

Estimation of tourism demand function in selected cities: A case study of Esfahan

Hamidreza Alipour

Sanaz Ghavidel

Department of Management and Economic
Islamic Azad University, Rasht branch, Rasht, Iran

Keywords

Tourism demand function - Panel Data - Price Index - Tourist Attractions

Abstract

Tourism as an economic sector with high profitability allocates an important place to itself in the current state of the world that will be remembered as the tourism industry. With regard to tourist attractions in Iran, should be considered that the industry is able to single products out the dependence on petroleum. Therefore, the author intends in this article to show some effective factors on demand of tourism and share of each factor in Esfahan province that is one of the tourist province in our country and has an important role in this field. In this case, 8 tourist cities in a period of 2005 to 2011 were studied. By linear logarithm function and its estimation in panel data method, it was determined that variable number of hotels (TH) is the most efficient variable in the total demand for tourism. Meanwhile, the coefficient of this variable (TH), in addition, coefficient of variable of total tourism attractions (TJ) and total tourism and travel agencies(TA) is positive, showing direct relationship between number of passengers and three mentioned variables in that city. And the only negative variable factor is price of hotel(GH) and shows hotel prices are negatively relationship of number of tourists and this variable (GH), it can be justified in both foreign and domestic tourists, which caused the hotel prices have not significant effect on attract tourism.

Introduction

Iran due to its diverse climatic conditions, ancient civilizations and vestiges, exquisite sights and natural landscapes, the art of architecture, handicrafts and other cultural advantages and especially the specific geographical location in the area, has a potential for attracting tourists and changing into a major pole in its area (Alvani, 2006). Our country stands among the foremost ten, five and three countries of the world respectively in terms of tourist attractions, diversity of tourism and variety of handicrafts. According to the released statistics by the World Trade Organization (WTO) in 2000, after India, Iran has the highest tourism rating in South Asia (Fateh and Abbasi nezhad, 2005). The Esfahan province could be a suitable model for scientific studies and also the implementation of tourism projects because of the special feature in terms of tourism so be provided the field for attracting foreign and domestic tourists. Studies show due to the availability of the potential and actual capabilities in Iran, especially in the tourism industry and particularly in the Esfahan province but the number of foreign tourists should be, tens and hundreds of times while an annual statistics of the number of foreign tourists show that exist about 50 thousand visitors from natural and historical monuments of province.

Due to the potential that exists in Iran's tourism industry, especially in the Esfahan province, there is a hope that with the investment and planning in this industry, Iran becomes a major tourism pole in the area in such a manner that in medium and long term, its foreign exchange earnings propound as an effective factor in coming up from the Single-Product economy. On the other hand in this study according to tourism industry and the release of Single-Product economy, the country escaped from fluctuation's income of the changes oil price, that besides economic aspect, political aspect effects of adverse can be considered by policymakers. In this research the author intends to investigate the factors affecting on tourism demands in 8 selected city of Esfahan provinces. The cities have been selected based on the

two criteria; the first is the number of tourists in the years before and the second is the number of tourist's attractions in the previous years. However, in this study the examination of the factors affecting tourism demands was a documentary one which its results can be used to present macro strategies for policy-making in country's tourism pale.

Problem Statement

Tourism is the third phenomenon of dynamic economy and in Iran tourism is facing with the problems such as high rate of unemployment, restrictions on foreign exchange and resource and Single-Product economy and it has won 74 ranking in terms of income from attract tourists. Tourism industry is among high-income and safe, clean, for the economy of any country. Prosperity of the industry in world is representing political stability, social, economic, security, cultural and scientific. In other words, the tourism industry by having exclusive privileges provide several objectives simultaneously in the country's national space, Thus, the development of tourism in order to diversify the sources of economic growth and foreign exchange earnings and also create new job opportunities in the country, and the prosperity of other economic sectors such as transportation, manufacturing, and distribution of food, fuel and energy, handicraft and the construction industry is very important. As the existence of tourism potential in the countries cause to attract significant foreign exchange earnings, governments take it into consideration. On the other hand, it is also favored by the countries which don't have desirable industrial productions for export or resources like oil to earn foreign exchange income (Romilly, 1998).

There are many natural attractions and acquired in Esfahan province, there are natural sights, historic and cultural sites in different cities of Esfahan and can be determined behavior patterns of travel demand, considering by motivations tourists and travel of persons to visit tourist places. According to the type of tourists, Tourism industry is noteworthy in two dimensions: foreign and domestic tourists. Foreign tourists with entering foreign exchange to the country and changing it into the national currency or spending it directly in the tourism pale can improve the country's foreign exchange income. So the presence of foreign tourists is important for any country. On the other hand, a significant proportion of each county's tourists belong to domestic tourists. However those tourists do not earn foreign exchange for the country but from the viewpoint of creating job openings and spending costs in tourist areas they become important (Papoli Yazdi et al, 2006). Because of the lack of research in the field of tourism in each city of province and the Esfahan province is a popular tourist province, the main purpose of the author in this research is to examine the amount of effective factors on tourism demand in selected cities. In terms of object, this study is an applicable research and in terms of the nature of the case and research method, it's a descriptive-analytical research and correlation. In this study, among the top cities in terms of the number of tourists and tourist attractions between the years 2005-2011, 8 cities have been selected. These cities are Esfahan, Ardestan, Khonsar, Shahreza, Kashan, Golpayegan, Natanz, Nain.

Research objectives and hypotheses

The main purpose of the author in this research is to examine the amount of effective factors on tourism demand in selected cities. According to the said purpose and on the basis of the selected variables, the following hypotheses were examined in this study:

H₁: The number of tourist attractions in the selected city has a significant and positive correlation with the number of inbound tourists to each city.

H₂: The number of tourism travel and service agencies in selected cities has a significant and positive correlation with the number of inbound tourists to each city.

H₃: The number of hotels in each city has a significant and positive correlation with the number of inbound tourists to each city.

H₄: The average price of hotels in each city has a significant and negative correlation with the number of inbound tourists to each city.

Theoretical framework and model introduction

The domestic tourism demand theory is based on the consumer behavior and the starting point of the consumer behavior theory is the consumer rational behavior. It is assumed that the consumer among all goods which are available choose those cause the maximum satisfaction to him. It shows that consumers are aware of all options and be able to evaluate them. In other hand, the consumer choice is limited by his budget. In these circumstances people seek the best choices. Economic theorists generally believe that analyzing the consumer's behavior requires that consumer be able to rank products based on his preference. The consumer after ranking goods and services based on his taste and regarding to income limits, chooses a combination that has the highest utility for him (Henderson and Quandt, 2001). Demands functions can be extracted from the analysis of utility maximization. According to theoretical discussions of microeconomics, in the following part the extraction of demand function by the use of utility maximization (the dominant constraint on optimization is the limitation of individual's budget) is discussed (Summary, 1987). We assume that in a space of two-commodity, the consumer consumes a tourism good "q^{tourism}" and the other good "q^o" as a sample of other goods and services. The tourism demand function obtains from the consumer's Maximization utility (which is the result of consumption of both goods "q^{tourism}" and q^o) and the constraint budget is obtained as follows:

$$\text{Max: } u = u(q^{\text{tourism}}, q^o_t) \quad (1)$$

$$\text{Subject to: } y_t = p_t^{\text{tourism}} \cdot q_t^{\text{tourism}} + p^o_t \cdot q^o_t \quad (2)$$

After forming the Lagrange function and solving the systems of equations, the tourism demand function is obtained as follows:

$$q_t^{\text{tourism}} = f(y_t, p_t^{\text{tourism}}, p^o_t) \quad (3)$$

Since analyzing the elasticity of price, income and intersecting of demand is the purpose of estimating the demand function, it is more suitable that the demand function estimates logarithmically. So if the initial shape of the demand function is as follows:

$$q_t^{\text{tourism}} = \beta_0 (y_t)^{\beta_1} (p_t^{\text{tourism}})^{\beta_2} (p^o_t)^{\beta_3} e_t^o \quad (4)$$

We will:

$$\ln q_t^{\text{tourism}} = \ln \beta_0 + \beta_1 \ln y_t + \beta_2 \ln p_t^{\text{tourism}} + \beta_3 \ln p^o_t + U_t \quad (5)$$

In this case each of the coefficients will be directly an estimation of elasticity's income, price and cross of demand. In the demand function, the said elasticity is stable (Maraseli, 1995). According to the previous studies on the field of tourism, the structure of this model made in a way that can describe both the need factors and the factors which affect on the selected cities' tourism demand. Regard to the used data consisted of the combination of time and cross-sectional series, the model is estimated using panel data. Thus, the implicit form of the estimable model for the tourism demand function is:

$$TT = f(TJ, TA, GH, TH) \quad (6)$$

TT the number of inbound tourists to the city, TJ number of citie's tourist attractions, TA the number of travel and tourism services agencies in destination city, GH the average price of hotels in the city, TH the number of hotels in the city. This function shows the relation between tourism demand and factors affecting on their demand, so after the estimation of economic relations model, the identification and distinction of each factor's impact can be possible. Since the purpose of this study is "evaluation of the effects of each of these factors changing on the selected provinces' tourism demand", it is necessary to calculate the demand elasticity toward to each of these variables. Thus the most appropriate form of tourism demand function can be the Cup Douglas function which is a nonlinear function.

$$TT = \beta_0 TJ^{\beta_1} TA^{\beta_2} GH^{\beta_3} TH^{\beta_4} \quad (7)$$

Now can turn it into a linear function by taking its logarithm, so the final form of the model is as follows:

$$\log TT_{it} = \beta_0 + \beta_1 \log TJ_{it} + \beta_2 \log TA_{it} + \beta_3 \log GH_{it} + \beta_4 \log TH_{it} \tag{8}$$

This model is estimated for the 8 cities which are: Esfahan, Ardestan, Khonsar, Shahreza, Kashan, Golpayegan, Natanz, Nain. As the used data were in a both form of “cross-section” and “time series data”, to estimate this model, the panel data method used and the model estimated for the period of 2005-2011.

The estimation of model

The tourism demand function in the previous section was obtained as follows:

$$\log TT_{it} = \beta_0 + \beta_1 \log TJ_{it} + \beta_2 \log TA_{it} + \beta_3 \log GH_{it} + \beta_4 \log TH_{it}$$

The above model is estimated and its initial outputs are shown in Table 1.

Table 1. Dependent variable: logarithm of the number of inbound traveler to the city. Log (TT) (The initial outputs of software).

Independent variable	T statistic	Coefficient	Probability
C	12.51	7.022	0.000
TJ?	4.43	0.001	0.000
TA?	4.34	0.012	0.000
LOG(GH?)	-1.10	-0.04	0.275
LOG(TH?)	14.36	0.547	0.000
F-statistic	267.88		0.000000
R-squared	0.95		
Durbin-Watson stat	2.01		

As can be seen, all coefficients are significant and their signs are also compatible with the theory. The value of R2 represents the high explanatory power of independent variable. Meanwhile, the value of F statistic is higher than its tabled value, so we can claim that the whole of regression is significant. And of course, the value of Durbin-Watson stat (2/01) represents that the model have no problem or deases. To determine the presence or absence of a separate intercept for each cities, the Limer test were examined and used to test among the accumulated and non-accumulated data (stable or random effects). In that test, the hypothesis H₀ indicates the similarity of intercepts (the combined method) and the hypothesis H₁ indicates the dissimilarity of intercepts (the Panel method). The needed Statistic for the above test is F statistic. If the computed F with the degrees of freedom (n-1) and (nt-n-k) is bigger than the table’s F, then the hypothesis H₀ is rejected. So the regression is not valid and various intercepts should be considered within the estimation (Ledesma et al, 2001, Lee and chang, 2008, Mobasheri, 2011)

Table 2. Test Results of verisimilitude test.

Test of verisimilitude test.	Result	Test Results of verisimilitude test.	Test Results of verisimilitude test.	Test Results of verisimilitude test.
Test of verisimilitude test.	Result	Test Results of verisimilitude test.	Test Results of verisimilitude test.	Test Results of verisimilitude test.
Test of verisimilitude test.	Result	Test Results of verisimilitude test.	Test Results of verisimilitude test.	Test Results of verisimilitude test.

As the value of probability is equal to 0.15 and the value of computed F statistic is equal to 1.67 and less than the table's F statistic, with the confidence level of 95% cannot be said that the null hypothesis rejects, so the regression is valid and various intercepts (stable or random effects method) should not be considered within the model. Thus, the model will be POOLED type. And the regression equation is as follows:

$$\log(TT) = 7.02 + 0.001TJ + 0.012TA - 0.045 \log(GH) + 0.547 \log(TH) \quad (9)$$

The coefficient on the number of hotels (TH) is positive and is equal to 0.54, and is the most effective variable in the demand for tourism, indicates direct relation between the number of incoming tourists and the number of hotel of that cities, and the positive sign indicates that there is a strong positive relation between them. Due to the seasonality of tourism and lack of travel demand management by consumers, generally ensure that there is suitable accommodation of destination is very effective decision for tourists. After a variable number of hotels, the highest coefficient is belonging to the number of travel and service agencies' coefficient than other cities' income (TA) with the positive value 0.012 is effective variable in the rate of tourism demand in recent years, keep pace with changing patterns persons consumer and be eager them to this product Providing cheap travel and raise awareness in this field by travel agencies caused, the number and function of these agencies have a key role in attracting tourism. The coefficient of the number of tourist attractions variable (TJ) is positive and is equal to 0.001. Its sign is consistent with the theory and indicates that there is a direct relation between the number of travelers and the number of tourist attractions of that cities. However, since the number of attractions in each area has not changed during the years of study therefore small coefficient of 0/001 was expected. Finally, the average variable cost of hotel (GH) the result is the hotel prices have an inverse relationship with the number of tourists, that is consistent with economic theory but prob over 0.50 this variable indicates the meaningless on the decision of persons to choose travel destinations in the cities of province. It can be justified in both domestic and foreign tourists. First, the cost of staying is not high on foreign tourists basket Therefore, these variables they are not sensitive towards these variables on the other hand, due to the existence of alternative accommodation for domestic tourists homes caused the hotel prices are not a significant effect on attract tourism.

Results and Discussion

Due to the importance of tourism in countries' economy and earning the high foreign exchange from this area, the author was determined to examine the effective factors on tourism demand. Although this study did not separate the domestic tourism from the foreign tourists but the effective factors can be significant for both types of tourists. Therefore, 8 cities of province were selected and their relevant data were collected during the years 2005-2011. Two criteria were considered for selecting the cities. The first criterion was the number of inbound tourists to these cities during the study period and the second criterion was related to the number of tourist attractions of each city. These discussed cities are: Esfahan, Ardestan, Khonsar, Shahreza, Kashan, Golpayegan, Natanz, Nain.

The introduced model to estimate in this paper was presented as follows:

$$\log TT_{it} = \beta_0 + \beta_1 \log TJ_{it} + \beta_2 \log TA_{it} + \beta_3 \log GH_{it} + \beta_4 \log TH_{it}$$

The above model estimated based on random effects. All coefficients are significant except the variable of hotel price. The signs of all coefficients are also compatible with the theory. The value of R2 represents that 95% of the variability is explained by the independent variables. Meanwhile, the value of F statistic is higher than its tabled value. And by having prob = 0, So we can claim that the whole of regression is significant and

the value of Durbin-Watson stat is equal to 2.01, represents that the model have not any condition or disease.

The coefficient on the number of hotels (TH) is equal to 0.54, and is the most effective variable in the rate of tourism demand. It means 1% decrease in the total index of number of hotels will increase 14.36 domestic and foreign trips. So the third hypothesis is confirmed. After this variable, the highest coefficient belongs to the ratio of travel and service agencies' coefficient than other cities' income (TA) and with the positive value 0.012 is effective variable in the rate of tourism demand in recent years, according to significance of this factor so the second hypothesis is confirmed. The coefficient of the number of tourist attractions variable (TJ) is positive and is equal to 0.001. Its sign is consistent with the theory and indicates that there is a direct relation between the number of domestic travelers and the number of tourist attractions of that city. So the first hypothesis is confirmed. Finally, the average variable cost of hotel (GH) The result is the hotel prices have an inverse relationship with the number of tourists, that is consistent with economic theory but probe over 0.50, it means this variable indicates the meaningless on the decision of persons to choose travel destinations in the cities of province. This caused the hotel prices have not a significant effect on tourism according to this results the fourth hypothesis is not confirmed.

References

- Alvani S.M. and Pirouz Bakht M. 2006. *The Process of Tourism Management*. Cultural Research Bureau. Tehran.
- Gee C.Y. and Sola E.F. 2009. *Tourism In A Global Perspective*. Translated by Parsaeeyan and Aarabi. Cultural Research Bureau. 6th edition. Tehran.
- Habibi F. and Abbasi Nezhad H. 2005. The Stipulation and Estimation of Iran's Tourism Demands Functions, *Economic Research Journal*, 6, 70, 91-115.
- Henderson J.M. and Quandt R.E. 2002. *Microeconomic Theory* translated by Qarebaqian M. and Pazhoyan J. institute of cultural services- Rasa. 12th edition.
- Ledesma-Rodriguez F.J. and Navarro-Ibanez M. and Perez-Rodriguez J.V. 2001. Panel Data and Tourism: A Case Study of Tenerife. *Tourism Economics*, 7,1, 75-88.
- Lee C.C. and Chang C.P. 2008. Tourism Development and Economic Growth: A Closer Look at Panels. *Tourism Management*, 29,1, 180-192.
- Maraseli A. 1995. Estimation of Supply and Demand Functions of Foreign Tourism in Iran. M.A. Thesis. Tarbiat Modares University. Tehran.
- Mobasheri M.R. 2011. *The Models of Panel Data*. available online on www.amar.dpzs.ir.
- Papoli Yazdi M.H. and Saghaee M. and Arvaneh M. 2006. *Tourism (Nature and Concepts)*. Samt Publication. 1st edition. Tehran.
- Pourpasha M.K. 2012. Application Entropy Method in Identify the Effective Factors in Success Knowledge Management on Organizational Learning, Using Fuzzy Logic. M.A. Thesis. E-Campus University. Tehran.
- Rasekhi Nezhad A. 2009. Estimation of Domestic Tourism Demand Function in Iran. M.A. Thesis. Tarbiat Modares University. Tehran.
- Rasouli E. 2002. Estimation of Inbound Tourist's Demand Function to Iran. M.A. Thesis. Allameh Tabatabaee University. Tehran.
- Romilly P. and Liu X. and Song H. 1998. Economic and Social Determinant of International Tourism Spending: A Panel Data Analysis. *Tourism analysis*, 3, 1, 3-15.
- Summary R. 1987. Estimation of Tourism Demand by Multivariable Regression Analysis. *Tourism Management*, 8, 4, 317-322.
- Torki Samaei R. 2012. Effect of Government Spending and Macro-Economic Uncertainty on Private Investment: Evidence from Iran. M.A. Thesis, Islamic Azad University. Tehran.