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# **Risk and Risk Premium on International Tourism Receipts of Asia and The Pacific Region**

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**Abstract:** Tourism industry is continuous expansion and becomes the one of major industry in recent decades. The number of international tourist arrivals and international tourism receipts in 2016 are 1,235 million and 1,220 billion US dollars, respectively. Asia and The Pacific region is the highest growth in term of international tourist arrivals. However, the international tourism receipts is volatile. Therefore, the arbitrage pricing theory (APT) is applied to find the risk and risk premium on international tourism receipts of the countries in Asia and The Pacific region. The results show that the change in foreign exchange rate has highly impact on Hong Kong international tourism receipts whereas inflation ratio has more effect to the international receipts growth have to concern next and the change in crude oil price, that has lowest impact on international tourism receipts, is the last. Furthermore, the high risk on international tourism receipts is the cause of low expected international tourism receipts.

Keywords: International Tourism Receipts, Risk, Risk Premium, Arbitrage Pricing Theory, Asia and The Pacific.

## **1. INTRODUCTION**

Tourism industry is continuous expansion over six decades and becomes the one of major industry in recent decades. The number of international tourist arrivals and international tourism receipts in 2016 are 1,235 million and 1,220 billion U.S. dollars, respectively. Tourism industry creates the economic activities and has the direct and indirect linkages to others industries such as the transportation industry, hotel and accommodation industry, souvenir industry, or food industry. These linked industries have use more material in its own country or have the low level of the import content. Their also have the high value added. This means that the tourism industry will creates the jobs and income to the country from upstream industry to

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downstream industry. Moreover, it is the source of the foreign income that can stabilize the foreign exchange rate.

In table 1, the international tourist arrivals is growing continuously in all regions with the average growth rate 3.9% per year in 2005 - 2015. Asia and the Pacific international tourist arrivals has the highest average growth rate at 6.1% while the others regions growth only 3.0 - 4.7%. For international tourism receipts, America and Middle East regions has positive growth in 2015 whereas Europe, Asia and the Pacific, and Africa regions has negative growth until 2015. However, in table 2, international tourism receipts in term of local currency is decreasing in 2013 - 2015. Asia and the Pacific region has the same trend as the world while the others regions have fluctuation. The falling and unstable in international tourism receipts have the high proportion in export sector and it also has the direct impact on both real and monetary sectors.

Table 1       The international tourist arrivals       International tourist arrivals (million)						
World	809.0	953.0	1,189.0	1,235.0	3.9	
Europe	453.2	489.0	603.7	616.2	3.0	
Asia and the Pacific	154.1	208.1	284.0	308.4	6.1	
Americas	133.3	150.1	192.7	199.3	3.7	
Africa	34.8	50.4	53.4	57.8	4.4	
Middle East	33.7	55.4	55.6	53.6	4.7	

Source: World Tourism Organization (2017)

The international tourism receipts					
	International tourism receipts Local currencies, constant prices (% change)				
	2013	2014	2015	2016	
World	5.6	4.3	4.1	2.6	
Europe	4.1	4.4	2.7	0.9	
Asia and the Pacific	8.5	1.5	2.5	4.8	
Americas	6.6	6.7	8.2	2.7	
Africa	2.5	3.7	0.5	8.3	
Middle East	1.9	5.1	1.3	-2.0	

Table 2The international tourism receipts

Source: World Tourism Organization (2017)

As the economy is more rely on tourism sector in many developing countries. The income from international tourists is become the one of economic variables that under consideration of business and government sectors to launch the policies. Therefore, international tourism spending has been studied widely in recent decades. The international tourists will spend more or less depending not only on their income, it also depending on some economic factors such as the exchange rate, the inflation rate, or the cost of transportation. The change in economics factors will effect to international tourist's spending. Hence, the international tourism receipts depend on the economics factors. Additionally, the impact, or the risk, of each economic factor on international tourism receipts has the different magnitude as well as the risk premium of the risk from these economic factors.

The risk of international tourism receipts is useful to manage and launch the appropriate policy of the firms, authorities and government. The understanding of the impact of economic factors on international tourism receipts will give the executive and policy makers more easily to stabilize the income from international tourists. As well as the risk premium on the risk of economic factor is important for making the policy decision. Therefore, the arbitrage pricing theory (APT), which widely used in finance, is applied in this study to find the risk and risk premium on international tourism receipts of the countries in Asia and The Pacific region.

#### 2. PREVIOUS RESEARCH AND MODEL SPECIFICATION

Many research have been investigated to assess the relationship of tourism and macroeconomic variables. The tourism arrivals and tourism receipts are used to reveal the effect of tourism on macroeconomic variable as well the effect of macroeconomics variables on tourism. Most of research in the past are focus on the relationship of tourism and economic growth. Ivanov and Webster (2013) studied the impact of tourism GDP on tourism's contribution to economic growth by employing ordinary least square. The finding found that it had no relationship of the considered variables. However, Jalil, Mahmood, and Idrees (2013) found the positive impact in long run relationship between international tourism and economics growth of Pakistan using Autoregressive Distributed Lag model. Chatziantoniou, *et al.* (2013) employed VAR model to investigated the relationship of oil price shocks, tourism variables, and economic indicators in France, Italy, Spain, and Greece. Tang and Abosedra (2014) used tourism, energy consumption and political instability variables to find its impact on economic growth by using panel data of 24 countries in Middle East and North African region. The generalized method of moments model found that tourism and energy consumption contribute to economic growth in MENA region.

Tugcu (2014), Seghir, *et al.* (2015), Pérez-Rodríguez, Ledesma-Rodríguez, and Santana-Gallego (2015), Vita and Kyaw (2016), Ohlan (2017), and Shahzad, *et al.* (2017) are analyze the relationship of tourism and economics growth in difference region and difference methodology. The results found the significant impact and relationship of tourism and economic growth. The study of Rakotondramaro and Andriamasy (2016) indicated the causality of tourism development, economic growth and poverty in Madagascar. Moreover, the finding of Perles-Ribes, *et al.* (2017) and Martins, Gan, and Ferreira-Lopes (2017) also found the effect of macroeconomic variable on tourism demand.

The previous research are focus only on the relationship of tourism variables and macroeconomic variables. They are not consider the risk in tourism industry. Therefore, this paper will apply the financial model to determine the risk and the risk premium in tourism industry.

The financial model that widely used to estimate the risk is the capital asset pricing model (CAPM). The model describes the systematic risk of the stock returns as follows:

$$r_i = r_f + \beta_i (r_m - r_f) \tag{1}$$

where  $r_i$  is the rate of return on stock *i*,  $r_f$  is the risk-free rate,  $r_m$  is the rate of return on market, and  $\beta_i$  is the risk of rate return on stock *i*. This model can express as the rate of return on stock *i* is composed of risk-free rate and risk premium.

The CAPM is simplest model that it has only one factor impact on the individual stock return. The arbitrage pricing theory (APT) is generalize CAPM to any number of factor as follows:

$$r_{i} = r_{f} + \beta_{i1}f_{1} + \beta_{i2}f_{2} + \dots + \beta_{in}f_{n}$$
<sup>(2)</sup>

where  $\beta_{ij}$  is the risk of factor *j* on return on stock *i* for i = 1, 2, ..., m and  $f_j$  represents the factor *j* for *j* = 1, 2, ..., n.

Then, the APT states that the risk premium can be estimated by equation (3).

$$\mathbf{r}_{i} = \gamma_{0} + \gamma_{1}\beta_{i1} + \gamma_{2}\beta_{i2} + \dots + \gamma_{n}\beta_{in}$$

$$\tag{3}$$

where  $\overline{r_i}$  is the expected return on any stock *i* for i = 1, 2, ..., m and  $\gamma_j$  is the risk premium of the risk of factor *j* for j = 1, 2, ..., n.

The study will apply the APT to estimate the risk and the risk premium of the international tourism receipts of the countries in Asia and the Pacific region. The growth rate in international tourism receipts will be used instead of the rate of return of the stock and the factors that have effect on growth rate in international tourism receipts are growth in world gross domestic product, world international tourism receipts growth rate, rate of change of crude oil price, the ratio of the inflation of country *i* and inflation of the world, and the rate of change in foreign exchange rate of local currency per US dollars.

#### 3. DATA

The risk and risk premium of the international tourism receipts are estimated by using annual growth in international tourism receipts, growth in world gross domestic product, world international tourism receipts growth rate, rate of change of crude oil price, the ratio of the inflation of country *i* and inflation of the world, and the rate of change in foreign exchange rate of local currency per US dollars. The sample ranges from 1996 to 2014 of the countries in Asia and the Pacific region, namely Australia, China, Hong Kong, Indonesia, Japan, Malaysia, Maldives, New Zealand, the Philippines, Singapore, South Korea, Sri Lanka, and Thailand. All of variable names are summarized in table 3.

Variables	Names	
WGDP	Growth in World Gross Domestic Product	
WTI	Growth in WTI Crude Oil Price	
WITR	Growth in World International Tourism Receipts	
AUITR	Growth in Australia International Tourism Receipts	
		contd. table 3

Table 3Summary of variable names

Variables	Names
CHITR	Growth in China International Tourism Receipts
HKITR	Growth in Hong Kong International Tourism Receipts
IDITR	Growth in Indonesia International Tourism Receipts
JPITR	Growth in Japan International Tourism Receipts
MYITR	Growth in Malaysia International Tourism Receipts
MVITR	Growth in Maldives International Tourism Receipts
NZITR	Growth in New Zealand International Tourism Receipts
PHITR	Growth in The Philippines International Tourism Receipts
SPITR	Growth in Singapore International Tourism Receipts
KOITR	Growth in South Korea International Tourism Receipts
LKITR	Growth in Sri Lanka International Tourism Receipts
THITR	Growth in Thailand International Tourism Receipts
AUEXC	Growth in Australia Foreign Exchange Rate
CHEXC	Growth in China Foreign Exchange Rate
HKEXC	Growth in Hong Kong Foreign Exchange Rate
IDEXC	Growth in Indonesia Foreign Exchange Rate
JPEXC	Growth in Japan Foreign Exchange Rate
MYEXC	Growth in Malaysia Foreign Exchange Rate
MVEXC	Growth in Maldives Foreign Exchange Rate
NZEXC	Growth in New Zealand Foreign Exchange Rate
PHEXC	Growth in The Philippines Foreign Exchange Rate
SPEXC	Growth in Singapore Foreign Exchange Rate
KOEXC	Growth in South Korea Foreign Exchange Rate
LKEXC	Growth in Sri Lanka Foreign Exchange Rate
THEXC	Growth in Thailand Foreign Exchange Rate
AUINF	Australia Inflation Ratio
CHINF	China Inflation Ratio
HKINF	Hong Kong Inflation Ratio
IDINF	Indonesia Inflation Ratio
JPINF	Japan Inflation Ratio
MYINF	Malaysia Inflation Ratio
MVINF	Maldives Inflation Ratio
NZINF	New Zealand Inflation Ratio
PHINF	The Philippines Inflation Ratio
SPINF	Singapore Inflation Ratio
KOINF	South Korea Inflation Ratio
LKINF	Sri Lanka Inflation Ratio
THINF	Thailand Inflation Ratio
ITR	Average International Tourism Receipts
BWGDP	Risk of World Gross Domestic Product
BWITR	Risk of International Tourism Receipts
BEXC	Risk of Foreign Exchange rate
BINF	Risk of Inflation ratio
BWTI	Risk of WTI Crude Oil Price

#### **4. EMPIRICAL RESULTS**

The plots of the international tourism receipts growth rate are shown in figure 1. Figure 1 shows that the international tourism receipts growth rate of the countries in Asia and the Pacific region are fluctuate overtime. It means the risk in international tourism receipts growth rate exist. Table 4 is the descriptive statistic of the variables in this study. In table 4, the average growth rate in international tourism receipts of all countries are higher than the average growth rate of the world international tourism receipts except Indonesia. Maldives, Sri Lanka, and The Philippines have the highest growth rate (at around 13.39 – 15.51 percent) while the lowest growth rate are Indonesia, Australia, and Singapore. This show that the Asia and the Pacific region is the world's top destination in term of international tourism receipts. Although the average growth rate in international tourism receipts is higher than the world's average, the standard deviation, the measurement of risk, is more than the world's standard deviation. It should be emphasize that international tourism receipts growth rate risk must be concerned.

For the foreign exchange rate, China Yuan and Singapore dollar against U.S. dollar are appreciation over 19 years on arithmetic average while the rest are depreciation. This means the 11 of 13 countries in Asia and the Pacific region are attractive international tourist because of the advantage of currency exchange rate. Moreover, Indonesia, Sri Lanka, and the Philippines have the advantage in term of relative price that increasing lower than world's goods and services price.



Figure 1: International tourism receipts growth rate

Descriptive statistic of the variables							
	AUITR	CHITR	HKITR	IDITR	JPITR	MYTTR	<i>MVIT</i> R
Mean	6.16	10.98	9.77	5.97	10.05	10.07	15.51
Maximum	22.86	48.37	34.09	39.77	89.08	46.16	75.37
Minimum	-14.85	-13.96	-26.48	-36.00	-26.13	-34.27	-5.52
Std. Dev.	10.22	12.27	15.83	18.38	24.06	20.17	19.11
	NZITR	PHITR	SPITR	KOITR	LKITR	THITR	WITR
Mean	8.04	13.39	6.73	7.49	14.32	9.38	6.04
Maximum	35.00	85.32	53.69	45.22	71.18	37.28	19.05
Minimum	-16.01	-40.38	-27.24	-8.08	-23.16	-12.68	-9.93
Std. Dev.	15.27	31.00	20.12	13.72	22.98	15.75	6.42
	AUEXC	CHEXC	HKEXC	IDEXC	JPEXC	MYEXC	MVEXC
Mean	0.40	-1.58	0.01	12.48	1.10	2.33	1.52
Maximum	30.06	0.05	0.43	128.72	22.30	53.82	20.92
Minimum	-25.68	-8.66	-0.45	-13.62	-13.05	-9.96	-6.03
Std. Dev.	14.26	2.25	0.23	32.34	10.13	13.18	5.61
	NZEXC	PHEXC	SPEXC	KOEXC	LKEXC	THEXC	WGDP
Mean	1.83	3.67	-0.17	4.19	4.89	3.10	5.18
Maximum	25.82	51.71	19.70	100.47	16.36	87.79	12.63
Minimum	-23.88	-15.78	-8.26	-29.06	-3.00	-24.54	-5.24
Std. Dev.	13.84	14.46	6.48	26.39	5.12	22.21	5.26
	AUINF	CHINF	HKINF	IDINF	JPINF	MYINF	MVINF
Mean	0.66	-0.14	0.30	2.56	0.00	0.59	0.93
Maximum	1.23	1.13	1.69	11.43	1.01	1.19	3.15
Minimum	0.04	-2.05	-1.24	0.81	-0.47	0.20	-0.46
Std. Dev.	0.31	0.76	0.87	2.53	0.30	0.25	0.97
	NZINF	PHINF	SPINF	KOINF	LKINF	THINF	WTI
Mean	0.52	1.22	0.40	0.74	2.16	0.67	19.45
Maximum	0.87	1.91	1.19	1.47	3.48	1.57	129.40
Minimum	-0.04	0.55	-0.13	0.25	1.12	-0.28	-60.74
Std. Dev.	0.24	0.39	0.37	0.28	0.67	0.41	52.11

Table 4

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Stationarity of the data is tested, before estimate the risk and risk premium, by using the Augmented Dickey-Fuller (ADF) test. The test is given as follows:

$$\Delta y_{t} = \alpha + \beta t + \theta y_{t-1} + \sum_{i=1}^{p} \phi_{i} \Delta y_{t-i} + \varepsilon_{t}$$
(4)

The null hypothesis is  $\theta = 0$ , if the null hypothesis is rejected, it means that the series  $y_t$  is stationary. If the series are non-stationary, then the variance of the data generating process will become infinitely large. Therefore, statistical inference will be affected. The estimated values of and the t-statistics of all the variables are significantly less than zero at the 10% level, as given in table 5, which shows that all series are stationary.

Table 5

ADF test of a Unit Root in the Variables					
Variables	Coefficient	t-statisitc	Variables	Coefficient	t-statisitc
WGDP	-0.7195	-3.0032	LKEXC	-0.8042	-3.1964
WITR	-0.9309	-3.7386	MVEXC	-1.1716	-4.7618
AUITR	-1.3215	-4.2050	MYEXC	-1.0793	-4.3241
CHITR	-1.4543	-6.5847	NZEXC	-0.9544	-3.8171
HKITR	-0.9428	-3.8821	PHEXC	-0.6451	-2.1881
IDITR	-1.2495	-5.2157	SPEXC	-1.0079	-3.9738
JPITR	-1.0033	-3.9903	THEXC	-1.3341	-10.4845
KOITR	-1.0753	-4.3546	WTI	-4.3258	-5.1697
LKITR	-0.9227	-3.9698	AUINF	-0.6656	-3.3005
MVITR	-0.3365	-1.9357	CHINF	-1.5847	-4.6701
MYITR	-0.9047	-3.6321	HKINF	-0.5918	-3.4983
NZITR	-0.7630	-3.1367	IDINF	-0.5032	-6.1577
PHITR	-2.1750	-5.4854	JPINF	-1.6288	-1.9345
SPITR	-0.8281	-3.3718	KOINF	-0.9384	-3.6686
THITR	-1.0073	-3.8852	LKINF	-0.6255	-2.5191
AUEXC	-1.1202	-4.5031	MVINF	-0.2790	-1.6692
CHEXC	-0.3367	-1.8485	MYINF	-7.3265	-4.0003
HKEXC	-1.4803	-4.2155	NZINF	-0.9479	-2.7087
IDEXC	-0.8563	-3.9497	PHINF	-0.8365	-3.4784
JPEXC	-1.1077	-4.0340	SPINF	-1.2323	-3.6462
KOEXC	-1.1914	-4.8605	THINF	-0.9435	-3.7977

The APT is employed to estimate the risk and the risk premium on international tourism receipts for the countries in Asia and the Pacific region. The results of the risk on international tourism receipts are given in table 6. From table 6, the risk, which is the effect of macroeconomics variables on international tourism receipts, of the growth in world GDP on growth in international tourism receipts has the positive sign for Japan, Maldives, New Zealand and Singapore. This shows that, in general, increasing in tourist's income growth lead to increasing in international tourism receipts growth for developed countries. In addition, 1 percent growth in tourist's income effects on growth in international tourism receipts by 2.80, 1.22, 1.19, and 1.04 percent for Maldives, New Zealand, Singapore, and Japan, respectively. It also means that lower income tourist will visit the developing countries rather than developed countries. The growth in world international tourism receipts has positive effects to international tourism receipts in all countries except Japan and Maldives. This is because, for examples, many newly emerging destinations in those countries, the trend of arrival in the emerging economy destination, or the characteristic of destination to attract international tourist.

Table 6

Estimation results: International Tourism Receipts Risk					
Countries	WGDP	WITR	EXCH	INFR	WTI
Australia	-0.5183	1.4471	-0.3795	-1.5842	0.0484
China	-2.5648	2.7878	1.0852	-0.8584	0.0339
Hong Kong	-1.0201	2.2586	-8.6529	-0.2755	0.0329
Indonesia	-3.0157	3.2270	-0.0338	-3.2392	0.0880
Japan	1.0494	-0.1304	-0.1242	11.9686	0.1193
South Korea	-0.1741	0.8563	0.0219	5.7776	-0.0115
Sri Lanka	-0.9276	1.1289	-1.1850	-0.5818	-0.0330
Maldives	2.8013	-0.8904	-0.5333	-2.9818	-0.0326
Malaysia	-2.0638	2.6841	-0.4046	-19.8846	-0.0029
New Zealand	1.2215	0.3025	0.4641	-0.2405	-0.0050
The Philippines	-0.2318	2.3631	0.4524	10.8933	-0.1891
Singapore	1.1967	0.5962	-0.7689	15.6851	0.0420
Thailand	-1.0150	2.4184	-0.1307	-7.4014	0.0170

It is clearly that the exchange rate has more impact on international tourism receipts for Hong Kong. The 1 percent depreciation in Hong Kong dollar lead to decrease 8.65 percent in international tourism receipts while the international tourism receipts of others countries have low influence from the currency fluctuations. The inflation ratio create the international tourism receipts risk greatly for Malaysia, Singapore, the Philippines, and Japan that is 1 unit change in inflation ratio lead to more than 10 percent change in international tourism receipts. On the contrary, the growth in crude oil price has low effect, less than 0.18 percent, on international tourism receipts for all countries.

The estimated risk premium for international tourism receipts is presented in table 7. The risk premium are all negative. This results are contradictory from the expectation in APT because the estimated of the risk have both positive and negative values. However, it reveals to the tourism authorities that if there are high risk on international tourism receipts, the low international tourism receipts are expected.

Risk	Risk Premium
BWGDP	-1.4756
BWITR	-2.7104
BEXC	-0.2356
BINF	-0.0664
BWTI	-32.6114

 Table 7

 Estimation results: International Tourism Receipts Risk Premium

### **5. CONCLUSION**

The risk and risk premium on international tourism receipts of the countries in Asia and the Pacific Region are estimated by using annual growth rate in international tourism receipts, world gross domestic product growth, world international tourism receipts growth, rate of change of crude oil price, the inflation ratio, and the rate of change in foreign exchange rate. The sample ranges from 1996 to 2014 of the 13 countries in Asia and the Pacific region The APT is employed to estimate risk and risk premium. The results suggest that Hong Kong international tourism receipts is highly effected by foreign exchange rate while Malaysia, Singapore, the Philippines, and Japan have to concern more on inflation ratio. Growth in world GDP and growth in world international tourism receipts are the next factors to consider. The change in crude oil price is the last one to aware because it has the lowest impact on international tourism receipts for all countries. Moreover, the tourism authorities have to remind that the higher risk on international tourism receipts lead to the lower expected international tourism receipts.

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