International Tourism Demand for Turkey: A Dynamic Panel Data Approach

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Abstract

Empirical studies on tourism field for Turkey have illustrated little attention in modelling properly the demand function for tourism and identifying the main basis of tourism flows. The majority of studies take into consideration the demand side determinants of tourism, usually proxies by income and price measurements, and little attention has been given to the supply factors, which might influence substantially the tourism performance. Factors such as infrastructures in networks and accommodation capacity in the hosting country have been ignored in such studies. Taking into accounts these facts, in this paper, a dynamic model is used to estimate the demand function of tourism in Turkey with respect to its nine major clients, Germany, Russia, United Kingdom, Holland, France, Austria, Iran, Bulgaria and Ukraine, for a period of 10 years (1995-2004) by using the GMM-DIFF estimator proposed by Arellano and Bond (1991). One of the main conclusions of the study is the significant value of the lagged dependent variable (0.28), which may be interpreted as a minor word-of-mouth effect on the consumer decision in favour of the destination.

Keywords: Tourism Demand, GMM-DIFF, Turkey.

1. Introduction

Tourism has grown significantly since the creation of the commercial airline industry and the advent of the jet airplane in the 1950's. By 1992, it had become the largest industry and largest employer in the world. According to the World Travel & Tourism Council (WTTC), travel and tourism is the biggest industry in the world on virtually any economic measure, including gross output, value added, capital investment, employment, and tax contributions.

In 2003, the industry's gross output was estimated to be in excess of US$4.5 billion of economic activity, more than 10 percent of the total gross national product spending. The travel and tourism industry is one of the world's largest employers, with nearly 195 million jobs, or 7.6 percent of all employees. Furthermore, the World Tourism Travel Council (WTTC, 2005) expects that the scale of the world tourism industry, which made up approximately 10.4% of the world's GDP in 2004, will increase to 10.9% in 2014. When all components of the tourism industry are taken into account, i.e., investment, tourism consumption, government spending and exports, the industry grew 5.9% in 2004 alone, reaching US$5.5 trillion (Theobald, 2005). Furthermore it is expected to contribute 3.6 % to Gross Domestic Product (GDP) in 2007 and 231.2 million jobs in 2007, 8.3% of total employment by WTTC. The 76.1 million T&T Industry jobs account for 2.7% of total employment in 2007 and are forecast to total 86.6 million or 2.8% of the total by 2017.

This growth led to the development of a major new industry: tourism. In turn, international tourism became the concern of a number of world governments because it not only provided new employment opportunities, but it also produced a means of earning foreign exchange.

For these reasons, thoroughly examining all aspects of tourism development and economic growth is tremendously significant for governments. Despite its importance for the world economy, applied economists have paid little attention to tourism as Papatheodorou (1999) and Balaguer et al. (2002) argue in their papers.

The current papers on this issue are Balaguer and Cantavella-Jordà (2002) for Spain, Dritsakis (2004) for Greece, Gündüz and Hatemi-J (2005) for Turkey, Oh (2005) for Korea and Kim *et al.* (2006) for Taiwan. The possible causal relationship is analysed between tourism and economic growth in a bivariate context by these papers; nevertheless, not all of them find evidence of the long-run causality from tourism to economic growth. Therefore, economic growth strongly contribute to tourism growth is a question not well answered at this moment in time.

The purpose of this paper is to empirically examine the whether tourism growth causes the economic growth or not in Turkey by using dynamic panel data models based on the Generalized Method of Moment estimation (GMM). The main contributions of the present research can be found in the following: the estimated model, the applied methodology and the variables included in the model.
The rest of paper is organized as follows. The section 2 describes the importance of the tourism sector in economy. Section 3 describes the data, methodology and results from this empirical analysis. Section 4 presents the concluding discussion and further comments.

2. The importance of the tourism sector in Turkey

In regards to the total tourist arrivals to Turkey, it seems that the number of foreign visitors has accelerated rapidly in the last two decades. In 1990, Turkey attracted 4.8 million foreign tourists, which generated an income of $3.4 billion but reached $18.2 billion in 2005 with 20.3 million visitors. In addition these knowledge, when taking into consideration top destinations for international tourism according to international tourism receipts and international tourist arrivals, Turkey has assured its position in recent years due to its cultural and natural attractions as the fourth most important destination in the Mediterranean region and the sixth in Europe after the tourism giants France, Spain, Italy, the UK and Germany.

INSERT TABLE 2.1

When comparing with 2004, the top ten destination rankings in 2005 remained unchanged. For international tourist arrivals and tourism receipt, the major change has been that Turkey entered the

ranking in the ninth position in arrivals and eighth in receipt, as a result of its 21% and %14 increases in 2005.

INSERT TABLE 2.2

Moreover according to the WTTC forecasts, real Turkish visitor exports growth will be 7.5% over the ten years (2001-2010), which is the highest rate in comparison to the EU countries. However, in contrast with the important role of the tourist industry in the Turkish economy, little attention has been paid to its quantitative analysis. Existing empirical research of the international tourism demand in Turkey is based on traditional econometric techniques without examining the stability situation of the estimated regression equations; see for example, Uysal and Crompton (1984), Var et al. (1998) and Akis (1998).

Uysal and Crompton (1984) have found the income variable to be statistically significant and the income elasticity to be generally above unity. Var et al. (1998) illustrated that the elasticities for all of the variables significantly vary from negative values to highly elastic measure. It indicates the responsiveness to tourism flows to Turkey varies with the change in the travel agency numbers.
Akis (1998) found that there has been positive relationship between tourist arrivals and national income of tourist generating countries and a negative relationship between tourist arrivals and relative prices by using double-logarithmic functional form of the regression model.

3. Sample and Model Specification

It is aimed to apply dynamic approach to the Turkey case by using panel data estimation. Because static regression models can suffer from a number of problems, including structural instability and spurious regression (Witt and Song, 2000). In order to avoid these problems, dynamic analysis has started to be explored in the tourism field especially co-integration analysis such as the works by Sieddighi and Shearing (1997); Divisekera, (2003); Dritsakis (2004); Halicioglu (2004); Narayan (2004); Croes and Vanegas (2005); Han, Durbarry, and Sinclair (2006); Muñoz, (2006); Song and Witt (2003, 2006); and Toh, Habibullah and Goh (2006); Muñoz and Martin (2007).

However, panel data estimations are relatively rare in the empirical literature, especially involving dynamics. The panel data approach is used to estimate the demand function of tourism in Turkey with respect to its nine major clients, Germany, Russia, United Kingdom, Holland, France, Austria, Iran, Bulgaria and Ukraine, for a period of 10 years (1995-2004). There are two main advantages in using this type of data. First, the use of annual data avoids the seasonality problems, which are dominant in this sector. Second, the utilization of a pooled time-series or cross-sectional data set enables us to have more degrees of freedom than with time-series or cross-sectional data, and one can control for omitted

variable bias and reduce the problem of multicollinearity, hence improving the accuracy of parameter estimates (Hsiao, 2003).

Accordingly, the estimated demand function for tourism in Turkey involves the following variables;

-The dependent variable

Tourism demand is defined as the share of the expenditures of each sending country to the total expenditures on tourism in the receiving country (Turkey):

$$v_{i,t} = \frac{Tourism\ Spendings\ of\ the\ Sending\ Country}{Total\ Tourism\ Spendings\ in\ the\ Destination\ Country} \quad (1)$$

with i = 1,..,9 (the nine major sending countries, Germany, Russia, United Kingdom, Holland, France, Austria, Iran, Bulgaria and Ukraine.) and t = 1995,….,2004. The source of the data is TURKSTAT (Turkish Statistical Institute), Tourism Statistics, and Central bank of The Republic Turkey, Electronic Data Delivery System, several years.

- Explanatory variables

1) Demand dynamics

The most important factor affecting the decision of households to travel abroad is their real personal income. As a measure of the households' wealth, it is used real per capita income of the sending country defined by the following ratio:

$$Y_{i,t} = \frac{GDP_{i,t}}{CPI_{i,t}.POP_{i,t}} \quad (2)$$

Where, GDP, POP and CPI are Gross Domestic Product, Total Population and Consumer Price Index of the sending country, respectively. The source of the data is OECD (2005).

Besides being sensitive to their own income, tourists are also sensitive to relative prices between the receiving and the sending countries. Relative price is given by the ratio of the price index level of the receiving country (Turkey) and the sending country adjusted by the bilateral exchange rate:

$$P_{i,t} = \frac{CPI_{T,t}}{CPI_{i,t}.EX_{i,t}} \quad (3)$$

where, CPI_T and CPI_i are the Consumer Price Indexes in Turkey and the sending country, respectively; and EX_i is the real effective exchange rate of the sending country with respect to Turkey. The source of the Turkish data is Central bank of The Republic Turkey, Electronic Data Delivery System and OECD for the other variables.

2) Supply dynamics

Supply conditions from the point of view of the hosting country are important factors in attracting more tourism inflows. It is introduced two main supply measures. The first is accommodation capacity (S) measured by the number of foundation available each year to host the tourists who visit Turkey. The data are collected from TURKSTAT (Turkish Statistical Institute), Tourism Statistics. The second is a more general supply measure related to infrastructures (airports, railways, roads, hospitals, and telecommunications). The ratio of public investment to GDP (PI) is used as a proxy to capture the welfare effects emanated from public infrastructure networks. The data for the public investment ratio in Turkey is collected from State Planning Organization, Public Investment Expenditures. Finally, two dummy variables (D99 and D01) are included to capture the influence of possible effects on tourism of the Marmara Earthquake in Turkey which takes a value of 1 in 1999 and 0 otherwise and September 11th events, which takes value of 1 in 2001 and 0 otherwise. Having defined the variables to include in the model the dynamic model to be estimated will therefore be

$$lnv_{i,t} = \alpha_i + \beta_1 lnv_{i,t-1} + \beta_2 lnY_{i,t} + \beta_3 lnP_{i,t} + \beta_4 lnS_t + \beta_5 lnPI_t + \beta_6 D99_t + \beta_7 D01_t + \varepsilon_{i,t} \quad (4)$$

Where, $v_{i,t}$ is the tourism spending ratio in the host country;

$Y_{i,t}$, is real per capita income of the sending country;

$P_{i,t}$, is relative price between the host and sending countries;

S_t, is accommodation capacity in the host country;

$\mathbf{PI_t}$, is public investment ratio in the host country;

$D99_t$ is dummy variable to capture Marmara Earthquake in Turkey;

$D01_t$ is dummy variable to capture September 11th events;

$\varepsilon_{i,t}$, is the stochastic error.

The empirical literature suggests that the most commonly specifications used for estimating the demand function of tourism are linear and log linear functions. Witt and Witt (1995) concluded that 75% of the analyzed models used a double log functional form. The preference given to the double log specification is due to more satisfactory estimation results obtained and easy interpretation of the estimated coefficients through the demand elasticities. In this paper, the dynamic structure of tourists' preferences is considered because knowledge about the destination spreads as people talk about their holiday, thus decreasing the uncertainty for potential visitors to that country. Because of this reason, if people are satisfied with a destination they may be more likely to come back and tell others about their

favourable experiences related to the destination. That's why the parameter for the lagged dependent variable may be considered as a measure of habit formation and interdependent preferences.

A positive sign is expected for the coefficients β_1, β_2 and β_5 and negative one for the coefficients of β_3, β_6 and β_7.

4. Empirical result and policy implication

In order to insert dynamics into the demand function of tourism in Turkey, it is introduced a lagged dependent variable as an explanatory factor to capture persistence effects of the tourists behaviour. However with this dynamic specification, it is faced that the correlation between the lagged variable and error term. Therefore the estimations with fixed effect (OLS) or random effects (GLS) would not be appropriate since the obtained estimates would be biased. One way suggested by Doornik, Arellano and Bond (2002) to solve this problem is to estimate dynamic panel data models based on the Generalized Method of Moment estimation (GMM).

INSERT TABLE 4.1

In this methodology, it is assumed that there is no second-order autocorrelation in the errors; therefore a test for the previous hypotheses is needed. It is also conducted a test for autocorrelation and J statistic for the validity of instruments as derived by Hansen (1982). Failure to reject the null hypothesis in both tests gives support to model and the Wald test denotes the joint significance of the independent variables.

The value of the adjustment coefficient (72%) gives evidence of a rather low adjustment process between the actual variation of the demand for tourism and the desired long-run level. This means that the number of tourists visiting Turkey each year differs substantially from the previous years giving evidence of some kind of inertia or rigidity in the tourism inflows. As for the tourism demand studies, general conclusions indicate that income elasticity has commonly been found to be greater than one, confirming the luxury nature of tourism travel. However, contrary to expectations, income in nine major clients is positively related to the demand for tourism in Turkey with the elasticity less than one. The estimated coefficient for the income variable suggests that the demand for tourism in Turkey is not dependent on the economic situation in nine major clients. This means that tourism in Turkey is considered by nine major clients as not a luxury. The own-price elasticity is normally negative, although magnitudes vary considerably among studies. Generally elasticity estimates show negative values ranging from 0 to -1. Consistent with demand theory, relative prices are negatively related to tourism demand. This means that %1 decrease in relative prices, demand for tourism rise around %0.2

However, contrary to expectations, the ratio of public investment to GDP (PI) which is used as a proxy to capture the welfare effects emanated from public infrastructure networks is negatively and Marmara Earthquake is positively related to the demand for tourism in Turkey. A possible explanation could be that public investment gains speed in summer. Therefore these actions make life difficult for tourists. On the other hand, a possible explanation of positive effect of Marmara Earthquake could be caused by important price dumping in Turkey.

INSERT TABLE 4.2

Based on the above empirical studies that have carried out the calculation of elasticities in both the short- and long-run demonstrate that the values of both income and price elasticities in the long-run are greater than their short-run corresponding items, suggesting that tourists are more sensitive to income/price changes over the long-run.

5. Conclusions

The model was used to measure the performance of tourist arrivals from nine generating countries to Turkey between 1995 and 2004, and it was estimated by using the GMM-DIFF estimator proposed by Arellano and Bond (1991) for the case of dynamic panel data models. The dynamic model used in this study provides short and long-run elasticities for the variables of interest. This is an additional advantage over most studies of tourism demand, which are based on static models and only estimate long-run elasticities. This is a substantial improvement, since these models are only valid for short-term predictions. One of the main conclusions of the study is the significant value of the lagged dependent variable (0.28), which may be interpreted as a minor word-of-mouth effect on the consumer decision in favour of the destination. The value of the adjustment coefficient (72%) gives evidence of a rather low adjustment process between the actual variation of the demand for tourism and the desired long-run level. This means that the number of tourists visiting Turkey each year differs substantially from the previous years giving evidence of some kind of inertia or rigidity in the tourism inflows.

The estimated values of the income elasticity suggest that the economic conditions of tourists who visit Turkey are not very important factor in determining tourism demand in Turkey. The estimated values of the income elasticity are not in line with the results of previous studies. Therefore tourism to Turkey is not a luxury good. Moreover tourism to Turkey is not very sensitive to prices. According to the selected model, the estimated values for the own-price short- and long-run elasticities are –0.23 and -0.32, respectively. In order to capture the welfare effects emanated from public infrastructure, the ratio of public investment to GDP (PI) is used as a proxy. And finally, just as in other studies, it has been found that external and internal shocks (e.g., September 11th events and the Marmara Earthquake) may have an impact on tourism demand by using dummy variables. Contrary to expectations, public

infrastructure networks are negatively Marmara Earthquake is positively related to the demand for tourism in Turkey and it is found that September 11th events affect negatively Turkey tourism.

Table 2.1 International Tourist Arrivals (million)

	2004	2005*	Change (%) (05*/04)
1) France	75.1	76	1.2
2) Spain	52.4	55.6	6
3) United States	46.1	49.4	7.2
4) China	41.8	46.8	12.1
5) Italy	37.1	36.5	-1.5
6) United Kingdom	27.8	30	8
7) Mexico	20.6	21.9	6.3
8) Germany	20.1	21.5	6.8
9) Turkey	16.8	20.3	**20.5**
10) Austria	19.4	20	3

Source: World Tourism Organization, (*) = Provisional data.

Table 2.2 International Tourism Receipt (US$ billions)

	2004	2005*	Change (%) (05*/04)
1) United States	74.5	81.7	9.6
2) Spain	45.2	47.9	5.8
3) France	40.8	42.3	3.5
4) Italy	35.7	35.4	-0.7
5) United Kingdom	28.2	30.7	8.7
6) China	25.7	29.3	13.8
7) Germany	27.7	29.2	5.6
8) Turkey	15.9	18.2	**14.2**
9) Austria	15.3	15.5	0.9
10) Australia	13.6	15	9.6

Source: World Tourism Organization, (*) = Provisional data.

Table 4.1 Estimation results for the dynamic model 1995–2004

Variable	Coefficient
lnW(-1)	0.28
	(2.41)**
lnY	0.04
	(2.87)***
lnP	-0.23
	(-3.24)***
lnA	1.72
	(3.07)***
lnPI	-1.40
	(-3.48)***
D99	0.19
	(3.26)***
D01	-0.97
	(-2.54)**
J-statistic	1.749963
	(0.939)
Arellano-Bond test for AR(2)	0.65
	(0.515)
Wald test	675.03(7)***

t statistics in parenthesis: ***,**, and * indicate significance at p<0.01, p<0.05, and p<0.1 levels respectively.

Table 4.2 Comparison of results to previous studies

Study	Data origin-destination	Short run price elasticity	Long run price elasticity	Short run income elasticity	Long run income elasticity	Coefficient of adjustment
Song et al. (2000)	UK-Germany UK-Spain UK-France	-0.69 -0.49 -0.78	-1.25 0.50 -1.08	2.30 2.77 1.67	2.26 2.20 2.12	
Garin- Muñoz and Perez-Amaral (2000)	Rest of the World- Spain	-0.10	-0.23	0.91	2.07	0.44
Rosello et al. (2005)	UK-Balearic Islands	-	-	-	0.98	-
	Germany-Balearic Islands	-	-0.59	-	2.10	-
Garin- Muñoz (2006)	Rest of the World -Canary Islands	-0.66	-1.85	1.17	2.92	0.40
Garin- Muñoz (2007a)	Germany–Spain	-1.06	-2.16	2.69	5.40	0.49
Garin- Muñoz and Monteno Martin (2007b)	Rest of the World - Balearic Islands	-0.76	-1.65	0.92	2.02	0.46
Present Study	**Rest of the World- Turkey**	**-0.23**	**-0.32***	**0.04**	**0.06***	**0.72**

* The corresponding long-run elasticities have been calculated by dividing each of the estimated coefficients by (1- β_1).

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