The determinants of inbound tourism in China from different regions

Haichen Dou\textsuperscript{1}, Jianxu Liu\textsuperscript{1,2,3}, Jirakom Sirisrisakulchai\textsuperscript{1,2} and Songsak Sirboonchitta\textsuperscript{1,2}

\textsuperscript{1}Faculty of Economics, Chiang Mai University, Chiang Mai 50200 Thailand
\textsuperscript{2}Puey Ungphakorn Center of Excellence in Econometrics, Chiang Mai University, Chiang Mai 50200 Thailand
\textsuperscript{3}Email: liujianxu1984@163.com

Abstract. This study analyses the determinants of inbound tourism in China while considering the influence of regional distribution and income groups of 44 origin countries during the period from the year of 2006 to 2015. The empirical results show that inbound tourism in China is not a luxury good for a majority of tourists. At the same time, tourists from relatively developed regions pay more attention to tourism infrastructure construction and quality of tourism in China. Furthermore, compared to tourists from other regions, African tourists have a stronger desire to travel to China than other regions. In addition, increasing income of both high-income and lower middle-income countries has a positive effect on the demand for inbound tourism in China, which is on the contrary to the upper middle-income countries. Policies that improve the construction of tourism facilities, reduce entry barriers for African tourists, and provide citizens of the origin countries with an enabling environment for learning Chinese would attract more tourists from different regions to China.

1. Introduction
Tourism is an essential industry for many countries’ economy. Inbound tourism, as a crucial part of tourism, is an important indicator to measure the level of internationalization and industrial maturity of tourism in a country or region. As one of the world’s largest inbound tourist markets, China is ranked as the 4th position in Top 10 international arrivals in the year of 2015 (UNWTO Highlights, 2016). The number of inbound tourists in China has reached to 25.98 million, which is an increase of 17.3\% over the year of 2006. The total inbound tourism receipts in China reached 1136.50 hundred million dollars in the year of 2015 (The Yearbook of China Tourism Statistics, 2016). Table 1 shows the current situations related to inbound tourism in China. During this decade, despite slight fluctuations in the number of inbound tourist arrivals in China, tourism receipts had gradually increased. In general, tourism receipts occupy an increase in proportion of China’s GDP except there was slight decline in 2008 and 2009. This clearly demonstrates that inbound tourism plays a leading role to China’s economy.

Several studies have contributed to inbound tourism in China. Ayeh and Lin [1] employed a gravity model to find two main factors influencing China’s inbound tourism, which are income level of the origin country and the visiting expenditure in China. The empirical results of JooKang [2] used gravity framework to indicate that tourism demand had statistically significant elasticity on income, tourism prices, and distance. Wang and Xi [3] found that distance plays as a negative role between the origin
country and China by using gravity framework. These studies have shown that both of the economic factors and distance are closely related to the number of inbound tourists to China. At the same time, the gravity model is an effective way to find the determinants of China’s inbound tourism. This paper will investigate in the context of the gravity model.

In view of the gravity model, it is traditionally used to study log-linear form. However, several issues have been examined in empirical results. According to Kaplan and Aktas [4], due to heteroskedasticity problem, the parameters of log-linearized models estimated by Ordinary Least Squares (OLS) would result in biased estimations. Another common estimator is Poisson Pseudo-Maximum Likelihood (PPML). Okafor [5] used PPML to reach consistent and unbiased estimates. Although they found a valid way to estimate, their results were based on large sample size. Considering that the sample size of this study may be limited, Bayesian analysis is applied in this study. Bayesian estimates provided higher flexibility and accuracy than those traditional estimation methods [6] such as the OLS and PPML.

Based on analysis of inbound tourism in China in recent years, it could be reviewed that inbound tourist arrivals are mainly from China’s neighboring countries. An exhaustive data of inbound tourist arrivals in 2015 is presented in Table 2. It could be found that the top 15 countries, leading by Korea, Japan, Vietnam, account for more than 70 percent of the total inbound arrivals. At the same time, tourists from Americas, Europe and Oceania take up a relatively small proportion. This shows that the different attractiveness of travelling to China may differ for different regions. This suggests that countries in different regions of the world and at various levels of development [5] may have different drivers for tourist flows.

### Table 1. Current situations of inbound tourism in China.

| Year | Tourism Receipts (100Mn. US$) | Growth rate (%) | GDP (100Mn. US$) | Share of GDP (%) | Number of inbound tourist arrivals (10,000 Person) |
|------|-------------------------------|-----------------|------------------|-----------------|---------------------------------------------------|
| 2006 | 339.49                        | —               | 2752.13          | 12.34           | 2221.03                                           |
| 2007 | 419.19                        | 23.48           | 3552.18          | 11.8            | 2610.97                                           |
| 2008 | 408.43                        | -2.57           | 4598.21          | 8.88            | 2432.53                                           |
| 2009 | 396.75                        | -2.86           | 5109.95          | 7.76            | 2193.75                                           |
| 2010 | 458.14                        | 15.47           | 6100.62          | 7.51            | 2612.69                                           |
| 2011 | 484.64                        | 5.78            | 7572.55          | 6.4             | 2711.20                                           |
| 2012 | 500.28                        | 3.23            | 8560.55          | 5.84            | 2719.16                                           |
| 2013 | 516.64                        | 3.27            | 9607.22          | 5.38            | 2629.03                                           |
| 2014 | 1053.80                       | *               | 10482.37         | 10.05           | 2636.08                                           |
| 2015 | 1136.50                       | 7.85            | 11064.66         | 10.27           | 2598.54                                           |

* Source: The Yearbook of China Tourism Statistics 2016; World Bank, World Development Indicators.

* *: Do to the change of statistical scope in 2014 it is not proper to make simple comparison with the figures of previous years.

Note: Inbound tourists in China refers to foreigners (does not include tourists from Hong Kong, Macao and Taiwan).

Reviewing previous studies, there is insufficient evidence for the relationship between inbound tourism in China and the region development level. This study aims to investigate on the determinants of inbound tourism demand in China while considering the influence of region distribution and income groups of 44 origin countries. It is hoped that this study could put forward reasonable and targeted suggestions for the policy-making departments. The potential contributions of this study could be divided into three parts. First of all, this is the first study to analyse the determinants of inbound tourism in China based on the impact of regional distribution and income groups. Secondly, this study
attempts to use Bayesian estimation as it may achieve a higher degree of accuracy. Lastly, the results show that affect China’s inbound tourism in region distribution and income groups are different, especially in the sample of relatively developed regions and upper middle-income countries. This makes suggestions and policies based on the results of this study more targeted.

Table 2. Number of inbound tourist arrivals by country in 2015 (10,000 Person).

|   | Asia           |   | Europe         |   | Americas        |
|---|----------------|---|----------------|---|-----------------|
| 1 | Korea          | 444.44 | 1 | Russia         | 158.23 | 1 | U.S.A.          | 208.58 |
| 2 | Japan          | 249.77 | 2 | Germany        | 62.34  | 2 | Canada          | 67.98  |
| 3 | Vietnam        | 216.08 | 3 | U.K.           | 57.96  | 3 | Brazil          | 8.55   |
| 4 | Malaysia       | 107.55 | 4 | France         | 48.69  | 4 | Mexico          | 6.83   |
| 5 | Mongolia       | 101.41 | 5 | Italy          | 24.61  |   |                 |       |
| 6 | Philippines    | 100.40 | 6 | Netherlands    | 18.18  |   |                 |       |
| 7 | Singapore      | 90.53  | 7 | Ukraine        | 14.17  |   |                 |       |
| 8 | India          | 73.05  | 8 | Spain          | 13.63  |   |                 |       |
| 9 | Thailand       | 64.15  | 9 | Sweden         | 11.84  |   |                 |       |
| 10| Indonesia      | 54.48  | 10| Poland         | 7.48   | 1 | Australia       | 63.73  |
| 11| Kazakhstan     | 24.15  | 11| Switzerland    | 7.27   | 2 | New Zealand     | 12.54  |
| 12| Myanmar        | 14.44  | 12| Denmark        | 7.09   |   |                 |       |
| 13| Iran           | 11.32  | 13| Belgium        | 6.52   |   |                 |       |
| 14| Pakistan       | 11.31  | 14| Austria        | 6.08   |   |                 |       |
| 15| Turkey         | 9.95   | 15| Finland        | 5.51   |   |                 |       |
| 16| Israel         | 7.62   | 16| Portugal       | 5.34   |   |                 |       |
| 17| Sri Lanka      | 5.81   | 17| Norway         | 4.11   |   |                 |       |
| 18| Nepal          | 5.00   |   |                |        | 1 | Egypt           | 8.65   |
| 19| Kyrgyzstan     | 4.37   |   |                |        | 2 | South Africa    | 6.55   |

*Source: The Yearbook of China Tourism Statistics 2016.

2. Data and methodology

2.1. Theoretical rationale

The determinants of inbound tourism in China can be explored through a combination of gravity model theory and tourism demand theory. The fundamental idea of the tourist gravity model referring to the trade gravity model derives from the Law of Universal Gravitation. The equation is expressed as follows:

$$ F = G \frac{m_1 m_2}{r^2}. $$

(1)

Since the 1940s, economists have introduced gravity models into theoretical analysis and large-scale empirical tests. Tingbergen (1962) established the trade gravity model in the study of international trade in order to explain the asymmetry of trade flow in the world. Economists [7-9] often use the similar trade gravity model to explain the decisive problems about the flow and direction of the trade in one department. The basic gravity model for international flow [8] can be expressed as:

$$ F_{ij} = B \frac{GDP_i GDP_j}{D_{ij}} U_{ij}, $$

(2)
where \( F_{ij} \) denotes the international flow between regions i and j, \( GDP \) refers to the gross domestic product of each region, \( Dis \) is the distance between region i and region j, \( U_{ij} \) is a log-normal distributed error term, \( B \) is the parameter to be estimated. For estimation purposes, the basic gravity model for international flow can be transformed using natural logarithms to:

\[
\ln F_{ij} = \beta \ln GDP_i + \ln GDP_j + (-2 \ln Dis_{ij}) + \varepsilon_{ij},
\]

where \( \varepsilon_{ij} \) is a normal error term with \( E(\varepsilon_{ij})=0 \) and \( \beta=\ln(B) \).

Tourism demand theory has been studied for half a century. The earliest study could be traced back to the 1960s, notably pioneered by Guthrie [10]. Since then there have been significant developments in the research of this field, in terms of the diversity of research interests, the depth of theoretical foundations, and advances in research methodologies [11]. Li et al. [11] and Song and Li [12] reviewed the most recent 84 and 121 tourism demand studies respectively. They have laid a solid foundation for the latest methodological developments and started a new trend in this area of research.

The baseline gravity model variables and the tourism-specific price based on the tourism demand are used in this study. Population is an appropriate variable to capture economic size [13] for studies dealing with international tourism or migration. \( GDP \) per capita is used to capture the income level because individuals from rich countries are more likely to require tourism services or face a lower barrier to international migration [13]. Distance also plays a crucial variable as a proxy [5] for the cost of travelling to China from the origin country. Language and Border are the two dummy variables, which are used to represent the culture and geographical relationship respectively.

To capture the influence of the levels of development and regions in the underlying relationship, the sample is disaggregated into different income groups and different regions [5]. \( GDP \) per capita is used as a proxy for the level of development. Similar to World Bank's new country classifications by income level for the fiscal year 2018, the sample classifies low income countries, lower middle income countries, upper middle income countries, and high income countries. To ensure that the estimations are not sensitive to the year used as a benchmark for the classifications, this study reclassifies countries into different income groups using the fiscal year 2015 instead of the fiscal year 2010.

As for the classification of regions in this study, this study adopts the method of regional division by China National Tourism Administration (CNTA). By CNTA regions, there are five main regions, which are Asia, Americas, Europe, Oceania and Africa.

In this study, Asian countries are fully divided by income into four groups, while Americas, Europe and Oceania occupy only the first two groups in the origin countries due to their high level of development. As for Africa, it occupies only 2% of the total number and its development level is relatively lower than other regions. Thus, Africa is studied as a region by itself.

### 2.2. Model specification

The model function forms of this study have been derived as follows:

\[
Y_{ijt} = F(POP_{it}, GDP_{it}, GDP_{jt}, DIS_{ij}, PRI_{it}, LAN_{ij}, BOR_{ij}),
\]

where \( Y \) is inbound tourist arrivals; \( ijt \) refers to origin country, China and time; \( POP \) is population; \( GDP \) denotes GDP per capita (constant 2010 US$); \( DIS \) measures the gravity distance between China and origin country i, and plays a crucial variable as a proxy for the cost of travelling to China from the origin country; \( LAN \) is common official language dummy (If origin country i and China share the same official language then the value takes 1 otherwise 0); \( BOR \) is border dummy (If country i and China share a border then the value takes 1 otherwise 0). \( PRI \) is the tourism-specific price in China and is shown as follows:

\[
PRI_{it} = \frac{CP_{ijt}/EX_{it}}{CP_{it}/EX_{it}},
\]
where \( \text{CPI}_{it} \) is the CPI of China in the year of \( t \), \( \text{EX}_{it} \) is the exchange rate of China in the year of \( t \), \( \text{CPI}_{it} \) is the CPI of origin country \( i \) in the year of \( t \), \( \text{EX}_{it} \) is the exchange rate of origin country \( i \) in the year of \( t \).

Taking the natural logarithm of the equation, the derived equation of this study for inbound tourism in China is:

\[
\ln Y_{ijt} = \beta_0 + \beta_1 \ln \text{POP}_{it} + \beta_2 \ln \text{GDP}_{it} + \beta_3 \ln \text{GDP}_{it} + \beta_4 \ln \text{DIS}_{ijt} + \beta_5 \text{PRI}_{it} + \beta_6 \text{LAN}_{ij} + \beta_7 \text{BOR}_{ij} + \varepsilon_{it},
\]  

(6)

where \( \ln \) denotes the natural logarithm, \( \beta_0 \) is constant term and \( \varepsilon_{it} \) is error term.

Bayesian analysis answers questions based on the distribution of parameters conditional on the observed sample. The data of Bayesian analysis are considered to be fixed. The results of Bayesian analysis are based on probability distributions about unknown random parameters and produced by combining the data with prior beliefs about the parameters. The posterior distribution is used to make explicit probabilistic statements [14].

If there is a probability model for a vector of observations \( y \) and a vector of unknown parameters \( \theta \), the model can be represented with a likelihood function as follows:

\[
L(\theta; y) = f(y; \theta) = \prod_{i=1}^{n} f(y_i|\theta)
\]  

(7)

where \( f(y; \theta) \) is conditional probability of \( y \) given \( \theta \).

Assume that \( \theta \) has a probability distribution \( \pi(\theta) \), and that \( m(y) \) denotes the marginal distribution of \( y \), the equation is expressed as follows:

\[
m(y) = \int f(y; \theta) \pi(\theta) d\theta.
\]  

(8)

The following is the inverse law of probability (Bayes’ theorem):

\[
f(\theta|y) = \frac{f(y;\theta)\pi(\theta)}{f(y)},
\]  

(9)

but notice that the marginal distribution of \( y, f(y) \), does not depend on \( \theta \).

Then, the fundamental equation for Bayesian analysis is expressed as follows:

\[
P(\theta|y) \propto L(y|\theta)\pi(\theta).
\]  

(10)

Assuming that the intercept varies across individuals, the equation is shown as follows:

\[
Y_{it} = \alpha + \beta X_{it} + \varepsilon_{it},
\]  

(11)

where \( \alpha \) accounts for individual effects and \( \alpha \) is normal distribution.

Thus we can get the following:

\[
P(y|\alpha, \beta, h) = \prod_{i=1}^{n} \frac{h^T}{2\pi^2} \left\{ \exp \left[ -\frac{1}{2} (Y_i - \alpha_i - \bar{X}_i \beta)^T (Y_i - \alpha_i - \bar{X}_i \beta) \right] \right\}.
\]  

(12)

The non-hierarchical prior assumption for the coefficients \( \beta^* \) and the variance of \( \varepsilon \) are shown as follows:

\[
\beta^* \sim N(\beta^*, V), \quad h \sim G(s^{-2}, \nu)
\]  

(13)

where \( \beta^* \) and \( h \) are normal and Gamma distribution respectively. \( h \) is the variance of \( \varepsilon \).

The likelihood function for the random coefficients \( \beta_i \) is shown as follows:

\[
P(y|\beta, h) = \prod_{i=1}^{n} \frac{h^T}{2\pi^2} \left\{ \exp \left[ -\frac{1}{2} (Y_i - X_i \beta_i)^T (Y_i - X_i \beta_i) \right] \right\}.
\]  

(14)

The hierarchical prior and their variance are shown as follows:
\[ \beta_i \sim N(\mu_\beta, V_\beta), \ h \sim G(s^{-2}, v). \] (15)

where \( \beta_i \) and \( h \) are normal and Gamma distribution respectively. \( h \) is the variance of \( \varepsilon \).

The Bayesian statistics of this study apply Gibbs sampling of Markov Chain Monte Carlo (MCMC) by Stata 15.0 program.

2.3. Overview of data sources

In terms of the data sources in this study, inbound tourist arrivals and tourism receipts in China are collected from China National Tourism Administration. Population, GDP per capita and CPI are collected from World Development Indicators, World Bank. Distance, common official language, and border is collected from CEPII Database. Exchange rate is collected from International Financial Statistics, IMF. All the data are from the year of 2006 to 2015.

Table 3 presents the summary statistics. Inbound tourism in China tends to attract more tourists in Asia, which may due to the regional advantages of neighboring countries. Tourist arrivals from other four regions are significantly less than that from Asia. This suggests that for different regions, there are different attractions in China’s inbound tourism.

Population, as a measure of economic size, is one of the potential determinants of inbound tourist arrivals. However, the impact of population may depend on income groups. Similar with population, GDP per capita of the origin country stands for the income level. For instance, individuals in the wealthier regions of Americas, Oceania, and Europe are more likely to travel abroad than individuals from Asian and Africa regions. GDP per capita in China not only represents the level of income, but also explains the degree of tourism service construction. In general, tourism-specific price reflects the consumption level between the origin countries from different regions and China. Due to regional advantages, the distance variable shows that tourists from Asia have a significantly shorter distance to China than other regions, such as Americas and Oceania.

| Table 3. Summary statistics. | Variable | Asia | Europe | Americas | Oceania | Africa | All regions |
|-----------------------------|----------|------|--------|----------|---------|--------|-------------|
| Ln tourist arrivals         | 3.47     | 2.69 | 3.28   | 3.30     | 1.79    | 3.07   |
| ln Population (Origin)      | 17.56    | 16.88| 18.65  | 16.10    | 18.01   | 17.35  |
| ln GDP per capita (Origin)  | 8.42     | 10.41| 10.01  | 10.66    | 8.37    | 9.43   |
| ln GDP per capita (China)   | 8.44     | 8.44 | 8.44   | 8.44     | 8.44    | 8.44   |
| ln Price                    | 3.24     | -0.91| -0.59  | -1.67    | 1.98    | 1.01   |
| ln Distance                 | 8.17     | 8.97 | 9.44   | 9.13     | 9.17    | 8.68   |

3. Empirical results

3.1. The determinants of inbound tourism in China by regional distribution

Table 4 shows the Bayesian statistics by regions. As expected, for all regions, the signs are reasonable. However, the price variable and GDP per capita of China are not significant, which suggests that tourism price between China and origin country may have divergence in regions and income groups. Language dummy and border dummy fit well in the model. This suggests that Chinese-speaking tourists can reduce the potential cost of communication in China. Moreover, for countries bordering
China, tourists can choose airplanes, vehicles, or even by foot through direct entry at their convenience. Compared to tourists who could only travel by airplane, diversification of travel methods is equivalent to reducing transportation costs. Columns 1 to 5 present Bayesian statistics for the region of Asia, Europe, Americas, Oceania and Africa respectively. Unlike other regions, price variable shows positive correlation in Asia region. This may benefit from China’s special status in Asia and close economic and cultural links with other Asian countries. In addition, except that GDP per capita in China is not significant, the signs of other variables are consistent with expectations. However, it is worth noting that tourism-specific price variable is not significant for tourists from Europe. This may mean that European tourists pay less attention to the consumption in China as they are mostly from high income countries. Furthermore, one percent change in population and GDP per capita of European countries leads to about 0.905% and 0.607% change in tourist arrivals respectively.

When referring to Americas, GDP per capita representing the income level has the greatest impact on the number of tourist arrivals, with one unit increase in GDP per capita of Americas resulting in 1.083 unit increase in tourist arrivals. At the same time, GDP per capita of China also has energetic effect on tourists from Americas, which may indicate that tourists from Americas pay more attention to the enjoyment and quality of tourism in China since GDP per capita of China represents the degree of tourism service construction. Similar with Americas, tourists from Oceania are also influenced by GDP per capita of China. If GDP per capita of China rises by one percentage, it will attract around 0.678% Oceania tourists to China. For the Americas, Oceania and Africa regions, with the gradual increase of tourism price in China, tourism arrivals decrease by degrees. This is also consistent with demand theory. It is worth mentioning that the population of Africa region, representing the economic size, has a crucial influence on inbound tourism, with the coefficient up to about 7.259. Simultaneously, among the five regions observed, GDP per capita of African origin countries displays the most impactful. This indicates that individuals in Africa have a strong desire to travel to China.

3.2. The determinants of inbound tourism in China by income groups of origin countries
Bayesian statistics by income groups based on origin countries is presented in table 5. Column 1 shows the statistics for high-income countries. The signs of population, GDP per capita of origin country, distance and language dummy are all as expected. However, neither GDP per capita of China nor tourism-specific price level in China is significant. This may suggest that tourists from high-income countries do not care about the tourism price in China. The statistics of upper middle-income countries are shown in column 2. In this sample, all variables are significant. Interestingly, as GDP per capita of upper middle-income countries increases by one unit, it significantly leads to 1.322 unit reduction in the number of tourist arrivals. This may mean that China, which is also an upper middle-income country, and its level of development is similar to that of the origin countries, has a limited attractiveness.

Column 3 represents the statistics for lower middle-income countries. Distance and GDP per capita of origin countries have the greatest impact on inbound tourists from lower middle-income countries. One percent change in GDP per capita of lower middle-income countries, results in attracting about 1.074% tourists to travel to China. Furthermore, if the distance between the lower middle-income countries and China increase one percentage unit, tourists from lower middle-income countries significantly decrease around 2.676% unit. This suggests that tourists from lower middle-income countries are more concerned about tourism transportation costs as their income is slightly lower. As for the statistical results of low income countries, since there is only one country, Nepal, in this sample and most of the statistical results are insignificant, the statistics of low income countries are not listed in table 5.

4. Conclusions and policy implications
The conclusions of this study can be summarized as follows. First of all, the statistics of tourism-specific price for nearly all of regions are significant, which are between 0 and 1. This means that inbound tourism in China is inelastic and is a normal good in consumption for a majority of tourists.
At the same time, tourists from relatively developed regions pay more attention to tourism infrastructure construction and quality of tourism in China. Secondly, increasing income of high-income and lower middle-income countries has a positive effect on the demand for inbound tourism in China, which is on the contrary to the upper middle-income countries. Thirdly, the distance variable representing the transportation cost is negatively related to inbound tourism in China. However, African tourists far away from China still have a stronger desire to travel to China than other regions. What’s more, if individuals can speak Chinese or live in a country bordering China, they prefer to travel to China as the two determinants correspond to reducing potential cultural costs and transportation costs respectively.

The empirical results of this study provide important policy implications for China. On the one hand, tourism administration in China can improve the construction of tourism facilities, which would benefit tourists from relatively developed regions, such as Americas and Oceania. On the other hand, reducing entry barriers for tourists coming from Africa can attract more tourists from Africa. Last but not least, policies that provide citizens in the origin countries with an enabling environment for learning Chinese would promote inbound tourism in China, such as Asia, which is closely linked with Chinese culture, and Europe, which does not use Chinese as a common official language.

Table 4. Bayesian statistics by regions.

| Variable                      | Asia   | Europe | Americas | Oceania | Africa | All regions |
|-------------------------------|--------|--------|----------|---------|--------|-------------|
| Ln Population (Origin)        | 0.424  | 0.905  | 0.480    | -0.022  | 7.259  | 0.648       |
|                              | [0.361, 0.487] | [0.830, 0.981] | [0.435, 0.524] | [-1.966, 2.043] | [4.384, 9.832] | [0.596, 0.701] |
| Ln GDP per capita (Origin)    | 0.564  | 0.607  | 1.083    | -0.950  | 1.814  | 0.759       |
|                              | [0.470, 0.656] | [0.500, 0.715] | [0.577, 1.586] | [-3.136, 1.206] | [0.303, 3.461] | [0.684, 0.832] |
| Ln GDP per capita (China)     | 0.145  | 0.096  | 0.672    | 0.678   | -0.627 | 0.149       |
|                              | [-0.208, 0.501] | [-0.137, 0.334] | [0.409, 0.939] | [0.363, 0.977] | [-1.251, 0.045] | [-0.119, 0.425] |
| Ln Price                      | 0.055  | -0.025 | -0.545   | -0.733  | -0.680 | -0.011      |
|                              | [0.023, 0.089] | [-0.091, 0.040] | [-0.901, 0.192] | [-1.087, 0.389] | [-1.029, 0.303] | [-0.042, 0.022] |
| Ln Distance                   | -2.227 | -1.945 | 0.158    | -9.932  | 4.807  | -1.710      |
|                              | [-2.415, -2.037] | [-2.715, 1.162] | [-0.313, 0.631] | [-23.878, 4.997] | [-1.261, 10.009] | [-1.866, 1.550] |
| Language                      | 1.680  | 1.125  | 1.069    | 1.733   | 0.866  | 1.099       |
|                              | [1.352, 2.013] | [0.769, 1.476] | [1.069] | [1.733] | [0.640, 1.099] |
| Efficiency                    | 0.9819 | 0.9908 | 0.9458   | 0.8616  | 0.8555 | 0.9895      |

*Note: All of the statistics are at 95% equal-tailed confidence intervals by using Stata 15.0 program.*
Table 5. Bayesian statistics by income groups based on origin countries.

| Variable                        | High income | Upper Middle income | Lower Middle income | All regions |
|---------------------------------|-------------|---------------------|---------------------|-------------|
| Ln Population (Origin)          | 0.875       | 0.974               | 0.486               | 0.648       |
|                                 | [0.802, 0.948] | [0.863, 1.084]      | [0.419, 0.554]      | [0.596, 0.701] |
| Ln GDP per capita (Origin)      | 0.771       | -1.322              | 1.074               | 0.759       |
|                                 | [0.576, 0.968] | [-1.730, -0.930]    | [0.718, 1.440]      | [0.684, 0.832] |
| Ln GDP per capita (China)       | 0.047       | 0.645               | 0.066               | 0.149       |
|                                 | [-0.261, 0.354] | [0.369, 0.920]      | [-0.380, 0.512]     | [-0.119, 0.425] |
| Ln Price                        | 0.006       | -0.106              | 0.043               | -0.011      |
|                                 | [-0.071, 0.083] | [-0.133, -0.079]    | [-0.001, 0.085]     | [-0.042, 0.022] |
| Ln Distance                     | -1.121      | -1.279              | -2.676              | -1.710      |
|                                 | [-1.412, -0.829] | [-1.463, -1.092]    | [-3.012, -2.346]    | [-1.866, -1.550] |
| Language                        | 2.011       | 2.378               | 1.397               |             |
|                                 | [1.561, 2.460] | [2.085, 2.677]      | [1.069, 1.733]      |             |
| Border                          | 2.311       | 0.227               | 0.866               |             |
|                                 | [2.079, 2.549] | [-0.168, 0.622]     | [0.640, 1.099]      |             |
| Efficiency                      | 0.9938      | 0.9862              | 0.9788              | 0.9895      |

*Note: All of the statistics are at 95% equal-tailed confidence intervals by using Stata 15.0 program.

Acknowledgments

As a graduate student in the Faculty of Economics, Chiang Mai University, my ability in the academic field is limited. Here, I would like to sincerely thank the staffs in Faculty of Economics, Chiang Mai University. They have provided me with valuable guidance in the writing of this paper. I could complete this paper with their impressive instruction and kindness. Specially point out that I want to show my sincere gratitude to the assistants in Puey Ungphakorn Center of Excellence in Econometrics, Chiang Mai University. They have provided me massive data and materials to support my study.

References

[1] Ayeh J K and Lin S 2011 *Tourism and Hospitality Research* 11(3) 197-206
[2] JooKang M 2014 *International Journal of Tourism and Hospitality Research* 28(10) 21-9
[3] Wang H and Xi J 2016 *International Journal of Business and Management* 11(2) 205
[4] Kaplan F and Aktas A R 2016 *The Empirical Economics Letters* 15(3) 265-72
[5] Okafor L E, Khalid U and Then T 2018 *Tourism Management* 67 127-38
[6] Assaf A G and Tsionas M 2018 *Tourism Management* 65 131-42
[7] Kosman S S A, Ismail N W and Kaniappan S R 2012 *Prosiding Perkem VII, Jilid 1* 44-50
[8] Morley C, Rossello J and Santana-Gallego M 2014 *Annals of Tourism Research* 48 1-10
[9] Oh J and Zhong W 2016 *Asia Pacific Management Review* 21(4) 239-243
[10] Guthrie H W 1961 Papers and Proceedings of the Regional Science Association 7 159-75
[11] Li G, Song H and Witt SF 2005 *Journal of Travel Research* 44(1) 82-99
[12] Song H and Li G 2008 *Tourism management* 29(2) 203-220
[13] Gil-Pareja S, Llorca-Vivero R and Martinez-Serrano J A 2007 *Review of International Economics* 15(2) 302-312
[14] Balov N 2016 Bayesian hierarchical models in Stata 2016 Stata Conference