

# The Study on the Determinants of International Tourism Demand: The Case of Chinese Outbound Tourism to Japan

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**Abstract:** The determinants of international tourism demand are country-specific, and the variables' elasticity varies by destinations. Accordingly, this paper aims to identify critical determinants of tourism demand for Japan. The empirical analysis indicates that the effect of word-of-mouth and effective relative price are significant factors in the tourism demand determination, whilst the effective substitute price, openness and transport cost show no impact on tourism demand. It is also found that external shocks caused by Japan's natural disasters and Sino-Japanese relations have a significant impact on the demand for Chinese citizens to travel to Japan.

## 1. Introduction

With the advancing of globalization and economic integration, international tourism has achieved remarkable development during the past decades. As one of the leading forces in the world economy, international tourism represents 10% of the world's GDP and greatly contributes to the creation of jobs and infrastructure. The number of international tourists increased from 25 million in 1950 to 1.23 billion in 2016, while international tourism receipts surged from \$2 billion to \$1.22 trillion [1].

Demand for international tourism in China is amazingly striking. Since the late 1990s, China has got significant development in economy, and the GDP per capita continued to increase at a solid growth rate, therefore, more and more Chinese choose to travel overseas. Till now, China has become the largest source of international tourists in the world, and the data are quite impressive. The outbound tourist number increased from 34.52 million in 2006 to 122 million in 2016, and the tourism expenditure reached to 261 billion at the end of 2016[2].

As an important neighboring country of China, Japan has been a quite popular destination for Chinese tourists since the 1990s. Greatly encouraged by the implementation of 'Nation-building upon Tourism Strategy', the number of international tourists has experienced a sustained expansion over the past years. During the period of 2003 to 2016, tourist arrivals from China has surged from 150 thousand to 2.12 million [3], which makes China the largest market of international tourists to Japan.

Accordingly, academic researchers have conducted extensive studies on the international tourism. By reviewing the literature, we found that the important determinants of international tourism demand are country-specific and the performance of the forecasting model varies from case to case. The purpose of this study is to identify the important determinants of outbound tourism demand in the context of China-Japan pair.

## 2. Literature Review

Published researches on tourism demand analysis fall into two groups. The first group tend to use time-series modelling approaches whilst another focus on econometric methods [4]. The time-series approaches forecasting historic trends of tourism demand into the future without examining the underlining causes of the trends. In contrast, the econometric modelling methods forecasting the tourism demand based on the causal relationship between dependent and independent variables,

which involves more practical implications [5].

In general, tourist arrival is the most commonly used proxy in the modelling of tourism demand. Meanwhile, a few researchers employ tourism expenditure and tourism receipts. Although the use of those proxies is theoretically sound, the forecasting performance varies according to the specific research context [6]. Song, Li, Witt, and Fei (2010) reveals that the forecasting performance of tourism expenditure is better than tourist arrivals. Also, they maintain that the choice of demand measure is based on the objective of analysis [7].

Tourism demand is a function of several economic and non-economic variables. Income has been identified as an important factor in many tourism demand researches [8], and the relationship between income and tourism demand is positive, that is, the higher the income, and the more demand for tourism. Normally, studies use gross domestic production or gross national product per capita as a proxy for income.

Another important determinant of tourism demand is tourism price. According to the classical economic theory, an increase of tourism prices will lead to a fall of the demand for tourism. Tourism price is comprised of living cost and transport cost [9]. Specifically, there are typically two components of living cost: (1) the prices of products and tourism service in destination country, such as accommodation, food and beverage prices, and local transportation cost [10]; (2) the exchange rate for destination country [11].

According to Song and Li (2008), the living cost in destination can be formulated as relative price(RP) and substitute price(SP), and both of them have an effect on tourism demand [12]. Normally, in the econometric studies of tourism demand, at least one of those price variables should be included into the construct of tourism price [13]. Since there is no specific index for the price level of tourism, hence, researchers tend to use the consumer price index(CPI) to represent the living cost in destination.

Exchange rate is another element of living cost, which was proved to be a dominant determinant of tourism demand. A devalue of a country's currency makes inbound tourism price less expensive, and therefore more international tourists travel to the destination [14]. However, researchers hold different views about the inclusion of these two elements of living cost in tourism demand model. Some studies include exchange rate alone in the model on the grounds that international tourists are more aware of exchange rate rather than price level [11]. Some scholars prefer the inclusion of exchange rate and price level independently in the model. However, Lim (1996) argued that the inclusion of both variables may cause multicollinearity because relative price is highly dependent on exchange rate [15]. In some cases, researchers claimed that exchange rate and relative price (or substitute price) ought to be incorporated into the model separately [16], and the rationale is that tourists' reaction to the fluctuation of exchange rates probably differs from the changes in relative prices. To further muddy the water, De vita (2013) concluded that the inclusion of relative prices adjusted by exchange rate as an effective relative price is reasonable [14].

Another component of tourism price is the transportation cost which represents an influencing factor in international tourism demand. Prideaux (2000) revealed that transportation cost discourages tourism demand between destinations [17]. Due to the complexities of the price structure, no completely favorable index exists in the context of international transportation cost [18]. Normally, geographic distance and jet fuel price have been widely used as proxies for travel cost [14]. Despite the significance of the transport cost has been proved in many empirical studies, transport cost has been one of the variables omitted from the estimation of tourism demand due to the complexities of the price structure and the possible multicollinearity between the transportation cost and income variables [19].

International trade, albeit rarely, has been investigated in the estimation of tourism demand models. Shan and Wilson (2001) concluded that there was a bilateral causal relationship between international trade and international tourism in the context of China [20]. Wong and Tang (2010) examined the causal relationship between the openness and tourism demand for Singapore, and arrived at the same conclusion [21].

Lagged dependent variable is a critical explanatory variable should be included in the demand

model to capture tourist's re-visiting and word-of-mouth effect. The incorporation of this variable is to explain the behavior that tourists spread the information to others after they returning to their country, which may influence potential tourists' decision making [22]. The exclusion of this variable in the modelling process can result in unreliable forecasts [4].

Dummy variables were used to analyze the effect of exogenous shocks and crisis which may exert negative impact on international tourism demand. Wang 2009 found that any threat to safety could greatly frustrate the potential tourists' demand for tourism [23].

### 3. Methodology

#### 3.1 Model

The sample is based on the quarterly outbound tourist numbers from China to Japan during the period of 2003 to 2016. Due to the inconsistent use of tourism price in literature, we formulate two tourism demand models with different price variables, and a double log-linear function was used, which allow researchers to examine the elasticity. The tourism demand functions are expressed as follows:

$$\ln TD_t = \beta_0 + \beta_1 \ln(\text{lag}TD)_t + \beta_2 \ln INCM_t + \beta_3 \ln ERP_t + \beta_4 \ln ESP_t + \beta_5 \ln OPS_t + Q_2 + Q_3 + Q_4 + \beta_6 DM_1 + \beta_7 DM_2 + \varepsilon_{it} \quad (1)$$

$$\ln TD_{it} = \beta_0 + \beta_1 \ln(\text{lag}TD)_t + \beta_2 \ln INCM_t + \beta_3 \ln ERP_t + \beta_4 \ln ESP_t + \beta_5 \ln TRC_t + \beta_6 \ln OPS_t + Q_2 + Q_3 + Q_4 + \beta_7 DM_1 + \beta_8 DM_2 + \varepsilon_{it} \quad (2)$$

Where the letter t denote time, and the variables introduced are defined as:

$TD_t$  = total number of tourists from China at time t;

$(\text{Lag}TD)_t$  = lag one total number of tourists from China;

$INCM_t$  = real GDP per capita for China at time t;

$ERP_t$  = effective relative price calculated as :

$\left\{ \left[ \frac{CPI_{Japan,t}}{CPI_{China,t}} \right] * \left[ 1 / \text{Exchange rate}_{China,Japan,t} \right] \right\}$ , where CPI is the consumer price index, Exchange rate is the bilateral exchange rate between China and Japan;

$ESP_t$  = effective substitute price calculated as :

$\left\{ \left[ \frac{CPI_{Japan,t}}{(Weighted\ CPI)_{Competing\ destinations,t}} \right] * \left[ 1 / \text{Exchange rate}_{China,Japan,t} \right] \right\}$ , and South Korea, Singapore and Taiwan China were selected as substitute destinations for Japan, and they were equally weighted in the model estimation;

$TRC_t$  = the jet fuel price per gallon at time t in dollars;

$OPS_{Japan,t}$  is the economy openness defined as  $\left[ \frac{(imp_{Japan,t} + exp_{Japan,t})}{GDP_{Japan,t}} \right]$ , where  $imp$  is the volume of imported goods, and  $exp$  is the volume of exported goods, and GDP is the gross domestic product;

$Q_2, Q_3, Q_4$  = seasonal dummies for the second, third and fourth quarter of the year;

$DM_1$  = the Fukushima Nuclear Leakage in the first quarter of 2011;

$DM_2$  = the anti-Japan activities triggered by Diaoyu Islands territorial dispute in the third quarter of 2014.

#### 3.2 Data source

The data about the tourist numbers from China to Japan was collected from website of the Japanese National Tourism Organization; The CPIs, exchange rate, import goods and export goods are from IMF statistics database, and the GDP data was obtained from OECD. The CPI for Taiwan is from Statistical yearbook of the republic of China 2017. The jet fuel price data was obtained from EIA (US Energy International Administration).

#### 4. Empirical Results

To avoid spurious regression problems, the data must be modeled in a suitable econometric framework. Accordingly, prior to panel data analysis, the test for unit roots is necessary to check the stationarity of the variables. We examine the stochastic properties of the data mainly by the ADF test developed by Maddala Wu (1999) and the PP test developed by Phillips and Perron (1988). Both of them have the null hypothesis of a unit root.

Table 1 Unit root test results.

| Test<br>Variable | ADF         |        | PP          |        |
|------------------|-------------|--------|-------------|--------|
|                  | T statistic | P-valu | T statistic | P-valu |
| TA               | -1.188      | 0.67   | -0.476      | 0.897  |
| LagTA            | -0.955      | 0.76   | 0.001       | 0.959  |
| GDP Per          | -1.512      | 0.52   | -2.721      | 0.071  |
| ERP              | -0.666      | 0.85   | -0.835      | 0.809  |
| ESP              | -0.824      | 0.81   | -1.015      | 0.748  |
| OPS              | -0.913      | 0.78   | -0.582      | 0.875  |
| $\Delta$ TA      | -13.466     | 0.00   | -14.106     | 0.000  |
| $\Delta$ LagTA   | -13.192     | 0.00   | -13.975     | 0.000  |
| $\Delta$ GDP Per | -11.880     | 0.00   | -15.785     | 0.000  |
| $\Delta$ ERP     | -5.204      | 0.00   | -5.068      | 0.000  |
| $\Delta$ ESP     | -5.154      | 0.00   | -5.025      | 0.000  |
| $\Delta$ OPS     | -10.024     | 0.00   | -11.490     | 0.000  |

Notes: (1) All variables are in natural logarithmic form. (2)  $\Delta$  is first difference operator. (3) \*\*\*, \*\*, \* indicate 1%, 5% and 10% significance, respectively.

Table 1 illustrates the results of unit root test. According to the results, the tests do not reject the null hypothesis of a unit root. In other words, the variables are not stationary at the 1% confidence level. However, all variables are stationary after taking the first order difference. Subsequently, we utilized the Johansen (1988) test statistics to investigate the cointegration between the dependent and independent variables.

Table 2 Johansen test results.

| Null      | Eigenvalue | $\lambda$ -max statistics | Trace    |
|-----------|------------|---------------------------|----------|
| None      | 1          | 1828.21*                  | 1985.13* |
| At most 1 | 0.87       | 113.12*                   | 156.91*  |
| At most 2 | 0.36       | 25.25                     | 43.76    |
| At most 3 | 0.22       | 14.31                     | 18.54    |
| At most 4 | 0.04       | 2.67                      | 4.22     |

Notes: \* denotes rejection of the hypothesis at the 5% significance level

Table 2 demonstrates the Johansen test of the null hypothesis of no cointegration, and the results indicate the presence of the long-run cointegration relationship in the model. Therefore, outbound tourism demand for Japan converges to its long-run equilibrium by correcting any possible deviation from this equilibrium in the short-run. Once the cointegration is determined, the long-run parameters of the independent variables could be estimated.

Table 3 summarizes the results of model regressions. Overall, two models fit the data well as both  $R^2$ s are above 0.95. All seasonal dummy variables and autoregressive term are significant, while the income, effective substitute price, openness, and the anti-Japan activities occurred in 2014 are not significant in two models.

For the first model, the coefficient of the variable LagTD is found to be positive and statistically significant at the 1% confidence level, and the elasticity indicates that a 1% increase of the tourist number in current quarter stimulates the 0.7% of the tourists in next quarter. The GDP per capita is not significant, which means no evident relationship exists between income and tourism demand. Furthermore, the living cost of Japan represented by the variable ERP was found to be statistically significant at the 10% level and the sign is negative. In terms of the price elasticity, it shows a 1% increase of the price can lead to a 6% decline of the tourist arrivals. Meanwhile, the coefficient of ESP

is not significant, in other words, the price level in substitute destinations is not an important factor in determining the tourism demand for Japan. What's more, the openness of Japan exerts no effect on the inbound tourist numbers from China.

Table 3 OLS estimation results.

| Variable       | Model 1           | Model 2           |
|----------------|-------------------|-------------------|
| LagTD          | 0.699*** (6.609)  | 0.654*** (5.936)  |
| GDP per capita | -0.198 (-1.075)   | 0.429 (0.850)     |
| ERP            | -6.094*(-1.738)   | -4.756 (-1.315)   |
| ESP            | 5.840(1.624)      | 4.331 (1.158)     |
| TRC            | -                 | -0.299 (-1.334)   |
| OPS            | -0.313(-1.239)    | 0.357 (0.636)     |
| DM1            | -0.342*(-1.638)   | -0.370* (-1.779)  |
| DM2            | -0.082(0.339)     | -0.095 (0.398)    |
| Q2             | -0.191**(-2.289)  | -0.173** (-2.071) |
| Q3             | 0.159*(1.732)     | 0.175* (1.912)    |
| Q4             | -0.374***(-3.836) | -0.362*** (-3.73) |
| F-statistic    | 78.20***          | 73.10***          |
| DW statistic   | 1.991             | 2.063             |
| R <sup>2</sup> | 0.951             | 0.953             |

Notes:(1) All variables are in natural logarithmic form. (2) \*\*\*, \*\*, \*indicate 1%,5%and 10% significance, respectively.

In the second model, we include transport cost into the tourism demand model. The habit persistence and word-of-mouth effect are also found important in explaining the outbound tourism to Japan. Apart from the LagTD variable, the coefficients of GDP per capita, ERP, ESP, TRC and OPS are not significant in model 2.

Seasonal dummy that captures the fourth quarter is significant in two models at the 1% significance level, while the seasonal dummies that capture the second and third quarter are significant at the 5% and 10% level respectively. The dummy variable that captures the effect of nuclear leakage is significant at the 10% level in two models, and the effect from the anti-Japan activities are not significant in any model.

## 5. Summary

This study aims to investigate the economic determinants of Chinese outbound tourism to Japan during the period of 2003 to 2016. From the empirical results, we can conclude that the habit persistence and effective relative price are significant determinants in explaining the tourism demand for Japan, whilst the income, effective substitute price, transport cost and openness are not important factors.

Considering the word-of-mouth effect and habit persistence, which is largely attributable to the high satisfaction in tourism. Japan is widely known as a country of ceremony and propriety, and the high quality of tourism service encourages international tourists to spread the destination information to potential tourists. In addition, the strong ties in economy and culture definitely boost the Chinese tourism demand for Japan. The income variable is not significant in two models, showing that visiting Japan is a consistent and stable travelling behavior for Chinese tourists. The effective relative price was proved to be of great importance in determining the outbound tourism for Japan, and this conclusion is consistent with the findings from de vita (2013) [14]. Since the inflation rate in the destination can be offset by exchange rate, therefore, the relative price and exchange rate alone cannot represent the living cost in destination country. Accordingly, the prices adjusted by exchange rate (effective relative price) is a reasonable proxy for tourism price. As for price elasticity, we can claim that Chinese tourist are sensitive to tourism price in Japan. The effective substitute price is not significant in two models, which indicates that Chinese tourists are more aware of the living cost in Japan and they pay little attention to the price levels in alternative destinations. Similarly, the transport cost is found to be not important in tourism demand model, which may attribute to the

geographic proximity of those two countries, and the result confirms the conclusion from Kim 2016. What's more, the openness of Japan imposes no effect on tourism demand for Japan, and the results from seasonal dummy variable imply that Chinese tourists visit Japan mainly in the third quarter, which can be ascribed to the fact that most public holidays are distributed over autumn in China. The external shocks from Fukushima nuclear leakage had frustrated Chinese tourists to Japan in 2010, while the anti-Japan activities reveals no significant impact on Japanese tourism demand from China.

Apart from the theoretical findings, practical implications are clearly involved in this study. It is found that Chinese tourists are likely to repurchase the tourism service from Japan, therefore, maintaining and improving the high quality of tourism service is of paramount importance to attract more Chinese tourists. Meanwhile, tourists are highly sensitive to the change of tourism price in Japan, and the "explosive buying" result from the fall of the Japanese Yen in 2014 is a good example for this. Although the government cannot exert effect to the tourism price directly, some indirect measures could be practiced, for instance, the tax credits for international tourists is contributing to increase the attractiveness of shopping tourism in Japan. Particularly, Chinese tourists tend to visit Japan in third quarter, thus, it is essential for policy makers and tourism enterprises to launch some promotions to reallocate the tourism resources in low season.

As with any studies, this research also has some limitations. First, the generalizability of the study is limited due to the small subject pair and observations. Second, this study mainly focuses on the investigation of economic determinants, however, cultural and political factors also play an important part in affecting the Chinese outbound tourism demand to Japan.

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