Determinants of demand for international tourist flows to Turkey

Muzaffer Uysal and John L. Crompton

This article describes the development and findings of a set of models used to identify the most important of the following selected variables influencing international tourist flows to Turkey: per capita income; relative prices; relative exchange rate; promotional expenditure (the Turkish Government has invested a substantial amount in promoting foreign tourism) and 'special events', eg political unrest. The demand for travel was measured both by the number of tourists, and by the total tourist expenditure. Data were obtained from secondary sources, and analysis was by least squares multiple regression. Income, price and exchange rate were found to be important factors but the impact of promotional expenditure was minimal.

Keywords: Turkey; tourism demand; multiple regression

Muzaffer Uysal is Assistant Professor at Do Kuz Eylul University, Aydin School of Tourism and Hotel Administration, Aydin, Turkey, and John Crompton Associate Professor, at the Texas A & M University, Department of Recreation and Parks, College Station, TX 77843, USA.

Tourism is a key ingredient in the economic development strategy of many developing nations. The growing contribution of tourism has been accompanied by an increased interest in understanding the major factors which influence visitation levels to those countries. The main purpose of this paper is to identify those factors which most influence international tourist flows to Turkey—a developing country.

The general approach used in this study is similar to the approaches used by Gerakis; Gray; and Krause. Jud and Joseph. It parallels recent empirical studies of international tourist movements by Smith and Toms; Little; Loeb; and Quayson and Var. However, this study differs from earlier investigations, in four ways:

- Turkey is a developing country whereas most reported models have been directed at explaining demand in developed countries. The question arises as to whether the same variables emerge as key determinants of tourist travel to developing as to developed nations?
- Most models have not attempted to assess the impact of promotional expenditure upon international tourism demand. This variable was included in the study reported here because of the very substantial investment in tourism promotion made by the Turkish government.
- The approach used in quantifying variables used in the model was somewhat different from that used by others.
- This study used a country-by-country approach rather than a single generic econometric model.

The tourist market in Turkey

Until recently tourism played only a minor role in the expansion of Turkey's economy. However, between 1980 and 1982 Turkey's receipts from international tourism grew more rapidly than those of any other major nation involved in tourism. There are two main reasons for this. First, from 1973 to 1979 the country was in a severe economic downturn resulting from the oil crisis in 1973 and subsequent social and political unrest. In the late 1970s tourism declined as prices soared with inflation, which reached a rate of 100% a year, and labour strikes occurred which closed hotels and other tourist amenities. In 1980 internal political and
continued from page 288

The University of Texas at Austin, Austin, Texas, 1973.


Statistical Yearbook of Turkey, SPD, Ankara, Turkey, 1981.


See for example: Gray, op cit, Ref 2; Kwack, op cit, Ref 7; Little, op cit, Ref 3; and Loeb, op cit, Ref 3.

Loeb, op cit, Ref 3.

Loeb, op cit, Ref 3; and Quayson and Var, op cit, Ref 3.

Determinants of demand for international tourist flows to Turkey

The second main factor contributing to this tourism growth is the substantial government effort which is directed at attracting foreign tourists. In recent years the Turkish Government has directed more money in promoting foreign tourism than any other major government in the world. In addition the government is offering substantial incentives to attract foreign investment in hotels and other resort accommodation, to supplement the very small number of hotel beds (50,000) currently available in Turkey.

Turkey's international tourism business comes mainly from the developed countries. Tourists constitute 98% of the total international travellers to Turkey, whereas business travellers account for only 2% of the total. For this reason business travellers were not included in this study. The major tourist-generating countries are FR Germany, the USA, France, Italy, the UK and Greece. According to the Tourism Authority of Turkey, foreign visitors to Turkey can be geographically divided into four main categories. These categories are: OECD countries, other European countries (eg, Bulgaria, Yugoslavia, Romania, Poland), the Middle East (eg, Iraq, Iran, Lebanon, Syria, Jordan), and Latin America. Almost 60% of the total foreigners arriving in Turkey originate from countries which are members of the Organization for Economic Cooperation and Development. The categories of 'other European countries' and 'the Middle East' account for approximately the same proportion of visitors to Turkey. (17% and 16% respectively).

Selection of the variables

A review of the literature was undertaken to identify which variables were likely to be most useful for explaining and predicting tourist flows to Turkey:

Income

Income has most commonly been used as an explanatory (independent) variable to explain international travel. Conceptually, the larger the real per capita income of a country, the more likely are its citizens to be able to afford to purchase foreign tourism, all things being equal. Empirical studies have supported this contention.

Relative prices

The effect of relative prices has also been suggested as an important variable in explaining international tourism flows. This suggests that tourists are likely to react when there is a change in the ratio between prices in the exporting country relative to prices in the receiving country or prices in alternative tourist destinations. Hence, as relative prices decline, an increase in the quantity of international tourism services imported by a tourist-generating country should be anticipated, other things being equal.

Exchange rate

It has been found that exchange rate may have a significant effect on the extent of international travel. The price of foreign currency will influence tourists. Thus, if the price of foreign currency declines,
Determinants of demand for international tourist flows to Turkey

For example, if the price of a vacation in Turkey remained constant in the last two years in terms of Turkish lira, but the price of the Turkish lira declined significantly relative to the German mark in the second year, it would be expected that Germans would purchase more travel services from Turkey in the second year.

Transportation costs

International tourism is also dependent upon transportation costs. It may be anticipated that an increase in relative transportation costs would result in a decline in international tourism, all things being equal. A number of researchers have used the cost of travel in their models. However, others used air distances rather than monetary costs of travel, while still others did not include any form of travel cost in their studies.

In this study, transportation cost was not considered. Several reasons contributed to this decision:

- it is difficult to obtain accurate data on transportation costs, the data would have had to be aggregate in nature and the quality of such data were suspect;
- it creates the problem of multicollinearity, eg income and air fares are highly correlated;
- access to Turkey is fairly equally distributed among three travel modes, sea, land and air, so defining one representative travel cost was difficult;
- in those studies where a relative transportation cost was incorporated, relatively insignificant statistical results were obtained;
- since there were 21 data points (1960–80), the inclusion of an extra variable would have decreased the degrees of freedom. This meant there would have been fewer data points for the statistical analysis to determine significance levels of the selected variables.

Promotional expenditure

The final quantitative variable included in the study was promotional expenditure. This has not been included in most of the econometric models which have been reported in the literature. However, it has been suggested that this variable may have an effect on international tourist flows to major tourist destination countries. Assessment of the relative impact of promotional expenditure is likely to be of particular interest to public and private agencies as they formulate plans for developing the tourism industry.

Other factors

In addition to these quantitative variables, one qualitative variable was introduced into the model: special events which may have influenced the demand for international travel. For example, it would be reasonable to expect that internal political unrest would result in a decline in travel to a country so afflicted.

All other factors which may affect the demand for international tourism to Turkey were subsumed in the catch-all category of ‘tastes’, which was assumed to remain constant over the period of the analysis.
Variable definitions

The variables used in the model were defined in the following ways:

**Number of tourists:** is the total number of tourists to Turkey from the generating countries. It includes travel for the following motives: persons travelling for a holiday, visiting friends or relatives, or for health reasons; persons attending meetings or conferences (scientific, religious, and sports); students, including those on holiday; and ocean/sea cruise visitors. It does not include business travellers.

**Tourist expenditure:** is calculated by multiplying per capita expenditure by the number of tourists to Turkey.

**Per capita income:** is the gross national product divided by the consumer price index and the population of the tourist-generating countries.

**Relative prices:** is a weighted ratio of prices in Turkey compared to those of the tourist-generating countries. It is derived by dividing prices in Turkey by weighted prices in the tourist-generating countries. The weighting is obtained by dividing the generating country's consumer price index by the generating country's rate of exchange, expressed in the number of domestic currency units per Turkish lira.

**Relative exchange rate:** is calculated in units of Turkey's currency divided by units of currency used in the tourist-generating countries.

**Promotional expenditure:** is calculated by multiplying the promotional expenditure per tourist by the number of tourists received from the generating countries.

Data sources

Secondary data sources were used in the study. Data on the number of tourists and their total expenditure were obtained from the following sources: *Statistical Yearbook of Turkey, 1964–1965; Tourist Statistics, 1965–1971; and the Bulletin of Tourism Statistics, 1972–1980;* all published by the Turkish Ministry of Tourism and Culture, and *Tourism Statistics (1977–1978–1979): Summary Data,* published by the Prime Ministry of the State Institute of Statistics, Turkey, in 1980. The promotional expenditure data were obtained from the annual reports of the Ministry of Tourism and Culture in Turkey. These figures do not represent the total cost of promoting the country. Individual hotels, tour promoters, and travel agencies conduct independent promotional campaigns. Thus, the expenditure of the Ministry of Tourism and Culture constitutes only a part of the total investment in promotion.


Development of the model

After selecting what the literature suggested were likely to be the most
useful variables for explaining international tourism to Turkey, the following model was derived:

\[ T_{RG} = (PCI, RPI, EXR, PE, DUMV) \]  

where:

- \( T_{RG} \) = a measure of the demand for travel services by country \( G \) to country \( R \) (that is, number of tourists, and/or total expenditure);
- \( PCI \) = a measure of per capita income in country \( G \);
- \( RPI \) = relative prices, that is, the ratio of prices in \( R \) to prices in tourist-generating countries, \( GS \);
- \( EXR \) = relative exchange rate between unit of \( R \)'s currency and unit of \( G \)'s currency;
- \( PE \) = promotional expenditure;
- \( DUMV \) = Variable portraying social/economic instability in country \( R \);
- \( R \) = subscript denoting the country exporting tourism services, namely Turkey;
- \( G \) = subscript denoting the country importing tourism services, namely tourist-generating countries.

Given the model specified for explaining international tourism flows to Turkey, the following signs of the coefficients of elasticity were expected:

\[
\frac{\% \lambda T_{RG}}{\% \lambda PCI} > 0, \quad \frac{\% \lambda T_{RG}}{\% \lambda RPI} < 0, \quad \frac{\% \lambda T_{RG}}{\% \lambda EXR} > 0, \quad \frac{\% \lambda T_{RG}}{\% \lambda PE} > 0 \quad \text{and} \quad DUMV, > 0, \text{and/or} < 0.
\]

Equation [1] portrays the general model that was investigated. More precisely, the models which were developed for explaining and predicting the number of tourists and total expenditure, could both be specified in logarithmic form as:

\[
\log TRG = \alpha + \beta_0 \log \frac{GNP_G}{POP_G CPI_G} + \beta_1 \log \frac{RPI_R}{WCPIA_G} +
\]

\[
\beta_2 \log \frac{EXR_R}{EXR_G} + \beta_3 \log (PE \cdot T_{RG}) + \gamma_1 DUMV \ldots + \epsilon \]  

and

\[
\log \frac{TEX}{CPI_G} = \alpha + \beta_0 \log \frac{GNP_G}{POP_G CPI_G} + \beta_1 \log \frac{RPI_R \cdot EXR_R}{WCPIA_G} +
\]

\[
\beta_2 \log \frac{EXR_R}{EXR_G} + \beta_3 \log (PE \cdot T_{RG}) + \gamma_1 DUMV \ldots + \epsilon \]  

where:

- \( POP_G \) = population of the tourist-generating countries;
- \( CPI_G \) = consumer price index of the tourist-generating countries;
TO measure the responsiveness of international tourist demand to the level of relative prices, a tourist-service index is needed. Unfortunately, no such index is available, and to compile a reliable one requires more complete data than those presently available. As an approximation, the study uses the consumer price-index as the price of tourism services.


2. Better explanation might have been obtained by trying lags in promotional expenditure. However, this would have meant abandoning the double-logarithm form which was successfully used in the analysis. The double-logarithm form would not have been an appropriate procedure for estimating the coefficients of the selected variables (except for the dummy variables), because the estimated coefficients could not then have been elasticities of the selected variables. For this reason, lags in promotional expenditure were not used. If the linear form had been used it would have been possible to use lags in promotional expenditure.

\[
\begin{align*}
RPI_R & = \text{consumer price index of the receiving country, Turkey;} \\
EXR_R & = \text{exchange rate of the receiving country, Turkey;} \\
EXR_G & = \text{exchange rate of the tourist-generating countries;} \\
TEX & = \text{total tourist expenditure;} \\
WCPI_AG & = \text{weighted consumer price indices of the tourist-generating countries;} \\
\alpha, \beta_0, \beta_1, \beta_2, \beta_3, \gamma_1 & = \text{various parameters;} \\
\epsilon & = \text{a stochastic disturbance term.}
\end{align*}
\]

The factors influencing international tourist flows to Turkey were analysed by using the ordinary least squares multiple regression technique. Since the amount of tourism in Turkey is only a small fraction of world income, it is reasonable to argue that the current value of the income variable is not influenced by the current value of the endogenous (dependent) variable. The prices of goods and services consumed by tourists are determined primarily by economic conditions within the local economy; they do not respond to changes in the level of foreign tourism because tourist business represents only a small part of the total demand.

Similarly, it is argued that exchange rates are determined by international economic conditions together with the national adjustments of currency units. These may respond slowly to changes in demand. Furthermore, promotional expenditure is nationally determined, changing only slightly in response to changes in demand. Therefore, it is reasonable to assume that the explanatory variables may be regarded as predetermined in the development of an international tourism-demand model. It has been pointed out that a demand function with these attributes may be called a 'uni-equational complete model' to indicate that it contains only one genuine variable and can properly be estimated by ordinary least squares. In addition, the lower costs and the availability and reliability of the data, contributed to the decision to use least squares multiple regression in this investigation.

Using annual time-series data for the period 1960–1980, estimates explaining flows to Turkey were obtained from models derived for each of the following countries: FR Germany, the USA, France, Italy, the UK, Greece, Austria, Yugoslavia, Spain, Canada and Switzerland. However, some of the models which were estimated using ordinary least squares appeared to suffer from serial correlation. Whenever a serial correlation was detected by the Durbin–Watson d statistic, a Corcoran Orrcutt procedure was used in an attempt to alleviate the problem. This procedure uses an internal ordinary least squares regression to form an initial guess of the first-order serial correlation in order to increase the efficiency of the estimates.

Two different types of dependent variables were used in estimating the demand for international tourism to Turkey: number of tourists, and total expenditure. Both the linear and double logarithmic forms were tested. The double logarithmic form provided the better fit, and thus was chosen for use in the analysis.

**Empirical results**

All results reported are based on the natural-logarithm model. Hence,
Determinants of demand for international tourist flows to Turkey

the coefficients associated with the non-dummy variable are estimates of elasticities (Tables 1 and 2).

**Income variable**

The coefficients of the income variable were statistically significant at the 5% probability level for 10 of the 11 countries in the tourist-expenditure model. The exception was the USA, whose coefficient was significant only at the 10% probability level.

Only five of the coefficients of the income variable were statistically significant in the number-of-tourists models. Although the results for the UK, Spain and Australia were negative, the coefficients were not significant and elasticity was less than unity. Yugoslavia, Switzerland and Canada had positive signs, but the coefficients were not significant.

**Relative price variable**

The relative price variable had the appropriate sign for all 11 countries except Italy, for the tourist expenditure models. However, in the case of Greece, Austria, Canada, and the USA, the coefficients were not significant at the 5% probability level. When the number of tourists was

Table 1. The influence of selected variables on the number of tourists visiting Turkey from selected countries.

<table>
<thead>
<tr>
<th>Generating countries</th>
<th>Constant</th>
<th>Per capita income</th>
<th>Relative price index</th>
<th>Coefficients</th>
<th>Promotional expenditure</th>
<th>Dummy variable</th>
<th>$R^2$</th>
<th>D-W</th>
<th>Estimation technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>9.315</td>
<td>-0.295</td>
<td>-2.060</td>
<td>3.494</td>
<td>-0.075</td>
<td>0.886</td>
<td>2.21</td>
<td>CORC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(7.17)</td>
<td>(-0.72)</td>
<td>(-5.42)</td>
<td>(4.360)</td>
<td>(-0.95)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>0.120</td>
<td>0.795</td>
<td>0.42</td>
<td>1.094</td>
<td>0.174</td>
<td>0.331</td>
<td>1.04</td>
<td>OLSQ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.20)</td>
<td>(0.68)</td>
<td>(0.47)</td>
<td>(0.46)</td>
<td>(1.23)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>-2.574</td>
<td>3.484</td>
<td>0.104</td>
<td>3.828</td>
<td>0.022</td>
<td>0.821</td>
<td>1.21</td>
<td>OLSQ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.56)</td>
<td>(3.01)</td>
<td>(0.16)</td>
<td>(2.74)</td>
<td>(0.17)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td>-1.448***</td>
<td>3.340</td>
<td>-1.542</td>
<td>5.79</td>
<td>0.27</td>
<td>0.956</td>
<td>2.43</td>
<td>CORC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.12)</td>
<td>(7.94)</td>
<td>(-2.10)</td>
<td>(3.77)</td>
<td>(5.82)</td>
<td>(-2.42)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>-1.237</td>
<td>1.585</td>
<td>-1.317***</td>
<td>3.832</td>
<td>0.293</td>
<td>0.829</td>
<td>1.55</td>
<td>OLSQ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.270)</td>
<td>(2.33)</td>
<td>(-1.75)</td>
<td>(2.10)</td>
<td>(4.96)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>7.226</td>
<td>-0.835</td>
<td>-2.387</td>
<td>2.729***</td>
<td>0.596</td>
<td>0.926</td>
<td>2.30</td>
<td>OLSQ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(3.26)</td>
<td>(-1.31)</td>
<td>(-3.05)</td>
<td>(1.65)</td>
<td>(8.04)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>3.291</td>
<td>1.651</td>
<td>0.131</td>
<td>1.875</td>
<td>-0.077</td>
<td>0.306</td>
<td>1.33</td>
<td>OLSQ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.75)</td>
<td>(1.10)</td>
<td>(0.19)</td>
<td>(0.80)</td>
<td>(-0.31)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FR Germany</td>
<td>-0.071</td>
<td>1.000</td>
<td>-0.021</td>
<td>1.902</td>
<td>0.054</td>
<td>0.306</td>
<td>1.33</td>
<td>OLSQ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(6.37)</td>
<td>(5.37)</td>
<td>(-0.14)</td>
<td>(3.32)</td>
<td>(2.30)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>16.90*</td>
<td>-0.064</td>
<td>-1.57*</td>
<td>1.682</td>
<td>0.279</td>
<td>0.874</td>
<td>1.64</td>
<td>OLSQ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(6.26)</td>
<td>(-1.30)</td>
<td>(-3.27)</td>
<td>(2.87)</td>
<td>(6.50)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>-13.22***</td>
<td>6.072</td>
<td>-0.347</td>
<td>6.536</td>
<td>0.079</td>
<td>0.838</td>
<td>1.91</td>
<td>CORC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.73)</td>
<td>(3.27)</td>
<td>(-0.65)</td>
<td>(3.56)</td>
<td>(0.97)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yugoslavia</td>
<td>9.464*</td>
<td>0.096</td>
<td>-0.75**</td>
<td>1.762</td>
<td>0.26</td>
<td>0.789</td>
<td>1.68</td>
<td>OLSQ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(5.41)</td>
<td>(0.38)</td>
<td>(-2.24)</td>
<td>(2.51)</td>
<td>(3.34)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:

*a*Models were estimated in natural logarithmic form, but the dummy variables entered the equations in the non-logarithmic form.

*b*CORC indicates the equation was estimated using the Cochrane-Orcutt procedure and OLSQ indicates estimation by ordinary least squares.

***, **, * indicate significance at the 20%, 10% and 5% probability levels, respectively.

***Correct to three decimal places.

The dummy variable was included in the German model for the years 1979 and 1980 because of the decline in the number of tourists received from FR Germany. This could be attributed to two major world-wide events: the energy crisis and the economic recession, together with social and economic instability in Turkey.

Numbers in parentheses indicate $t$ values associated with the estimated coefficients.
Determinants of demand for international tourist flows to Turkey

Table 2. Overall measures of the selected variables on expenditure in Turkey by tourists from selected countries.

<table>
<thead>
<tr>
<th>Generating countries</th>
<th>Constant</th>
<th>Per capita income</th>
<th>Relative price index</th>
<th>Coefficients†</th>
<th>Promotional expenditure</th>
<th>Dummy variable</th>
<th>R²</th>
<th>D-W</th>
<th>Estimation technique</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>-6.542**</td>
<td>2.742*</td>
<td>-0.230</td>
<td>0.187</td>
<td>-0.166</td>
<td>0.966</td>
<td>2.35</td>
<td>CORC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-2.23)</td>
<td>(6.04)</td>
<td>(-0.40)</td>
<td>(0.22)</td>
<td>(-1.49)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td>-5.003</td>
<td>2.72*</td>
<td>-0.753</td>
<td>1.468</td>
<td>-0.001</td>
<td>0.975</td>
<td>1.47</td>
<td>CORC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.06)</td>
<td>(6.61)</td>
<td>(-1.02)</td>
<td>(1.09)</td>
<td>(-0.01)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>-0.552</td>
<td>2.482*</td>
<td>-2.065*</td>
<td>4.227*</td>
<td>0.255</td>
<td>0.929</td>
<td>1.24</td>
<td>OLSQ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.10)</td>
<td>(3.30)</td>
<td>(-2.38)</td>
<td>(3.00)</td>
<td>(1.44)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greece</td>
<td>-4.737</td>
<td>2.573*</td>
<td>-1.708</td>
<td>3.135</td>
<td>0.022</td>
<td>0.911</td>
<td>1.73</td>
<td>CORC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.69)</td>
<td>(2.99)</td>
<td>(-0.98)</td>
<td>(0.97)</td>
<td>(0.07)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Italy</td>
<td>-19.23*</td>
<td>5.957*</td>
<td>-5.058</td>
<td>-6.739</td>
<td>-0.235</td>
<td>0.952</td>
<td>2.20</td>
<td>CORC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-3.13)</td>
<td>(5.96)</td>
<td>(4.54)</td>
<td>(-3.85)</td>
<td>(-1.65)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>-6.71</td>
<td>1.919*</td>
<td>-1.683***</td>
<td>2.971***</td>
<td>0.27</td>
<td>0.971</td>
<td>1.90</td>
<td>CORC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-1.28)</td>
<td>(2.66)</td>
<td>(-1.69)</td>
<td>(1.76)</td>
<td>(1.63)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switzerland</td>
<td>-6.005*</td>
<td>2.092**</td>
<td>-1.488</td>
<td>2.836***</td>
<td>0.06</td>
<td>0.973</td>
<td>1.35</td>
<td>OLSQ</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-2.61)</td>
<td>(2.16)</td>
<td>(-1.22)</td>
<td>(1.75)</td>
<td>(0.22)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FR Germany</td>
<td>-9.736*</td>
<td>3.973*</td>
<td>-2.013*</td>
<td>3.659*</td>
<td>0.086</td>
<td>-0.759*</td>
<td>0.990</td>
<td>CORC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-4.68)</td>
<td>(0.01)</td>
<td>(5.18)</td>
<td>(8.82)</td>
<td>(1.11)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UK</td>
<td>10.41</td>
<td>2.092**</td>
<td>-1.488</td>
<td>2.836***</td>
<td>0.28</td>
<td>0.931</td>
<td>1.59</td>
<td>CORC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.80)</td>
<td>(2.16)</td>
<td>(-1.22)</td>
<td>(1.74)</td>
<td>(1.73)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA</td>
<td>-6.852</td>
<td>3.185***</td>
<td>-0.956</td>
<td>2.071</td>
<td>0.14</td>
<td>0.885</td>
<td>1.41</td>
<td>CORC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.61)</td>
<td>(2.08)</td>
<td>(-0.66)</td>
<td>(1.05)</td>
<td>(0.72)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yugoslavia</td>
<td>8.723</td>
<td>0.923*</td>
<td>-1.851</td>
<td>4.091*</td>
<td>0.225*</td>
<td>0.978</td>
<td>2.63</td>
<td>CORC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(9.30)</td>
<td>(5.86)</td>
<td>(7.37)</td>
<td>(8.85)</td>
<td>(5.40)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. Models were estimated in natural logarithmic form, but the dummy variables entered the equations in the non-logarithmic form.
2. CORC indicates the equation was estimated using the Cochrane-Orcutt procedure and OLSQ indicates estimation by ordinary least squares. *** indicates significance at the 20%, 10% and 5% levels, respectively.
3. Correct to three decimal places.
4. The dummy variable was used for the years 1979 and 1980.
Numbers in parentheses indicate t-values associated with the estimated coefficients.

used as the dependent variable, only the coefficients of Greece, Yugoslavia, Spain, Austria and the UK, were significant at the 5% probability level.

Exchange rate variable

In both the number-of-tourists and tourist-expenditure equations, the variable of exchange rate was found to play a positive role in stimulating international tourist flows to Turkey. The tourist-generating countries were more sensitive to exchange rates as the elasticity exceeded unity, varying from 1.094 to 6.636. The only exception was Italy, whose exchange-rate variable had a negative sign.

Promotional expenditure variable

Promotional expenditure as a factor affecting international tourism flows to Turkey was shown to be significant in six of the 11 countries. However, in each of these models the coefficient was low; less than 0.6 in each case. The coefficients of the promotional expenditure were inelastic in all cases, ranging from 0.022 for France, to 0.596 for Spain. These findings suggest that investment in promoting Turkey as a tourist destination is likely to have minimal impact on international tourist flows to Turkey.
Determinants of demand for international tourist flows to Turkey

Multicollinearity

The majority of the individual models had a relatively high $R^2$ with significant coefficients. That is, the probability of multicollinearity existing was minimal. However, the analyses indicated that when the model was applied to the tourist-expenditure equation of the UK, the probability of multicollinearity existing was recognized because of the high values of the standard error of some of the coefficients, and the high $R^2$ (0.94) with non-significant coefficients. The removal of variable $PE$ increased the coefficients of the PCI and EXR variables.

'Special events' variable

Dummy variables for the energy crisis, and social and economic instability were included in the models for FR Germany, and for the Cyprus conflict in the Greek model. The coefficients of both dummy variables in the German and Greek models proved to be significant and had a negative impact on international tourist flows.

Model fit

The 'worst' fit was obtained for the number-of-tourists model when the model was applied to Switzerland and Canada. The model only explained 49.20% and 67.09% of variation in the dependent variables, respectively. Although all signs of the coefficients (with the exception of the variable $RP$ for Switzerland) were as expected, none of the coefficients were significant. This poor fit may be explained by the omission of some significant variable(s) from the model or mis-specification of the functional form.

Model significance

Results of the regression equations measuring overall impact of the selected variables showed that nine out of the 11 models were statistically significant at the 5% probability level. None of the Durbin–Watson $d$ tests were below the lower bound, and 15 out of 20 equations were in the inconclusive range. This suggests that most of the estimated equations were free from autocorrelation.

Concluding comments

The variables of income, price, and exchange rate were consistently significant factors in the determination of international tourist flows to Turkey for all the tourist-generating countries. The statistical results indicated that the majority of the income-variable coefficients were positive and significant. These results are similar to the findings reported in other investigations of international tourism. The income elasticities varied from 0.795 to 6.072, suggesting that the degree of responsiveness of international tourism to Turkey due to changes in income, varies widely from country to country.

The coefficients associated with the relative price variable were generally negative and significant for Greece, Yugoslavia, France, Spain, Australia, FR Germany and the UK, indicating the importance of price. The demand for tourism in Turkey is highly price elastic, which emphasizes the high degree of competition faced by the Turkish tourist industry. The price coefficients indicate substitution is likely, i.e., as relative prices increase in Turkey vis-à-vis prices in alternative travel

29Kwack, op cit, Ref 7; J. Diamond, 'Tourism's role in economic development: the case reexamined', Economic Development and Cultural Change, Vol 25, No 3, April 1977, pp 593-593; Smith and Toms, op cit, Ref 3; Little, op cit, Ref 3; and Loeb, op cit, Ref 3.
Determinants of demand for international tourist flows to Turkey

locations, there will be a reduction in international tourism to Turkey from the generating countries.

The analyses suggested that in both the number-of-tourists and the tourist-expenditure models the exchange rate variable has a strong positive effect on international tourism in all countries except Canada and Italy. In the Italian case, the coefficient was negative.

Generating countries which are closer to Turkey (e.g., Greece, Yugoslavia) were more responsive to changes in exchange rates than those which are further away, suggesting that proximity and high frequency of trips may be important elements in explaining exchange rate differentials. Empirical work reported by Quayson and Var supports this contention.\(^{26}\)

The magnitude of the promotional expenditure coefficients varied from 0.094 to 0.596 in absolute values. That is, expenditure invested in promoting Turkey as a tourist destination is likely to exert only minimal impact on international tourist flows to Turkey.

\(^{26}\) Quayson and Var, op. cit. Ref. 3.