variables are also included. The purpose of including dummy variables is to measure the impact of "one shot" events. Dummies are specially constructed variables which take the value "1" when the event occurs and "0" otherwise. In this study two dummy variables are incorporated in the model specification, namely the 1997 East Asian economic crisis (D97) and the outbreak of SARS (D03).

Model Specification

The proposed model is given as below:

$$LnTA_{ijt} = \beta_0 + \beta_1 LTP_{ijt} + \beta_2 LTC_{ijt} + \beta_3 LSPSing_{it} + \beta_4 LSPThai_{it} + \beta_5 LSPIndo_{it} + \beta_6 LRPI_{it} + \beta_7 LER_{ijt} + \beta_8 D97 + \beta_9 D03 + \varepsilon_t \quad (1)$$

where i and j refer to the individual country of the Asian7 and Malaysia respectively. LnTAijt refers to the log of tourist arrivals from the individual country of the Asian7 to Malaysia in year t; LTPijt is the log of tourism price from the individual country of the Asian7 to Malaysia in year t; LTCijt is the log of travelling cost from the Asian7 to Malaysia in year t; LSPSingit, LSPThaiit, and LSPIndoit is the log of tourism price of the individual country of the Asian7 to an alternative tourism destinations referred as Singapore, Thailand and Indonesia respectively; LRPIit is the log of real per capita income of the individual country of the Asian7 in year t; LERijt is the log of exchange rate between the individual country of the Asian7 and Malaysia in year t; D97 is the economic crisis in 1997-98; and D03 is the SARS outbreak in 2003. The dummy variables are used to capture the effect of economic crisis and the outbreak of SARS. The variables take the value of 1 in the year of the economic crisis and SARS, and 0 otherwise; εt is the error term; and the β0, β1, β2, β3, β4, β5, β6, β7, β8 and β9 are the elasticities to be estimated.

Annual data are used and they cover the period from 1970-2004. Data on tourist arrivals are collected from Annual Statistical Report, Tourism Malaysia while other data are collected from the World Bank database 2006 and IMF International Financial Statistics database 2005.

Methodology

In this study, the cointegration in ARDL framework or the bound test approach has been selected, since it can be applied for a small sample size. Furthermore, it can estimate the long-run and short-run relationships in tourism demand model simultaneously. It can also distinguish dependent and explanatory variables, and allow to test for the existence of relationship between variables in level irrespective of whether the underlying regressors are purely I(0), I(1) or mutually cointegrated.

An ARDL representation of equation (1) is formulated as follows:

$$\Delta LTA_{ijt} = \beta_0 + \sum_{h=1}^{m}\beta_1 LTA_{ijt-h} + \sum_{h=0}^{m}\beta_2 LTP_{ijt-h} + \sum_{h=0}^{m}\beta_3 LTC_{ijt-h} + \sum_{h=0}^{m}\beta_4 LSPSing_{it-h} + \sum_{h=0}^{m}\beta_5 LSPThai_{it-h} + \sum_{h=0}^{m}\beta_6 LSPIndo_{it-h} + \sum_{h=0}^{m}\beta_7 LRPI_{it-h} + \sum_{h=0}^{m}\beta_8 LER_{ijt-h} + \beta_9 LTA_{ijt-1} + \beta_{10} LTP_{ijt-1} + \beta_{11} LTC_{ijt-1} + \beta_{12} LSP_{izt-1} + \beta_{13} LRPI_{it-1} + \beta_{14} LER_{ijt-1} + \beta_{15} D97 + \beta_{16} D03 + \varepsilon \quad (2)$$

To investigate the presence of long-run relationships among the LTA, LTP, LTC, TSP, LRPI and LER, bound testing under Pesaran, et al. (2001) procedure is used. The bound testing procedure is based on the F-test. The F-test is actually a test of the hypothesis of no coinetegration among the variables against the existence or presence of cointegration among the variables, denoted as:

H_o: $\beta_9 = \beta_{10} = \beta_{11} = \beta_{12} = \beta_{13} = \beta_{14} = 0$

i.e., there is no cointegration among the variables.

H_a : $\beta_9 \neq \beta_{10} \neq \beta_{11} \neq \beta_{12} \neq \beta_{13} \neq \beta_{14} \neq 0$

i.e., there is cointegration among the variables.

This can also be denoted as follows:

F_{LTA}(LTA| LTP, LTC, LSP, LRPI, LER).

Since the F-test has a non-standard distribution, thus two critical values (CV) generated by Pesaran et al. (2001) are used.. The lower critical bound assumes all the variables are I(0), meaning that there is no cointegration among the variables, while the upper bound assumes that all the variables are I(1), meaning that there is cointegration among the variables. If the F-computed exceeds the upper critical bound, then the Ho will be rejected. Therefore, there is cointegration among the variables. However, if the F-computed is less than the lower critical bound, then Ho cannot be

rejected. Therefore, there is no cointegration among the variables. If the F-computed falls between the lower and upper bound, then the results are inconclusive.

EMPIRICAL RESULTS

The estimation of ARDL model and cointegration test

Using the general-to-specific approach (Hendry, 1995) the results of the ARDL are shown in Table 1, and the results of bounds test is reported in Table 2. The calculated F-statistics for the individual country of the Asian7 as shown in Table 2 are greater than the upper bound critical value at 5% level. Thus, the null hypothesis of no cointegration is rejected. There is indeed a cointegration relationship among the variables (tourism price, travelling cost, substitute price, income and the exchange rate) as presented in Equation (2).

The determinants of tourism demand for Malaysia

Based on the ARDL estimation as presented in Table 1, the long-run elasticities of the variables can be calculated by normalizing on the tourist arrivals. Table 3 presents the long-run elasticities for all the variables. Most of the variables are statistically significant in determining tourism demand for Malaysia in the long run. However, the magnitude of the elasticities is different.

Tourism price is a statistically significant variable influencing the tourism demand for Malaysia from all the individual countries of the Asian7 except Japan. The sign of the variable is also theoretically correct except for Indonesia. The result implies that 1% decrease in tourism price would lead to an increase in approximately 8% of tourist arrivals from Singapore, 5% from Thailand and Hong Kong, 6% from Brunei, and 7% from China. However, 1% increase in tourism price would lead to an increase in approximately 11% of tourist arrivals from Indonesia, which is in contrast with the economic theory.

As a tourism price, travelling cost also is expected to have a negative relationship with tourist arrivals. Based on the above estimation, travelling cost has a correct sign and statistically significant in Singapore, Brunei and China, but has a positive sign in Thailand and Hong Kong. Here the estimation shows that 1% increase in traveling cost tends to decrease the number of tourist arrivals by 0.7% for the Singapore and Brunei market, and 3% for China, but increase the number of tourism arrivals by 0.7% for Thailand and 0.6% for Hong Kong.

Substitute prices are also important variables in influencing the demand for tourism by all the individual countries of the Asian7. In this case, the substitute prices are tourism prices in Singapore, Thailand and Indonesia. These three countries are the alternative tourism destinations to Malaysia. The positive sign of substitute price means that the country is a substitute destination for Malaysia, while the negative sign means that the country is a complementary destination for Malaysia. Based on the empirical results, most of the time, tourism price has a positive sign rather than a negative sign.

For instance, when Singapore is an alternative destination, it is significant and shows a positive sign for Indonesia, Thailand, Brunei, and Hong Kong but a negative sign for Japan. Only Thailand, Brunei and China show a positive sign and Hong Kong show a negative sign and significant when Indonesia is chosen as an alternative destination. Singapore is the only significant country and shows a positive sign when Thailand is the alternative tourism destination (for detail please refer to Table 3). Thus, most of the times the alternative tourism destinations are behave as a substitute destinations for Malaysia.

In many cases, an increase in the income of the countries of origin may benefit the tourism industry of the receiving countries. This means that the income of the countries of origin is positively related to the volume of tourist arrivals. This holds true only for Japan, Thailand and Hong Kong. But for Singapore, Brunei and China, as their income increases, the number of tourist arrivals to Malaysia will decrease in the long-run. From the above results, a 1% increase in income will lead to 2%, 5% and 3% increase in tourist arrivals in Thailand, Japan and Hong Kong respectively. However, a 1% increase in income would result in a decline in tourist arrivals by 1.4$, 0.8% and 0.9% from Singapore, Brunei and China respectively. Such an outcome is not totally surprising because the wealthy tourists may feel it is better for them to travel to better place as their income increases.

The exchange rates should also have a positive relationship with the number of tourist arrivals. However, the number of tourist arrivals is not affected by the change in exchange rates, except in Hong Kong. This result implies that a 1% increase in the exchange rate tends to increase tourist arrivals to Malaysia from Hong Kong market by 3%.

The short-run relationships between tourist arrivals and the same determinants were also tested, incorporating WoM (LTAijt-i) and the dummies D97 and D03. The empirical results demonstrate that most of the determinants are affected tourist arrivals to Malaysia in the short-run, including the WoM, the 1997 economic crisis (D07) and

the outbreak of SARS (D03) (please refer to Table 4). WoM shows a positive relationship, while D07 and D03 show a negative relationship.

In order to ensure the model is an appropriate model, several diagnostic tests were carried out, such as the test for serial correlation ($LM_{(SC)}$), heteroscedasticity (ARCH test), normality ($LM_{(N)}$), omit variables/functional form (RRT) and the test for structural break (Cusum and $Cusum_{(sc)}$). Based on the diagnostic test results, the estimated models of all the individual countries of the Asian7 are well specified, follow correct functional form and are stable (please refer to lower panel of coefficient of Table 4).

CONCLUSION

The objective of this paper is to investigate the long-run and short-run relationship among tourist arrivals and some of the macroeconomics variables. In other words, it attempt to estimate the demand for tourism to Malaysia. Tourism price, travelling cost, substitute tourism price, income and exchange rate have been selected as the determinants in the long-run as well as the short-run. Besides two dummy variables, namely the 1997 Asian economic crisis and the outbreak of SARS are also included as short-run variables.. Here the Asian7 have been chosen since it is the highest market share of tourist arrivals to Malaysia. A single cointegration technique, ARDL, was applied to test the evidence of long-run and short-run relationship between demand for tourism and its determinants.

The empirical results show that there is a cointegration among the variables in all the individual countries of the Asian7. Most of the variables are significant in the tourism demand for Malaysia in the long-run as well as for the short-run granger causality. Even some of the findings (tourism price and travelling cost) contradict the theory, a possible explanation that we can offer is that some of the selected origin countries are also cross-border to Malaysia. Furthermore, there are some similarities in term of the culture and religions among the citizens. These factors may also motivate the citizens to travel irrespective of high tourism price and travelling cost.
However, in overall, the empirical results are consistent with the economic theory and models pass all the diagnostic tests. Thus, the results form this study can be used as a guide in order to formulate relevant tourism policy for Malaysia.

Table 1 The Estimated ARDL Model of the Asian7

Variable	Country						
	Singapore	Indonesia	Thailand	Brunei	China	Hong Kong	Japan
Constant	26.6469***	2.4276***	-7.2431	15.8816***	18.9472	-26.4983	-94.0088
LTA_{ijt}	-0.8332***	-0.4706***	-1.0391***	-0.7098***	-0.9938***	-1.1671***	-2.5467***
LTP_{ijt}	-7.0393***	5.2277**	-5.2805***	-4.6790***	-7.8376***	-6.2838***	4.3962
LTC_{ijt}	-0.5419***	0.1747	0.6944***	-0.4994***	-0.3501*	0.7031***	0.2073
$LSP_{izt\ (Singapore)}$	-	-4.2650**	4.9839***	5.3405***	3.3010	3.6859**	-7.1393***
$LSP_{izt\ (Indonesia)}$	0.2147	-	0.3354	1.7773***	2.9050***	-0.8799**	-0.6540
$LSP_{izt\ (Thailand)}$	7.1743***	-1.6349	-	0.7934	-0.8541	-0.5257	-1.0923
RPI_{it}	-1.1675*	0.4648	2.1384***	-0.5784***	-0.8702***	3.8983***	1.6348***
ER_{ijt}	-3.2046	0.0906	0.0770	-0.3309	0.2821	0.9704***	-0.4524
ΔLTA_{ijt-1}	-0.0048	0.0300**	0.3945***	-	0.0971	-	1.4483***
ΔLTA_{ijt-2}	-	-	-	-	-	0.3740***	0.7992***
ΔLTA_{ijt-3}	-	-	-	0.5043**	-	-	-
ΔLTP_{ijt}	-	-	-2.8085***	2.3383**	-1.4484***	-4.3839***	-
ΔLTP_{ijt-1}	7.7334***	-2.1305***	-	-	-	-	-
ΔLTP_{ijt-2}	-	-	-	-	-	-	1.3159
ΔLTC_{ijt}	-	-	0.4266***	-	-	0.2659*	-
ΔLTC_{ijt-1}	-	-	-0.3906**		-	-	-
ΔLTC_{ijt-2}	0.1085	-	-	-	0.3530**	-	-
$\Delta LSP_{izt\ (Singapore)}$	-	-	4.9740***	-	2.1107***	-	-1.7042
$\Delta LSP_{izt-1\ (Singapore)}$	-	-	-	1.0690	-	-	-
$\Delta LSP_{izt\ (Indonesia)}$	-	-	-	-	-	-	-
$\Delta LSP_{izt-1\ (Indonesia)}$	-1.5078**	-	-	-	-1.6653***	-	-
$\Delta LSP_{izt-2\ (Indonesia)}$	-	-	-	1.6678*** - 0.8337***	-	-	-

Table 1 The Estimated ARDL Model of the Asian7 (continued)

Variable	Country						
	Singapore	Indonesia	Thailand	Brunei	China	Hong Kong	Japan
$\Delta LSP_{izt\ (Thailand)}$	-	-	-	-	-	-	-
$\Delta LSP_{izt-1\ (Thailand)}$	-5.5672***	-	-	-	-	1.7562**	-
$\Delta LRPI_{it}$	-3.9191***	-	1.2680***	-0.4624**	-	-	-
$\Delta LRPI_{it-1}$	-	4.3155**	-	-	0.5064**	-	-7.8810***
$\Delta LRPI_{it-2}$	-	-	-	-	-	2.1074**	-
ΔLER_{ijt}	2.4672***	-	0.5301	-	-	-	-
ΔLER_{ijt-1}	-	-	-	-	-	-	-
D97	-0.8454***	-0.3086	-0.4884***	-	-	-0.4714**	-0.3255**
D03	-0.2802**	-0.5698**	-	- 0.4712***	-0.2279	-	-
R^2	0.8487	0.7018	0.8323	0.8761	0.7966	0.8415	0.8243
R-adjusted	0.6874	0.5229	0.6844	0.7523	0.6060	0.7110	0.6796
F-statistic	5.2607	3.9228	5.6274	7.0771	4.1796	6.4476	5.6973

Note: ***, ** and* denote significant at 1%, 5% and 10% level of significance.

Table 2 Bounds Test Results Based on Equation (2)

	Critical value			
	Lower		Upper	
Level of Significance (5%)	a	b	a	b
	2.365	2.272	3.553	3.447
Country				
Singapore	-	-	7.4499** (7,15)	-
Indonesia	-	-	3.9375** (7,15)	-
Thailand	-	-	7.7488** (7,15)	-
Brunei	-	-	-	8.9242** (8,13)
China	-	-	-	6.3172** (8,16)
Japan	-	-	-	7.4060** (8,17)
Hong Kong	-	-	-	6.9578** (8,17)

Notes: The critical values are taken from Pesaran, et al. (2001), Table Case III, Intercept and no trend. Page 300.
a and b refer to the number of parameters (variables) a = 7, b=8.
** denote significant at 5%.

Table 3 Long-run Elasticities of the tourism demand determinants

	Variables						
Country	Tourism price in Malaysia (LTP_{ijt})	Travelling cost (LTC_{ijt})	Tourism price in Singapore (LSP_{izt}	Tourism price in Indonesia (LSP_{izt})	Tourism price in Thailand (LSP_{izt})	Income ($LRPI_{it}$)	Exchange rate (LER_{ijt})
Singapore	-8.4485***	-0.6504***	-	0.2577	8.6105***	-1.4012***	-3.8461
Indonesia	11.1085**	0.3712	9.0628**	-	-3.4740	0.9876	0.1925
Thailand	-5.0818***	0.6682***	4.7963***	0.3227***	-	2.0579***	0.0741
Brunei	-6.5920***	-0.7035***	7.5239***	2.5039***	1.1177	-0.8148***	-0.4661
China	-7.8865***	-0.3522*	3.3215	2.9231***	-0.8594	-0.8756***	0.2838
Japan	1.7262	0.0813	-2.8033***	-0.2568	-0.4289	4.5685***	-0.1776
Hong Kong	-5.3849**	0.6025***	3.1582**	-0.7540**	0.4505	3.3403***	3.1740***

Note: ***, ** and* denote significant at 1%, 5% and 10% level respectively.

Table 4 Short-run UECM Results of the ASIAN7

Variable	Country						
	Singapore	Indonesia	Thailand	Brunei	China	Hong Kong	Japan
ΔLTA_{ijt-1}	-0.0048	0.0300**	0.3945***	-	0.0971	-	1.4483***
ΔLTA_{ijt-2}	-	-	-	-	-	0.3740***	0.7992***
ΔLTA_{ijt-3}	-	-	-	0.5043**	-	-	-
ΔLTP_{ijt}	-	-	-2.8085***	2.3383**	-1.4484***	-4.3839***	-
ΔLTP_{ijt-1}	7.7334***	-2.1305***	-	-	-	-	-
ΔLTP_{ijt-2}	-	-	-	-	-	-	1.3159
ΔLTC_{ijt}	-	-	0.4266***	-	-	0.2659*	-
ΔLTC_{ijt-1}	-	-	-0.3906**		-	-	-
ΔLTC_{ijt-2}	0.1085	-	-	-	0.3530**	-	-
ΔLSP_{izt} (Singapore)	-	-	4.9740***	-	2.1107***	-	-1.7042
ΔLSP_{izt-1} (Singapore)	-	-	-	1.0690	-	-	-
ΔLSP_{izt} (Indonesia)	-	-	-	-	-	-	-
ΔLSP_{izt-1} (Indonesia)	-1.5078**	-	-	-1.6678***	-1.6653***	-	-
ΔLSP_{izt-2} (Indonesia)	-	-	-	-0.8337***	-	-	-
ΔLSP_{izt} (Thailand)	-	-	-	-	-	-	-
ΔLSP_{izt-1} (Thailand)	-5.5672***	-	-	-	-	1.7562**	-
$\Delta LRPI_{it}$	-3.9191***	-	1.2680***	-0.4624**	-	-	-
$\Delta LRPI_{it-1}$	-	4.3155**	-	-	0.5064**	-	-7.8810***
$\Delta LRPI_{it-2}$	-	-	-	-	-	2.1074**	-
ΔLER_{ijt}	2.4672***	-	0.5301	-	-	-	-
ΔLER_{ijt-1}	-	-	-	-	-	-	-
D97	-0.8454***	-0.3086	-0.4884***	-	-	-0.4714**	-0.3255**
D03	-0.2802**	-0.5698**	-	-0.4712***	- 0.2279	-	-
Dianostic test							
$LM_{(SC)}$	2.0566 (0.1674)	0.7446 (0.3989)	2.4751 (0.1352)	2.3542 (0.1234)	1.1440 (0.3465)	1.0734 (0.3666)	0.9753 (0.8399)
ARCH test	2.0976 (0.1423)	0.0909 (0.7649)	0.0472 (0.8294)	1.0565 (0.3859)	0.4909 (0.6174)	0.5661 (0.5743)	0.5308 (0.5940)
$LM_{(N)}$	0.6770 (0.7128)	19.6367 (0.0000)	0.9027 (0.6368)	0.4007 (0.8184)	0.7229 (0.4225)	0.5013 (0.4720)	0.3814 (0.0411)
RRT	0.0415 (0.8414)	0.7549 (0.3957)	0.0237 (0.8795)	2.5965 (0.1294)	1.3432 (0.2645)	1.7187 (0.2084)	2.6827 (0.1209)
Cusum	No structural break						

Note: ***, ** and* denote significant at 1%, 5% and 10% level of significance.

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