The Responsiveness of International Tourists on Uncertainty and Instability: The Case Study of Inbound Tourists to Thailand

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Abstract— **The purpose of this study is to examine the impact of uncertainty and instability factors as well as to recognize the determinants of the international tourism flows to Thailand. The study investigated the hypothesis that international tourists negatively respond to natural disasters, epidemic diseases, political unrest, and terrorism. The study uses panel data set during period 2003 – 2015 with 7020 observations. The data include the inbound tourists from East Asia, South Asia, Middle East, ASEAN, Europe, America, and Oceania. The results reveal that most of the variables in the model are statistically significant. Epidemic disease event counts immediately decrease tourist arrivals, but the effects will not extend to the next season. The study additionally found that terrorism event counts will delay the travel decision of tourists in the future. Tourists perceive more risk from the terrorism factor than others, so the factors prolong the impacts longer than other factors. The uncertainty and instability variables impact the tourist behaviors differently in different regions. Tourists from ASEAN and East Asia are more sensitive than other regions. The results reveal that all uncertainty and instability factors decrease the inbound tourists from these areas and extend the impact longer than other regions. The very same factors seem not to influence the travel decision of the tourists from South Asia, America, and Oceania.**
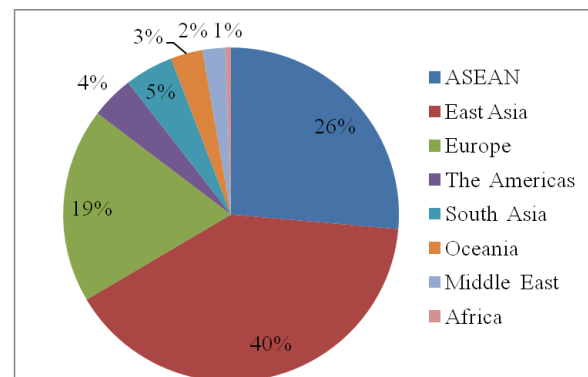
Keywords: Uncertainty, instability, tourist demand

I. INTRODUCTION

Thailand is located in Southeast Asia where the climate is controlled by tropical monsoons. Thailand is also a major tourist destination because of its friendly people, delicious food, numerous attractions, history and culture, and cheap living costs. Consequently, tourism plays an important role in the Thai economy. The direct contribution of travel and tourism to GDP was 1,037.3 billion baht (8.6% of total GDP) in 2014, and the total contribution of travel and tourism to GDP was 2,345.1 billion baht (19.3% of GDP) in 2015. The total contribution of travel and tourism to employment, including jobs indirectly supported by the industry, was 14.1% of total employment or about 5,383,000 jobs [1] (Turner, 2015). Also, we find that the contributions tend to be higher.

The graph of inbound tourists to Thailand in the year 2015 in Figure 1 shows that the tourists from East Asia are the largest group coming to Thailand. This group accounts for 40 percent followed by the tourists from ASEAN (26 percent). Europe comes in third at 19 percent.

FIGURE1: PERCENTAGE OF NUMBER OF TOURISTS INBOUND TO THAILAND IN YEAR 2015

Source: Immigration Bureau, Royal Thai Police and Department of Tourism of Thailand

These three groups are 85% of the entire tourism market of Thailand and consequently play an important role in the high growth rate of the tourist industry in Thailand.

"The bombing, one of the most serious terrorist incidents to occur in the Thai capital, is likely to have a negative impact on tourism growth for the remainder of the year." [2] (Beirman, 2015)

"The number of tourist arrivals is expected to fall and could continue declining if anti-government protests in Bangkok prolong. In fact, airport arrival figures show numbers continuing to rise, albeit more slowly than earlier in the year." [3] (Anon, 2013)

"Tourism industry losses mount as peak season in December approaches. 25 billion in losses if floods continue through December, 15 billion if not" [4] (Fernquest, 2011)

"International visitor arrivals at Bangkok airport have plunged by 41% in first three-week period of April 2003 over the same period of 2002 due to the SARS crisis, the biggest fall ever in history of Thai tourism." [5] (Muqbil, 2003)

As you can see, Thailand has faced the instabilities such as disaster, epidemic disease, political conflict, and terrorism for decades. The reporting of such events by newspapers, particularly if the stories occur at the time of booking holidays, can adversely affect the level of inbound tourists because they can increase the perception of risk at a destination. The news usually reported such events as causing a decline in a number of inbound tourists. However, by how much and for how long was the effect of the events is still unclear. Additionally, the tourists from the different regions may respond to the destabilizing events differently. To understand the tourists' behavior will benefit the government's efforts to mitigate the effect of the aforementioned events and rebuild confidence in Thailand as a tourist destination.

II. METHODOLOGY

A. Data

The study has a complete panel data set during period 2003 – 2015 with 7020 observations from 45 countries. The inbound tourists' data including East Asia, South Asia, Middle East, ASEAN, Europe, America, and Oceania.

TABLE I. YEARLY AVERAGE NUMBER OF TOURISTS INBOUND TO THAILAND

	Mean	Std. Deviation
ASEAN	44,153.45	56,367.38
East Asia	88,358.74	100,667.98
Middle East	4,717.50	4,428.72
South Asia	16,498.62	24,919.80
Europe	23,688.88	27,217.91
America	16,790.69	22,905.21
Oceania	31,319.60	27,154.97

Source: Author's estimation

According to the data, the greatest numbers of tourists to Thailand by region are from East Asia (primarily China, Japan, and Korea) which are averagely 88,358.74 persons per year. The tourists from Middle East are the least, averaging 4,717.50 persons per year.

TABLE II. YEARLY AVERAGE LENGTH OF STAY (DAYS) OF TOURISTS INBOUND TO THAILAND

	Mean	Std. Deviation
ASEAN	6.52	1.29
East Asia	7.32	0.77
Middle East	11.30	2.66
South Asia	7.55	1.03
Europe	16.67	1.88
America	14.45	2.13
Oceania	13.19	0.68

Source: Author's estimation

Table 2 presents the tourists' average length of stay in Thailand. The data reveals that Europeans stay the longest period which is averagely 16.67 days per trip. The tourists from ASEAN stay the shortest period, averaging 6.52 days per trip. Noticeably, distance may be a significant factor influencing tourist demand and destination preference.

A. Model

This study uses Dynamic Econometric Estimation with the hypothesis that the uncertainty and instability in the past will impact the number of international tourists arriving today. The function is presented as follows:

$$NT_{it} = f\ (GDP_{it}, PRICE_t, DIST_i, RAIN_t, TEMP_t, UNC_t, UNC_{t-1}, UNC_{t-2})$$

where

NT_{it} = Number of inbound tourists from country i arriving to Thailand at time t

GDP_{it} = GDP of country i at time t

$PRICE_t$ = Prices at time t

$DIST_i$ = Distance between country i and Thailand

$RAIN_t$ = Average rain in Thailand at time t

$TEMP_t$ = Maximum temperature in Thailand at time t

UNC_t = Uncertainty and instability event count in Thailand at time t

UNC_{t-1} = Uncertainty and instability event count in Thailand at time t-1

UNC_{t-2} = Uncertainty and instability event count in Thailand at time t-2

The previous studies have found that the number of inbound tourists, the length of stays, and tourists' expenditures are defined as the dependent variables. Because of the limitations of data provided, the number of international tourists arriving to Thailand is set to be only dependent variable in this study. The model constructed in this study is based on demand function, the classical economic theory which assumes that income and price are the main factors influencing the demand for international tourism. Additionally, climate and distance are factors which impact the number of tourists.

Gross domestic product (GDP) of the tourist's country represents the income of the tourists. Income is an important variable. If one has more income, one necessarily has the ability to spend an increased amount on leisure activities such as travel. This implies that income has a positive impact on international tourism arrivals [6 -7] (Yu-Shan Wang, 2009 and MA Ibrahim, 2011).

Most of the previous studies stated the price has a negative relationship with tourist demand. When prices rise, the inbound tourists will fall. This is amplified by the fact that, prices may include travel costs which tourists have to consider. Consequently, if prices are high, the willingness to visit a given place will decrease [8] (Yu-Shan Wang, 2009).

The exchange rate can also determine the cost of living. If an exchange rate (host country's currency per 1 unit of visitor's country's currency) increases (which means the host country's currency is depreciating) the tourists' demand will be higher [9-10] (Yu-Shan Wang, 2009 and MA Ibrahim, 2011). The exchange rate increases (THB depreciation) implies price of goods and services in Thailand are cheaper. The study uses consumer price index (CPI) expressing the prices and adjusted by exchange rate (Thai Baht (THB) per 1 unit of visitor's country's currency) [11] (Teresa Garin-Munoz, 2006). Therefore, if the prices increase, the number of tourists inbounds to Thailand will be decreased.

As the target variables are uncertainty and instability, we moreover, focus on analyzing the effects of natural disaster, epidemic disease, political conflict, and terrorism at the time t, t-1, and t-2 on the dependent variables. Also, there are other determinate factors on tourist demand. Distances between the visitor's countries to Thailand and climates, which consist of monthly average rain and maximum temperature of each month, are included in this analysis.

III. ESTIMATION AND RESULTS

The dependent variable data in this study are from Immigration Bureau, Royal Thai Police and The Department of Tourism. Other independent data are provided from several sources. The exchange rates and consumer price index are collected from the Bank of Thailand. GDP was provided by the Office of the National Economic and Social Development Board and the Thai's climate data are from Thai Meteorological Department. Lastly, the uncertainty event counts are from Thailand's major newspapers.

As present above, the inbound tourist demand depends on income of tourists, exchange rate, distance, climate, and uncertainty factors. In order to clearly illustrate the variables, the equation of the tourists demand is presented as follows:

$$
\begin{aligned}
\ln NT_{it} = \alpha &+ \beta_1 \ln GDP_{it} + \beta_2 \ln PRICE_t + \beta_3 \ln DIST_i + \beta_4 \ln RAIN_t \\
&+ \beta_5 \ln TEMP_t + \beta_6 PC_t + \beta_7 ND_t + \beta_8 ED_t + \beta_9 TER_t \\
&+ \beta_{10} PC_{t-1} + \beta_{11} ND_{t-1} + \beta_{12} ED_{t-1} + \beta_{13} TER_{t-1} \\
&+ \beta_{14} PC_{t-2} + \beta_{15} ND_{t-2} + \beta_{16} ED_{t-2} + \beta_{17} TER_{t-2} \dots (1)
\end{aligned}
$$

TABLE III.   THE ESTIMATION ON INBOUND TOURIST DEMAND TO THAILAND

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
lnPRICE	-0.067	**	-0.069	***	-0.066	**	-0.065	**	-0.066	**	-0.071	***
lnGDP	0.620	***	0.585	***	0.611	***	0.610	***	0.609	***	0.573	***
lnDIST	-7.312	***	-8.132	***	-7.579	***	-7.599	***	-7.633	***	-8.386	***
lnRAIN	-0.007		-0.004		-0.007		-0.006		-0.006		0.000	
lnTEMP	-0.857	***	-0.967	***	-0.815	***	-0.865	***	-0.887	***	-0.789	***
political conflict t			0.011	***							0.011	***
political conflict t-1			-0.005	**							-0.001	
political conflict t-2			0.001								0.002	
natural disaster t					-0.003						-0.001	
natural disaster t-1					-0.011						-0.008	
natural disaster t-2					0.017	***					0.020	***
epidemic diseases t							-0.026	**			-0.027	**
epidemic diseases t-1							0.002				0.004	
epidemic diseases t-2							0.001				-0.001	
terrorism t									0.009	***	0.001	
terrorism t-1									-0.007	*	-0.011	***
terrorism t-2									0.001		-0.002	
_cons	78.121	***	86.653	***	80.594	***	80.968	***	81.384	***	88.580	***
(Country-specific Fixed-effects Specification)												
R-Square	0.793		0.795		0.794		0.794		0.794		0.796	

Source: Author's estimation

where

NT_{it} = Number of inbound tourists from country i arriving to Thailand at time t

GDP_{it} = GDP of country i at time t

$PRICE_t$ = CPI at time t x Exchange rate at time t

$DIST_i$ = Distances between country i and Thailand

$RAIN_t$ = Monthly average rain in Thailand at time t

$TEMP_t$ = Maximum temperature in Thailand at time t

PC_t = Political conflict event counts in Thailand at time t

PC_{t-1} = Political conflict event counts in Thailand at time t-1 (last month)

PC_{t-2} = Political conflict event counts in Thailand at time t-2 (last 2 months)

ND_t = Natural disaster event counts in Thailand at time t

ND_{t-1} = Natural disaster event counts in Thailand at time t-1

ND_{t-2} = Natural disaster event counts in Thailand at time t-2

ED_t = Epidemic diseases event counts in Thailand at time t

ED_{t-1} = Epidemic diseases event counts in Thailand at time t-1

ED_{t-2} = Epidemic diseases event counts in Thailand at time t-2

TER_t = Terrorism event counts in Thailand at time t

TER_{t-1} = Terrorism event counts in Thailand at time t-1

TER_{t-2} = Terrorism event counts in Thailand at time t-2

For the estimation of equation (1) we have used STATA econometric software to obtain the country-specific fixed-effects specification for panel estimations [12-14] (Anderson and van Wincoop, 2003: Feenstra, 2004: Matyas, 1997). Table 3 shows the results from the estimation. The results of Model 1 reveal that most of the independent variables are statistically significant and consistent with the demand theory, except monthly average rain. Prices have a negative impact on tourist demand. If prices increase, the number of inbound tourists will be decreased. GDP of the host countries has a positive impact on the number of inbound tourists to Thailand. The distance and temperature have negative signs. The longer the distance from the country of origin decreases the number of inbound tourists from those countries. Average rain and temperature variables represent the season. We find that the rainy season is not significant on tourists' decisions while the number of inbound tourists rise when the weather is cooler (Normally, the weather is cooler at the end of the year). Additionally, we estimate Model 2 – Model 6 with the country-specific fixed-effects specification estimator to examine the effects of uncertainty and instability factors. The results of Table 3 show that all models perform satisfactorily. The influences of the classic demand variables, distance, and season in all models have the same impacts on the number of inbound tourists.

Model 2 – model 5 separately examine the impacts of each uncertainty factor. Model 2 considers the political conflict variable. The study found that the current event counts (time t) have a positive effect on a number of inbound tourists which is not inconsistent with previous research. The related research [15] (Maria D. Alvarez and Sara Campo, 2014) also stated that political conflict decreases intention to visit in the future. Consistent with the previous research, the estimations of this study reveal that the event counts in the past month negatively impact the number of tourists today while the event counts in the past two months (time t – 2) do not. It confirms that political conflict has only short-run impact on decreasing inbound tourists.

Concerning the natural disasters event counts (Model 3), the results show that the event counts on the current period and period t – 1 have a negative relationship with the number of incoming tourists on the current period but they are not significant. However, event counts on period t – 2 have a positive impact. The estimations cannot confirm that in the time during disasters, the number of inbound tourists drastically decreases [16-18] (Yu-Shan Wang, 2009: Jennifer De Vries, 2010: Jen-Hung Huang, Jennifer C.H. Min, 2002).

We found that epidemic diseases event counts in Model 4 have a statistically significant impact on the dependent variable at the current period but the impacts will not extend beyond the current period if estimating only this factor alone. Unlike other uncertainty and instability factors, the terrorism positively influences in the period that the event occurs, but the terrorism event counts suppress the volume of incoming tourists in the next period (Model 5). Since people are concerned for their safety but cannot change their commitments, they instead choose to travel elsewhere or not travel after the event.[19-20] (Yu-Shan Wang, 2009: B.N. Rittichainuwat and Goutam Chakraborty, 2009).

The empirical results in model 6 have shown that most of the variables in the model are statistically significant. Epidemic disease event counts negatively influence tourist arrivals immediately which are consistent with other studies. There is some evidence showing epidemic diseases decrease tourist demand in the same period [21] (Hsiao-I. Kuo, Chi-Chung Chen, Wei-Chun Tseng, Lan-Fen Ju, Bing-Wen Huang, 2008). B.N. Rittichainuwat and Goutam Chakraborty (2009) [22] found the negative impacts on the number of inbound tourists to Thailand during the SARS period in 2003 and during Avian Flu in 2008. The effects will not extend to the next period. The study additionally found that terrorism event counts will delay travel decisions of tourists in the next period. In other words, the terrorism news of last month changes tourists' travel decisions in the present as they are concerned for their safety. The numbers of inbound tourists are then decreased.

Conversely, political conflict event counts at time t positively affect the number of tourists. It supports the Phuket News' report in year 2013 which stated the tourists' arrival continued to rise at the same period of the protest.

TABLE IV.   THE ESTIMATION ON INBOUND TOURIST DEMAND TO THAILAND BY REGIONS

	ASEAN	East Asia	Europe	America	Oceania	Middle east	South Asia
lnPRICE	-0.048 ***	0.294 *	0.054	2.531 ***	0.293	1.855 ***	-0.977 **
lnGDP	0.947 ***	1.063 ***	0.291 ***	1.079 ***	1.290 ***	0.736 ***	0.186
lnDIST	-1.258 ***	6.237 ***	14.989 ***	2.286	5.867 **	-4.506	4.025 *
lnRAIN	0.028 ***	0.016	-0.115 ***	-0.084 **	0.021	0.087 ***	0.034
lnTEMP	-0.782 ***	-0.763 **	-1.419 ***	0.578	-1.016	-0.562	-1.231
political conflict t	-0.003	-0.004	0.021 ***	0.011	-0.003	0.008	-0.002
political conflict t-1	-0.023 ***	-0.026 ***	0.014 *	0.014	-0.017	-0.004	-0.009
political conflict t-2	-0.018	-0.045 **	-0.050 ***	0.005	0.028	0.053	-0.012
natural disaster t	0.000	0.003	-0.006	-0.001	0.002	0.010	0.005
natural disaster t-1	0.002	-0.005	-0.005	-0.004	-0.003	-0.009	0.004
natural disaster t-2	-0.002	-0.025 **	-0.007	-0.008	0.000	-0.015	-0.009
epidemic diseases t	0.001	0.007	0.009	-0.018	0.004	-0.025	0.025
epidemic diseases t-1	-0.008 ***	-0.021 ***	-0.006	-0.007	-0.009	-0.026 *	-0.007
epidemic diseases t-2	-0.002	-0.008 *	0.007 *	-0.004	-0.004	-0.010	0.000
terrorism t	-0.004	-0.025 ***	0.051 ***	0.030	-0.012	-0.012	-0.002
terrorism t-1	-0.021	-0.011	0.013	0.034	0.033	0.023	-0.022
terrorism t-2	-0.010 **	-0.018 ***	0.007	0.011	-0.003	0.005	-0.010
_cons	16.845 ***	-44.532 ***	-123.6292 ***	-43.546	-49.727 **	33.921	-13.586
(Country-specific Fixed-effects Specification)							
R-Square	0.952	0.756	0.675	0.753	0.355	0.413	0.486

Source: Author's estimation

The result is not inconsistent with the previous studies [23-24] (M A Clements and A Georgiou, 1998: Eric Neumayer, 2004). These studies showed the negative relationship between tourist demand and political violence. However, some related research said that the more experience tourists perceived political instability to be less of a risk than other factors. The perception of risk associated with political instability is not significant [25] (Lepp and Gibson, 2003).

The estimation results show the positive relationship between number of inbound tourists and the natural disasters event counts at time $t - 2$ while there are no statistically significant at present period and time $t - 1$.

Furthermore, the study examines the tourist behaviors across regions including ASEAN, Middle East, South Asia, East Asia, Europe, America, and Oceania to understand the responsiveness of inbound tourists from different regions to uncertainty and instability events. The results are shown in Table 4.

The uncertainty and instability variables impact the tourist behaviors differently in different regions. Some factors seem not to influence the travel decision of the tourists from America, Oceania, and South Asia. The epidemic diseases t-1 has a negative relationship with the number of tourists from the Middle East while other instabilities do not. The uncertainty and instability variables have a greater influence on the decision making of tourists from ASEAN, East Asia, and Europe. However, the political conflict at the current period positively impacts the number of tourists from Europe while there is no statistically significant effect on the tourists from ASEAN and East Asia. The political conflicts in the past (at time $t - 1$) slows down the ASEAN and the East Asian tourists inbound to Thailand as we see in the news that tourists are cancelling trips in the future due to political instability. Also, the tourists from East Asia and Europe are affected by political conflicts more than ASEAN. In fact, the impacts continue to depress the number of tourists in the next 2 periods.

Next, natural disasters impact only the number of tourists from East Asia while not influencing the travel decision of others. Natural disasters create a decline in East Asian tourist demand in the future. However the events do not affect tourist demand in the present period.

The results reveal that epidemic disease event counts decrease tourist demand from East Asia, ASEAN, and Middle East in the next period while there is no impact on tourists from other regions. In addition, we found that these events significantly prolong the negative impacts on East Asia tourist demand, but they do not influence the ASEAN's and the Middle East's demands.

Furthermore, we found that the tourists from East Asia are more sensitive on terrorism than other regions since the terrorism event counts immediately depress the tourist demand, and there is a continuous effect in the long term. The news related terrorism in the past (time $t - 2$) delays the travel decisions of tourists from ASEAN and East Asia and draws

out the impact longer than other regions. However, the terrorism at the current period has a positive impact on European tourists while the news in the past is not significant which is inconsistent with previous studies.

The climate variables seem to impact the tourist behaviors differently in different regions as well. Lower temperature increases the number of tourists from ASEAN, East Asia, and Europe while there is no effect on other regions. The ASEAN's and the Middle East's tourists like to visit Thailand in rainy season though the Europeans and Americans do not.

Prices and GDP, which are the important variables in the classic demand function, also drastically influence the number of inbound tourists. These variables are statistically significant. Changes in GDP are consistent with the theory, but the prices are not. The number of ASEAN and South Asia tourists has a negative relationship with the prices. This means if the price of goods and services increases, the tourists from those regions will decline. Interestingly enough, an increase in price has a positive impact on the East Asian, the American, and the Middle Eastern tourists while changes in price will not influence the travel decision making of European and Oceania tourists.

IV. CONCLUSION

Since Thailand is a main tourist destination of the world, the uncertainty and instability factors impact the number of tourists   only in the short run, not in the long run. Tourists perceive more risk from the terrorism and epidemic diseases factors than others, and the impact of these factors is far more prolonged than other factors.

Tourists from ASEAN and East Asia are more sensitive than other regions. The results reveal that all uncertainty and instability factors decrease the inbound tourists and extend the impacts longer for these two regions than other regions. Tourists from these two regions account for 66 percent of all. Government, therefore, should pay the most attention to those regions. Government should further improve information and communication to tourists about security and emphasize the image of a peaceful and beautiful land of smiles.

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