DETERMINANTS OF TOURIST INFLOWS IN TURKEY: EVIDENCE FROM PANEL GRAVITY MODEL

Res. Asst. M. Ozan SARAY Asst. Prof. Kadir KARAGÖZ

Inonu University Zonguldak Karaelmas University

FEAS Department of Economics FEAS International Trade and Business Department

ozansaray@inonu.edu.tr kkaragoz3@hotmail.com

ABSTRACT

Turkey is one of the foremost destinations in the world and today, tourism sector has gained importance in the Turkish economy. With a tourism revenue of 16.9 billion USD, Turkey has placed 9th among the top 10 highest revenue earned countries. Nevertheless, it cannot be said that Turkey fully uses her tourism potential which stems from her geographical and historical wealth. Therefore, in order to develop the sector in a most planned and controlled manner, it is important to determine the factors which have impact on Turkey's tourist inflows. In this paper, we aimed to investigate these effective factors based on a panel gravity model framework for the period of 1992-2007. Though the results are highly sensitive to the specification of the model both in terms of the significance and sign of the coefficients, all variables (i.e. the economic size, population and distance) seem to have significant effect on tourist inflows.

Keywords: Tourist Inflow, Turkey, Panel Gravity Model.

TÜRKİYE'YE YÖNELİK TURİST AKIMININ BELİRLEYİCİLERİ: PANEL ÇEKİM MODELİNDEN BULGULAR

ÖZET

Günümüzde Türkiye dünyanın önde gelen turizm destinasyonlarından biridir ve turizm Türkiye ekonomisi içinde giderek önem kazanmaktadır. Türkiye 16,9 milyar dolarlık turizm geliri ile ilk 10 ülke içinde 9. sıradadır. Bununla birlikte, Türkiye'nin coğrafî ve tarihî zenginliğinden kaynaklanan turizm potansiyelini tam olarak kullandığı söylenemez. Bu nedenle sektörün daha plânlı ve kontrollü bir şekilde geliştirilmesi açısından Türkiye'ye yönelik turist akımı üzerinde etkili olan faktörlerin belirlenmesi önem arz etmektedir. Bu çalışmada 1992-2007 dönemi için, çekim modeli yapısı içinde bu faktörler araştırılmaya çalışılmıştır. Her ne kadar sonuçlar katsayıların işaret ve anlamlılığı açısından modelin biçimine duyarlı olsa da tüm değişkenler (yani, ekonomik büyüklük, nüfus ve uzaklık) turist akımı üzerinde anlamlı etkiye sahip görünmektedir.

Anahtar Kelimeler: Turist Akımı, Türkiye, Panel Çekim Modeli.

1. INTRODUCTION

Even though it is an ancient phenomenon, it is widely accepted that as an economic activity tourism begun to attract more attention in the second half of the 20th century, more precisely after World War II. It seems that increasing economic prosperity, quick development of transport and some other factors (such as, improvement in working condition and communication, change in labor-leisure preferences) contributed to this case (Matias, 2004:4). So, tourism is one of the most rapidly growing sectors in the world. Global tourism flows and tourism receipts show a stable increase in recent years. Therewith, as an effective tool, importance of tourism on economic growth and development increases. In 2008, international tourist arrivals reached 922 million persons, up 18 million over 2007, representing a growth of 2%. International tourism receipts rose by 1.7% in real terms to 944 billion USD. Despite the fact that global tourism demand fallen significantly under the influence of an extremely volatile world economy (financial crises, commodity and oil price rises and sharp exchange rate fluctuations) for many developing countries it is still one of the main income sources and the number one export category, creating much needed employment and opportunities for development (UNWTO, 2009).

Turkey is one of the foremost destinations in the world and today, tourism has become an importance-gaining sector in the Turkish economy. Nevertheless, it cannot be said that Turkey fully uses her tourism potential which stems from her geographical and historical wealth. Spain and Italy, which are Mediterranean countries like as Turkey, each received 57.6 billion and 42.7 billion USD tourism revenue respectively, in 2008. Therefore, in order to develop the sector in a most planned and controlled manner it is important to determine the factors which have impact on Turkey's tourist inflow.

Tourism can be considered as an invisible export item which has considerable impacts on the balance of payments. In this respect, tourism is a good and service exporting activity done in retail prices. Automation and mechanization ability of the sector is quite low while employment/investment ratio is high in general. Tourism, because of its stimulant effects, also causes to production, employment and income enhancement in other sectors directly or indirectly (Kozak *et al.*, 2000). Micro and macro externalities which tourism had and its growth potentials urge most countries to obtain bigger part from the global tourism market. This makes it crucial to determine the factors those effective on tourist inflow in a country.

This paper aims to investigate these effective factors based on a panel gravity model framework in which the economic size, population and distance are key variables. The paper is organized as follows. A brief description of Turkish tourism sector is given in the next section. Employed methodology, data and variables used are described in Section 3. Empirical findings are presented in Section 4. The paper concludes in Section 5.

2. THE IMPORTANCE OF TOURISM SECTOR IN TURKEY

Even though the domestic tourism with regard to pilgrimages, spa tourism and summer resorts has a long past in Turkey, till to late 1980s Turkey could not entered the international tourism market. From then the Turkish government regarded the international tourism as a tool for economic development and a source for foreign exchange. In order to support tourism investments government established some tourism facilities and provided incentives for private investors (Yıldırım and Öcal, 2004). In this regard, Tourism Encouragement Law of No. 2634 came into force in 1982. This regulation seems to cause a significant jump in Turkish tourism sector both in terms of tourist number and revenue. Another possible effect on this expansion may be the liberalization wave which has been launched with early 1980s.

After these advances and efforts Turkey attracted more and more tourists in last two decades. Table-2 shows that weight of the tourism sector in the overall economy increased over the last three decades. According to the statistics, tourism sector in Turkey is estimated to directly produce 18.5 billion USD and this is equivalent to 4.3% of the GNP in 2007. This accounts for 17.3% of total exports revenues in Turkey which was reached its peak in 2000 at 27.5% level.

Year	TR ¹	TR/GNP ²	TR/EXP 3	TI / \sum I ⁴	TE / Σ E ⁵
1970	52	0.5	8.8	0.8	na
1975	201	0.5	14.3	0.5	na
1980	327	0.6	11.2	0.5	na
1985	1 482	2.8	18.6	1.3	na
1990	3 225	2.1	24.9	3.9	na
1995	4 957	3.0	22.9	2.4	3.4
2000	7 636	3.8	27.5	4.0	4.8
2005	18 153	5.0	24.7	1.1	1.6
2006	16 851	5.2	19.7	1.9	0.7
2007	18 487	4.3	17.3	1.5	0.5

Table 1: Share of Tourism Sector In Turkish Economy

Notes: 1) TR: Annual tourism revenue, in million USD, 2) TR/GNP: Ratio of tourism revenue to GNP (%), 3) TR/EXP: Ratio of tourism revenue to exports (%), 4) TI/∑I: Ratio of tourism investment to total investment (%), 5) TE/∑E: Ratio of tourism employment to total employment (%), Source: The Association of Turkish Travel Agencies (TURSAB) and State Planning Organization (SPO).

In addition to these information, when taking into consideration top destinations for international tourism in terms of tourism receipts and tourist arrivals, Turkey has strengthened her position in recent years as the fourth most important destination in the Mediterranean region and the sixth in entire Europe after the tourism giants France, Spain, Italy, the UK and Germany (Aslan *et al.*, 2008:2). According to UNWTO data, Turkey hosted to 25 million tourists in 2008, which means 12.3% increase in compared

with 2007. On the other side, tourism revenues of Turkey constitute nearly 3% of her GDP in 2008. With tourism revenue of 22.0 billion USD, Turkey has placed at 9th row among top 10 most tourism revenue gained countries.

Table 2: Top 10 Countries in Terms of Tourist Inflow and Tourism Revenue

Tourist inflows (Million persons)				Tourism revenue (Billion USD)					
Rank	Country	2007	2008	% Change	Rank	Country	2007	2008	% Change
1	France	81.9	79.3	-3.2	1	U.S.A.	96.7	110.1	13.8
2	U.S.A.	56.0	58.0	3.6	2	Spain	57.6	61.6	6.9
3	Spain	58.7	57.3	-2.3	3	France	54.3	55.6	2.4
4	China	54.7	53.0	-3.1	4	Italy	42.7	45.7	7.2
5	Italy	43.7	42.7	-2.1	5	China	37.2	40.8	9.7
6	U.K.	30.9	30.2	-2.2	6	Germany	36.0	40.0	9.9
7	Ukraine	23.1	25.4	9.8	7	U.K.	38.6	36.0	11.6
8	Turkey	22.2	25.0	12.3	8	Australia	22.3	24.7	25.0
9	Germany	24.4	24.9	1.9	9	Turkey	18.5	22.0	9.7
10	Mexico	21.4	22.6	5.9	10	Austria	18.9	21.8	13.5

Source: United Nations-World Tourism Organization (UNWTO), 2009.

Turkey's key market for the tourism exports is Europe. The most important single market is Germany, which is closely followed by the UK. A list of the Top-10 tourist sender countries is given in Table 3, below.

Table 3: Top - 10 Tourist Sender Countries to Turkey (as of 2007)

Source	Tourist Number	Source	Tourist Number
1. Germany	4,248,200	6. France	768,100
2. U.K.	1,916,000	7. U.S.A.	646,300
3. Bulgaria	1,239,600	8. Belgium	542,700
4. Iran	1,058,200	9. Italy	514,800
5. Netherland	1,053,600	10. Israel	511,400

A number of empirical studies have been conducted to assess the significance of various aspects of tourism sector in Turkish economy (*inter alia* İçöz *et al.*, 1998; Tosun 1999, 2001; Tosun *et al.*, 2003; Halıcıoğlu, 2004; Gündüz and Hatemi-J, 2005; Bahar, 2006; Karagöz *et al.* 2007; Karagöz, 2008; Aslan *et al.*, 2008).

İçöz et al. (1998), employing multivariate regression model based on OLS estimates, devoted their effort to estimate the supply-side determinants of demand for Turkish tourism in the case of 10 European countries. Results of the analysis suggest that the responsiveness to tourism flows to Turkey varies significantly with respect to

changes in the number of travel agencies as well as the relative exchange rates. In a relatively more new study, using more sophisticated econometric tools, Halicioğlu (2004) also estimated the aggregate tourism demand for Turkey. His empirical results indicate that income is the most significant variable in explaining the total tourist arrivals to Turkey and there exists a stable tourism demand function.

In recent years, an increasing attention is being paid to the debate on the tourismled growth hypothesis. Empirical studies give controversial results for different countries. Gündüz and Hatemi-J (2005) examined the interaction between tourism and economic growth by conducting a bootstrap causality test with leveraged adjustment in the case of Turkey. Their findings show that the tourism-led growth hypothesis is supported empirically in the case of Turkey. They attribute this result to the relative weight of tourism in the economy which might be more important in testing tourism-led growth hypothesis as in the case of Spain. Using quarterly data set, Zortuk (2009) investigated causal relation between tourism and economic growth via Granger causality test base don VECM and he obtained evidence in favor of a unidirectional causality from tourism to economic development. In another study, Kaplan and Celik (2008) employed a VAR procedure and found a significant long-run relationship between real output, real tourism receipts and real exchange rates. In addition, test results indicate the presence of uni-directional causality between tourism and output. On the other hand, Yıldırım and Öcal (2004), despite they confirm the long-run growth promoting impact of tourism revenues, they did not find significant short-run relationship between tourism and economic growth.

External as well as internal shocks may have substantial effect on tourism inflows and hence on tourism revenues. The paper of Karagöz *et al.* (2007) provides evidence on the unit root hypothesis for tourist arrivals to Turkey in the case of structural change. Results of the his analysis show that Turkey's time series of tourist arrivals have deterministic properties implying that tourists are not vulnerable to any form of external shocks and make adjustments to their tourism destination whenever news of these shocks is received. On the other hand three structural changes within the deterministic components have been detected as well by dummy variables. In this regard the earthquake of August 1999 has a significant but temporary negative effect on tourism demand. The relative political stability started from 2003 has given a momentum to the growth in tourism demand for Turkey, by increasing the slope and decreasing the intercept parameters.

The majority of studies those devoted to investigate the determinants of tourist flows consider the demand side factors. But the supply side factors might have influence upon tourism performance. Aslan *et al.* (2008) analyzed these supply side factors for the case of tourism demand for Turkey in a dynamic model framework by using GMM-DIFF estimator. One of the main conclusions of the study is the significant value of the lagged dependent variable, which may be interpreted as a minor word-of-mouth effect on the consumer decision in favor of the destination.

It is widely accepted that compared with similar countries such as Spain and Mexico, Turkey could not use her tourism potential fully. As seen from the Table 2,

tourist inflow in Turkey has increased in recent years and this development points to more enhancement ability in near future. In this respect Karagöz (2008) investigated tourism potential of Turkey employing an augmented gravity model based on cross-sectional data set for 97 countries from all over the world. Estimation results show that tourist inflow was affected positively by the economic size and negatively by the distance of tourist sender countries. It is also evident from the estimations that historical/cultural ties and muslimship plays significant role on tourist arrivals. On the other hand, based on the estimated gravity model nearly half of the in-sample countries promise an expansion potential in tourist inflows.

3. EMPIRICAL MODEL, METHOD AND DATA

3.1. Gravity Model Approach

The gravity model belongs to the class of empirical models concerned with the determinants of interactions. In its most general formulation, it explains a flow (of goods, capital, people etc.) from an area to another area as a function of characteristics of the origin, characteristics of the destination and some separation measurement. Customarily the model is estimated in log-linear form (Porojan, 2000:2).

The gravity model has its origin in Newton's law of gravitation in seventeenth century. Newton's law of gravity in mechanics states that two bodies are subjected to a force of attraction force that depends positively on the product of their masses and negatively on their distance. Social scholars, in nineteenth century, applied this law to social phenomena of quite different nature the common character of which was transfers or flows between two or more entities or sources. Thus migration or traffic laws (vehicles, information etc.) were examined using this "law" (Simwaka, 2006:6).

Following a specification reminiscent of Newton's gravitation theory, gravity models relate bilateral trade to the mass of these two countries (commonly measured as the size of the countries involved) and the distance that separates them. This standard formulation of the model, which is consistent with standard models of international trade, is commonly extended to include other factors generally perceived to affect bilateral trade relationships. Indeed, the notion of distance does not only relate to the geographical distance (i.e. transportation costs), but also to other factors affecting transaction costs. Besides or instead of distance variable some other variables also can be used, such as a dummy variable for each of the variables of having common language, common border, being in same territory and same free trade arrangement (Bussière and Schnatz, 2006:14).

The simplest form of the gravity model can be stated as below,

$$T_{ij} = A \cdot \frac{(Y_i \times Y_j)^{\alpha}}{D_{ij}^{\gamma}} \tag{1}$$

where, T_{ij} is the trade volume between country i and j; A is proportionality constant; Y_i ve Y_j are economic sizes of country i and j (with respect to GNP, GDP or

per capita GDP); D_{ij} is the distance between countries. Equation (1) is the core gravity model equation where bilateral trade is predicted to be a positive function of income and negative function of distance. When applied to predict trade flows, population size of both exporter and importer country are often included as variables in the equation, assuming larger populations support and promote larger trade volumes:

$$T_{ij} = A \cdot \frac{(Y_i \times Y_j)^{\alpha} (P_i \times P_j)^{\beta}}{D_{ii}^{\gamma}}$$
 (2)

After a simple arrangement equation (2) can be written as follow:

$$T_{ij} = A \cdot \frac{(P_i \times Y_i)^{\alpha} (P_j \times Y_j)^{\beta}}{D_{ii}^{\gamma}}$$
(3)

If for the both side logarithms are took, the equation becomes linear:

$$log T_{ij} = A^* + \alpha log (P_i \times Y_i) + \beta log(P_j \times Y_j) - \gamma log D_{ij} + \varepsilon_{ij}$$
(4)

Where, A^* is log A, and α , β , and γ are parameters to be estimated. e_{ij} is a white noise error term with constant variance and zero mean, and stands for to represent the random factors those effect bilateral trade.

Now trade flows are defined as a function of per capita GDP in two countries and the distance between these countries. Since there is no deviation in $(P_i \times Y_i)$ with respect to the various importer countries, thus it cannot be a source of explanation for trade deviations to those importer countries, and hence can be dropped from the equation (Bos and van de Laar, 2004:5). The estimable model can be written as;

$$\log T_{ij} = A^* + \alpha \log P_i + \beta \log Y_i - \gamma \log D_{ij} + \varepsilon_{ij}$$
 (5)

Trade theories based upon imperfect competition and the Hecksher-Ohlin model justify the inclusion of the core variables – income and distance. Most studies have however, included additional dummy variables to control for differences in geographic factors, historical ties and at times economic factors like the overall trade policy and exchange rate risk (Batra, 2004:4).

Aforementioned gravity type models have achieved increasing recognition in the analysis of economic phenomena related to the flow of goods and services. In this respect it was also applied to the various aspects of tourism (see for example Durbarry, 2000; Batra, 2004; Matias, 2004; Gil-Pareja *et al.*, 2007).

The vast majority of the empirical papers on international tourism in the literature are divided into two main types. The first consists of papers that use modern time series and co-integration techniques in an attempt to model and forecast the dependent variable, between one or several pairs of countries. The second type includes papers that estimate the determinants of international tourism flows using classical multivariate regression framework (Halicioğlu, 2004; Eita and Jordaan, 2007). The gravity model approach used in this paper can be counted in the second class.

Another distinction can be made in terms of the data nature. Most of the studies use time series data while some have used pooled/panel and cross-sectional data. Standard gravity models generally use cross-section data for a particular time period, such as one year, or over averaged data. However, panel data models might provide additional insights, capturing the relevant relationships over time and avoiding the risk of choosing an unrepresentative year. Moreover, panels allow monitoring unobservable individual effects between trading partners. Therefore, in order to investigate the impact of gravitational factors on the tourist inflows, we used panel gravity model framework. Panel data models have three basic approaches: They are pooled and estimated by OLS, or they are assumed to be motivated by fixed effects model (FEM). The third approach is the random effects model (REM). Each approach has its own advantages and disadvantages. As Antonucci and Manzocchi (2005) pointed out REM would be more appropriate when estimating flows between a randomly drawn sample of trading partners from larger population. On the other hand, FEM would be a better choice than the REM when one is interested in estimating flows between a predetermined selection of countries (Egger, 2000, 2005). Since our sample only contains tourist inflows of Turkey from different parts of the world, the REM might be most appropriate specification. However, the result of Hausman specification test supports our choice.

3.2. Model, Variables and Data

The models encompass the core explanatory variables of gravity model that is economic size, population and distance. It should be said something about the variables.

The variables that best measure the economic size are GDP and GDP per capita. With respect to the economic size of the origin country it seems evident that, the wealthier the country the larger the number of tourists. Additionally, since international tourism is a normal good in consumption (and, for most people, a luxury one) per capita income of the origin country should also have a positive effect (Gil-Pareja *et al.*, 2007). Assuming that tourism is an individual activity, it may be more plausible to use the per capita GDP instead of GDP itself. Because the former reflects the purchasing power more.

The most controversial part of gravity model is, probably, the determination of distance. Some claim that this distance would preferably be the one between commercially important cities of the countries or the distance between capital cities. But, at global scale this choice does not make so much difference. Definition of the distance is also problematic, due to its time invariant nature. Although it is not a problem in cross sectional analysis, when time dimension entered in the analysis (i.e. panel-data) the variable causes to trouble. In order to overcome this difficulty and to make the distance a *varying variable* over time, various approaches have been suggested in the literature. These approaches suggest weighted definitions of distance. The distance we adopt in this paper is defined as;

$$WDIST_{ijt} = \frac{(DISTANCE_{ij} \times GDP_{it})}{\sum GDP_{it}}$$
 (6)

Where, $WDIST_{ijt}$ is the weighted distance between the countries i and j at year t; $dist_{ij}$ is the geographical distance between the countries i and j; GDP_{it} is GDP of the country i at year t; and $\sum GDP_i$ is overall sum of the GDPs of the countries for the years 1992 up to 2007.

Based on the distinction as to represent economic size we have estimated two alternative balanced panel-data models as below.

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Model I: log TI_{it} = \alpha_0 + \alpha_1 log GDP_{it} + \alpha_2 log POP_{it} + \alpha_3 log WDIST_{it} + \varepsilon_t
Model II: log TI_{it} = \beta_0 + \beta_1 log GDPPC_{it} + \beta_2 log POP_{it} + \beta_3 log WDIST_{it} + u_t
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Where *TI* is number of tourists from sampled countries, *GDP* (gross domestic product) and *GDPPC* (GDP per capita) are proxies for economic size of the source country, *POP* is mid-year population of the source countries, and *WDIST* is a weighted measure of the distance between source countries and Turkey. In this paper, considering the data availability, we have employed a balanced panel of 48 countries and 16 years of time span (1992-2007).

4. EMPIRICAL RESULTS

Estimation of the *Model I* and *Model II* are given in Table 4-5 below. As seen therein, results are highly sensitive to the specification of the model both in terms of the significance and sign of the coefficients. If the *Model I* is adopted, each variable has a highly significant effect on tourist inflows except the (weighted) distance (see Table 4). Economic size, as expected, seems to have positive impact on tourist inflow to Turkey. The value of the coefficient is slightly over the unit value which indicates that tourism is a luxury good. On the other hand *POP* also has a significant but an adverse signed coefficient which implies the more populated the country the lesser tourist inflow. This result can be explained as, if the economic size is represented by GDP this cannot adequately reflect the prosperity of population. So it would be more appropriate to use GDP per capita as a proxy for economic size.

Variables	Coefficients	Std. Error	t - statistics	Probability
α_0	- 9.9142	1.5546	- 6.3775	0.0000
log GDP	1.0651	0.0586	18.1645	0.0000
log POP	- 0.4155	0.0915	-4.5396	0.0000
log WDIST	0.0204	0.0403	0.5057	0.6132

Table 4: Estimation of Model I

Table 5 shows the estimation of *Model II* in which GDP per capita (*GDPPC*) is used to represent the economic size. In this case all variables seem have significant effect on tourist inflows. *GDPPC* positively affects the tourist arrivals and its coefficient is exceeds unit value which more strongly (compare Table 4) indicates that

tourism is a luxury good. It is evident from the table that, opposed to previous model, *POP* has a positive impact on tourist inflows to Turkey. This means that Turkey attracts more tourists from more crowded countries. Unlike the *Model I*, this time *WDIST* has a significant but positive effect on tourist arrivals. This result may be sourced from the features of the Turkey's tourism market. European countries constitute the biggest part of the market and here just the half of the sampled countries is from Europe. So Europe has a great weight in the sample. Since most of the big tourist senders placed at the far parts of Europe it may be seem as if the more far the country the more tourist inflows.

Variables	Coefficients	Std. Error	t - statistics	Probability
β_0	- 12.8328	1.5404	- 8.3311	0.0000
log GDPPC	1.5153	0.0716	21.1689	0.0000
log POP	0.5282	0.0814	6.4871	0.0000
log WDIST	0.0784	0.0358	2.1892	0.0289

Table 5: Estimation of Model II

5. CONCLUSION

Tourism is one of the most rapidly growing sectors in the world. Global tourism flows and tourism receipts show a stable increase in recent years. Therewith, as an effective tool, importance of tourism on economic growth and development increases. For most of the countries, tourism constitutes a prominent source of additional income, foreign exchange, employment and tax revenue.

Turkey is one of the foremost destinations in the world and today, tourism has become an importance-gaining sector in the Turkish economy. Therefore, in regards to develop the sector in a most planned and controlled manner it is important to determine the factors which have impact on Turkey's tourist inflow. In this paper we aimed to investigate these effective factors based on a panel gravity model framework in which the economic size, population and distance are key variables.

Based on the distinction as to represent economic size we have estimated two alternative balanced panel-data models. Results are highly sensitive to the specification of the model both in terms of the significance and sign of the coefficients. If GDP is adopted as a proxy for economic size each variable has a highly significant effect on tourist inflows except the (weighted) distance. It also worth to note that population has a negative effect on tourist number. On the other hand if GDP per capita is used instead of GDP all variables seem have significant effect on tourist inflows. GDP per capita positively affects the tourist arrivals and its coefficient is exceeds unit value which compared to previous model, more strongly indicates that tourism is a luxury good. In this latter case distance becomes a significant factor in explaining the tourist arrivals. But its sign is positive which is adverse to expectation. This may be explained by the features of the Turkey's tourism market.

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Appendix: Countries Included in the Sample.

Albania	China	Iceland	Mexico	Singapore
Argentina	Colombia	India	Netherland	Spain
Australia	Czech Rep.	Iran Ireland	New Zealand	Sweden
Austria	Denmark	Israel	Norway	Switzerland
Bangladesh	Egypt	Italy	Pakistan	Syria
Belgium	Finland	Japan	Philippines	U.K.
Brazil	France	Jordan	Poland	U. S. A.
Bulgaria	Germany	Lebanon	Portugal	Venezuela
Canada	Greece	Luxemburg	Romania	
Chile	Hungary	Malaysia	S. Arabia	