

## RISK PREMIUM OF INCOME FROM FOREIGN TOURISTS OF THAILAND

Chaiwat Nimanussornkul<sup>a\*</sup> and Kunsuda Nimanussornkul<sup>a</sup>

<sup>a</sup> Faculty of Economics, Chiang Mai University, 239 Huay Kaew Road, Mueang, Chiang Mai, Thailand

\* Corresponding Author: [chaiwatnim@gmail.com](mailto:chaiwatnim@gmail.com)

**Abstract:** Tourism sector has continuously and increasingly played a significant role for world economy. The number of international tourist arrivals and international tourism receipts were 1,235 million and 1,220 US dollar in 2016, respectively. The Asia and the Pacific region had the highest international tourist arrivals growth. The international tourism receipts was the source of income for developing country. Thailand is one of developing countries that tourism sector leads to employment opportunities and boosts revenue for all tourism-related industries in the country. However, the revenue from foreign tourist was volatile. Therefore, the arbitrage pricing theory (APT) is applied to investigate the risk and risk premium on international tourism receipts of Thailand. The seemingly unrelated regression and ordinary least square models were employed to the macroeconomic data from 13 countries in year 2001 to 2015. The results shown that the risk of Thai international tourism receipts came from the growth rate of foreign gross domestic product per capita, the change in exchange rate, and the ratio of the consumer price index while the risk premium did not found.

**Keywords:** International Tourism Receipts, Risk, Risk Premium, Arbitrage Pricing Theory.

### 1. INTRODUCTION

Tourism has experienced continued growth over six decades and become one of the major economic sectors in the world. World Tourism Organization (UNWTO) (2018) reported that tourism sector had around 10 percent share in world gross domestic product, 7 percent of world's exports, and 30 percent of services exports. Moreover, the international tourist arrivals and international tourist receipts were 1,235 million and 1,220 US dollar in 2016, respectively (World Tourism Organization, 2017). Table 1 shows the international tourist arrivals and its growth rate. In overall, the international tourist arrivals were continuous increase overtime in all regions. The average growth rate of international tourist arrivals was 3.9 percent. The Asia and the Pacific region had the highest growth over a decade in both absolute and relative terms across five regions.

The tourism sector, nowadays, is one of the main income sources for many developing countries. It's also creates many economic activities such as the souvenir, the transportation, hotel and accommodation, etc. Thailand, the world's top tree tourism earners in 2016 (World Tourism Organization, 2018), is one of the developing countries that tourism sector has continuously and increasingly played a significant role for Thailand. According to statistics of Thailand Department of Tourism shown in table 2, there were 29.88 million foreign tourists visiting Thailand in 2015 and the number increased by 20.44 percent and created income of 1.45 trillion baht or a 24.25 percent increase in revenue. Although the trends in tourism industry in 2015 were better than the ones in 2014, it was found that the number of international tourist arrivals and the international tourism receipts from 2007 to 2015 were fluctuating. In particular, the international tourism receipts of Thailand in some years rose to 30.94 percent while the rate fell by

**Table 1**  
**The international tourist arrivals**

	<i>International tourist arrivals (million)</i>				<i>Average growth (%)</i>	<i>Annual growth (%)</i>
	<i>2005</i>	<i>2010</i>	<i>2015</i>	<i>2016</i>	<i>(2005-2016)</i>	<i>(2015-2016)</i>
<b>World</b>	809.0	953.0	1,189.0	1,235.0	3.9	3.9
<b>Europe</b>	453.2	489.0	603.7	616.2	3.0	2.1
<b>Asia and the Pacific</b>	154.1	208.1	284.0	308.4	6.1	8.6
<b>Americas</b>	133.3	150.1	192.7	199.3	3.7	3.5
<b>Africa</b>	34.8	50.4	53.4	57.8	4.4	8.1
<b>Middle East</b>	33.7	55.4	55.6	53.6	4.7	-3.7

Source: World Tourism Organization (2017)

**Table 2**  
**International tourist arrivals and international tourism receipts of Thailand**

<i>Year</i>	<i>International tourist arrivals of Thailand</i>		<i>International tourist receipts of Thailand</i>	
	<i>Number (million)</i>	<i>Annual growth (%)</i>	<i>Revenue (Million baht)</i>	<i>Annual growth (%)</i>
2008	14.58	0.83	574,520	13.57
2009	14.15	-2.98	510,255	-11.19
2010	15.94	12.63	592,794	16.18
2011	19.23	20.67	776,217	30.94
2012	22.35	16.24	983,928	26.76
2013	26.55	18.76	1,207,145	22.69
2014	24.81	-6.54	1,172,798	-2.85
2015	29.88	20.44	1,457,150	24.25

Source: <http://www.tourism.go.th/home/details/11/222/24839>

11.19 percent in some years. This revealed the uncertainties or risks arose from it.

Due to the risks of international tourism receipts of Thailand, it would be difficult to predict tourism income and this affected the implementation of economic policies of policy makers. As a result, identifying factors having effects on the changing rate of international tourism receipts can help policy makers of the country to maintain the stability of tourism revenue. Furthermore, recognizing the impacts and risk levels of the factors as well as the risk premium will gain more ability to make an appropriate and right decision on economic policy implementations. Therefore, the aims of this study were to find the value at risk and risk premium of economic factors having an impact on international tourism receipts of Thailand. The result of the study would benefit economic policy makers to implement economic policies. Arbitrage Pricing Theory

(APT) was applied to find the risk and the risk premium on international tourism receipts of Thailand in this study.

## 2. PREVIOUS RESEARCH AND MODEL SPECIFICATION

The previous research have been investigated the relationship of tourism variables and macroeconomic variables. The tourism variables that have been used are tourism arrivals and tourism receipts in term of the absolute value and percentage growth. The economic growth were used in most previous research as a macroeconomic variable. Tugcu (2014), Seghir, *et al.* (2015), Pérez-Rodríguez, Ledesma-Rodríguez, and Santana-Gallego (2015), Vita and Kyaw (2016), Ohlan (2017), Martins, Gan, and Ferreira-Lopes (2017), Perles-Ribes, *et al.* (2017), and Shahzad, *et al.* (2017) were analyze the relationship, or the risk, of tourism variable and

macroeconomics variables in difference region and difference methodology. Many research found the significant relationship of tourism variables and macroeconomic variables. Some research added more socio-economic variable in their studies such as the political instability or poverty variable in the research of Tang and Abosedra (2014) and Rakotondramaro and Andriamasy (2016), respectively. In addition, some research explored both risk and risk premium but in the financial area such as Lim and Chan (2013) and Chang, Hsu, and McAleer (2014). However, the previous research concerned only the effect of explanatory variables on the tourism variables except the research of Nimanussornkul and Quang Do (2017) that investigated more in the risk premium of the macroeconomics variables as well. Unfortunately, they employed the ordinary least square in their estimations that leads to inefficiency of estimators. Therefore, this study was applied the arbitrage pricing model to determine the risk and the risk premium in tourism sector using the appropriate methodology.

The capital asset pricing model (CAPM) is the simplest model to explain the effect of only one factor, stock market return, to the individual asset return. The size and sign of these effect is called the systematic risk or beta. Stephen A. Ross (1976) introduced the arbitrage pricing theory (APT) that generalize the CAPM. The APT allow any number of factor impact on individual asset return. The mathematical model of APT can be expressed as follow:

$$r_{jt} = \beta_{j0} + \beta_{j1} F_{1t} + \beta_{j2} F_{2t} + \dots + \beta_{jk} F_{kt} + \varepsilon_{jt} \quad (1)$$

where  $r_{jt}$  is the return of asset  $j$  at time  $t$  for  $j = 1, 2, \dots, m$

$\beta_{ji}$  is the risk of factor  $i$  on return of asset  $j$  for  $j = 1, 2, \dots, m, i = 1, 2, \dots, k$

$F_{it}$  is the factor  $i$  effect to return of asset at time  $t$  for  $i = 1, 2, \dots, k$

$\varepsilon_{jt}$  is the error term of asset  $j$  at time  $t$  for  $j = 1, 2, \dots, m$

The equation (1) would be estimated by using the seemingly unrelated regression (SUR) model. In this study, the SUR model was appropriate and efficiency than the

ordinary least square (OLS) model because the error terms were correlated across the equations. The  $\beta_{ji}$  or the risk of factor  $i$  in equation (1) would be employed to estimate the risk premium. The APT model estimated the risk premium by using the OLS model on equation (2).

$$E(r_j) = \lambda_0 + \lambda_1 \beta_{j1} + \lambda_2 \beta_{j2} + \dots + \lambda_k \beta_{jk} + e_j \quad (2)$$

where  $E(r_j)$  is the expected return of asset  $j$  for  $j = 1, 2, \dots, m$

$\lambda_i$  is the risk premium of factor  $i$  for  $i = 1, 2, \dots, k$

$e_j$  is the error term of asset  $j$  for  $j = 1, 2, \dots, m$

The study estimated the risk and risk premium of Thailand international tourism receipts by employing the APT model. The rate of change in international tourism receipts from 13 foreign tourists travel to Thailand were used as the asset return. The factors that had impact on rate of change in international tourism receipts were the rate of change in exchange rate of country  $i$  currency against Thai Baht, the ratio of consumer price index of country  $i$  to Thai consumer price index, and the gross domestic product per capita growth of country  $i$ .

### 3. DATA

Economic factors including the rate of change in exchange rate of country  $i$  currency against Thai Baht, the ratio of consumer price index of country  $i$  to Thai consumer price index, the gross domestic product per capita growth of country  $i$ , and the international tourism receipts of Thailand from 2001 to 2015 were utilized in this study. The international tourism receipts of Thailand was chosen in accordance with the first 13 international tourists' original countries distributing the highest income to Thai tourism sector. The list of the 13 countries and the variables used in this study are illustrated in Table 3 and Table 4, respectively.

### 4. EMPIRICAL RESULTS

The findings of this study with reference to the risk premium of the international tourism receipts of Thailand are as follows:

**Table 3**  
**The list of the 13 countries studied in this study**

<i>Abbreviation</i>	<i>Country</i>
AU	Australia
CN	China
DE	Germany
FR	France
IN	India
JP	Japan
KR	Korea
LA	Laos
MY	Malaysia
RU	Russia
SG	Singapore
UK	United Kingdom
US	United States of America

**Table 4**  
**Summary of variable names**

<i>Abbreviation</i>	<i>Definition</i>
EXCH	Exchange rate of foreign currency against Thai Baht
CPI	The ratio of consumer price index of foreign country to Thai consumer price index
GDP	Gross domestic product per capita growth of foreign country
REXCH	Risk of exchange rate
RCPI	Risk of consumer price index ratio
RGDP	Risk of gross domestic product per capita growth

The findings concerning the risk premium of the international tourism receipts of Thailand were shown in Table 5. It reveals that the changing rates in the exchange rate of Thai baht against Australian dollar, Chinese yuan, French euro, Indian rupee, Japanese yen, Malaysian ringgit, Singapore dollar, and English pound sterling had the effect on the growth rate of the international tourism receipts of those countries. It shows that the changing rate of Thai baht against Malaysian ringgit, Chinese yuan, and French euro had the most influential effects on the growth rate of the international tourism receipts. In other words, if exchange rate of Thai baht against Malaysian ringgit changed one percent, the international tourism receipt from Malaysian tourists

would alter 5.27 percent. Conversely, if the exchange rate of Thai baht against Malaysian ringgit fell one percent, there was a 5.27 percent change in international tourism receipts from Malaysian tourists. While the changing rates of Thai baht against Chinese yuan and French euro changed one percent, the changing rate of the international tourism receipts from Chinese and French tourists would be altered in the opposite direction by 3.27 and 1.71 percent, respectively. Therefore, related organizations have to give importance to the changing rate of Thai baht against Malaysian ringgit, Chinese yuan, and French euro due to the fact that it considerably had effects on the changing rate of international tourism receipts. With regard to the changing rate of Thai baht against German euro, Korean won, Lao kip, Russian ruble, and US dollar, it had no effect on the changing rate of international tourism receipts from those countries.

Concerning proportion of consumer price index of foreign countries to consumer price index of Thailand, it shows that only the proportion of consumer price index of China, Korea, the United Kingdom, the United States had the impact on the changing rate of international tourism receipts. If the consumer price index of those countries to consumer price index of Thailand was increase, the changing rate of international tourism receipts from Chinese, British, and American tourists was decrease. However, it resulted in an increase of the changing rate of revenue from Korean tourists. Furthermore, the findings also reveal that if the average price of goods from China, the United Kingdom, and the United States of America was higher than the average price of goods from Thailand by 10 percent more, the tourists from these three countries would spend less money in Thailand by 15.7, 6.9, and 3.9 percent, respectively. However, if the average price of goods from Korea was higher than the average price products from Thailand by 10 percent more, the Korean tourists would spend more money in Thailand by 23.4 percent. Consequently, when predicting the revenue from the Chinese, the Korean, the British, and the American, the ratio of inflation between these four countries and Thailand had to be considered. Regarding to the rest of the countries, there was no change of the inflation ratio affecting the international tourism receipts.

With regard to the increase or decrease of the gross domestic product per capita growth of China, Japan, and Singapore, it had no effects on the changing rate of international tourism receipts from the tourists of those countries. When considering the change of gross domestic product per capita growth of Laos, Korea, and the United States, it had the highest impact on the changing rate of the international tourism receipts. In other words, if the gross domestic product per capita of China, Japan, and the United States of America increased one percent, the international tourism receipts from those countries increased 3.6, 1.9, and 1.8 percent, respectively.

The findings in Table 6 illustrates that the occurrence of international tourism receipts risk from the change of the exchange rate, the consumer price index ratio, and the growing rate of the gross domestic product per capita

**Table 5**  
**The risk of international tourism receipts of Thailand**

	<i>Constant</i>	<i>EXCH</i>	<i>CPI</i>	<i>GDP</i>
AU	264.8349	<b>-1.5570</b>	-245.7487	<b>1.3447</b>
	1.5223	<b>-3.5259</b>	-1.5002	<b>4.2646</b>
CN	<b>215.3612</b>	<b>-3.2740</b>	<b>-157.5917</b>	-0.2223
	<b>10.6111</b>	<b>-7.6056</b>	<b>-9.4032</b>	-1.0691
DE	-3.9134	-0.2261	7.7355	<b>0.6366</b>
	-0.1732	-1.9270	0.3862	<b>7.3469</b>
FR	69.1491	<b>-1.7102</b>	-57.5165	<b>1.3037</b>
	1.4873	<b>-3.7957</b>	-1.3132	<b>3.0697</b>
IN	13.6892	<b>-1.5354</b>	-7.7172	<b>0.4699</b>
	0.9950	<b>-5.1315</b>	-0.6688	<b>2.0015</b>
JP	5.8284	<b>-1.1353</b>	-1.7642	0.7666
	0.2527	<b>-2.5400</b>	-0.0872	1.5610
KR	<b>-234.4925</b>	-0.6103	<b>234.9344</b>	<b>1.9335</b>
	<b>-2.5831</b>	-1.5988	<b>2.5943</b>	<b>4.7564</b>
LA	30.9297	1.1918	-51.8151	<b>3.6259</b>
	0.5038	0.9276	-0.9360	<b>6.3923</b>
MY	82.5902	<b>-5.2722</b>	-79.9604	<b>1.2784</b>
	0.4036	<b>-4.5872</b>	-0.4322	<b>2.6406</b>
RU	-15.2425	0.9287	11.6373	<b>0.9262</b>
	-0.6673	1.4844	1.8830	<b>2.4050</b>
SG	-29.9256	<b>-1.6669</b>	38.1823	0.2449
	-0.4466	<b>-3.6244</b>	0.5695	0.9552
UK	<b>74.1393</b>	<b>-0.6279</b>	<b>-69.4011</b>	<b>1.0660</b>
	2.4851	-3.2592	-2.3450	6.1277
US	<b>96.9577</b>	-0.6720	<b>-39.0636</b>	<b>1.8101</b>
	<b>1.8930</b>	-1.5220	<b>-1.8443</b>	<b>3.9280</b>

Note: Entries in bold are significant at the 95% level

**Table 6**  
**The risk premium of international tourism receipts of Thailand**

<i>Constant</i>	<i>REXCH</i>	<i>RCPI</i>	<i>RGDP</i>
<b>1182.5060</b>	-46.2446	-1.2060	-218.2161
<b>4.4249</b>	-0.5250	-1.0025	-1.4759

Note: Entries in bold are significant at the 95% level

had no risk premium. That is to say, the impact level which was from the change of three economic variables had no effects on the international tourism receipts of Thailand.

## 5. CONCLUSION

The purpose of this study was to find out the risk and the risk premium of economic factors having the effects on international tourism receipts of Thailand. Annual data of the rate of change in exchange rate of foreign country currency against Thai Baht, the ratio of consumer price index of foreign country to Thai consumer price index, the gross domestic product per capita growth of foreign country, and the international tourism receipts of Thailand from 13 countries between 2001 and 2015 were used in this study.

The findings illustrates that the important economic factor which had an influence on international tourism receipts of Thailand was the growth rate of gross domestic product per capita of countries. There were 9 countries whose growth rate of gross domestic product per capita had the effect on the changing rate of revenue of international tourist arrivals to Thailand except China, Japan, and Singapore. The reason behind this is because more and more Chinese tourists have travelled aboard and their national income has increased consistently over the past decade. Therefore, it results in Chinese tourists continuously travelling aboard. Compared to Japanese and Singaporean tourists, they are from developed countries with high income per capita, but their expenditure of visiting Thailand was not high. Consequently, the travelling of tourists from these 2 countries may depends on other factors.

The economic factor which was the second importance of this study was the exchange rate. The change of the exchange rate affected the international

tourism receipts from 8 countries who visited Thailand. However, concerning the magnitude of the impact, the change in the exchange rate had the greater impact on international tourism receipts than the change of the gross domestic product per capita when the change having the same magnitude. In other words, the risk from the change of the exchange rate had the most significant effect on the international tourism receipts of Thailand. With regard to the ratio of consumer price index of foreign countries to consumer price index of Thailand, it was found that only the consumer price index ratio of China, Korea, the United Kingdom, and the United States of America had the effect on international tourism receipts of Thailand. This revealed that foreign tourists visiting Thailand did not place importance on the comparison of the change in the price of goods and services of their countries with the one of Thailand.

Consequently, organizations related to tourism sector should devote much attention to the change in exchange rate, the ratio of consumer price index, and the growth rate of gross domestic product per capita of foreign countries for the imposition of tourism policies in order to boost more international tourism revenue.

With reference to the risk premium, it reveals that although the international tourism receipts of Thailand was at risk from the change of growth rate of the income per capita, the changing rate of the exchange rate, and the ratio of consumer price index, no risk premium was found from the three economic factors studied. This is due to the fact that Thailand tourism policies were not imposed by the risks of those economic factors.

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