

## TO ANALYZE THE FACTORS AFFECTING TOURISM RECEIPTS FROM GLOBAL TRAVELERS: APPLICATION OF RANDOM COEFFICIENT MODEL

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### ABSTRACT

Tourism industry in the global economy plays an increasingly important role, not only the direct economic contributions, but also as a drive to the promotion of international trade. As a result, tourism has become very important in the economic development for any economy, and the study of the economic factors about how tourism receipts from both domestic and abroad influence economic development have become an important issue. This paper uses an econometric model called random coefficient model (differential slope model) by utilizing panel data, in order to explore the cross-sectional differences of the fundamentals in terms of tourism receipts from international inbound travelers, economic growth, exchange rate volatility, trade openness and growth of tourist arrivals among countries. The empirical results show that the economic growth rate can be a positive impact to tourism receipts and under the policy leading to economic growth and stability of exchange rate volatility, an even higher growth rate in tourism receipts from international inbound travelers can be achieved.

**Keywords:** Tourism Receipts, Economic Growth, Exchange Rates, Tourism Arrivals, Panel Data

## 1. INTRODUCTION

Travelling and tourism can create a lot of kinetic energy in consumption, tourism receipts for national economic growth is positive, and the foreign exchange income generated from tourism industry is one of the main reasons why the economy of the host countries can keep growing (Gokoali and Bahar, 2006; Belloumi, 2010; Bouzahzah and Menyari, 2013; Singh, 2014). The development of tourism industry has impact of economies of scale, and the value of tourism and international passenger arrivals can be increased. That is the reason why governments of many countries are attracted to invest a lot in both software and hardware constructions in tourism industry, in order to drive tourism-related industry supply chain output effect, and thus create more foreign exchange income. Tourism industry has been regarded by many advanced countries as one of sources in generating foreign exchange income. Through improving competitive advantage in tourism industry and enhancing the quality of tourism environment, international exchanges and communication, and national visibility can also be promoted and increased.

Many economic factors can be used to explain international travelling behavior. Through the international tourism-related literature review, it indicates that the relevant variables are tourism receipts, economic growth, foreign exchange rates, trade liberalization and tourism arrivals respectively (Sequeira and Campos, 2005; Lim & McAller, 2002; Gokoali and Bahar, 2006; Akinboade and Braimoh, 2010; Lee et al, 2014). Among them, changes in the foreign exchange rate have a significant impact on the tourism market, reflected in product prices and tourists travel behavior, with derived effects on tourists' willingness to traveling abroad. The increase in arrivals and tourism receipts may encourage both owners and government units to invest more in tourism industry, as well as in infrastructure for the industry. Economic growth, which is the trend of change in the overall economy, is one of the important indexes used to measure whether the economic activities of a country or region are buoyant or in recession, while the openness in terms of international trade in the face of globalization also indicates the degree of openness of the economy and international competitiveness. The objective of this paper is to understand the relationship between the tourism receipts from global travelers and GDP, exchange rate, trade liberalization, and the growth rate of tourist arrivals, as well as to explore the influence between variables by using differential coefficient model (random coefficient model). Further analysis of individual countries and variable slope is also made to provide rich information and insight for

governments and industry investors to understand the trend of global tourism development. It is believed that the differences in different countries can be discovered and can be improved, in order to effectively meet the global economic benefits of tourism activities.

## 2. LITERATURE REVIEW

In recent years, the literature findings on tourism receipts and economic discourse vary. For example, in analyzing the relationship between Tunisia international tourist receipts and economic growth, Belloumi (2010) found that there is no significant relationship between tourism receipts, GDP and the exchange rate. In the analysis of the contribution from international tourists to South Africa's economy, Akinboade and Braimoh (2010) used multivariate VAR model: GDP, international tourism receipts, the real effective exchange rate and export as the variables, and found that a significant positive relationship exists between tourism receipts and exchange rate, but no significant relationship between tourism receipts and GDP. By using a structural break and dynamic co-integration test, Nanthakumar et al. (2013) explored the relationship between tourism arrivals, CPI, the exchange rate, and found that a significant positive relationship exists between tourists arrivals from Singapore, Indonesia, and Thailand to Malaysia and the change of exchange rates in these three countries. By using auto-regression model, Said et al (2013) explored the relationship between the numbers of tourist, exchange rates, and inflation, and found there is a significant positive relationship between the numbers of tourist and the exchange rate.

Wang (2009) investigated the auto-time-lagged relationship between the numbers of international inbound tourist and GDP, CPI (tour price), exports, oil prices (transportation costs), and found that there is a significant positive relationship between the growth in the number of Japanese tourists to Taiwan and changes in exchange rate. By using the Panel causality test, Ekanayake and Long (2012) studied the relationship between GDP, tourism receipts, labor and the total amount of fixed capital formation, and showed that in the long term, tourism receipts bring no significant impact to GDP. In studying the relationship between per capita GDP of the countries around the Mediterranean and tourism spending, tourism receipts, Tugcu (2014) found that there is a significant positive impact on economic growth in European countries, but no significant or even negative impact in Asia and African countries. Mushtaq and Zaman (2013) explored the relationship between South Asian Association for Regional Cooperation (SAARC) tourism receipts and per capita GDP, total

amount of capital formation, trade openness, and CPI, and found that a significant positive relationship exists between tourism receipts and GDP, trade openness.

In the traditional study of sightseeing tours, econometric models and time series models are usually adopted as a research tool. These methods mainly utilize a time-series or a cross-sectional study data separately, so it is relatively easy to overlook the information provided by other sections. Therefore, we expand the scope of our study by using the Panel Data approach, with the purpose to obtain additional samples degrees of freedom and the degree of change, in order to overcome the heterogeneity problems of the linear regression model. By observing the differences in sample countries in terms of individual tours factors, comparative studies are conducted, aiming to assess the relationship between tourism receipts and economic variables, and trying to figure out whether there will be differences in the needs due to different touring backgrounds.

### 3 METHODOLOGIES

#### 3.1 Empirical Model

By referring to previous literature, this study employs panel data research methods to explore the degree of impact to tourism receipts caused by the factors such as economic growth, foreign exchange rates, tourist arrivals, and import/export trade, and establishes a common slope empirical model as follows:

$$TR_{i,t} = \alpha + GDP_{i,t} + EX_{i,t} + T_{i,t} + TA_{i,t} + \varepsilon_{i,t} \quad (3.1)$$

Among them,  $TR_{i,t}$  represents national tourism receipts growth rate;  $GDP_{i,t}$  on behalf of the economic growth rate;  $EX_{i,t}$  represents the exchange rate volatility;  $T_{i,t}$  represents trade openness, and  $TA_{i,t}$  on behalf of tourist arrivals growth rate.

From the model only the fixed coefficient relationship between the relevant economic variables and inbound tourism receipts can be observed, the impact of individual differences between countries cannot be captured. Therefore, another estimation method called

random coefficient model is introduced, and the equation (3.1) is modified as equation (3.2), where the subscript  $j$  represents random coefficient.

$$TR_{i,t,j} = \alpha + GDP_{i,t,j} + EX_{i,t,j} + T_{i,t,j} + TA_{i,t,j} + \varepsilon_{i,t,j} \quad (3.2)$$

### 3.2 Data and Variable Selection

Data used in this study are extracted from the World Development Indicators (WDI) database, and national data for the period 1996 to 2012 years from 39 countries are selected and use, based on the criterion that in 2012, international tourist arrivals reached more than 5 million. The exchange rate volatility is measured by using national currencies against the US dollar, and therefore the United States is not included in the analysis. The dependent variable used inbound tourism receipts growth rate (TR), and the four independent variables used are economic growth (GDP), exchange rate volatility in terms of national currencies against the US dollar (EX), trade openness (T), and the growth rate of international tourist arrivals (TA). All the variables used are shown in Table 1.

**Table 1 The Variables Used In The Study**

Variable	Definition	Measurement	Data source
TR	Inbound tourism receipts growth	Growth rate in tourism receipts from international tourist compared with the previous year (%)	WDI
GDP	GDP growth	Annual growth rate of GDP (%)	WDI
EX	Exchange rate volatility	Exchange rate volatility based on national currencies against the US dollar (%)	WDI
T	Trade openness	(Exports + imports of services) / GDP (%)	WDI
TA	tourist arrivals growth rate	Annual growth rate of international tourist arrivals.	WDI

Source: Data from the World Development Indicators (WDI) database.

## 4. EMPIRICAL RESULTS

### 4.1 The Fixed Effect Model

By using the four independent variables: economic growth rate (GDP growth), the fluctuation of exchange rate between the national currencies against the US dollar (EX), trade openness (T), and the growth rate of international tourist arrivals (TA), the fixed effect model analyses are made to understand the fixed effect brought by the above four independent variables to inbound tourism receipts growth rate (TR). The empirical results from Table 2 reflect that all variables show a significant impact to TR. The economic growth rate, trade openness, and growth of international tourist arrivals express a positive relationship with TR, indicating that when these three variables are in growth trend, the host country's tourism receipts also increase, with GDP growth showing the greatest influence on TR, followed by the growth rate of international tourist arrivals. Fluctuations of exchange rate between national currencies against the US dollar (EX) express a negative relationship with TR, indicating that when national currencies are in weak trend, the international tourists will be attracted to consume, and thus tourism receipts be increased. On the contrary, visitors may reduce the amount of unnecessary consumption, or change itineraries and select other countries as their destination countries due to higher price level caused by a strong FX trend.

**Table 2 Impact Of Each Variable On The Tourism Receipts- Fixed Effect**

Variables	Coefficient	Std.Error	t-statistic	Prob
C	-6.5771	2.8629	-2.2973	0.0219**
GDP	0.7898	0.1476	5.3498	0.0000***
EX	-0.1669	0.0237	-7.0418	0.0000***
T	0.1254	0.0340	3.6900	0.0002***
TA	0.6342	0.0480	13.2248	0.0000***

Note: (1) \*, \*\* and \*\*\* represent 10%, 5% and 1% significant level.

(2) TR represents inbound tourism receipts growth rate, GDP the economic growth rate, EX the official exchange rate against the US dollar, T the trade openness, and TA the growth rate of international tourist arrivals.

### 4.2 The Random Effect Model

By using the same variable, the random effects model analysis is also conducted, and different results obtained (Table 3), compared with those of fixed effects model analysis.

The main differences are that trade openness (T) does exhibit an insignificant negative relationship with TR, and the degree of influence delivered by exchange rate (EX) is much lower, compared with that of fixed effects model analysis. The above results represent that under the random effects model the inbound tourism receipts have nothing to do with trade openness; that is the business travel tourism receipts created by trade development are actually no help to promoting inbound tourism receipts. In addition, the difference of the marginal effect brought by the fluctuations of EX to TR in the two models has up to 4 times. Since the conclusions of the two models can be interpreted differently, we need to use the Hausman Test to determine which model is the optimal model to explain the causal relationship between the variables (Table 3).

**Table 3 Impact Of Each Variable On The Tourism Receipts- Random Effect**

Variables	Coefficient	Std.Error	t-statistic	Prob
C	3.9251	1.4365	2.7324	0.0065***
GDP	0.8937	0.2072	4.3123	0.0000***
EX	-0.0449	0.0192	-2.3371	0.0197**
T	-0.0039	0.0126	-0.3094	0.7571
TA	0.4705	0.0633	7.4382	0.0000***

Note: \*, \*\* and \*\*\* represent 10%, 5% and 1% significant level.

### 4.3 Hausman Test

In this paper, we use both fixed effect model and random effect model to analyze the impact of each variable to inbound tourism receipts growth. Due to different results obtained from these two models, as well as to avoid the possible bias derived from interrelation between intercept term and explanatory variables, the most suitable model to explain the relationship between intercept term and explanatory variables is selected via Hausman Test<sup>1</sup>. By judging the empirical results shown in Table 4, the explanatory ability is better through the variables of fixed effect model. That is, except the significant negative relationship between EX and TR, a significant positive relationship exists between the growth rate of inbound tourism receipts (TR) and all the other independent variables used (the economic growth rate (GDP), trade openness (T), and the international tourist arrivals growth rate (TA)). It is worth mentioning that the variable data used in this study was the data of percentage, with a flexibility concept, and therefore not only so different from the

<sup>1</sup> The model test and measurement errors test for variables introduced by Hausman (1978) are the same. Therefore, if Hausman model test is employed, the null hypothesis is to test there is no relationship between the errors of intercept term and independent variables.

standard value of the information used in the previous literature, but also can be used to explore the properties of influence to inbound tourism receipts brought by each variable factors. To further confirm the existence of cross-sectional differences between each country in the fixed effect model, this study also explores the differences between each country brought by the cross-sectional variables to inbound tourism receipts through Wald Test.

**Table 4 Hausman Test Results**

Model	Chi-Sq. statistic	Prob	Select
Each variable to TR	24.9558	0.0001	Fixed Effect

Note: International inbound tourism receipts growth rate (TR).

#### 4.4 Wald Test

In order to examine whether the corresponding coefficients of the independent variables are in differences with the individual groups, Wald test is further applied, in order to understand the fitness of the estimated values. The null hypothesis in a Wald Test is that all the coefficients of each independent variables are equal, ie.  $H_0: \alpha_1 = \alpha_2 = \alpha_3 = \dots = \alpha_x$ . If the null hypothesis is rejected, it shows that the effect of specific explanatory variables to the explained variable will vary, following the changes of cross-sectional data. In this situation, the estimation method used is called the fixed effect model with random coefficient. Under the circumstance that the fixed effect model is determined to better and each explanatory variable possess significant impact to the explained variable, the Wald Test is further conducted in this paper, in order to examine whether there are differences in individual variable between each country. From the empirical results shown in Table 5, it is evidenced that among the four variables influencing inbound tourism receipts growth, there are three variables in each country with inconsistent observations of the slope. This means that transnational differences exist between these three variables (economic growth, fluctuations of exchange rate, and growth rate of international tourist arrivals) and inbound tourism receipts growth, and even a significant impact is found in some countries. This represents different interpretations of meanings about the relationship between the four variables and inbound tourism receipts growth in different countries, and why the differences happen need to be analyzed. The trade openness variable (T) is not significant in the Wald Test result, representing the null hypothesis is accepted, and common slope



presences among each county, which means the importance of trade openness to each country is consistent.

**Table 5 Wald Test Estimation Results**

Variables	F. statistic	Prob
GDP	1.5230	0.0265**
EX	8.7330	0.0000***
T	1.3089	0.1081
TA	7.2761	0.0000***

Note: \*, \*\* and \*\*\* represent 10%, 5% and 1% significant level.

#### 4.5 Random Coefficient Analysis

Table 6 shows that a significant impact is reported in 18 countries (Canada, France, Singapore, Spain, Sweden, United Kingdom, Bulgaria, Korea, Indonesia, Malaysia, Mexico, Morocco, Poland, Romania, Egypt, India, Thailand and Tunisia) regarding the variables that affect inbound tourism receipts growth, and in 17 countries a positive effect is reported. This result represents that in the majority of countries, economic growth will contribute to a country's inbound tourism receipts growth. It is worth mentioning that only the Republic of Korea reports a negative estimated coefficient, which represents that the higher the economic growth rate, the lower the inbound tourism receipts growth. This result for Korea may be due to the global economic growth environment that all countries are vigorous in promoting international tourist arrivals. In this premise, crowds of sightseeing tour immigrants are further dispersed, and the spatial effects are produced, so that increases in international tourist arrivals in neighboring countries cause decreases in population of international tourist to Korean and thus reducing tourism receipts. This empirical result is the same with the findings of Sequeira and Campos (2005). In addition, the results for the other 21 countries are not significant, because all of these countries are slow in economic growth, as well as less growth in international tourist arrivals, and thus rendering the situation is not significant. That is the impact of economic growth in these 21 countries is less significant than that in the 18 countries, resulting in a significant impact in the overall results.

**Table 6 Tourism Receipts And GDP Estimation Results - Random Coefficient Analysis**

Countries	Coefficient	Countries	Coefficient	Countries	Coefficient
Austria	1.1977	Norway	-0.1458	Indonesia	2.5575***
Australia	0.7974	Portugal	0.4357	Malaysia	2.6088**
Belgium	2.6804	Singapore	3.2632***	Mexico	1.6330***
Canada	2.9587***	Spain	1.8246**	Morocco	2.4931***
Denmark	0.5664	Sweden	2.6828**	Nigeria	-2.3136
France	3.2362**	Switzerland	1.9550	Poland	6.3585***
Germany	1.3079	United Kingdom	2.2425***	Romania	3.9999***
Greece	1.5500	Brazil	1.0816	Russian Federation	0.4326
Ireland	0.7154	Bulgaria	3.5050**	South Africa	1.8687
Italy	1.3213	China	1.1391	Thailand	1.9219***
Japan	4.2223	Dominican	0.7377	Tunisia	4.8063***
Korea	-1.8937**	Egypt	6.3633**	Turkey	0.9637
Netherlands	0.8592	India	2.8331*	Ukraine	1.3036

Note: \*, \*\* and \*\*\* represent 10%, 5% and 1% significant level.

Table 7 shows that in the estimation results of international inbound tourism receipts growth and exchange rate volatility, and a total of 26 countries show a different random coefficients, namely Austria, Australia, Canada, Denmark, France, Germany, Ireland, Italy, Korea, Netherlands, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, United Kingdom, India, Indonesia, Malaysia, Morocco, Poland, Romania, Russian Federation, South Africa and Thailand. This means that there are factors in differences between these countries. Except Korea, in the rest of these countries significant negative results were shown between international tourism receipts growth and exchange rate volatility. This result may be due to foreign currency exchange rate volatility represents uncertainty. The greater the exchange rate volatility, the higher the risk in the higher cost of traveling expenses and currency exchange. Therefore, with increasing risk, international tourist arrivals also will decrease. Of particular importance is that of Korea, because Korea's statistical results present positive relationship, and this result may imply that the Central Bank of Korea has been always paying intervention in the foreign exchange market to peg

the volatility in both exchange rate and oil prices, in order to stabilize domestic prices, making the price level comparatively stable with other countries<sup>2</sup>. Therefore, compared to other countries, if the cost can be maintained stable during traveling, it will bring positive effect in increasing the number of international tourists to Korea. In addition, Korea in recent years is committed to the development of cultural and creative industries.

With the Korea drama in the high-impact of tension globally and attractiveness to idol groups, the number of international tourist visits to Korea surged several times in recent years. The success of the cultural and creative industries to make Korea as the tourist destination Korea also is an indisputable fact. In other countries with exchange rate is insignificant, the possible reason maybe that the international tourist arrivals to the countries are mostly from the neighboring countries, with a circulation of currencies, and thus the lower the impact of exchange rate volatility.

**Table 7 Tourism Receipts And EX Estimation Results - Random Coefficient Analysis**

Countries	Coefficient	Countries	Coefficient	Countries	Coefficient
Austria	-1.0750***	Norway	-1.3092***	Indonesia	-0.1738**
Australia	-0.8883***	Portugal	-0.8123***	Malaysia	-1.3073***
Belgium	-0.4008	Singapore	-3.2638***	Mexico	-0.2700
Canada	-0.7719**	Spain	-0.8751***	Morocco	-0.9353*
Denmark	-0.5828***	Sweden	-0.8357***	Nigeria	-0.0714
France	-0.7570***	Switzerland	-0.8238***	Poland	-0.7775**
Germany	-0.6553***	United Kingdom	-1.1742***	Romania	-0.4021*
Greece	-0.0778	Brazil	-0.0914	Russian Federation	-0.4214***
Ireland	-0.9308***	Bulgaria	-0.0330	South Africa	-0.9711***
Italy	-0.8480***	China	1.0718	Thailand	-0.9974***
Japan	-0.5046	Dominican	0.0135	Tunisia	-0.3911
Korea	0.3966*	Egypt	-0.4112	Turkey	0.0429
Netherlands	-0.7786***	India	-1.6858***	Ukraine	-0.5545

Note: \*, \*\* and \*\*\* represent 10%, 5% and 1% significant level.

<sup>2</sup> See Country Intelligence Report: South Korea, 2012.

In Table 8, heterosexual slope (random coefficient) results are presented in 20 countries, and this result means that the growth rate of international tourist arrivals in Austria, Canada, Germany, Greece, Ireland, Korea, Portugal, Singapore, United Kingdom, China, Dominica, Egypt, India, Indonesia, Malaysia, Mexico, Russian Federation, Thailand, Tunisia and Turkey, a total of 20 countries, show a significant and positive impact. The other 19 countries present insignificant impact, among which, 13 countries, including Australia, show positive effect, while the other six countries, namely Denmark, Italy, Sweden, Netherlands, Bulgaria and Morocco, show negative effect. This empirical result indicates different impact across each country, and also shows that those countries reflecting a significant impact also indicate positive impact results. This means an increase in inbound tourist arrivals also can significantly increase inbound tourist receipts growth, and the effect of international tourist arrival is different with inter-country.

**Table 8 Tourism Receipts And TA Estimation Results - Random Coefficient Analysis**

Countries	Coefficient	Countries	Coefficient	Countries	Coefficient
Austria	2.3050**	Norway	0.7114	Indonesia	1.7531***
Australia	0.6913	Portugal	0.7171**	Malaysia	0.9427***
Belgium	0.3534	Singapore	1.3071***	Mexico	0.6079**
Canada	1.1881***	Spain	0.7114	Morocco	-0.0309
Denmark	-0.0876	Sweden	-0.0363	Nigeria	0.3537
France	0.4954	Switzerland	0.2888	Poland	1.0110
Germany	0.6745*	United Kingdom	1.4223***	Romania	0.3847
Greece	1.5156**	Brazil	0.1577	Russian Federation	0.7194*
Ireland	1.0609***	Bulgaria	-0.1454	South Africa	0.25653
Italy	-0.0344	China	1.3400***	Thailand	1.4917***
Japan	0.5753	Dominican	1.0480***	Tunisia	0.8752***
Korea	0.8026*	Egypt	1.0436***	Turkey	0.9273**
Netherlands	-0.0581	India	1.6260***	Ukraine	0.1957

Note: \*, \*\* and \*\*\* represent 10%, 5% and 1% significant level.

## 5. CONCLUSION

In recent years, tourism and leisure sectors have become a national economic indicators expected to grow and prosperous. The results of corporate globalization make sightseeing tour become more diversified development, and stimulate development and investment in tourism by both governments and owners, in order to promote economic development through increasing the international inbound tourism receipts. In this paper the random coefficient model is constructed to estimate the fixed effect of the growth of international inbound tourism receipts. In this model, the economic growth rate (GDP), the official exchange rate of national currency against US dollar (EX), the trade openness (T), as well as the growth rate of international tourist arrivals (TA), are used as the fundamental factors delivering the impact to the growth rate of international inbound tourism receipts (TR) fundamentals. All of these factors have been examined in previous literature, in order to avoid the error in selecting the variables. More importantly, the random coefficient model, with differential slope, is employed, and the cross-sectional differences between the fundamental factors among each country can be found through this model.

The empirical results of this paper can be summarized as the three points as follows: First, economic growth can positively affect international inbound tourism receipts. However, Korean's economic growth poses a negative effect to TR. It is recommended that in addition to the development of R & D and industrialization, South Korea should invest more resources in tourism-related industries in the development of economy, in order to reverse the negative impact of economic growth on TR. Secondly, the fluctuation of exchange rate is regarded as the surrogate of risk, and will hinder the growth rate of international inbound tourism receipts. Therefore, governments in every country should pay more attention and implement measures in stabilizing the fluctuation of exchange, in order lower the cost of traveling and to increase the growth rate of international inbound tourism receipts. Thirdly, under the policy to increase economic growth and stabilize the exchange, the international inbound tourism niche can be further expanded if population of tourist can be increased through word of mouth, and therefore, the higher growth rate in international tourist arrivals also can be achieved.

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