The Gravity Model of Tourism Demand in the Philippines

Chariss C. Verdida
Lemuel S. Preciados*
Visayas State University, Baybay City, Leyte

Abstract

This study has empirically examined the validity of gravity theorem in the context of international tourism demand in the Philippines. There is a growing trend of tourist arrivals in the Philippines and the benefits that the country gained from the tourism sector is increasing. The factors that explain these trends are therefore important to be fully understood given the significant contribution of the tourism sector in the socio-economic growth of the country. In this study, a panel data was set-up through statistical software consisting of 27 time-series set from 1991-2017 with the top 20 countries visiting the Philippines. Estimates from the random effects model show that gross domestic product, direct flights, common colonizers, population and distance have significantly affected tourism inflows in the Philippines over time. Results from both the classical and augmented gravity models conform to the prediction of gravity theorem that inflows of tourists in the Philippines are coming from countries with larger GDP and coming from countries that are closer in distance from the Philippines. Based on the results, the Philippines has to establish more direct flights with the identified origin countries of the tourists to increase international tourism demand and to further enhance the tourism sector’s contribution to the country’s economic growth.

Keywords: Gravity theorem; Panel data; Tourist inflows

Introduction

Tourism is one of the important sectors that have an impact on the development of the country’s economy. Income creation and generation of jobs are the main benefits of tourism. It is the most important source of welfare for many regions in the Philippines. The Philippine tourism performance in terms of arrivals grew by 10.91 percent reaching 5,360,682 visitors in 2015 that is a 10.91 percent growth from 4,833,368 in 2014, and during this year it is notable that there were 4.982 million workers directly employed in the tourism industry which is estimated to account for 12.7 percent of the total employed population in the country. Of this total, passenger transportation is the leading sector with 1.792 million trailed closely by the accommodation, food and beverage sector with 1.734 million in employment (UNWTO, 2015). The top famous tourist destinations in the Philippines are Banaue Rice Terraces, Chocolate Hills, Boracay, Cebu, Davao, Manila, Palawan, and Vigan (Department of Tourism, 2017). As of 2016, the Philippines is the top 46th country in terms of the number of tourist arrivals and ranked 79th out of 136 countries in terms of tourism travel and competitiveness. The top 20 countries that mostly visited in the Philippines are South Korea, China, United States of America, Japan, Australia, Taiwan, Canada, United Kingdom, Singapore, Malaysia, Hong Kong, India, Germany, France, Indonesia, Saudi Arabia, Thailand, Spain, Netherlands, and...
Italy (Department of Tourism, 2017).

While there is a growing trend of tourist arrivals in the Philippines and the benefits that the country gained from the tourism sector is increasing, the industry is also facing economic issues such as increasing concerns for safety and security, resolving barriers to travel such as visas, fuel price increases, airline/transportation fees, airline delays, and few direct flights. Although there is an existing policy in place such as the Republic Act No. 9593 with the aim to develop and boost the tourist arrivals in the Philippines, the implementation of these policies still appears to be limited and not evident at a wider scale.

In relation to this, the factors explaining tourism demand are yet to be fully understood. The pieces of literature provide only a few updated studies that determine the factors influencing the tourist preference of visiting the Philippines. Crouch (1994) analyzed a significant number of quantitative works related to international tourism demand, and he found out that there is a large number of explanatory variables to be considered depending on the origin and destination countries. Amaral and Garin (2000) tried to measure the impact of some factors on the international demand for tourist services in Spain. He also used a panel data set of 17 countries over the period 1985-1995 and found that real per capita income, exchange rates, and real prices significantly affect the demand for Spanish tourist services. Other researchers also used a gravity model and assessed the role of transport infrastructure (Khadaroo & Seetanah, 2008), the impact of mega-sporting events (Fourie & Gallego, 2011), the impact of economic size, population, distance (Saray & Karagoz, 2010), the importance of bilateral trade (Hanafiah et al., 2010) in explaining international tourism demand.

In addition, Ibrahim (2011) there is a positive effect of per capita income, the negative effect of prices, the relative cost of living of tourists in Egypt, and the real effective exchange rate in international tourism demand. While Habibi and Abbainejad (2011) found out that the habit persistence, income, accommodation capacity, and political stability have positive effects on European tourism demand in Malaysia. Marrocu and Paci (2013) investigated the determinants of tourism for a number of Italian provinces through the estimation of spatial autoregressive models and gravity equations, stressing the presence of high degree of spatial interconnectivity in tourism flows. Moreover, Chasapopoulos et al., (2014) estimated a gravity model for tourism flows from 31 countries to Greece.

Deluna and Jeon (2014) investigated the determinants of international tourism demand for the Philippines, by employing a double-log augmented form of the gravity model. Empirical estimation determines the factors that affect Philippine tourism demand. These factors include income, market size, distance, relative prices, cost of living and price of goods and services in the Philippines and other related tourism destination like Malaysia, Indonesia, and Thailand.

The gravity model has been applied in a large number of empirical works on international trade, migration, foreign direct investment, but relatively less on tourism. Therefore, this study has incorporated gravity theorem in explaining tourism flows in the Philippines. More specifically, this study aimed to describe the trends of tourist arrivals in the Philippines, to identify the determinants of tourism inflows in the Philippines, and to provide inputs for current and future policy recommendations relevant to the enhancement of the contribution of the tourism sector to the Philippine economy. Furthermore, this study was able to find shreds of evidence that predictions of the gravity theorem could likely explain tourism demand.
Theoretical Framework

The Gravity Theorem

Dutch economist and Nobel laureate, Tinbergen (1962), was trained in physics and thought of comparing the trade between countries to the force of gravity between objects. In physics, objects with a larger mass, or those that are close together, have greater gravitational pull between them. In economics, the gravity equation for trade states that countries with larger GDPs, or that are close to each other, will have more trade between them. The gravity model, which has been used intensively in analyzing patterns and performances of international trade in recent years, can be applied to quantify the trade flows empirically. The model applies Newton’s universal law of gravitation in physics, which states that the gravitational attraction between two objects is proportional of their masses and inversely related to the square of their distance. The gravity model is expressed as follows:

\[ F_{ij} = \frac{M_i M_j}{D_{ij}^2} \]  \hspace{1cm} \text{Eqtn (1)}

where:

- \( F_{ij} \) = the gravitational attraction
- \( M_i, M_j \) = the mass of two objects
- \( D_{ij} \) = the distance

In estimating tourism demand, Rodrigue (2004) has used the Tinbergen Gravity Model and suit the tourism variables; some adjustment has been made with the model. The model proposed by Rodrigue (2004) is:

\[ TD_{ij} = K \left( \frac{m_i m_j}{D_{ij}^2} \right) \]  \hspace{1cm} \text{Eqtn (2)}

where:

- \( TD_{ij} \) = stands for tourist arrival from country j to destination country
- \( K \) = a constant term
- \( m_j \) = a factor to generate movement of international tourism
- \( m_i \) = a factor to attract movement of international tourism
- \( D_{ij} \) = the distance between origin country j and destination country i

This basic model of gravity can be expanded to accommodate other variables that generate and attract movement of international tourism which is called an augmented gravity model.

This study applied an augmented gravity model where other factors that are likely to affect tourism inflows in the Philippines were included. In addition to distance and GDP, the gravity model used in the study was augmented with the following variables:

- Population- used to estimate the market size of each country which is a factor affecting international trade
- Relative Price of Tourism- will be used to estimate the cost of living between the countries
- Relative Prices of Tourism in Competing Destination countries – used to determine the impact of commonality of tourism features
- Relative Effective Exchange Rate- used to explain the variation in terms of currency among participating countries
- Common colonizer/s- will be used to estimate culture and shared language where it can affect tourist inflows
- Direct Flights- to determine countries that have a direct flights to the Philippines
- ASEAN- will be used to identify if the country is part of ASEAN or not
- Language- will be used to capture commonality of English language

Figure 1 shows the conceptual framework and variables included in this study. These include several factors affecting tourist arrivals in the Philippines.
This model used the framework above (Fig. 1) incorporating 20 countries over 27 years. The gravity models estimated in this paper are based on the panel data with pooled, random and fixed effect estimation and allowing for suitable presentation of individual country effects.

**Econometric Model**

An important part of this study is to explain the tourist inflows through the Gravity Model. To achieve this objective, demand factors of international tourism followed an augmented form of the gravity model. The study used 20 sample countries from 1991 to 2017. The augmented gravity model tourism demand function is presented in equation 4 as follows:

\[
TD_{ijt} = f(GDP_{jt}, Pop_{jt}, Dist_{ijt}, TCP_{ijt}, TCP_{ijt}, TCP_{mjt}, TCP_{thjt}, TCP_{injt}, REER_{ijt}, DF_{ijt}, C_{ij}, ASEAN_{j}, Lang_{j})
\]

Equation (3) is the economic model used to determine the factors explaining tourism demand in the Philippines. It is hypothesized the Tourism Demand \(TD_{ijt}\) is a function or that depends upon the economic size of the origin country of the tourist visiting in the Philippines \(GDP_{jt}\), the population of the origin country \(Pop_{jt}\), the distance between Manila (destination) and capital cities of tourist home country \(Dist_{ijt}\), cost of tourism in destination (Philippines) relative to the cost of living in the origin country \(TCP_{ijt}\), cost of tourism in Malaysia relative to the cost of living \(TCP_{mjt}\), cost of tourism in Thailand relative to the cost of living \(TCP_{thjt}\), cost of tourism in Indonesia relative to the cost of living \(TCP_{injt}\), cost of tourism in China relative to the cost of living \(TCP_{chnjt}\), and cost of tourism in Japan relative to the cost of living \(TCP_{janjt}\).

**Methodology**

**Data Collection**

This study used annual panel data series from the year 1991 until 2017 for 20 countries that mostly visited the Philippines. A total of 540 data points of selected tourism factors and economic indicators are used for the data analysis. Data concerning the macroeconomic variables of the twenty countries used in this study were sourced from the published data on the official World Bank website. The time series data from 1991-2017 for gross domestic product (GDP), population, consumer price index for calculating relative prices and relative effective exchange rate from the twenty countries were gathered from the World Bank (2017). All the collected data were then aggregated into a panel dataset for analysis in a statistical software called STATA.
in the origin country (TCPinjt), cost of tourism in Indonesia relative to the cost of living in the origin country (TCPinjt), relative effective exchange rate between the Philippines and origin countries (REERijt), direct flights from the Philippines to the source of origin of the tourist and vice versa (DFijt), culture of origin country (Cc), ASEAN membership (ASEANj), commonality of English language (Langj), transforming equation 3 into a double log form eased the estimation and interpretation of the estimated coefficients. The estimated coefficients of the model are interpreted directly as tourism demand elasticities. The double-log for the augmented gravity model of tourism demand is presented in equation 4.

\[ \text{Intdijt} = \beta_0 + \beta_1 \ln GDPjt + \beta_2 \ln Popjt + \beta_3 \ln Distijt + \beta_4 \ln TCPijt + \beta_5 \ln TCPmjt + \beta_6 \ln TCPthjt + \beta_7 \ln TCPinjt + \beta_8 \ln REERijt + D_1 DFijt + D_2 Ccj + D_3 ASEANj + D_4 Langj + \epsilon_{ijt} \] Eqtn(4)

where:
- \( i \) = origin/reporting country.
- \( j \) = destination/partner country.
- \( \ln \) = log of the variables.
- \( TDijt \) = total tourists arrivals by country of residence from origin country \( i \) to destination/partner country \( j \) in year \( t \).
- \( GDPjt \) = Gross Domestic Product of country \( i \) and \( j \) in the year \( t \).
- \( Popjt \) = country of origin at time \( t \), as proxy for market size.
- \( Distijt \) = between Manila (destination) and capital cities of tourist home country measured in kilometers.
- \( TCPijt \) = proxied by consumer price indices to represent the cost of tourism in destination (Philippines) relative to the cost of living in the origin country.
- \( TCPmjt \) = proxied by consumer price indices to represent the cost of tourism in Malaysia relative to the cost of living in the origin country.
- \( TCPthjt \) = proxied by consumer price indices to represent the cost of tourism in Thailand relative to the cost of living in the origin country.
- \( TCPinjt \) = proxied by consumer price indices to represent the cost of tourism in Indonesia relative to the cost of living in the origin country.
- \( \text{REERijt} \) = relative effective exchange rate between the Philippines and origin countries which measures the effective prices of goods and services in the Philippines relative to origin countries.
- \( \text{DFijt} \) = Direct flights from the Philippines to the source of origin of the tourist and vice versa (1 = if there is a direct flight from origin country to Philippines, 0 = none).
- \( \text{Cc} \) = culture (1 = if common colonizers, 0 = otherwise).
- \( \text{ASEAN}j \) = ASEAN membership (if member = 1, 0 = not member) of origin country.
- \( \text{Langj} \) = commonality of English language (1 = common language, 0 = otherwise).

**Data Description**

Table 1 shows the definitions of the variables that were used in this study and the hypothesized relationship between the dependent and independent variables.

**Results and Discussion**

**Descriptive Statistical Analysis**

**Time-Series Trends of Tourists Inflows in the Philippines.** As shown in Fig. 2 below, it can be observed that the trend of average tourist arrivals in the Philippines from the year 1991 up to 2017 is generally increasing over time. The trend of total tourist arrivals to the Philippines is increasing from 2001 to 2012 with a mild dip in 2003 and 2009 as the impact of the international crisis. The decreasing tourist arrivals in the international economy have been magnified by uncertainties in the US economy. Beyond 2009 it is observed that arrivals have increased rapidly than previous years.

Table 2 shows the number of tourist arrivals in the Philippines per 9 year-average from 1991-2017. The top five countries that most visited in the Philippines are South Korea, China, USA, Japan, and Australia. It can already be implied from this trend that countries with larger economic size such as these five countries explain the larger number of tourist arrival to the Philippines. In theory, as a country’s income increases, more of its residents can afford to visit other countries (Table 3).
Table 1. List and definition of variables used in the model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dependent Variable: Tourist Arrivals in the Philippines</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lnTD_{it}</td>
<td>Logarithm of the tourists’ arrivals in the Philippines.</td>
<td>Department of Tourism, Philippines.</td>
</tr>
<tr>
<td><strong>Independent Variables: Determinants of Tourist Arrivals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>lnGDP_{it}</td>
<td>Logarithm of the Gross Domestic Product per capita: gdp per capita at time t in current US$ of the country of origin.</td>
<td>World Bank</td>
</tr>
<tr>
<td>lnPop_{it}</td>
<td>Logarithm of population: the country of origin at time t, as proxy for market size.</td>
<td>World Bank</td>
</tr>
<tr>
<td>Dist_{it}</td>
<td>Distance: between Manila (destination) and capital cities of tourist home country measured in kilometers.</td>
<td>distancefromto.net</td>
</tr>
<tr>
<td>lnTCPI_{it}</td>
<td>Logarithm of relative price of tourism: proxied by consumer price indices to represent for the cost of living in the country relative to the cost of living in the origin country.</td>
<td>World Bank</td>
</tr>
<tr>
<td>lnTCPI_{init}</td>
<td>Logarithm of relative price of tourism: proxied by consumer price indices of Malaysia and origin country to represent for the cost of living.</td>
<td>World Bank</td>
</tr>
<tr>
<td>lnTCPI_{enth}</td>
<td>Logarithm of relative price of tourism: proxied by consumer price indices of Thailand and origin country to represent for the cost of living.</td>
<td>World Bank</td>
</tr>
<tr>
<td>lnTCPI_{init}</td>
<td>Logarithm of relative price of tourism: proxied by consumer price indices of Indonesia and origin country to represent for the cost of living.</td>
<td>World Bank</td>
</tr>
<tr>
<td>lnREER_{it}</td>
<td>Logarithm of relative real effective exchange rate: rate between the Philippines and origin countries which measures the effective prices of goods and services in the Philippines relative to origin countries.</td>
<td>World Bank</td>
</tr>
<tr>
<td>DF_{it}</td>
<td>Direct Flights: from the Philippines to the source of origin of the tourist and vice versa. This took the value of 1, when there is and 0, otherwise.</td>
<td>Skyscanner.com</td>
</tr>
<tr>
<td>Cc_{it}</td>
<td>Common colonizer/s: was included in the study to capture similarity in customs, history and traditions. When a tourist home country in any circumstances was under, the Spanish, Japanese and Americans or any of the following in their history took the value of 1 and 0, otherwise.</td>
<td>World Atlas</td>
</tr>
<tr>
<td>ASEAN_{it}</td>
<td>ASEAN membership as dummy variable to capture if this regional coalition of the Philippines has impact on increasing inflows of international tourist to the Philippines. It took a value of 1, when the country of origin is a member of ASEAN and 0 otherwise.</td>
<td>asean.org</td>
</tr>
<tr>
<td>Lang_{it}</td>
<td>This variable took the value of 1, when the tourist country of origin can speak English up to as 3rd language, and 0, otherwise</td>
<td>World Atlas</td>
</tr>
</tbody>
</table>
The Gravity Theorem

The classical gravity theorem for tourism states that visitation rate is proportional to the origin country’s economic size (GDP) and inversely related to the distance between them.

Tourist Arrivals and GDP. Figure 3 shows that there is a positive correlation between tourist arrivals in the Philippines and the GDP of the origin country. The scatter plot supplements the observation from the above time-series trends that huge numbers of total tourist arrivals in the Philippines are coming from countries with larger economics size. For instance, notably, the USA and China with their large GDP’s were also observed in Figure 4 below to have many of their citizens arriving in the Philippines as tourists. It is important to note however that this positive correlation does not necessarily explain a
significant influence of GDP on tourist arrivals. Regression analysis was done and presented in the next sections to statistically assess the significance of the relationship between GDP and tourist arrivals.

**Tourists Arrivals and Distance.** Figure 4 shows that there is a negative correlation between tourist arrivals in the Philippines and distance of origin country. The scatter plot supplements the observation from the above time-series trends that huge numbers of total tourist arrivals in the Philippines are coming from its neighboring countries. For instance, notably, the ASEAN countries with their shorter distance to the Philippines were also observed in Fig. 5 below to have many of their citizens arriving in the Philippines as tourists.

**Panel Regression Analysis**

**Classical Gravity Model.** Table 3 shows the fixed effects (FE) and random effects (RE) estimates using Tinbergen’s model with the number of tourist arrivals as the dependent variable. The first column represents the results of fixed effects (FE) regression and the second column represents the results of random effects (RE) regression. Results below show that GDP of origin country positively influences the probability of their visits to the Philippines. This result is true for both FE and RE models. The positively significant coefficient of GDP conforms to the prediction of gravity theorem. In terms of distance, RE determines that this variable negatively affects the likelihood of visits to the Philippines. Distance reflects travel costs for tourists thus the farther the distance the country of origin of the tourists, the more costly for them to visit the Philippines making them less encourage to experience the tourism services of the country. The FE model though cannot estimate the coefficient for distances as this variable is time-invariant and cannot satisfy the conditions for the fixed effects estimation procedure. Further, through Hausman Tests, it was found that Random Effects (RE) model is the most appropriate
Therefore, using RE, it is estimated that for every 1 percent increase in GDP of the origin country there is an associated increase in the probability of their visit to the Philippines by about 1.025 percent. This positive relationship between the two variables (GDP and Tourist Arrival) is significant at 5% level of significance (Table 3). The other variable distance, although significant, but the extent of its influence to tourist arrival is small showing only 0.002 percent likelihood of an increase in tourist visits if the origin country is closer to the Philippines by 1km.

Augmented Gravity Model. Tourism cannot be explained by just the distance and GDP of countries involved, other factors may also explain the variations of tourist arrival in the country over time. Table 4 shows the comparison of results using four different models (OLS, FE, and RE). Hausman test was conducted to determine which panel data estimation approach is best suited for this case and revealed that the best model to use is the random effects model.

Using the RE estimates as identified through the Hausman test as the most appropriate model to use in this case, results revealed that Philippines tourists’ arrivals are significantly and positively affected by GDP. That is, a percent increase in income across time and between countries will increase tourism demand by .86 percent. This is consistent with the result of Muñoz and Amaral (2000) which indicated that as the country’s income increases, more of its residents can afford to visit other countries, and therefore tourist arrivals are a positive function of income or directly related to income.
the Philippines. On the average between countries and time, an increase in population in the origin country will decrease tourism arrivals by 0.384 percent. This may imply that a number of people increases in the origin country, the less they are encouraged to visit Philippines. Also, this implies that the country with lesser population tends to visit more Philippines. It might be that crowded countries reflects many jobs and opportunities, thus, the residents in that country would tend to stay in their places than to travel abroad. Furthermore, a unit increase in distance will also decrease tourist arrivals by 0.0103%. This means that tourism in the Philippines depends on tourists from countries near to the Philippines. The farther the distance between countries of origin and the Philippines the fewer tourists are expected. These results are consistent with the results of Karagoz (2008) and Deluna and Jeon (2014), among others.

Relative prices of Philippine tourism and the cost of living in the Philippines measured in terms of exchange rate and consumer price index turns out insignificant. This means that the relatively low prices of goods and services, cost of living and tourism packages in the Philippines has no effect on attracting/pulling tourist inbound.

The existence of direct flights from the origin country to the Philippines is highly significant in increasing tourism inbound. That is, the presence of direct flights from origin to destinations will increase tourism inbound by 1.233 percent. This result means that more direct flights from country of origin to country of destination (Philippines) can attract or pull tourists from abroad.

Language and common membership to ASEAN between the host and country of origin are both not significant. This means that commonality of English language and the coalition of the Philippines has no impact on increasing inflows of international tourist to the Philippines.

The goodness of fit shows that 85 percent of the variability of the overall tourist arrival panel data can be explained/predicted by the regressors included in the model. Moreover, 91 percent and 68 percent variability can be predicted by the regressors of the model is fitted between and within the model respectively. The result of the F statistic test shows that the coefficients on the regressors of the model are all jointly zero, which means that the augmented gravity model of this study is significant in determining factors of international tourism demand for the Philippines.

The final expression of the model using random effects is below:

\[
\text{InTDijt} = \text{M}9.07 + 0.857\text{InGDPijt} \\
0.384\text{InPopijt} - 0.000103\text{Distijt} + 1.233\text{DFijt} + \\
0.841\text{Ccj} + \epsilon_{ijt} \quad \text{Eqtn(5)}
\]

In this study, the most relevant model for predicting the tourism demand for the Philippines is the augmented gravity model. This model explicitly predicts that factors such as GDP, common colonizer, and direct flights significantly and positively affect tourism demand in the Philippines. This prediction indicates that countries with higher GDP, and with common colonizer with that of the Philippines, and with direct flights from the Philippines are expected to increase tourism demand in the Philippines. In addition, the model also predicts that variables such as distance and population affect negatively and significantly tourism demand in the Philippines which suggests that countries with higher population and are farther from the Philippines are less likely to visit the Philippines.

Summary, Conclusion and Policy Implications

This study empirically examined the factors affecting tourist inflows in the Philippines as explained by the gravity theorem using secondary data from the Philippines Statistical Office, World Bank Indicators and Department of tourism from 1991-2017. Specifically,
Table 4. OLS, FE and RE regression estimates of augmented model with number of tourists arrivals as dependent variable

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>OLS Tourist Arrivals</th>
<th>Fixed Effects Tourist Arrivals</th>
<th>RANDOM EFFECTS Tourist Arrivals</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>0.747***</td>
<td>0.905***</td>
<td>0.857***</td>
</tr>
<tr>
<td></td>
<td>(-0.0409)</td>
<td>(-0.083)</td>
<td>(-0.317)</td>
</tr>
<tr>
<td>Population</td>
<td>-0.311***</td>
<td>-0.722**</td>
<td>-0.384**</td>
</tr>
<tr>
<td></td>
<td>(-0.0254)</td>
<td>(-0.35)</td>
<td>(-0.189)</td>
</tr>
<tr>
<td>Relative price of tourism</td>
<td>-0.195</td>
<td>-0.698</td>
<td>-0.641</td>
</tr>
<tr>
<td></td>
<td>(-1.264)</td>
<td>(-0.991)</td>
<td>(-1.197)</td>
</tr>
<tr>
<td>Relative price of Malaysia</td>
<td>-0.631</td>
<td>-0.183</td>
<td>-0.261</td>
</tr>
<tr>
<td></td>
<td>(-0.852)</td>
<td>(-0.692)</td>
<td>(-0.792)</td>
</tr>
<tr>
<td>Relative Price of Thailand</td>
<td>1.151</td>
<td>1.182</td>
<td>1.256</td>
</tr>
<tr>
<td></td>
<td>(-1.492)</td>
<td>(-1.175)</td>
<td>(-1.102)</td>
</tr>
<tr>
<td>Relative price of Indonesia</td>
<td>-0.664***</td>
<td>-0.362*</td>
<td>-0.42</td>
</tr>
<tr>
<td></td>
<td>(-0.247)</td>
<td>(-0.216)</td>
<td>(-0.356)</td>
</tr>
<tr>
<td>Relative effective exchange rate</td>
<td>0.0274</td>
<td>0.350**</td>
<td>0.305</td>
</tr>
<tr>
<td></td>
<td>(0.16)</td>
<td>(-0.157)</td>
<td>(-0.281)</td>
</tr>
<tr>
<td>Distance</td>
<td>-8.72e-05***</td>
<td>-0.000103***</td>
<td>(-0.0000368)</td>
</tr>
<tr>
<td></td>
<td>(-0.00000847)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common Colonizers</td>
<td>0.824***</td>
<td>0.841***</td>
<td>0.816***</td>
</tr>
<tr>
<td></td>
<td>(-0.0556)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct Flights</td>
<td>1.293***</td>
<td>1.233***</td>
<td>-0.263</td>
</tr>
<tr>
<td></td>
<td>(-0.0594)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language</td>
<td>-0.0388</td>
<td>-0.0588</td>
<td>-0.26</td>
</tr>
<tr>
<td></td>
<td>(-0.0561)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asean</td>
<td>-0.674***</td>
<td>-0.629</td>
<td>-0.388</td>
</tr>
<tr>
<td></td>
<td>(-0.0751)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>0.0694***</td>
<td>0.0539***</td>
<td>0.0559*</td>
</tr>
<tr>
<td></td>
<td>(-0.0209)</td>
<td>(-0.0179)</td>
<td>(-0.0305)</td>
</tr>
<tr>
<td>Constant</td>
<td>-5.720***</td>
<td>-2.021</td>
<td>-7.073</td>
</tr>
<tr>
<td></td>
<td>(-0.832)</td>
<td>(-5.616)</td>
<td>(-5.003)</td>
</tr>
<tr>
<td>Observations</td>
<td>540</td>
<td>540</td>
<td>540</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.855</td>
<td>0.686</td>
<td></td>
</tr>
<tr>
<td>Number of countries</td>
<td>20</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

this study aimed to describe the trends of tourist arrivals in the Philippines, identify the determinants of tourism inflows in the Philippines including factors identified by the gravity theorem and provide inputs for current and future policy recommendations.

Gravity theorem states that tourists from countries with larger GDP and are closer in distance from the Philippines are more likely to visit the Philippines. This prediction is mainly based from the classical gravity model, but tourism, as reported in the literatures, cannot be explained by just GDP and distance of the countries involved hence an augmented model was also designed and was analyzed in this study. The variables that were included in the augmented model were relative price of tourism of Philippines, the relative price of Malaysia, the relative price of Thailand, the relative price of Indonesia, the relative real exchange rate, direct flights, common colonizers, ASEAN membership, and language. Panel data regression (FE and RE) were utilized to analyze the data while diagnostic tests were conducted to test the validity of the estimates derived from the different regression techniques used. The robust test was also administered to observe
the behavior of the variables when new factors are introduced in the model.

This study was able to empirically examine gravity theorem and concluded the validity of its predictions for tourism inflows in the Philippines. GDP, direct flights and common colonizers are significantly influencing and positively affecting tourist inflows in the Philippines. While distance and population are negatively associated and significantly affecting tourist inflows.

Since direct flights found to positively and significantly affecting tourist inflows in the Philippines, then this highlights some policy insights that Philippines should establish more direct flights to these top 20 countries. With this, it can be expected that tourism demand will increase and that could contribute more significantly to the country’s economic growth. Based on the results of the study, the Philippines should continue in promoting Philippine tourism abroad, as the finding of the study suggests that prices are not significant indicators of tourism demand. Therefore, it is hypothesized that it might be the unique features of Philippine tourism that matter most on tourism demand. Moreover, Philippines should continue promoting its tourism initiatives on countries with relatively high income such as the United States in America, Netherlands, and Japan as these countries are expected to visit the Philippines more often implying that their people are bringing more income in the tourism sector of our country – the Philippines.

References Cited


DistanceFromTo. (2017). Distance between cities places on map. Retrieved from https://www.distancefromto.net/


