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Factors Affecting Tourism Demand of Chinese and Russian Tourists Traveling to Thailand

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Abstract

The main purpose of this research is to find the factors affecting tourism demand of Chinese and Russian tourists traveling to Thailand. The tourism data of Thailand were collected from the website of Ministry of Tourism and Spots during 2005 to 2019. By using multiple regression analysis, the results showed that the Per Capita Spending and the real China Gross Domestic Product variables affecting the Chinese tourist arrival in Thailand when three variables such as the Per Capita Spending, the real Russia Gross Domestic Product and the comparative ratio of Consumer Price Index of Russia and

the Consumer Price Index of Thailand variables affecting the Russian tourist arrival in Thailand.

1   Introduction

Tourism is one of the most important sectors that drives the Thai economy generating continuous high income for Thailand. The National Economic and Social Development Council (NESDC, Previously named NESDB) stated in the beginning of February 2019 that Tourism accounted for 18.4 % (or close to one fifth) of the Gross Domestic Product (GDP) of Thailand. This was an increase from 14.2 % of GDP in the past four years [1].

The number of foreign tourists traveling to Thailand has increased every year since 2015. In 2019, there was an increase of 4.55 % from 2018 (39.92 million). In the same year, Thailand also gained increased income from foreign tourists earning approximately 1.91 trillion Baht from the entry of foreign tourists. However, the number of visitors decreased in recent years due to disease outbreaks (COVID-19), political uncertainty, or natural disaster. A relatively recent development has been the ever-increasing number of Chinese mainland visitors. They surpassed 10.6 million visitors in 2018, making up 27.5 % of the total. Their number increased further to 11.1 million in 2019. China provides the largest number of tourists (27.6 % of total), and the increased number of Chinese visitors is quite obvious on Bangkok's streets and in shopping malls.

In 2019, tourists spent 1,911,807.95 million Thai Baht in Thailand. The average exchange rate in 2019 was 31.035 Thai Baht for 1 U.S. Dollar. So, the revenue from tourism was amounted to 61.60 billion U.S. Dollars. In 2018, income from tourist spending amounted to 1,876,136.9 million Thai Baht and so there was an increase of 1.90 % in revenue. In 2017, income in Thai Baht was 1.831 trillion which amounted to 53.591 billion U.S. Dollars (exchange rate 33.94 Thai Baht for 1 U.S. Dollar). The Thai Baht has been strengthened over the last few years, which actually means that there is higher income when things are measured in U.S. Dollars but less so when expressing income in Thai Baht. Average spending per tourist in 2019 was 47,895 Thai Baht (1,543 U.S. Dollars). Interestingly there was a clear difference between spending by Asians on the one hand and Europeans and Americans on the other. The average Asian person (including Chinese and Japanese visitors) spent about 2/3 of what the European or spent while on holiday in Thailand. The latter as mentioned before stayed longer in the country. The highest of tourism receipts in 2015-2019 was Russia and the average spending per

Russian tourist in 2019 was 70,000 baht (2,250 U.S. Dollars) per person, per trip.

Therefore, the researchers are interested in the factors affecting tourism demand of Chinese and Russian tourists traveling to Thailand for the period of 2005-2019. The remainder of the paper is organized as follows. The second section contains a brief literature review. A thorough explanation of this research methodology is provided in the third section and the results of this study are presented in the fourth section. Finally, a discussion and a conclusion of this research are discussed later in the paper.

2   Literature Review

Tourism demand is the total number of persons who travel or wish to travel away from their places of work and residence [2]. Extensive research has focused on describing factors affecting tourism. In 2009, Zhang, Qu and Tavitiyaman [3] developed a travel demand model of international tourist arrivals to Thailand and to assess the impact of crisis incidents on Thailands tourism industry. A 20-year (19872006) annual time series data of the number of international tourist arrivals, exchange rate, promotion budget, and dummy variables of Asia nancial crisis, special promotional campaigns, SARS and tsunamis were used to develop the travel demand model by performing a multiple regression analysis. The results showed that travel demand of international tourist arrivals to Thailand could be explained by exchange rate, promotion budget, Asia nancial crisis and SARS.

Kollayootsakul [4] studied factors affecting tourism demand of tourists from Malaysia, United Kingdom and United States and study the elasticities of demand of tourists from Malaysia, United Kingdom and United States. The data was a secondary data from 1993 2007 with multiple regression analysis in the natural logarithm from for analysis. The results found that real gross domestic product of Malaysia, United Kingdom and United States had a positive effect to the number of tourists coming to Thailand. Concerning to the ratio of consumer price index of Malaysia compare with consumer price index of Thailand had a negative effect to the number of tourists. For United Kingdom and United States, the ratio of consumer price index of United Kingdom and United States compare with consumer price index of Thailand had no effect to the number of tourists. For United Kingdom, Thailands budget for tourism promotions had a negative effect to the number of tourists. For Malaysia and United States, Thailands budget for tourism pro-

motions. had no effect to the number of tourists to Thailand. Concerning to exchange rate and the spending per capita had no effect to number of tourists from Malaysia, United Kingdom and United States. The elasticities of demand of tourists from Malaysia, United Kingdom and United States with real gross domestic product of Malaysia, United Kingdom and United States were 0.981, 4.452, and 2.087. For Malaysia, the elasticities of tourists from Malaysia, with ratio of consumer price index of Malaysia compare with consumer price index of Thailand were -3.72. For United Kingdom, the elasticities of tourists from United Kingdom with Thailands budget for tourism promotions were 0.281.

Next, Pipitpojanakarn [5] studied the factors affecting the tourism demand of Japanese tourists traveling to Thailand and the elasticity of demand for tourism of Japanese tourists traveling to Thailand. Studying the tourism demand of Japanese tourists traveling to Thailand was as follows: The real Japanese GDP, the foreign exchange rates (Yen vs Baht), the comparative ratio of consumer price index of Japan and the consumer price index of Thailand by using the secondary data from 1994 to 2008 and applying the multiple regression analysis existing in the natural logarithm. From the study results, it was shown that the foreign exchange rates (Yen vs Baht) had relation in the same direction with the number of Japanese tourists traveling to Thailand and the comparative ratio of consumer price index of Japan and the consumer price index of Thailand had relation in the opposite direction with the number of Japanese tourists traveling to Thailand. The real Japanese GDP had no relationship with the number of Japanese tourists traveling to Thailand. Moreover, it was indicated that the value of elasticity of demand for tourism of Japanese tourists traveling to Thailand towards the foreign exchange rates (Yen vs Baht) which was equal to 0.341. The value of elasticity of demand for tourism of Japanese tourists traveling to Thailand towards the comparative ratio of consumer price index of Japan and the consumer price index of Thailand that were equal to -0.692.

In 2017, Chinnakum and Boonyasana [6] examined the factors that inuence the behavior of international tourists to Thailand by using a dual generalized maximum entropy estimator for panel data regression models. The focus was on the tourists from 10 countries of origin having the highest number of international tourist arrivals to Thailand including Laos, Malaysia, Singapore, China, Japan, Korea, Russia, United Kingdom, USA, and India over the period of 22 years (1995-2016). A number of important economic factors such as income, price, exchange rate, and number of population, were studied regarding international tourism demand. The study compared

the results of two methods, namely ordinary least squared estimator and generalized maximum entropy estimator. According to minimum value of mean square error, the generalized maximum entropy estimator performed better than the ordinary least squared. The results of tourism demand estimation showed that the growth in income of Thailand was dependent on exchange rate, major tourists originating countries and number of population had positive impact on international visitor arrivals to Thailand while relative price had a negative impact. The study also showed that per capita national income exhibited strong predictive power for Thailand tourism demand. Moreover, Ali soofi, Rafsanjani and Zamanian [7] investigated factors affecting tourism demands in selected Organization of Islamic Cooperation (OIC) Countries for the period of 2004 to 2016. The economic variables used in this study were tourist receipts, GDP per capita, real exchange rate, population, Trade openness and Consumer Price Index. GLS method was applied in the research model in order to investigate the relationship between tourist receipts, GDP per capita, real exchange rate, population, Trade openness and Consumer Price Index.

In this research, they found that GDP per capita, real exchange rate, population, Trade openness had a positive impact on tourist receipts. These factors played a crucial role in tourism demand. The adoption of appropriate economic policies, in line with the tourism development policies, such as the appropriate rate of exchange, could help to reduce the travel costs and it enhances the competitive advantage of this industry. The results also showed that the Consumer price index (CPI) variable had a positive impact and was almost equal to zero, but it was insignificant in explaining tourism demand.

3 Methodology

3.1 Data

In this research, the data included 1) the number of Chinese tourists 2) the per capita spending (Baht/day) of Chinese tourists 3) the China exchange rates 4) the real China GDP (in billions) 5) the comparative ratio of consumer price index (CPI) of China and the CPI of Thailand 6) the number of Russian tourists 7) the per capita spending (Baht/day) of Russian tourists 8) the Russia exchange rates 9) the real Russia GDP (in billions) and10) the comparative ratio of CPI of Russia and the CPI of Thailand were collected by using the secondary data from the website of Ministry of Tourism and Spots during 2005 to 2019 (https://www.mots.go.th/).

3.2   Multiple regression analysis

Multiple linear regression, simply known as multiple regression, is a statistical technique that uses several explanatory variables to predict the outcome of a response variable. The goal of multiple linear regression is to model the linear relationship between the explanatory (independent) variables and response (dependent) variable. In other terms, multiple linear regression examines how multiple independent variables are related to one dependent variable. Once each of the independent factors has been determined to predict the dependent variable, the information on the multiple variables can be used to create an accurate prediction on the level of effect they have on the outcome variable. The model creates a relationship in the form of a straight line that best approximates all the individual data points [8].

Stepwise regression, a very popular method, is a combination of the forward and backward selection techniques. Stepwise regression is a modification of the forward selection so that after each step in which a variable was added, all candidate variables in the model are checked to see if their significance has been reduced below the specified tolerance level. If a nonsignificant variable is found, it is removed from the model. Stepwise regression requires two significance levels: one for adding variables and another for removing variables. The cutoff probability for adding variables should be less than the cutoff probability for removing variables so that the procedure does not get into an infinite loop.

For modeling tourist consumption, we use the multiple linear regression which is a model involving the dependent variable Y and p independent variables numbered X_1, X_2, X_p written as $Y_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + ... + \beta_p X_{ip} + \epsilon_i; i = 1, 2, , n$ where β_0 denotes the intercept, $\beta_1, \beta_2, , \beta_p$ are the partial regression slope coefficients, and ϵ_i is the residual term associated with the ith observation. The regression model gives the expected value of Y conditional upon the fixed values of $X_1, X_2, , X_p$ plus the error component.

The basic assumptions of regression analysis are the assumptions of no serial correlation and homoscedasticity. The assumption of no multicollinearity means a regression function should include only those variables that are not linear functions of some of the variables in the model. The multiple coefficients of determination R^2 and the adjusted R^2 coefficient are used as general indices of fit and they do not have to be evaluated from a statistical point of view. When the model represents a good fit to the data, R^2 should be near 1, whereas poor fits should result in R^2 values close to zero. R^2 can be artificially increased by simply adding explanatory variables to the

regression model. According to Dillon and Goldestein [9], it is better to use an adjusted R^2 coefficient for the final conclusion because:
(a) as the number of predictors increases the adjusted R^2 coefficient decreases,
(b) the adjusted R^2 coefficient can be less than zero, and
(3) the adjusted R^2 coefficient will always increase as long as the $t-$value of the coefficient of a newly added variable is, in absolute value, larger than 1, where the t-value is computed under the hypothesis that the true value of the coefficient is zero.

The next step in testing the model is the t-test. Each regression coefficient is tested individually; that is, separate hypothesis tests are set up for each coefficient β_i to 0. The null hypothesis for testing is $H_0 : \beta_1 = \beta_2 = ... = \beta_p = 0$. This is a joint or simultaneous hypothesis, since it postulates that $\beta_1, \beta_2, , \beta_p$ are jointly equal to zero. The easiest way to test the overall significance is by the analysis of variance technique. If the F-value exceeds the critical tabulated F-value at the α level of significance, we reject H_0, which states that Y is not linearly related to the Xs; otherwise, we accept it. The larger R^2 measure, the greater the computed F-value.

A variance inflation factor (VIF) provides a measure of multicollinearity among the independent variables in a multiple regression model. A high VIF indicates that the associated independent variable is highly collinear with the other variables in the model. In general, a VIF above 10 indicates high correlation and is cause for concern [10].

4 Results and Discussion

From the secondary data of 15 years in Table 1, the mean of the number of Chinese tourists was 4,517,509 persons/year significantly larger than the number of Russian tourists (922,246 persons/year). But the average of the per capita spending of Chinese tourists was 5,171.23 Baht/day slightly more than the per capita spending of Russian tourists (4,248.83 Baht/day).

Four independent variables such as the per capita spending of Chinese tourists (X_1), the China exchange rates (X_2), the real China GDP (X_3) and the comparative ratio of CPI of China and the CPI of Thailand (X_4) were used to find the factors affecting tourism demand of Chinese tourists. Pearson correlation analyses were made for the number of Chinese tourists with X_1, X_2, X_3 and X_4 (see Table 2). The results showed that the Pearson correlation between X_1, X_3, X_4 and the number of China tourists (Y_1) were

strongly positive correlations (r > 0.8). When X_2 and Y_1 were moderately positive correlation (r ≈ 0.3), the Pearson test statistic was a significant at 5 percent level or p-value < 0.05. Consequently, there was a significant linear relationship between X_1, X_3, X_4 and Y_1. Generally, no significant association between X_2 and Y_1 was observed (see Table 2).

Table 1: Descriptive statistics of variables

Variables	Mean	SD	Variables	Mean	SD
China			Russia		
Y_1	4,517,509	4,029,342.54	Y_2	922,246	567,713.32
X_1	5,171.23	864.97	X_5	4,248.83	280.36
X_2	4.92	0.275	X_6	0.945	0.343
X_3	54,648.09	25,558.54	X_7	1,606.43	420.55
X_4	92.66	10.78	X_8	78.78	26.55

Table 2: Pearson correlation coefficients between the number of Chinese and Russian tourists and independent variables

Variables	Correlation coefficients	t	p-value
X_1	0.975	15.776	< 0.000*
X_2	0.292	1.102	0.291
X_3	0.953	11.350	< 0.000*
X_4	0.911	7.965	< 0.000*
X_5	0.754	4.133	0.001*
X_6	0.743	-4.006	0.001*
X_7	0.716	3.694	0.003*
X_8	0.790	4.641	< 0.000*

significant at 5%

Similarly, four independent variables such as the per capita spending of Russian tourists (X_5), the Russia exchange rates (X_6), the real Russia GDP (X_7) and the comparative ratio of CPI of Russia and the CPI of Thailand (X_8) were used to find the factors affecting tourism demand of Russian tourists. In Table 2, the results showed that the Pearson correlation between X_5, X_6, X_7 and X_8 and the number of Russian tourists (Y_2) were positive correlations. There was significant linear relationship between the four independent variables (X_5, X_6, X_7, X_8) and the number of Russian tourists (Y_2).

In Table 3, since the residuals were not satisfied for the regression assumptions, the number of Chinese tourists (Y_1) was transformed with the

Table 3: Multiple linear regression coefficient of Chinese and Russian tourists

Variables	Regression coefficients	Std. Error	p-value	VIF	R^2_{adj}
China					
constant	-2456.016	386.567	< 0.000		0.980
X_1	0.683	0.109	< 0.000	6.736	
X_3	0.015	0.004	0.001	6.736	
Russia					
constant	3.393	0.327	< 0.000		0.974
X_5	0.000261	0.000	0.021	2.657	
X_7	0.000414	0.000	< 0.000	1.842	
X_8	0.009	0.001	< 0.000	1.625	

square root. Using the stepwise regression, the best regression model that had the highly adjusted R^2 (98%) contained the per capita spending of Chinese tourists (X_1) and the real China GDP (X_3) predictors. The VIF for the predictors were less than 10, also the multicollinearity did not exist. Therefore, the regression equation for predicting the number of Chinese tourists ($\hat{Y}_1$) was $\sqrt{\hat{Y}_1} = -2456.016 + 0.683X_1 + 0.015X_3$.

Similarly, in Table 3 the number of Russian tourists (Y_2) was transformed with the logarithm because of the problem of the assumption of residuals. The stepwise regression confirmed that the best model to predict the number of Russian tourists had the per capita spending of Russian tourists (X_5), the real Russia GDP (X_7) and the comparative ratio of CPI of Russia and the CPI of Thailand (X_8) predictors with the highly adjusted R^2 (97.4%). The VIF of all predictors were low. This finding indicates that multicollinearity did not exist. Thus, the regression equation for predicting the number of Russian tourists ($\hat{Y}_2$) was expressed as $\log \hat{Y}_2 = 3.393 + 0.000261X_5 + 0.000414X_7 + 0.009X_8$.

From the results of this research, the adjusted R^2 of the regression equation for predicting the number of Chinese tourists was 98%. This means that the per capita spending of Chinese tourists and the real China GDP factors explain 98% of the variation in the number of Chinese tourists and 2% was influenced by other factors. For the regression equation for predicting the number of Russian tourists, the adjusted R^2 was 97.4%. There was the per capita spending of Russian tourists, the real Russia GDP and the comparative ratio of CPI of Russia and the CPI of Thailand factors explain 97.4% of the variation in the number of Russian tourists and 2.6% were affected by other factors.

In order to apply the regression equations for prediction, one should know that the regression models should not be used to extrapolate beyond the range of the data [11]. Based on our regression equations of the number of Chinese and Russian tourists, they were handful for the normal event but not for this current epidemic and lockdown all over the countries. In fact, as of March 2020, the COVID-19 outbreak affected economic activities more severely in all aspects. In particular, the tourism sector severely contracted due to international travel restriction measures in many countries including Thailand. It was unclear what the economy would look like after COVID-19. However, flight costs were likely to drop amid the epidemic. Travel costs were expected to drop to 50%, compelling tourists to cash in on the more affordable traveling opportunities.

5   Conclusion

In this paper, we used multiple regression analysis to identify the major factors that influence tourism demand of Chinese and Russian tourists traveling to Thailand. The results found that two predictors: the per capita spending of Chinese tourists and the real China GDP, affecting tourism demand of Chinese tourists and three factors: the per capita spending of Russian tourists, the real Russia GDP and the comparative ratio of CPI of Russia and the CPI of Thailand influencing tourism demand of Russian tourists traveling to Thailand. The models and the results provided efficient references for the Thai government to make better plan for increasing the number of Chinese and Russian tourists traveling to Thailand by considering such factors while undertaking policy for the development of the Thai tourism industry in the future.

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