

## Bilateral Trade and Tourism Demand

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**Abstract:** Tourism industry can be claimed as one of the important sectors in the modern Malaysian economic development. It has been identified as second largest foreign exchange earning sector and had strengthen up the performance of Malaysia Gross Domestic Product and trade balance. Numbers of studies have been done in order to attempt the theory that there is a link between trade and tourism and most of them showed that it is positively correlated. This paper specifies tourism demand models in Malaysia and estimates demand equations using tourist inflow data for the period 1997-2008. Researchers identified that bilateral trade, population, income, tourism price and geographical distance between Malaysia and the Asian countries are the main determinants of tourism. It clearly shows that tourism demands relates significantly with the trades. With more proactive action taken by the policymaker in understanding the dynamic of this industry, Malaysia will able to increase the quality of tourism industry in order to be the main center for tourism Asia region and the world beyond 21<sup>st</sup> century.

**Key words:** Tourism • Trade • Economy • Demand

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### INTRODUCTION

As an evolving sector, tourism has been defined as the sum of those industrial and commercial activities which produce goods and services and mainly consumed by foreign visitors or domestic tourists.” Tourism industry can be claimed as an important sector for the Malaysia economy. It has been identified as the second largest foreign exchange earning sector and helped to strengthen the Malaysian economy in terms of international trade. World Tourism Organization classified tourism industry as comparable rather than export activities [1]. Tourism demand can be forecasted by using variables such as income, tourism price, transportation costs, trade of goods and services [2, 3]. International trade was the most important role in generating national income. In fact, tourism is a significant source of export revenues for any country in the world. It is important that the government policymaker comprehend the factors affecting foreign tourism demand. There are only a small number of studies has been done in order to identify the relationship between trade and tourism. Furthermore, poor quality of research has been a continual problem in tourism studies and most of the studies merely focus on tourist flows and receipts.

**Empirical Studies:** International tourism also has become a major foreign exchange earner for many low-income countries and small islands and it is a principal export for 83% of developing countries [4]. Many countries attempt to develop tourism sector and increase the number of coming visitors because of several reasons: international tourists bring foreign currency to a host country; tourism sector is much more merciful toward environment than many industries producing goods; growth in tourism industry accelerates other, related industries (retail, entertainment, transportation).

Since the September 11 event, Malaysia has become an oasis for tourists from the Middle East as it is able to provide a safe haven for Muslim tourists as an alternative to their traditional escapade to London (and Western Europe) during their hot and humid summer months. The problem called Islamophobia gave Malaysia a comparative advantage as the fear and/or hatred of Islam, Muslims or Islamic culture had encouraged the Middle East tourist to opted Malaysia rather than Europe as their travel destination [4].

The literature on tourism demand focuses on the determinants, as in cost of transport, price, income in tourism generating countries and population. During the past decade, numerous econometric models have been

developed and estimated in tourism literature to identify the relationship between tourist arrivals in a particular country and the factors that influence arrivals. In international tourism demand modeling, most of the previous studies have used the demand function approach to identify the quantitative [5]. Some studies have used the gravity model approach. However, the gravity model approach lacks a firm theoretical foundation and the final form of the model closely resembles the demand function [6].

The gravity-type models are applied in physics and have achieved increasing recognition in the analysis of economic phenomena related to the flow of goods and/or services [8]. This type of model has yet to be applied, with a proper theoretical base to tourism demand. Although some studies may claim to have estimated a variant of the gravity model, omitted variables from the model and incorrect estimation technique bias the results'.

There are sets of potential determinants that can influence the decision to travel classified into the following categories: socioeconomic factors, such as, income level, relative prices between the origin and the destination places, demography, urbanization and length of the leisure time; technical factors related to easier communications and transport facilities; psychological and cultural factors reflecting personal preferences and the style of life of the potential travelers; and random factors related to unexpected events, like political instability, weather conditions, natural disasters, epidemic diseases, etc [7].

Furthermore, the above variables are correlated with immigration and most of the immigrants prefer home-country products [6]. For that reason, this phenomenon can reduce the trading transaction costs. In particular, tourism can be thought as a form of temporary international migration. It clearly shows that inbound tourist could promote the tourism of their host country with their family and friends [9]. Not only that, international trade theory is simply international localization theory. Therefore, most of the economists linked tourism through an input-output matrix [6]. From the literature, it indicates that the demand for travel export is equal to:

$$TA: f(GDP, RP, TRADE, POP, DIS)$$

Where

- TA = The number of tourist arrivals;
- GDP = The income in tourist generation countries;
- RP = The relative price;

- TRADE = The bilateral trade;
- POP = The total population in tourist generation countries;
- DIS = The geographical distance.

Empirical literature reviews on tourism demand recommend that tourist demand is measured as in tourist arrivals and departures, with tourist arrivals as the dependent variable. On the other hand, empirical models of tourism demand use consumer's income, the price of services, exchange rate and distance as explanatory variables [2, 5, 10, 11].

Most of the empirical studies used an autoregressive model in demand estimation to evaluate the determinants of international tourism demand. The econometric model was formulated to evaluate the international tourism demand by residents of Argentina, Brazil, Colombia and Venezuela to Aruba [12].

Additionally, from a research on Caribbean tourism demand, the empirical results identified income as the most significant variable in explaining tourism demand [7]. Referring to other researchers who concluded that forecasting Portugal tourism demand is important in order to analyze the country's economy position and the econometric methodology showed that co-integration is non-existent in Portuguese tourism demand [12]. The authors concluded that communication for transportation infrastructures, destination risk, bilateral trade and geographical distance are the main determinants of tourism.

**Econometric Model:** A common model used in tourism demand studies is a single equation model with demand explained by the income of tourists in their countries of origin, the cost of tourism in the destination and alternative destinations and the substitute price variable. As to explanatory variables, the definitions of income used are usually personal disposable income or gross domestic product of the country of origin. In this study, income is measured by industrial output value, due to difficulties in obtaining figures for monthly GNP and population, or for per capita income and even disposable income for the originating countries. Therefore, the researchers employed real income, cost of living, exchange rate, arrival from origin country, inflation rate and dummy variable (economic crisis) as the independent variables.

The dependent variable used is the number of arrivals at destination (i) from origin (j) in a given year (TA). Data set from The World Development Indicators

and World Statistical Yearbook and The Tourism Compendium and Yearbook of Tourism Statistics have been used for the explanatory variables and dependent variable respectively.

The researchers converted the GDP per capita in tourist countries into logarithm modes in order to find out whether tourism demand will be influenced by income in the country of origin of the tourists or not. Based on the empirical literature, the researchers expected for a positive sign. Income in the origin country is the most frequently used explanatory variable. Most researchers have relied on national income and GDP as measures for income in the origin. This paper considers that income is highly significant as a determinant of demand. Other than that, this paper is also to find out whether a trade partner is an important vehicle to expand tourism or not.

A study on the determinants of inbound tourism in Laos found a positive sign when they used this proxy [13].

$$\text{Log TRADE} = \frac{X_t + M_t}{\text{GDP}_m + \text{GDP}_i}$$

Where

- $X_t$  = The annual exports of Malaysia to the country of origin of each tourist at time t; origin at time t;
- $M_t$  = The annual import of Malaysia from each tourist's country of origin at time;
- $\text{GDP}_i$  = The Gross Domestic Product per capita in tourist countries;

This research has been conducted in order to discover whether population changes will affect the number of immigration from a particular country or not and according to the literature on forecasting tourism demand, we expected a positive sign. The result shows that the level of tourism depends not only on the population of the origin country, but also on the immigrants from the destination country. Therefore, population of the origin country is also part of explanatory variable [7].

Nevertheless, most studies do not consider this variable because population tends to be highly correlated with income and at the same time will lead towards multicollinearity and autocorrelation problems. The researchers then manipulate Macroeconomic variables (tourism price) and distance (transportation cost) to analyze their influence on the cost of tourist service such as:

$$\log(\text{RP}_{im}) = \log [\text{CPI}_m / \text{CPI}_i]$$

Where  $\text{CPI}_m$  is the consumer price index in Malaysia and  $\text{CPI}_i$  is the consumer price index of origin country. The ratio will give the relative price of tourism and influences the decision for the tourist to decide whether to travel to Malaysia or not. Meanwhile, logarithm between the geographical distance and the partner country were compute in order to find out whether the cost of transports will moderate the tourist arrivals or not. A negative sign is expected for both variables [10, 11].

**Model Specification:** This paper also emphasizes on international trade either it can brings positive impact on Malaysia tourism demand or not. From the recent literature review, it shows that tourism demand was a dynamic phenomenon. Therefore, this study uses a panel data set between Malaysia and the Asian countries (China, Japan, Thailand, Indonesia and United Arab Emirates) for the period of 1997-2008. The proposed panel data applies Newton's gravitational law and the gravity models are based on the gravity law of spatial interaction.

The gravity models utilized the gravitational force concept as an analogy in order to explain the volume of trade, capital flows and migration of people among the countries in the world. These models have been accepted in tourism studies [14]. Several researchers modified the Tinbergen Gravity Model for the purpose of estimating tourism demand. A slight adjustment has been made by converting the variables in order to suit the tourism related variables [10, 15].

Nearly 80 of 100 empirical studies on tourism demand or arrivals used single equation of linear and/or log linear equation [2]. As a result, estimated coefficients can be interpreted as elasticities. Therefore, the variables such as  $\log(\text{GDP}_m)$ ,  $\log(\text{RP}_{im})$ ,  $\log(\text{TRADE}_{im})$ ,  $\log(\text{DIS}_{im})$  and  $\log(\text{POP}_{im})$  are treated as endogenous variables in this study. The log-linear model based on the modified Gravity Model is as follows:

$$\log(\text{TA}_{im}) = \alpha + \beta_1 \log(\text{GDP}_m) + \beta_2 \log(\text{RP}_{im}) + \beta_3 \log(\text{TRADE}_{im}) + \beta_4 \log(\text{DIS}_{im}) + \beta_5 \log(\text{POP}_{im}) + u_i$$

Where

- $\alpha$  = Constant
- $\text{TA}_{im}$  = The number of tourist arrivals in Malaysia
- $\text{GDP}_{im}$  = The gross domestic product
- $\text{RP}_{im}$  = The relative price

TRADE<sub>im</sub> = The bilateral trade  
 POP<sub>im</sub> = The population  
 DIS<sub>im</sub> = The distance  
 u<sub>i</sub> = The error

**Findings:** From the analysis, it is found that the explanatory power is quite high (Adjusted R<sup>2</sup>=0.738). All the explanatory variables are significant (LogGDP, LogTRADE, LogDIS and LogPOP at 95%) confidence interval, with the exception of LogRP. Gross Domestic Product is statically significant, with an expected positive sign.

The variables LogTRADE and LogRP are statistically significant with positive relationship with tourism demand. This outcome really shows that trade partners and relative price are crucial vehicle in order to inflate tourism demand. The coefficient of LogDIS (Distance) is negative, as expected. This result proves the justification of gravitational model and explains that high traveling cost really reduce the tourism demand. Finally, the variable population (LogPOP) finds a positive sign.

A series of t-test have been applied in each independent variable against the dependent variable. From the above gravity model equation, the variables log(GDP<sub>im</sub>), log(RP<sub>im</sub>), log(TRADE<sub>im</sub>), log(DIS<sub>im</sub>) and log(POP<sub>im</sub>) share the same significant level of 95 %. Taken as a whole, all independent variables are significant towards explaining the dependent variables and it shows that there are significant relationships between these variables. In other words, there are significant positive relationships between tourism demands with income, trade and population. On the other hand, there are significant negative relationship between tourism demand and distance and also tourism price.

F-test has been used in order to verify the relationships between the independent variables (price, income, distance, population and economic crisis) as a group and the dependent variable (tourism demand) [10]. As indicated in Figure 1, the F-value (18.0327) is more critical than the F-distribution value. Therefore, one can reject the null hypothesis and concludes with 95% confidence interval that the independent variables as a whole explained a significant changes in tourism demand. In a simple word, income, distance, population, tourism price and bilateral trade as a group have given significant effect either positive or negative towards tourism demand.

White's test was applied to eliminate heteroskedasticity problem by treating the data as degrees of freedom equal to the number of slope coefficient excluding the constant in the regression [11].

Table 1: The Impact of Trade on Malaysian Tourism Demand

Variables	Coefficient
LogGDP	0.582**
LogRP	-0.626**
LogTRADE	0.118**
LogDIS	-0.572**
LogPOP	0.620**
Adj. R <sup>2</sup>	0.738
N	84
Durbin Watson	0.674692
nR <sup>2</sup> = $\chi^2$	61.992

\*\* - Statistically significant at 5% confidence intervals

The critical value is then opted from Chi-square table and since the nR<sup>2</sup> value of 61.992 is lower than the 5% critical value, therefore we can accept that no heteroskedasticity problem exists.

Next, the variance inflation factor (VIF) has been conducted in order to find out any Multicollinearity problem with the variables. To test whether the variables have Multicollinearity problem, the variance inflation factor (VIF) had been conducted. If the VIF result is less than 4, it indicates that there is no serious Multicollinearity problems occurred. If the VIF result is more than 4, it indicates that the research model has serious Multicollinearity problems and the models need to be re-checked.

By entering VIFPF scalar formula, we will get:

$$\text{VIF} = 1 / (1 - 0.6579)$$

$$\text{VIF} = 2.93 < 4$$

As the VIF value is less than 4 (rule of thumb), there is supporting evidence that TA<sub>im</sub> is in absence of Multicollinearity.

## CONCLUSION

This paper investigates the relationship between bilateral trade and tourism demand in Malaysia. Any analysis of international tourism demand and the sensitivity of economic parameters in particular must be viewed with caution. There may be some unknown bias in the derived demand parameters due to the use of a small sample and that was the reason why the researchers used a modified gravity model. Thus, in order to understand the dynamic nature of tourism, the researcher constructed a log linear econometric model and the research findings confirmed the above assumption.

The logged tourism demand showed an expected positive sign while other explanatory variables such as geographical distance and tourism price are statistically significant. Moreover, the results were aligned with key economic theories. These results prove that an augment technique is needed in order to understand more about the demand for tourism determinants. Furthermore, this study generated new information on the affects and sensitivity of economic parameters and also their influence over demand for international tourism. As the quality of data for international travel and tourism increases and more data become available, the methodology and the database developed in this study can be extended to obtain more vigorous parameter estimates. Basically, recommendations for further study were only intended in order to give guidelines for improvement on this research paper and for better understanding on the discussed topic.

As a conclusion, this report meets its objectives by conducting an exploratory research and identifying key economic indicators that have significant effects towards tourism industry development and performance measures for future applications. Further, this research forms an understanding of the multitude of economic factors and issues that affect the nation's competitiveness and the effective operation of the government's strategies in the global tourism arena. Additionally, to the investors and businessmen exploring good potential investment opportunities in Malaysia, this report offers a glimpse into various significant tourism related economics that local companies can take advantage on current and future world economic condition. Lastly, this paper has amply satisfied its aims and at the same time, a similar study should be done using a bigger sample, more variables and current data in order to strengthen this study.

#### REFERENCES

1. World Travel and Tourism Council (WTTC), 2006. Malaysia: Travel and Tourism Climbing to New Heights. World Travel and Tourism Council. London.
2. Lim, C., 1977. Review of International Tourism Demand Models. *Annals of Tourism Res.*, 24(4): 835-849.
3. Kulendran, N. and K. Wilson, 2000. Is there a relationship between international trade and international travel? *Applied Economics*.
4. World Travel and Tourism Council (WTTC), 2006. Malaysia: Travel and Tourism Climbing to New Heights. World Travel and Tourism Council. London.
5. Turner, L.W. and S.F. Witt, 2001. Factors influencing demand for international tourism: Tourism demand analysis using structural equation modelling. *Tourism Economics*, 7(1): 21-38.
6. Witt, S. and C. Witt, 1995. Forecasting Tourism Demand: A Review of Empirical Research. *International J. Forecasting*, 11(3): 447-475.
7. Carey, K., 1991. Estimation of Caribbean Tourism Demand: Issues and Methodology. *Atlantic Economic J.*, 19(3): 32-40.
8. Wang, S. Yu., 2008. The impact of crisis events and macroeconomic activity on Taiwan's international inbound tourism demand. *Tourism Management*, pp: 1-8.
9. Dwyer, L., I. Burnley, P. Murphy and P. Forsyth, 1992. Tourism - Immigration Interrelations. Report Prepared for Bureau of Immigration Research.
10. Hanafiah, M.H. and M.F. Harun, 2010. Application of Gravity Model in Estimating Tourism Demand in Malaysia. *Proceedings of 2010 International Conference on Business, Economics and Tourism Management*, Singapore, 12(2): 121-129.
11. Hanafiah, M.H. *et al.*, 2008. Estimating Tourism Demand in Malaysia. *Proceedings of 7<sup>th</sup> Asia Pacific Forum for Graduate Students' Research Tourism*, Malaysia, 1(3): 141-146.
12. Daniel, A. and F. Ramos, 2002. Modelling Inbound International Tourism Demand Portugal. *International J. Tourism Res.*, 4(1): 193-209.
13. Phakdisoth, L. and D. Kim, 2007. The Determinants of Inbound Tourism in Laos. *ASEAN Economic Bulletin*, 24(2): 225- 237.
14. Tinbergen, J., 1962. *Shaping the World Economy*. New York: Twentieth Century Fund.
15. Rodrigue, J.P., 2004. *The geography of transport systems*. London: Routledge.