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Does price matter? The FMOLS and DOLS estimation of industrial countries tourists outbound to four ASEAN countries

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ABSTRACT

To provide the alternative idea of tourism demand research, instead of exploring tourism demand of panel group of origins to particular destination country, this paper adopts panel analysis to find long run relationship between number of tourists outbound from 8 rich countries to the panel of 4 ASEAN countries namely Malaysia, Philippines, Singapore and Thailand. Five statistic tests for panel unit root and ten types of panel cointegration test have ensured the appropriation of data to be estimated. The panel individual FMOLS test and group mean FMOLS and DOLS test have led to find the positive direction of price competitiveness and relative economic growth with number of outbound tourists. The results reveal that Singapore is mostly advantage compare to its neighbors in term of relative price and is not different from Malaysia and Thailand in term of relative economic growth. Philippines however need to accelerate its tourism promotion to enhance international tourist arrivals.

Keywords: Dynamic panel data, Tourism demand, FMOLS and DOLS Panel group mean estimation

JEL Classification: C33, F41, F42, F43, O57

1. Introduction

Tourism is defined as the sector that consumes less resources and the appropriate sector to be used as the acceleration of economic growth. Four ASEAN countries namely Malaysia, Philippines, Thailand and Singapore have been also employed tourism as one of the source of growth. These four countries are considered as the competitors among each other in tourism arena. Since each country has the similar tourism endowments, for particular beautiful beaches, rich cultures and delightful taste of culinary. Additional, the most beneficial factor of ASEAN countries that affects the decision of tourists from around the globe is the significant lower tourism prices or cost of living. Larry et al (2000) pointed out that the price competitiveness of Indonesia, Malaysia, and Thailand are 527.90, 260.30 and 336.70 in 100 point bases respectively compare to tourism price of Australia. In the other hand, the competitive price index of industrial countries as US, UK and Japan are respectively 84.80, 70.10 and 65.40 which are prominent lower than the exotic beach ASEAN countries. This key variable is one of the major determinants that inbound international tourists take as decision factor to choose their favorite destinations.

Plenty of studies devote their attempt to discover the factor affecting tourism demand in a certain country for example the latest papers of Chu (2011). However, most results of tourism demand conveyed the impacts of country characteristics of national income, exchange rates as well as traveling cost are the significant variables determine the arrival of international tourists. However, there are few researches deviate the objectives to study the choices of outbound countries. Those few studies are Shen et al (2011), Coshall and Charlesworth (2011) and Euginio and Campos (2010). Small numbers of studies have searched for the factors that persuade tourist from a rich country to visit the similar tourism endowments countries. To narrow this gap, this study will take the relative price of destinations and origin countries to be the substantial factor that influences the favorite choices of rich counties and use the panel model that is able to extract the magnitude of preference deviation and long run relationship in order to obtain the concrete role of price competitiveness in tourism sector. This paper will be presented as following; sector 2 will briefly summarize related literatures. Sector 3 will figure out the tourism roles to ASEAN economy. Data and estimation methodologies will be provided in sector 4 and estimation technique will be presented in sector 5. The results of estimation will be organized in sector 6. And finally, sector 7 will offer remarking conclusions and policy suggestions.

2. Literature review

This section will present the related studies of tourism researches. Most studies have focused on tourism demand by citing factor affecting number of arrival tourism. Song and Li (2008) reviewed that there are thousand studies have shed the light to tourism demand study. Most of researches devoted the focusing on the factors influence the motive of destinations choices and various methodologies are adopted. First stage of discovery relies on time-series data analysis, the model is autoregressive moving average model (ARIMA) which originated by Box and Jenkins (1970). The other sample of ARIMA models studies including Cho (2001), Akal (2004), Gil-Alana (2005)

Chang et al (2009) and Lin et al (2011). To put the matter of seasoning into the model, seasoning ARIMA (SARIMA) was also used for instance Lim and McAleer (2000) have studied on tourism demand of Austria and the recent study of Nanthakuma (2012) who forecast the tourism demand to Malaysia. In order to capture volatility from shock, the application of Generalized Autoregressive Conditional Hetroskedasticity (GARCH) model which applied from financial data have been adopted in tourism demand research, Chan et al (2005) explored tourism demand of Australia, Divino and McAleer (2010) for Peru and the most latest of Nicolau (2012) who examined tourism demand of Spain.

To validate the causality of tourism demand and its affecting factors, the econometric approach with dynamic time-varying model is taken place, Wong et al (2006). Additional, Error Correction Model, ECM, offers the ability to examine both short and long run relationship is widely applied as the study of Ouerfelli (2008), Bonham et al (2009) and the updated study of Wu et al (2012) are the examples. Up to present, the long run estimation of individual and mean group panel of tourism demand is the major objective of study. However, most of studies devote the interested country to be the destination and found out the factors determine the inbound tourists, Chaiboonsri et al (2010) and Unthong and Kaosa-ard (2009). To form the relationship of tourism demand model, one of significant factors found to be the determinants of tourism destination is price competitiveness and was emphasized in the studies of Larry et al (2000) and Han et al (2006).

3. Role of tourism to 4 ASEAN economies

The competition in tourism among four ASEAN countries massively exists. Malaysia has focused the competitiveness on the diversity of tropical wildlife. In Philippine, the major preferable factors are the beautiful islands, tasty culinaries as well as the brilliant city of Manila. Singapore, the small island provides the modern and convenient facility as the hub for transportation which links the Western and Eastern side with the down under and many of tourists use Singapore as the transit station, however they also spend few days to explore the within a day reached country. Thailand has firstly launched the Amazing Thailand campaign in 1998/1999. The event underscored the country's image as a peaceful, hospitable and a year-round tourism destination with high quality of value-for-money products and services. From the campaign, Thailand obtained the huge success for inbound tourists traveling in to the kingdom. The achievement of Thailand tourism has reduced the country from the severity of 1997 financial crisis. Many of travelers familiar with the stunning beach, exotic food and nightlife, the spending in Thailand is worth every penny (Rittichainuwat et al, 2001)

Tourism sector contributes the vast benefits to ASEAN countries. For decades, their economy is mainly supported by foreign currency from the tourist inflow. In 2010, the contribution of tourism income to GDP of Malaysia, Philippine, Singapore and Thailand are 38.10, 22.92, 18.11 and 49.39 bill US$ respectively. Malaysia and Thailand enjoy the benefits greater than the rest of two countries. Additional the tourism sector also well account for ASEAN employment. The data reveals that millions of labor forces in Thailand are working in tourism related industry.

TABLE 1. the contribution of tourism sector to 4 ASEAN economies

Year	Malaysia		Philippine		Singapore		Thailand	
	US$ (bill)	Employment (Mill)	US$ (bill)	Employment (Mill)	US$ (bill)	Employment (Mill)	US$ (bill)	Employment (Mill)
1995	17.36	0.48	12.03	0.55	12.75	0.08	23.52	1.57
1996	21.82	0.55	13.22	0.66	13.12	0.08	28.65	1.48
1997	23.10	0.53	14.92	0.77	14.53	0.08	29.99	1.61
1998	16.84	0.49	16.58	0.90	14.52	0.08	29.95	1.68
1999	19.78	0.61	19.04	0.69	14.45	0.08	31.96	1.64
2000	22.47	0.43	19.07	0.84	13.78	0.08	36.37	1.80
2001	24.35	0.54	19.50	0.88	9.88	0.08	37.29	1.90
2002	24.99	0.56	20.40	0.91	11.62	0.07	41.04	1.96
2003	23.89	0.50	19.81	0.86	10.47	0.05	42.16	1.81
2004	27.44	0.59	23.73	0.98	13.96	0.07	46.62	2.00
2005	29.81	0.62	24.86	1.00	14.64	0.08	44.42	1.76
2006	30.84	0.62	26.14	0.98	14.67	0.08	49.64	1.97
2007	38.26	0.76	27.48	0.97	17.94	0.09	51.42	1.96
2008	35.86	0.70	25.23	0.90	17.18	0.10	53.37	2.06
2009	37.95	0.77	21.53	0.77	17.37	0.08	49.02	1.95
2010	38.10	0.74	22.92	0.80	18.11	0.09	49.39	1.86

Source: World travel and tourism council (WTTC)

4. Data and model specification

Since the massive of studies devote their attempt to explore the factors affecting inbound arrival to the specific country as a panel basis. This study will inversely explore the choices of preferences of rich countries to the similar tourism endowments destinations. The main difference of this study from the previous traditional tourism demand researches is depicted in Figure.1

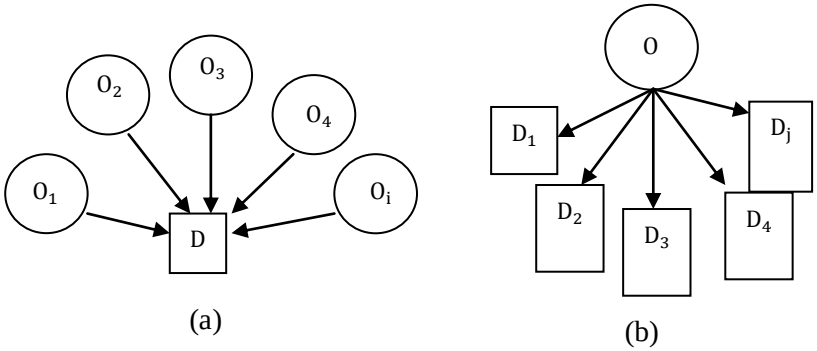

Figure1**.** Conceptual study on tourism flows of panel basis

(a) The traditional studies in tourism demand

(b) The concept of tourism demand in this study

O is origin country and D is destination country

The estimation will be separately made for eight panel equations of industrial countries i , Canada, Denmark, Finland, France, Germany, South Africa, United Kingdom and

USA. Each equation consists of four panels for ASEAN countries j, Malaysia, Philippines, Singapore and Thailand. To form the balance panel and due to the availability of data, the monthly data during 2000-2007 from Reuter-ecowin database is utilized.

To validate long run relationship between tourism and relative price competitiveness, the specified model of study is constructed as following:

$$\mathrm{LnOUT_{ijt}} = \alpha_j + \beta_j \mathrm{LnRCL_{ijt}} + \mathrm{LnTVC_{ijt}} + \mathrm{LnRPI_{ijt}} + u_{ijt} \quad (1)$$

$\mathrm{LnOUT_{ijt}}$ is natural logarithm of number of outbound tourists from origin country i to destination country j on particular month t.

$\mathrm{LnRCL_{ijt}}$ is natural logarithm of relative cost of living between original country i and destination country j. The comparison of each panel country will be measured as the price competitiveness for the specified original country. Follow Wong et al (2006) and Wong et al (2007), the relative cost of living index of each country compare to the origin countries is computed by:

$$\mathrm{LnRCL_{ijt}} = \mathrm{Ln}\left[\frac{\mathrm{CPI_{it}}/\mathrm{CPI_{jt}}}{\mathrm{EXR_{it}}/\mathrm{EXR_{jt}}}\right] \quad (2)$$

CPI is Consumer price index and EXR is exchange rate.

$\mathrm{LnTVC_t}$ is natural logarithm of monthly jet fuel wholesale price to proxy for air traveling cost as the suggestion of Chaiboonsri et al (2010), Becken and Lennox (2011) and Schiff and Becken (2011).

$\mathrm{LnRPI_{ijt}}$ is relative production index of destination country i to origin country j. This variable is proxied for the relative economic growth between origin and destination countries, the higher of LnRPI indicates the gap of economic performance between the countries of two, thus the higher of this index should come along with the increasing in tourist outbound from country i.

$$\mathrm{LnRPI_{ijt}} = \mathrm{Ln}\left(\frac{\mathrm{PI_{it}}}{\mathrm{PI_{jt}}}\right) \quad (3)$$

5. Model estimation

To investigate the long run relationship between tourist arrival and relative price competitiveness, the cointegration technique is widely used in order to eliminate the spurious relationship that comes up with the nature of time series data. Fully Modify Ordinary Least Square (FMOLS) is accounted for the endogeneity and serial correlation problem in cointegration regression, hence the estimated parameter is considered as unbiased (Philips and Hanson, 1990). Additional, De Bois et al (2007) and Pedroni (2000) stressed that using panel FMOLS will satisfy the size of observation even the small number of panels that less than number of years and heterogeneity is also allowed to be captured (Witt et al, 2003).

Estimating the long run relationship of FMOLS, the procedure of estimating has to be arranged as following. First, the stationary property of time series of each data must be tested to ensure the unit root is presence. Second, after testing of stationary, the

cointegration between all of interested variables must be conducted. Last step of estimation is to complete the study of relationship between outbound tourists from industrial countries to ASEAN countries, the coefficient of each variable will be estimated by using FMOLS method. And to emphasize the relationship for panel group, both FMOLS and Dynamic Ordinal Least Square (DOLS) group mean estimation will be validated.

5.1 Panel unit root test

Previously the unit root test is based on the traditional method of time series data by the Augmented Dickey-Fuller (ADF) test of Dickey and Fuller (1979). However, if the data is combined to panel, the numbers of methodologies are well developed. In this paper, the panel unit root test of Levin-Lin-Chu (2002, LLC), Breitung (2000), Im-Parasan-and Shin (2003, IPS), PP Fisher Chi-square test (Mandala and Wu, 1999), ADF Fisher Chi-square test (ADF-Fisher) and Hadri (1999) are adopted.

1) LLC-test offers the panel based ADF test. This method's major assumption is the homogeneity in the dynamic relationship of Autoregressive (AR) coefficients for all panel members. And each member in panel shares the similar AR(1) coefficient, however, LCC allows for individual and time effect as well as time trend. LLC-test restricts the identical across cross-sectional of ASEAN countries in the following equation:

$$\Delta y_{it} = c_{it} + \gamma_i y_{i,t-1} + \sum_{i=1}^{k} c_j \Delta y_{i,t-j} + e_{it} \quad (3)$$

$t = 1,2,3,..T$ is time period
n=1,2,3,..N is number of panels

The null hypothesis of LLC–test is $H_0: \gamma_1 = \gamma_2 = \gamma_i$ against the alternative hypothesis of $H_a: \gamma_1 \neq \gamma_2 \neq \gamma_i$ with the t-statistic:

$$t_\gamma = \frac{\hat{\gamma}}{s.e(\hat{\gamma})} \quad (4)$$

2) Brietung constructed t-test to test panel unit root by generating the standardized process and removing the AR part of the model. Therefore, according to Breitung:

$$\Delta y_{it} = \left[\Delta y_{it} - \sum_{k=1}^{\rho_i} \gamma_{ik} \Delta y_{i,t-k}\right]/S_i \quad (5)$$

$$\tilde{y}_{i,t-1} = \left[y_{i,t-1} + \sum_{k=1}^{\rho_i} \gamma_{ik} \Delta y_{i,t-k}\right]/S_i \quad (6)$$

Where S_i is the estimated standard error and transformed as following:

$$\Delta y_{it} = \sqrt{\frac{(T-t))}{T-t+1}}\left[\Delta y_{it} \frac{\Delta y_{i,t+1} + \cdots + \Delta y_{i,t+T}}{T-1}\right] \quad (7)$$

$$\Delta y_{i,t-1} = y_{i,t-1} - c_{i,t} \quad (8)$$

$$C_{i,t} = \begin{cases} 0 : \text{If no intercept or trend} \\ y_{i,1} : \text{With intercept and no} - \text{trend} \\ y_{i,t} - \left(T^{-1}(T-1)\right)y_{i,T} : \text{With intercept and trend} \end{cases} \quad (9)$$

3) IPS-test is used to test the same null and alternative hypothesis as LLC base on the mean group approach. IPS proposed the use of the panel-mean t statistic $(\bar{t})$ to test the null hypothesis. The statistic $\bar{t}$ is computed in following equation:

$$\bar{t} = \frac{\sqrt{N}(\bar{t}_{NT} - \mu_T)}{\sqrt{\sigma_T}} \quad (10)$$

$\bar{t}_{NT} = \sum_{i=1}^{N} t_{\rho_i}$, and μ_T and σ_t are the mean and variance of each t-statistic for σ. IPS test used $(\bar{t})$ to compute the following $\bar{Z}$ statistic:

$$\bar{Z} = \frac{\sqrt{N}(\bar{t} - E(\bar{t}))}{\sqrt{var(\bar{t})}} \quad (11)$$

$\bar{Z}$ approached to standard normal distribution. Base on Monte Carlo experiment results, IPS showed the more favorable finite sample properties that the LLC test.
4) Maddala and Wu used p-value of individual to test for t-statistic and combined to the panel concept. The chi-square distribution with two degree of freedom has a form:

$$\lambda = -2\sum_{i=1}^{N} Log\pi_i \quad (12)$$

π_i is the p-value of the test statistic in panel i.
5) Hadri (1999) argued that the null hypothesis should be reverse in order to become the stationary for the stronger power. Hadri used the Lagrange Multiplier (LM) as a criterion for testing the null. The LM statistic is calculated as follow:

$$\widehat{LM} = \frac{1}{N}\sum_{i=1}^{N}\left[\frac{\frac{1}{T^2}\sum_{t=1}^{T} S_{i,t}^2}{\hat{\sigma}_\varepsilon^2}\right], S_{i,t}^2 = \sum_{i=1}^{j} \hat{\varepsilon}_{i,t} \quad (13)$$

$\hat{\sigma}_\varepsilon^2$ is the consistent Newey and West (1987) estimate of the long-run variance of the disturbance terms. This paper uses these three panel unit root test as the means to verify the stationary of panel data series in the models.

5.2 Panel cointegration test

After verifying the level of stationary of every variable in the model, the cointegration test must be examined in order to ensure the long-run relation between dependent variables is existence. Follow Pedroni (1997, 1999), the statistics are divided into two groups, group one is panel cointegration statistics which are constructed by summing numerator and denominator terms separately over the N dimension. The group of

statistics including, panel –v, panel-ρ , panel pp and panel ADF statistics. Another group, group mean panel statistic, in the other hand, are the between dimension base statistic which constructed by dividing numerator by denominator before summing. The seven panel cointegration statistics are provided as equation 14-20.

1) Panel v-statistic:

$$T^2N^{3/2}Z_{\hat{V}_{N,T}} \equiv T^2N^{3/2}\left[\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{L}_{11i}^{-2}\hat{e}_{i,t-1}^2\right]^{-1} \quad (14)$$

2) Panel ρ- statistic*:*

$$T\sqrt{N}Z_{\hat{V}_{N,T}} \equiv T\sqrt{N}\left[\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{L}_{11i}^{-2}\hat{e}_{i,t-1}^2\right]^{-1}\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{L}_{11i}^{-2}\left[\hat{e}_{i,t-1}\ddot{A}\hat{L}_{11i}^{-2}\hat{e}_{i,t}-\hat{\ddot{e}}_i\right] \quad (15)$$

3) Panel pp -statistic:

$$Z_{PP_{N,T}} \equiv \hat{O}_{N,T}^2\left[\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{L}_{11i}^{-2}\hat{e}_{i,t-1}^2\right]^{-\frac{1}{2}}\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{L}_{11i}^{-2}\left[\hat{e}_{i,t-1}\ddot{A}\hat{L}_{11i}^{-2}\hat{e}_{i,t}-\hat{\ddot{e}}_i\right] \quad (16)$$

4) Panel ADF-statistic:

$$Z_{ADF_{N,T}} \equiv \tilde{S}_{NT}^{*2}\left[\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{L}_{11i}^{-2}\hat{e}_{i,t-1}^2\right]^{-\frac{1}{2}}\sum_{i=1}^{N}\sum_{t=1}^{T}\hat{L}_{11i}^{-2}\hat{L}_{11i}^{-2}\hat{e}_{i,t}-\ddot{A}\hat{\ddot{e}}_{i,t}^{*} \quad (17)$$

5) Group ρ-statistic:

$$NT^{-1/2}\hat{Z}_{\hat{n}_{N,T^{-1}}} \equiv TN^{-1/2}\sum_{i=1}^{N}\left[\sum_{t=1}^{T}\hat{e}_{i,t-1}^2\right]^{-1}\sum_{t=1}^{T}\left[\hat{e}_{i,t-1}\ddot{A}\hat{e}_{i,t}-\hat{\ddot{e}}_i\right] \quad (18)$$

6) Group pp-statistic:

$$NT^{-1/2}\hat{Z}_{PP_{N,T^{-1}}} \equiv N^{-1/2}\sum_{i=1}^{N}\left[\hat{O}_i^2\sum_{t=1}^{T}\hat{e}_{i,t-1}^2\right]^{-1/2}\sum_{t=1}^{T}\left[\hat{e}_{i,t-1}\ddot{A}\hat{e}_{i,t}-\hat{\ddot{e}}_i\right] \quad (19)$$

7) Group ADF-statistic:

$$NT^{-1/2}\hat{Z}_{ADF_{N,T^{-1}}} \equiv N^{-1/2}\sum_{i=1}^{N}\left[\sum_{t=1}^{T}\hat{S}_i^{*}\hat{e}_{i,t-1}^2\right]^{-1/2}\sum_{t=1}^{T}\hat{e}_{i,t-1}^{*}\hat{\ddot{A}}\hat{e}_{i,t-1}^{*} \quad (20)$$

$$\hat{\ddot{e}}_i = \frac{1}{T}\sum_{S=1}^{K_i}\left[1-\frac{S}{K_i-1}\right]\sum_{t=S+1}^{T}\hat{\mu}_{i,t}\hat{\mu}_{i,t-S} \quad (21)$$

$$\hat{S}_i^2 = \frac{1}{T}\sum_{t=1}^{T}\hat{\mu}_{i,t}^2 \quad (22)$$

$$\hat{O}_i^2 = \hat{S}_i^2 + 2\hat{\ddot{e}}_i \quad (23)$$

$$\hat{O}_{N,T}^2 = \frac{1}{N}\sum_{i=1}^{N}\hat{L}_{11i}^2\hat{O}_i^2 \quad (24)$$

$$\hat{S}_i^{*2} = \frac{1}{T}\sum_{t=1}^{T}\hat{\mu}_{i,t}^{*2} \quad (25)$$

$$\tilde{S}_{N,T}^{*2} = \frac{1}{T}\sum_{i=1}^{N}\hat{S}_{i,t}^{*2} \quad (26)$$

$$\hat{L}_{11i}^{2} = \frac{1}{T}\sum_{t=1}^{T}\hat{\varsigma}_{i,t}^{2} + \frac{2}{T}\sum_{S=1}^{K_i}\left[1 - \frac{S}{K_i+1}\right]\sum_{t-S+1}^{T}\hat{\zeta}_{i,t}\hat{\zeta}_{i,t-S} \quad (27)$$

$\hat{\mu}_{i,t}$, $\hat{\mu}_{i,t}^{*}$ and $\hat{\zeta}_{i,t}$ are obtained from the regressions:

$$\hat{e}_{i,t} = \hat{a}_i\hat{e}_{i,t-1} \quad (28)$$

$$\hat{e}_{i,t} = \hat{a}_{i,k}\hat{e}_{i,t-1} + \sum_{k=1}^{K_i}\tilde{a}_{i,k}\ddot{A}\hat{e}_{i,t-k} + \hat{u}_{i,t}^{*} \quad (29)$$

$$\ddot{A}y_{i,t} = \sum_{m=1}^{M}\hat{b}_{m_1}\ddot{A}x_{mi,t} + \hat{\zeta}_{i,t} \quad (30)$$

Besides the cointegration test of Pedroni, this paper also utilizes the Kao test (Kao, 1999) which specifies the intercept and homogenous coefficient from the regression. Kao offers the null hypothesis that the residuals from estimation are non-stationary or there is no cointegration between set of variables. Manddala and Wu (1999) also pointed out the methodology to combine both cross-section and time series statistic test to prove the full panel of cointegration. Two statistics, Fisher test from the trace test and Fisher test from the maximum eigen value are tested to confirm the cointegration among variables in the model.

5.3 Panel FMOLS and DOLS estimation

Since OLS estimation is inconsistent in the cointegration time series data, bias could be reduced by the magnitude of the cross section (Dreger and Reimer, 2005). The solving methodologies are either using the fully modified OLS or dynamic OLS as the estimation method. FMOLS is a non-parametric estimation that is able to handle with the problem of serial correlation. DOLS in the other hand is the parametric estimation which takes lagged of first different term in order to control for the endogenous effect (Saikkonen, 1991). Consider the following simple panel regression model:

$$y_{it} = \alpha_i + \beta_i x_{it} + \varepsilon_{it} \quad (31)$$

$$x_{it} = x_{i,t-1} + \varepsilon_{it} \quad (32)$$

From equation (32), Kao and Chiang (2000) expressed that FMOLS and DOLS are asymptotically normal. The coefficient of FMOLS estimator could be obtained from these following equations:

$$\hat{\beta}_{FMOLS} = \left[\sum_{i=1}^{N}\sum_{t=1}^{T}(x_{it} - \bar{x}_{it})'\right]^{-1}\left[\sum_{i=1}^{N}(\sum_{t=1}^{T}(x_{it} - \bar{x}_{it}))y_{it}^{+} + T\hat{y_i}\right] \quad (33)$$

$\hat{y_i}$ is the serial correlation term and y_{it}^{+} is the transformation of y_{it} in for eliminating endogeneity problem. For the lagged including equation:

$$y_{it} = \alpha_i + x_{it}\sum_{j=-k}^{ki}\gamma_{ik}\Delta x_{i,t-k} + \varepsilon_{it} \quad (34)$$

The coefficient of DOLS estimator is:

$$\widehat{\beta}_{DOLS} = \sum_{i=1}^{N}[\sum_{t=1}^{T} z_{it}z'_{it}]^{-1}\left[\sum_{t=1}^{T} z_{it}\hat{z_{it}}\right] \quad (35)$$

Where z_{it} is 2(K+1) x1, $\hat{z_{it}} = (x_{it} - \bar{x}_i)$

The estimation methods of FMOLS and DOLS were mostly developed by Pedroni (2000). To study the long-run relationship of exogenous variables of relative cost of living, travel cost and relative income of origin and destination countries, the research estimates FMOLS for individual and compares both FMOLS and DOLS for panel group.

6. The results of study

To illustrate all of results, the research will orderly display the results by offering the finding of panel unit root test, panel cointegration test, individual FMOLS estimation and compare the result of panel group between FMOLS and DOLS estimation.

6.1 Results of panel unit root test

This paper adopts six methods of testing whether or not the natural log of variables, outbound tourist from rich countries to each panel ASEAN country(LnOUT), relative cost of living(LnRCL), travel cost of jet fuel price(LnTVC) and relative producer index (LnRPI) have a unit root(non-stationary) for level test and stationary in first difference test. The panel data of outbound tourists of eight rich countries including Canada, Denmark, Finland, France, Germany, South Africa, UK and United State are separately tested. For the six methods LCC, Breitung, IPS, ADF, PP and Hadri, the first five methods have a null hypothesis that the panel data has a unit root or non-stationary series. The last method Hadri test however, the null is no unit root in panel series. The results of panel unit root test are presented in TABLE 2. For level testing, most of variables unable to reject the null for at least three methods or more. Additional, for first difference, only few methods are unable to reject the null of non-stationary. Thus, for 8 sets of panel model with 4 variables, all of variables are considered as I (1) then we can move forward to panel cointegration test.

TABLE 2 Panel unit root test

Country	Variable	Level						1st Difference					
		LLC	Breitung	IPS	ADF	PP	Hadri	LLC	Breitung	IPS	ADF	PP	Hadri
Canada	LnOUT	2.37 (0.99)	0.83 (0.79)	-2.57*** (0.00)	26.56*** (0.00)	53.19*** (0.00)	5.23*** (0.00)	32.32 (1.00)	-3.97*** (0.00)	-7.25*** (0.00)	72.09*** (0.00)	184.99*** (0.00)	-0.84 (0.79)
	LnRCL	1.43 (0.92)	1.22 (0.88)	1.06 (0.85)	4.02 (0.85)	4.06 (0.85)	6.45*** (0.00)	-19.65*** (0.00)	-5.09*** (0.00)	-17.13*** (0.00)	181.23*** (0.00)	180.24*** (0.00)	-0.21 (0.58)
	LnRPI	2.85 (0.99)	1.88 (0.97)	0.97 (0.83)	2.88 (0.94)	4.92 (0.77)	2.64*** (0.00)	-20.31*** (0.00)	-5.37*** (0.00)	-20.94*** (0.00)	222.52*** (0.00)	223.60*** (0.00)	0.86 (0.19)
	LnTVC	-0.33 (0.37)	-0.56 (0.28)	0.47 (0.68)	4.11 (0.85)	4.22 (0.84)	6.80*** (0.00)	-18.52*** (0.00)	-13.88*** (0.00)	-14.84*** (0.00)	153.90*** (0.00)	149.92*** (0.00)	-0.16 (0.56)
Denmark	LnOUT	-0.24 (0.40)	1.20 (0.88)	-4.19*** (0.00)	49.96*** (0.00)	58.67*** (0.00)	2.83*** (0.00)	6.11 (1.00)	-1.72* (0.04)	-8.56*** (0.00)	83.55*** (0.00)	183.33*** (0.00)	-0.16 (0.56)
	LnRCL	1.67 (0.95)	1.48 (0.93)	3.40 (1.00)	0.63 (1.00)	0.71 (1.00)	9.87*** (0.00)	-18.04*** (0.00)	-6.03*** (0.00)	-14.53*** (0.00)	149.83*** (0.00)	145.51*** (0.00)	3.18 (0.00)
	LnRPI	13.78 (1.00)	2.96 (0.99)	4.14 (1.00)	0.09 (1.00)	208.08*** (0.00)	11.35*** (0.00)	154.12 (1.00)	1.32 (0.91)	-6.07*** (0.00)	50.03*** (0.00)	73.68*** (0.00)	-0.68 (0.75)
	LnTVC	-0.33 (0.37)	-0.56 (0.28)	0.47 (0.68)	4.11 (0.85)	4.22 (0.84)	6.80*** (0.00)	-18.52*** (0.00)	-13.88*** (0.00)	-14.84*** (0.00)	153.90*** (0.00)	149.92*** (0.00)	-0.16 (0.56)

Notes: 1) Panel data including four ASEAN countries, Malaysia, Philippines, Singapore and Thailand
2) All variables included are natural logarithm
3) The number in parentheses indicate p-value
4) ***,**,* denote rejection of null hypothesis at 1%, 5% and 10% respectively
5) The null hypothesis is the panel data series has a unit root (non-station) except for Hadri that the null is no-unit root (stationary)

TABLE 2 Panel unit root test (cont.)

Country	Variable	Level						1st Difference					
		LLC	Breitung	IPS	ADF	PP	Hadri	LLC	Breitung	IPS	ADF	PP	Hadri
Finland	LnOUT	8.65 (1.00)	0.84 (0.80)	-2.33*** (0.01)	26.58*** (0.00)	33.45*** (0.00)	4.61*** (0.00)	-10.30*** (0.00)	-8.47*** (0.00)	-16.21*** (0.00)	160.37*** (0.00)	187.85*** (0.00)	-2.04 (0.98)
	LnRCL	1.53 (0.93)	1.24 (0.89)	3.05 (0.99)	0.82 (0.99)	1.00 (0.99)	9.81*** (0.00)	-18.40*** (0.00)	-6.35*** (0.00)	-14.57*** (0.00)	150.33*** (0.00)	145.44*** (0.00)	2.28*** (0.01)
	LnRPI	11.41 (1.00)	1.59 (0.94)	2.64 (0.99)	0.47 (1.00)	103.92*** (0.00)	5.33*** (0.00)	99.88 (1.00)	0.14 (0.56)	-5.64*** (0.00)	45.47*** (0.00)	73.68*** (0.00)	2.97*** (0.00)
	LnTVC	-0.33 (0.37)	-0.56 (0.28)	0.47 (0.68)	4.11 (0.85)	4.21 (0.84)	6.79*** (0.00)	-18.52*** (0.00)	-13.88*** (0.00)	-14.84*** (0.00)	153.90*** (0.00)	149.92*** (0.00)	-0.17 (0.57)
France	LnOUT	-4.01*** (0.00)	1.01 (0.84)	-4.08*** (0.00)	47.40*** (0.00)	73.29*** (0.00)	8.05*** (0.00)	32.55 (1.00)	-0.60 (0.28)	-8.31*** (0.00)	82.11*** (0.00)	131.76*** (0.00)	2.55*** (0.00)
	LnRCL	1.52 (0.94)	1.25 (0.89)	3.21 (0.99)	0.79 (0.99)	0.88 (0.99)	9.54*** (0.00)	-18.40*** (0.00)	-6.49*** (0.00)	-14.65*** (0.00)	151.33*** (0.00)	147.15*** (0.00)	3.61*** (0.00)
	LnRPI	2.59 (0.99)	-0.55 (0.29)	1.59 (0.94)	1.65 (0.99)	43.58*** (0.00)	8.67*** (0.00)	-19.36*** (0.00)	-7.63*** (0.00)	-23.44*** (0.00)	244.60*** (0.00)	168.13*** (0.00)	0.29 (0.38)
	LnTVC	-0.33 (0.37)	-0.57 (0.28)	0.48 (0.68)	4.11 (0.85)	4.22 (0.84)	6.79*** (0.00)	-18.52*** (0.00)	-13.88*** (0.00)	-14.84*** (0.00)	153.90*** (0.00)	149.92*** (0.00)	-0.17 (0.57)

Notes: 1) Panel data including four ASEAN countries, Malaysia, Philippines, Singapore and Thailand
2) All variables included are natural logarithm
3) The number in parentheses indicate p-value
4) ***,**,* denote rejection of null hypothesis at 1%, 5% and 10% respectively
5) The null hypothesis is the panel data series has a unit root (non-station) except for Hadri that the null is no-unit root (stationary)

TABLE 2 Panel unit root test (cont.)

Country	Variable	Level						1st Difference					
		LLC	Breitung	IPS	ADF	PP	Hadri	LLC	Breitung	IPS	ADF	PP	Hadri
Germany	LnOUT	3.23 (0.99)	-0.29 (0.39)	-4.42*** (0.00)	45.19*** (0.00)	47.23*** (0.00)	4.36*** (0.00)	16.47 (1.00)	-1.86** (0.03)	-6.75*** (0.00)	62.47*** (0.00)	176.99*** (0.00)	-1.22 (0.89)
	LnRCL	1.41 (0.92)	0.94 (0.83)	2.85 (0.99)	1.09 (0.99)	1.34 (0.99)	9.54*** (0.00)	-18.89*** (0.00)	-7.02*** (0.00)	-14.76*** (0.00)	152.74*** (0.00)	148.06*** (0.00)	2.92*** (0.00)
	LnRPI	3.65 (1.00)	3.09 (0.99)	5.51 (1.00)	0.03 (1.00)	0.41 (1.00)	11.66*** (0.00)	-20.09*** (0.00)	-15.37*** (0.00)	-25.73*** (0.00)	259.28*** (0.00)	262.31*** (0.00)	2.09*** (0.02)
	LnTVC	-0.33 (0.37)	-0.57 (0.28)	0.48 (0.68)	4.11 (0.85)	4.22 (0.84)	6.79*** (0.00)	-18.52*** (0.00)	-13.88*** (0.00)	-14.84*** (0.00)	153.90*** (0.00)	149.92*** (0.00)	-0.17 (0.57)
South Africa	LnOUT	1.61 (0.95)	-0.26 (0.40)	-5.53*** (0.00)	66.31*** (0.00)	148.60*** (0.00)	2.66*** (0.00)	11.64 (1.00)	-3.56*** (0.00)	-13.61*** (0.00)	141.57*** (0.00)	152.91*** (0.00)	-1.74 (0.96)
	LnRCL	0.82 (0.79)	-0.49 (0.31)	2.08 (0.98)	1.38 (0.99)	1.53 (0.99)	4.89*** (0.00)	-17.88*** (0.00)	-9.04*** (0.00)	-12.83*** (0.00)	128.50*** (0.00)	128.73*** (0.00)	4.17*** (0.00)
	LnRPI	2.26 (0.99)	0.11 (0.54)	-0.51 (0.31)	7.31 (0.50)	85.69*** (0.00)	7.19*** (0.00)	-5.02*** (0.00)	-8.35*** (0.00)	-26.77*** (0.00)	264.30*** (0.00)	97.93*** (0.00)	-1.09 (0.86)
	LnTVC	-0.33 (0.37)	-0.57 (0.28)	0.48 (0.68)	4.11 (0.85)	4.21 (0.84)	6.80*** (0.00)	-18.52*** (0.00)	-13.88*** (0.00)	-14.84*** (0.00)	153.90*** (0.00)	149.92*** (0.00)	-0.17 (0.57)

Notes: 1) Panel data including four ASEAN countries, Malaysia, Philippines, Singapore and Thailand
2) All variables included are natural logarithm
3) The number in parentheses indicate p-value
4) ***,**,* denote rejection of null hypothesis at 1%, 5% and 10% respectively
5) The null hypothesis is the panel data series has a unit root (non-station) except for Hadri that the null is no-unit root (stationary)

TABLE 2 Panel unit root test (cont.)

Country	Variable	Level						1st Difference					
		LLC	Breitung	IPS	ADF	PP	Hadri	LLC	Breitung	IPS	ADF	PP	Hadri
UK	LnOUT	-1.39* (0.08)	1.09 (0.86)	-2.85*** (0.00)	31.21*** (0.00)	48.91*** (0.00)	6.64*** (0.00)	-10.54*** (0.00)	-2.70*** (0.00)	-12.32*** (0.00)	128.61*** (0.00)	159.22*** (0.00)	0.20 (0.42)
	LnRCL	2.15 (0.98)	2.14 (0.98)	2.82 (0.99)	1.69 (0.98)	1.94 (0.98)	8.84*** (0.00)	-19.33*** (0.00)	-5.32*** (0.00)	-16.88*** (0.00)	178.14*** (0.00)	178.26*** (0.00)	2.49*** (0.01)
	LnRPI	-1.23 (0.11)	-4.99*** (0.00)	-1.73** (0.04)	13.59* (0.09)	39.19*** (0.00)	6.83*** (0.00)	-14.79*** (0.00)	-11.84*** (0.00)	-20.42*** (0.00)	218.49*** (0.00)	216.29*** (0.00)	-0.22 (0.59)
	LnTVC	-0.33 (0.37)	-0.57 (0.28)	0.48 (0.68)	4.10 (0.84)	4.21 (0.83)	6.79*** (0.00)	-18.52*** (0.00)	-13.88*** (0.00)	-14.84*** (0.00)	153.89*** (0.00)	149.92*** (0.00)	-0.17 (0.57)
USA	LnOUT	-0.52 (0.30)	1.54 (0.94)	-6.54*** (0.00)	58.23*** (0.00)	49.01*** (0.00)	6.39*** (0.00)	-2.31*** (0.01)	-3.63*** (0.00)	-10.35*** (0.00)	109.05*** (0.00)	205.38*** (0.00)	0.81 (0.21)
	lnRCL	2.15 (0.98)	2.14 (0.98)	2.82 (0.99)	1.69 (0.98)	1.94 (0.98)	8.84*** (0.00)	-19.33*** (0.00)	-5.32*** (0.00)	-16.88*** (0.00)	178.15*** (0.00)	178.26*** (0.00)	2.49 (0.01)
	LnRPI	-0.84 (0.20)	1.20 (0.88)	1.54 (0.94)	1.85 (0.98)	2.00 (0.98)	9.41*** (0.00)	-25.15*** (0.00)	-16.52*** (0.00)	-20.56*** (0.00)	218.92*** (0.00)	218.80*** (0.00)	0.85 (0.20)
	LnTVC	-0.33 (0.37)	-0.57 (0.28)	0.48 (0.68)	4.10 (0.84)	4.21 (0.84)	6.79*** (0.00)	-18.52*** (0.00)	-13.88*** (0.00)	-14.84*** (0.00)	153.89*** (0.00)	149.92*** (0.00)	-0.17 (0.57)

Notes: 1) Panel data including four ASEAN countries, Malaysia, Philippines, Singapore and Thailand
2) All variables included are natural logarithm
3) The number in parentheses indicate p-value
4) ***,**,* denote rejection of null hypothesis at 1%, 5% and 10% respectively
5) The null hypothesis is the panel data series has a unit root (non-station) except for Hadri that the null is no-unit root (stationary)

6.2 Result of panel cointegration test

Using 10 panel cointegration tests, the expected result is to find the long-run relationship among variables in each panel. Giving the null hypothesis of no-cointegration against the alternative, of cointegration, from TABLE 3, all methods of testing reveal the cointegration relation for four variables in most panels, except the panel-v test for France, UK and USA and group ADF test for Canada and Denmark. The rest of the models are considered to be cointegrated at lease at 5% level.

6.3 Results of FMOLS for individual test

From TABLE 4, there are varieties of results. First, for LnRCL, the coefficients are positive and significant for 13 out of 19 tourist flows. These directions and magnitude are: to Malaysia(2.87), Singapore(2.08) and Thailand(0.57) for Canada, to Singapore(0.53) and Thailand(0.14) for Denmark, to Malaysia(2.31) and Singapore(1.88) for Finland, to Malaysia(0.11), Singapore(0.12) and Thailand(0.26) for France, to Philippines(0.25) for Germany, and to Singapore(0.57) and Thailand(0.28) for South Africa. However, LnRCL presents the inverse direction of tourism flow from Germany to Thailand (-0.50) from South Africa to Malaysia (-0.23) and Philippines (-0.12), from UK to Thailand (-5.95) and from USA to Philippine (-0.59) and Thailand (-0.43). Another interesting result is for variable LnRPI which captures the relative wealthy between origin and destination countries. The results provide the information that 10 out of 14 tourist flows which significant at least at 10% level has the positive direction. These pairs of tourist flows including from Denmark to Singapore(0.04), from France to Malaysia(8.18) and Thailand(6.59), from South Africa to Malaysia(3.49) and Philippines(3.52), from UK to Malaysia(11.48), Philippines(8.13) and Thailand(11.42), finally, from USA to Malaysia(7.05) and Philippines (7.44).

To compare the competitiveness, this paper assigns the value according to the preferences of origin countries in TABLE 5. We found that the results are quite mixed. For variable LnRCL, among panel countries can be represented the price competitiveness between the ASEAN countries, Malaysia has a relative competitive over Singapore and Thailand for tourist from Canada and over Singapore for tourist from Finland. For France however, Malaysia seems to be fewer favorites from those two neighbors. If we put the weight equally to the magnitude of the coefficient but compare for the advantage for the preferences form industrial countries and consider the number of positive coefficients, we found that Singapore has the highest number of countries that come to Singapore when it price relative lower than the origins and follow by Thailand, Malaysia and Philippines with the number of countries 5, 4, 3 and 1 respectively. Therefore we may conclude that most rich countries prefer to travel to Singapore rather than Thailand, Malaysia and Philippines. For relative product index which proxied for the relative wealthy between origin and destination countries, number of countries that increase their travel to ASEAN countries are maximum for Malaysia, Philippines, Thailand and Singapore with the number of 5, 4, 3, and 1 respectively.

TABLE 3 Panel cointegration test

Country	Pedroni Residual Cointegration test							Kao-test	Johansen Fisher test	
	Panel v	Panel rho	Panel PP	Panel ADF	Group rho	Group PP	Group ADF	ADF	Fisher Trace test	Fisher Max-Eigen test
Canada	2.67*** (0.01)	-6.36*** (0.00)	-5.53*** (0.00)	-3.03*** (0.00)	-5.97*** (0.00)	-6.09*** (0.00)	-1.73** (0.06)	-5.98*** (0.00)	22.65*** (0.00)	26.72*** (0.00)
Denmark	2.03** (0.05)	-5.92*** (0.00)	-5.26*** (0.00)	-1.10 (0.22)	-5.38*** (0.00)	-6.03*** (0.00)	-0.73 (0.31)	-7.02*** (0.00)	94.08* (0.00)	79.51*** (0.00)
Finland	7.49*** (0.00)	-4.58*** (0.00)	-3.71*** (0.00)	5.63*** (0.00)	-4.73*** (0.00)	-4.93*** (0.00)	4.37*** (0.00)	-7.62*** (0.00)	97.24*** (0.00)	97.69*** (0.00)
France	-0.07 (0.39)	-7.95*** (0.00)	-7.44*** (0.00)	-5.99*** (0.00)	-7.81*** (0.00)	-8.54*** (0.00)	-6.55*** (0.00)	-2.96*** (0.00)	67.06* (0.00)	69.84*** (0.00)
Germany	3.56*** (0.00)	-3.89*** (0.00)	-4.12*** (0.00)	-2.30*** (0.00)	-3.01*** (0.00)	-5.12*** (0.00)	-5.83 (0.00)***	1.36* (0.09)	40.40*** (0.00)	50.46*** (0.00)
South Africa	4.68*** (0.00)	-15.10*** (0.00)	-11.54*** (0.00)	-10.14*** (0.00)	-15.70*** (0.00)	-14.05*** (0.00)	-11.70 (0.00)***	-1.84** (0.03)	46.11*** (0.00)	55.29*** (0.00)
UK	0.93 (0.26)	-8.48*** (0.00)	-7.10*** (0.00)	-7.32*** (0.00)	-6.62*** (0.00)	-6.56*** (0.00)	-5.86 (0.00)***	3.24*** (0.00)	28.00*** (0.00)	37.65*** (0.00)
USA	0.89 (0.27)	-6.83*** (0.00)	-6.06*** (0.00)	-5.14*** (0.00)	-5.94*** (0.00)	-6.21*** (0.00)	-5.03*** (0.00)	0.94 (0.17)	68.31*** (0.00)	42.27*** (0.00)

Notes: 1) Panel data including four ASEAN countries, Malaysia, Philippines, Singapore and Thailand
2) All variables included are natural logarithm
3) The number in parentheses indicate p-value
4) ***,**,* denote rejection of null hypothesis at 1%, 5% and 10% respectively

TABLE 4 the Individual FMOLS estimation of tourism inbound to ASEAN countries

Outbound from	Inbound to											
	Malaysia			Philippines			Singapore			Thailand		
	LRPI	LnTVC	lnRCL	LnRPI	LnTVC	lnRCL	LnRPI	LnTVC	lnRCL	LnRPI	LnTVC	lnRCL
Canada	3.68 (0.97)	0.69 (-1.22)	2.87** (2.19)	0.51 (-0.19)	0.44 (-0.42)	0.52 (-1.00)	-0.95 (-0.79)	0.83 (-0.72)	2.08* (1.42)	-1.69 (0.92)	0.46*** (-3.36)	0.57** (2.08)
Denmark	1.03 (0.06)	0.07*** (-4.81)	0.86 (-0.27)	-0.21*** (-2.40)	0.35*** (-4.11)	0.55 (-1.17)	0.04*** (-3.02)	0.27*** (-5.99)	0.53* (-1.41)	0.63 (-0.66)	0.24*** (-4.40)	0.14* (-1.51)
Finland	0.39 (-0.66)	0.93 (-0.24)	2.31* (1.66)	-0.59*** (-3.36)	0.38*** (-4.90)	1.06 (0.22)	-0.17** (-1.90)	0.61** (-2.07)	1.88* (1.64)	1.00 (0.00)	0.36* (-1.64)	0.27 (-0.58)
France	8.18* (1.79)	0.50*** (-2.58)	0.11* (-1.66)	1.63 (0.19)	0.22*** (-6.90)	0.64 (-1.11)	4.89 (1.03)	0.22*** (-6.53)	0.12* (-1.82)	6.59* (1.83)	0.24*** (-5.13)	0.26* (-1.74)
Germany	2.47 (0.73)	0.06*** (-2.81)	0.95 (-0.08)	-0.11 (-0.83)	0.27*** (-3.80)	0.25*** (-2.52)	0.09 (-0.82)	0.32*** (-3.76)	1.20 (0.57)	2.35 (0.51)	-0.07*** (-2.85)	-0.50* (-1.88)
South Africa	3.49* (1.57)	-0.18*** (-3.69)	-0.23*** (-3.08)	3.52*** (2.34)	0.08*** (-4.81)	-0.12*** (-4.86)	-2.34*** (-3.88)	0.68** (-1.83)	0.57* (-1.79)	-0.13* (-1.61)	0.22*** (-6.33)	0.28*** (-4.19)
UK	11.48** (1.93)	0.31 (-2.79)	1.00 (-0.00)	8.13*** (3.12)	0.41*** (-7.76)	0.57 (-1.31)	2.63 (0.55)	0.19*** (-6.95)	0.31 (-0.99)	11.42*** (2.23)	-0.92*** (-12.07)	-5.95*** (-6.98)
USA	7.05* (1.56)	-0.25 (-3.85)	1.05 (0.03)	7.44* (2.09)	-0.28*** (-5.39)	-0.59*** (-2.82)	2.01 (0.29)	0.00 (-3.32)	1.76 (0.48)	2.20 (0.38)	0.08*** (-4.34)	-0.43*** (-2.28)

Note: 1) t-stats in parentheses
2) ***,**,* denote rejection of null hypothesis at 1%, 5% and 10% respectively

TABLE 5. The preference comparison

Origin Countries	Comparison of preferences	
	lnRCL	lnRPI
Canada	MAS ≻ SIN ≻ THA	-
Denmark	SIN ≻ THA	SIN
Finland	MAS ≻ SIN	THA ≻ SIN ≻ PHI
France	THA ≻ SIN ≻ MAS	MAS ≻ THA
Germany	PHI	-
South Africa	SIN ≻ THA	PHI ≻ MAS
UK	-	MAS ≻ THA ≻ PHI
USA	-	PHI ≻ MAS

Note: the comparisons made only for significant and positive coefficients.

6.4 Results of panel group FMOLS and DOLS estimation

This paper conducts the panel group test in order to find out the long run relationship between explanatory variables and number of tourist outbound from origin countries. The estimation is compared the coefficients for FMOLS and DOLS method. The results are presented in TABLE 6. The empirical results suggest that the effects of relative production index to the number of outbound tourist from 8 countries are positive and most significant for both panel group of FMOLS and DOLS except for Canada, Germany, South Africa and USA of FMOLS estimation and Finland and South Africa for DOLS estimation. Interestingly, the fuel cost variable (LnTVC) is significant but only for UK and USA that have the correct sign for both FMOL and DOLS. Finally, most of all models suggest the significant and positive direction for LnRCL variable

TABLE 6. The Panel Group FMOLS and DOLS estimation

Outbound from	LnRPI		LnTVC		LnRCL	
	FMOLS	DOLS	FMOLS	DOLS	FMOLS	DOLS
Canada	0.39 (-0.47)	2.78*** (4.59)	0.83 (-0.72)	0.15 (1.91)	2.08* (1.42)	-0.14 (-0.55)
Denmark	0.37*** (-3.01)	0.39*** (3.52)	0.23*** (-9.66)	0.12* (1.44)	0.52** (-2.18)	-0.09 (0.36)
Finland	0.16*** (-2.96)	0.07 (0.25)	0.57*** (-4.43)	0.38*** (2.93)	1.38* (1.47)	0.08 (0.20)
France	5.32*** (2.45)	8.92*** (9.55)	0.29*** (-10.57)	0.20*** (2.97)	0.28*** (-3.16)	-0.03 (-0.13)
Germany	1.20 (-0.21)	2.11*** (2.79)	0.14*** (-6.61)	-0.11 (-1.16)	0.47* (-1.96)	-0.08 (-0.33)
South Africa	1.14 (-0.79)	0.26 (0.54)	0.20*** (-8.33)	0.39*** (4.77)	0.13*** (-6.96)	0.41*** (3.02)
UK	8.41*** (3.92)	4.93** (2.20)	-0.01*** (-14.78)	-0.08 (-0.59)	1.02*** (-4.64)	0.26 (0.51)
USA	4.67 (2.16)	5.06*** (5.63)	-0.11*** (-8.45)	-0.14** (-2.08)	0.45*** (-2.30)	-0.23 (-0.85)

Note: 1) t-stats in parentheses
2) ***, **,* denote rejection of null hypothesis at 1%, 5% and 10% respectively

7. Concluding remarks and policy implications

This paper applies the methodology to test for long run relationship between tourists outbound from eight industrial countries to four ASEAN countries which diverse from the traditional idea of tourism demand. Five test statistic of unit root including Levin, Lin and Chu (2002), Breitung (2000), Im, Parasa and Shin (2003), Fisher type-ADF, PP-test of Mandara and Wu (1999) and Hadri (1999). To ensure the long run relationship the cointegration test, Pedroni, Kao and Johanson Fisher cointegration are utilized. The model are suitable to be estimated the long run coefficients by using FMOLS. The individual effect suggest that the positive direction of tourist coming to ASEAN countries depend on the relative price measured by relative cost of living which implied the relative cheaper between origin countries and relative price competitiveness between ASEAN countries in the panel is more outbound tourists to ASEAN destinations. The results are the same direct as Han et al (2006), Bonhama et al (2009) and Larry et al (2000). Singapore sounds to be the most competitive competitor. Additional, for group mean panel estimation which adopted both FMOLS and DOLS estimations, the result confirm the individual positive direction between outbound tourists and relative cost of living. The policy recommendation is that ASEAN countries should launch campaigns to stimulate tourist arrivals. Singapore is the outstanding sample that she can beat her neighbor of shopping destination since Singapore currency is normally stronger than other ASEAN countries, therefore the small weaker of relative exchange rate the higher inflow of buyers from rich countries. Additional, since the data in this study is not divided between tourists and business travelers. Therefore, the results do favorite to Singapore as the leader in price competitor in the region.

To account for national income in monthly data, this paper employs producer index to represent the income growth, the result confirms the study of Chaiboonsri et al (2010), Munoz (2007) and reveal studies that each industrial country considers their income as the major factor that determines their traveling by the significant and positive of coefficients for both individual and pool panel data. Malaysia, Singapore and Thailand are not different for enhancing the tourist compare the isolate ASEAN country, the Philippines. The policy implication for Philippines is that, to catch up with the others, tourism promotion should be the priority issued policy. Travel cost which proxied by fuel in the other hand, the result are significant for most of the model but the direct is not follow the theory, except for UK and USA, in panel group analysis that associates with the study of Becken et al (2011) and Chaiboonsri et al (2010).

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