COINTEGRATION ANALYSIS OF TOURISM DEMAND FOR TURKEY

KETENCI, Natalya[1]

Abstract

This paper estimates the tourism demand model for Turkey from 14 countries: Austria, Belgium, Bulgaria, Denmark, France, Germany, Greece, Holland, Italy, Russia, Sweden, Switzerland, the United Kingdom and the United States. Different approaches were used to find cointegration in the considered model for the period from 1996 to 2000 on a monthly basis. From our results we found evidence at the high significance level of a long-run cointegration relationship among the variables. We found that income plays a more important role in the holiday-making decisions of tourists than the relative prices of the holiday destination. Inclusion in the model substitution destination decreased the degree of significance of relative Turkish prices in the demand model.

JEL Classification Codes: C32, C52, F14, F41

Keywords: tourism demand, elasticity, cointegration, vector error correction.

1. Introduction

Tourism is one of the important sectors in the Turkish economy. The contribution of tourism sector to the gross domestic product of Turkey is increasing with every year. The share of tourism in total exports increased from 6% in 1984 to 13% in 2007 with a peak of 19% in 2003. However, in real terms the income of tourism exports (in million dollars) continuously increased throughout these years, more than three times for the considered period between 1996 and 2007, or by 33 times from 1984 to 2007. The number of tourist arrivals has increased by 132% in the last 10 years (Turkish Statistical Institute, Central Bank of the Republic of Turkey). It increased from 8.5 million to 19.8 million tourists, with a sharp decline in 1999 to 7.5 million tourists following strong recovery in 2000, reaching 10.4 million tourists. The sharp decline was due to the earthquake in August 1999. According to the World Travel and Tourism Council (2008) the tourism economy in Turkey directly and indirectly accounts for 11.3% of the GDP. It is expected that in the forthcoming 10 years the tourism economy will grow by 4.8% annually.

Taking into account that tourism is one of the primary sources of foreign currency earning and employment generation, and considering the growing role of tourism in the economy of Turkey, it is surprising that so little attention has been paid to it in the literature and in particular to the economic determinants of the tourism for Turkey. Icos et al. (1998) in their research used a multivariable regression model where variables such as the number of ministry licensed hotel beds, the number of incoming travel agencies in Turkey, consumer price index and exchange rates show the number of tourists who came to Turkey from 10 selected European countries for the period between 1982 and 1993. The results of their study showed that the considered independent variables had slight effect on the number of tourists from selected European countries. The elasticities of the price index were found negative for most of the countries with high coefficient, while the

[1] Natalya Ketenci, Department of Economics, Yeditepe University, Kayisdagi, 34755, Istanbul, Turkey. E-mail: nketenci@yeditepe.edu.tr

elasticity of the coefficients of the foreign exchange rate variable displayed positive sign for most of the selected European countries.

A time period close to that of the previous paper was analyzed by Akis (1998), from 1980 to 1993. Akis focused only on the most important variables explaining tourism demand for Turkey using an approach similar to that of Smeral et al. (1992) in order to minimize some econometric problems such as multicollinearity and small degrees of freedoms. The national income of the tourist generating country and the relative price variables explain the tourism demand for Turkey in terms of the number of tourist arrivals from 18 selected countries. The findings of this research were similar to those of other studies on tourism demand. National income was found positively related to the number of tourist arrivals, while relative prices presented negative sign in relation to the number of tourist arrivals.

Halicioglu (2004) focused on a recent cointegration technique on the international tourism demand for Turkey in order to examine the main determinants that affect demand and to analyze the importance of a stable tourism demand equation. This paper's findings do not contradict previous empirical studies in the tourism economics literature. In addition, using stability tests it was found that a stable tourism demand function exists for the case of Turkey. This finding can be useful in tourism policy implementation, as "stability of a tourism demand function will reduce the uncertainty associated with the world economic environment." (Halicioglu, 2004). A limited number of studies as well in the foreign literature have focused on the theoretical and empirical analysis of tourism development in Turkey. See for example, Tosun (2001), Göymen (2000), Gezici (2006) and Akal (2004).

However, in the past several decades at the international level there has been a growing interest in tourism demand among researchers. Studies on tourism demand mainly are divided in two groups. One group uses time-series models, where tourism demand as a dependant variable is explored and forecasted according to historical trends without investigating the causes of the patterns. These studies mainly are based on the integrated autoregressive moving-average models (ARIMAs) and first were first proposed by Box and Jenkins (1970). See for example, Kulendran (1996), Kim and Song (1998), Martin and Witt (1989), Song et al. (2003) and Turner et al. (1997). Another group concentrates on the econometric approaches that explain the causal relationships between dependent and independent variables. At the same time, econometric techniques can be useful for policy recommendation by examining the estimated elasticities of tourism demand. Examples of studies based on econometric techniques are Dritsakis (2004), Song and Witt (2000), Song and Witt (2006), Witt et al. (2004), and Kulendran and Wilson (2000),

This paper presents a cointegration analysis of multivariate time series. This study differs from the previous empirical tourism studies on Turkey in how it employs an econometric model of tourism demand with the special case of substitute countries. Economic variables such as income of tourist generating country, relative prices of living in Turkey in relation to prices in tourist generating country and prices of living in substitute country are used to explain tourist arrivals to Turkey from 14 considered countries. Greece and Spain were chosen as substitute countries, due to the similarity in climatic factors. At the same time Greece and Spain, both Mediterranean countries, each has its own individuality. This study uses monthly data covering the period from 1996 to 2006.

2. The theoretical approach

In this study a vector auto regression model is used in order to measure the elasticities of income and relative prices in demand for Turkey from 14 countries. The number of tourists from these countries consists of 70% of all tourist arrivals to Turkey every year. The tourist demand function was taken as following:

$$Q_{it} = (Y_{it}, P_{it}, P_{jst}) \quad (1)$$

where Q_{it} is the number of tourist arrivals to Turkey from *i* country at *t* period. Y_{it} is the real income at *i* country origin at the *t* period, measured by real GDP at the 2000 constant prices. P_{it} is the relative price of Turkey compared to the tourists' origin *i* at the period *t* and measured by consumer price index (CPI), with 2000 as a base year. P_{jst} is the relative price of living for tourists in substitute destinations *j*=1,2, which are Greece and Spain, to price of living in Turkey and adjusted by the exchange rate. In the tourism-related literature it was found that variables such as tourists' income, relative cost of living, relative price of substitute destination and exchange rates are the most important variables of tourism demand modeling (see Lim, 1999; Lee et al., 2005).

Relative price of Turkey pit is calculated by the following formula:

$$P_{it} = \frac{CPI_T}{CPI_i xER_i}$$

where *CPI* and *ER* denote consumer price index and exchange rate, respectively, at the tourists' origin *i*, CPI_T is the consumer price index of Turkey. The relative price of the substitute destination is calculated by the following formula (Song, 2006):

$$P_{ist} = \frac{CPI_i xER_i}{CPI_T}$$

where *CPI* and *ER* denote consumer price index and exchange rate, respectively, at the substitute destination *i*=1,2, which are Greece and Spain. CPI_T is the consumer price index of Turkey. Transforming variables of the equation (1) to the logarithmic form we obtain the following equation:

$$\ln q_{it} = \alpha_0 + \alpha_1 \ln y_{it} + \alpha_2 \ln p_{it} + \alpha_3 \ln p_{jst} + \varepsilon_{it} \quad (2)$$

where ε is a stochastic disturbance term.

We assume that the coefficient of income of tourists' country of origin *i* - a_1 will be positively related with tourism demand in terms of tourist arrivals to Turkey. Generally, income elasticities are found positively related to the international tourism demand with relatively high value (Crouch, 1994). However, the coefficients of relative prices a_2 should be related negatively to the variable of tourism demand. For Bulgaria, Holland and Italy, exchange rate was used as a proxy of relative prices (see Unit Root); therefore, for these countries we make a hypothesis that exchange rate is related negatively to the tourism demand, because depreciation of foreign currency in relation to New Turkish Lira will make the prices of Turkish goods and services more expensive, while the appreciation of the foreign currency will attract tourists to Turkey for the relatively cheaper prices of goods and services. The relative prices of substitute destinations a_3 were included in the model as well, and it is supposed that they shall be related positively to the tourist arrivals variables. Higher relative prices in the substitute destination will attract more tourists to Turkey, while the lower relative prices of Greece and Spain will attract more tourists to those countries and consequently fewer tourists to Turkey. Therefore, the expected signs for parameters are as follows: $a_1>0$, $a_2<0$ and $a_3>0$.

3. Data description

The data set of this research includes 14 countries: Austria, Belgium, Bulgaria, Denmark, France, Germany, Greece, Holland, Italy, Russia, Sweden, Switzerland, the United Kingdom and the United States. These countries were chosen on the basis of tourism demand for Turkey. Only countries with the highest numbers of tourists entering Turkey were chosen. The number of tourists from each of the countries had to exceed 200,000 every year, which was a total of six million tourists in 1996 and increased to 13 million of tourists in 2006, composing around 70% of all tourist arrivals to Turkey. The number of tourists from countries like Georgia, Iran and Israel every year exceeds 200,000 as well; however, these countries were not included in the study due to the lack of relevant statistics for them. Monthly data were used covering the period from January 1996 to December 2006. The monthly statistics on the tourists flow to Turkey were obtained from the Turkish Statistical Institute. The quarterly data for real GDP were obtained from the official site of the Organization for Economic Co-operation and Development. The absent data necessary for the completing the monthly set were generated through extrapolation using the exponential smoothing method.

Monthly data are rarely used in model estimations due to the absence of monthly GDP data. However, there are some studies which pay special attention to monthly set usage in estimations and the findings of these studies are that monthly models generally outperform models that use purely quarterly data (Barhoumi et al., 2008). Thus Salazar and Weale (1999) showed in their study the importance of using monthly data in the VAR model. They demonstrated that interpolated monthly data can be used in estimations, with a definite risk of measurement error problem. At the same time they found that the monthly model contributes little to the quarterly forecast. However, it was found that an important role in the building up of a picture of the current quarter is played particularly by the monthly model.

The GDP data are used for the income variables of the demand model, where 2000 is the base year. The monthly CPI of selected countries are used in the calculation of foreign relative price variables and obtained from the Organization for Economic Co-operation and Development website as well. The real GDP and CPI data for Russia and Bulgaria were obtained from the Central Bank of the Russian Federation and from the Bulgarian National Bank. The nominal exchange rates are the national currencies per new Turkish lira, which are used in the calculation of foreign relative price variables as well and are obtained from the Central Bank of Turkey, except for Russia and Bulgaria, where national exchange rates per US dollar were taken from the national Central Banks of these countries and then recalculated into the Turkish lira parity. The time series of the exchange rate for Greece and Spain were obtained from the website Economagic.com. Greece and Spain were chosen as substitute destinations. All variables used in the model are measured in log levels.

4. Unit root and cointegration tests.

In order to test cointegration relations between the variables of equation (2) it is necessary to test for the non-stationarity of these variables. Therefore, first we applied the unit root test in order to find the stationarity of our variables (see Table 1 in the Annex). The country column shows the 14 selected countries in alphabetical order and the

variables column shows variables which have been tested for the stationarity. They are: the number of tourists visited Turkey, the national income of the country-origin (GDP) and the relative price indexes (CPI). For Bulgaria, Holland and Italy exchange rate (ER) was added due to the stationarity of relative price indexes. Therefore, in these countries exchange rate was considered as a proxy of relative prices.

In order to test the integration properties of variables we used the Dickey and Fuller (1979) Augmented Dickey-Fuller (ADF) test; the Phillips-Perron (1988) test; the Kwiatkowski, Phillips, Schmidt, and Shin (1992) KPSS test; and finally the Elliott, Rothenberg, and Stock (1996) DF-GLS unit root tests. The ADF test constructs a parametric correction for higher-order correlation. The lag length for the ADF tests was selected to ensure that the residuals were white noise. Testing for the integration properties of variables the Phillips-Perron test proposes a nonparametric method of controlling for serial correlation. This method estimates the non-augmented Dickey-Fuller test. In the DF-GLS test the simple modification of the ADF test is proposed where data are de-trended in order to maximize power. The main difference of the KPSS test from the other above-described tests is that the series are assumed to be stationary (no unit root) under the null hypothesis, while the null hypothesis of the described above tests assumes the non-stationarity of series.

Table 1 presents the results of the unit root tests. Every test includes the results of estimations with constant (*c*) or with constant and trend (*ct*) together. Stationarity columns (S) show the level of the integration of series, where *I*(0) denotes the stationarity of a variable or absence of the unit root, and *I*(1) indicates the non-stationarity of a variable or existence of the unit root. It is obvious that at conventional levels of significance almost none of the variables represents a stationary process when it is at levels, with the exception of the relative price variables of Bulgaria, Holland and Italy. The non-stationarity of these series is rejected by the majority of tests, and stationarity is accepted by the KPSS test in the majority of cases. Therefore, for these countries, the exchange rate was taken as a proxy of the foreign relative price variable. Unit root tests indicated the evidence of the non-stationarity of exchange rates for Bulgaria, Holland and Italy. Therefore, we conclude that all considered variables except the *relative price* variables of Bulgaria, Holland and Italy are integrated in order 1 or *I*(1) there was found evidence of unit root presence. As a result, we can test the cointegration relationships for all considered variables in selected countries. However, the cointegration relationship for Bulgaria, Holland and Italy is tested for the number of tourists, income variables and for exchange rate (as a proxy of foreign relative price index) due to the stationarity of the *relative price* variable.

Spain and Greece are taken in this study as substitute countries for Turkey. The price of a substitute country was taken as the relative CPI of this country to the relative CPI of Turkey adjusted by the exchange rate. According to the unit root analysis we have enough evidence to conclude that the *relative price* of Spain has a unit root. The *relative price* of Greece was found non-stationary as well in the above analysis. Therefore, we can include these two variables to the cointegration analysis for testing long-run relationships between the considered variables. The stationarity of the linear combination of a group of non-stationary series is defined by the cointegration test. In order to find the long-run equilibrium relationship among variables, the linear combination of the non-stationary time series has to be stationary.

To see whether there is any cointegration relationship between the explanatory variables and the dependent variable we used different estimation procedures such as the Ordinary Least Square (OLS) test (Engle and Yoo, 1987), the fully modified OLS (FM-OLS) test (Phillips and Hansen, 1990) the dynamic OLS (DOLS) test (Saikkonen, 1991; Stock and Watson, 1993), the Autoregressive Distributed Lag (ARDL) and the multivariate maximum likelihood procedure of Johansen (JOH-ML) (Johansen, 1988, 1991). Each method has different advantages and disadvantages. For example, the OLS estimates provide consistent coefficients of the long-run model, but standard errors are unreliable where the long-run model estimates suffer from small-sample bias. Therefore, the OLS estimators showed little evidence of efficiency. However, in some studies the opposite results were found, thus Lim and McAleer (2002) found that real income (as measured by the logarithm of real private consumption expenditures per capita in the tourism study) is significant when ordinary least squares estimation is used compared to the traditional cointegration technique, such as the JOH-ML test.

The FM-OLS test was designed to estimate cointegrating relationship between considered variables directly by modifying the OLS to determine serial correlation effects and endogeneity in variables that can exist due to cointegrating relationships. At the same time this method allows the provision of an estimator that follows a normal distribution asymptotically. In the FM case, nonparametric techniques are used to transform the residuals from the cointegration regression and to exclude nuisance parameters.This method was found useful for practitioners, as the FM corrections allow determining the investigator additional information on important features of the data (Phillips, 1995). For the time-series model we have the following cointegrated system:

$$y_{it} = \alpha_i + \beta_i x_{it} + u_{it}, \text{ where } \quad x_{it} = x_{it-1} + \varepsilon_{it} \tag{3}$$

With the stationary vector error process $\varpi_{it} = (u_{it}, \varepsilon_{it})'$ conditioned to the long-run covariance matrix of the joint residual process.

In the DOLS estimates, however, leads and lags eliminate asymptotically any possible bias due to endogeneity or serial correlation. Therefore, they are asymptotically efficient in Saikkonen's (1991) and Stock and Watson's (1993) sense, having an asymptotic distribution that is a random mixture of normals. As shown in Stock and Watson (1993), the presence of lead and lag values of the differenced variables in the estimation process deals with the simultaneity bias as well as with the small sample bias that is a problem in the OLS tests. Therefore, assuming that all considering variables are non-stationary, the DOLS estimation equation can be written as:

$$\ln q_{it} = \alpha_0 + \alpha_1 \ln y_{it} + \alpha_2 \ln p_{it} + \alpha_3 \ln p_{jst} + \sum_{k=-K}^{K} \delta_k \Delta \ln y_{it-k} +$$

$$+ \sum_{k=-K}^{K} \eta_k \Delta \ln p_{it-k} + \sum_{k=-K}^{K} \lambda_k \ln p_{jst-k} + u_{it} \tag{4}$$

In order to determine the number of lags and leads, K, Akaike Information Criterion was used. As a result, for every country the number of lags and leads may differ.

The ARDL and JOH-ML estimates are also asymptotically efficient and yield covariance matrices appropriate for inference. The ARDL test is used to capture the

dynamics of economics activities, and introduced by Song and Witt (2000) in the tourism modeling and forecasting. In this model, the time lag of tourists' decision-making process is taken into account. For annual data, two lags were proposed to be used, and more time lags may be introduced if quarterly or monthly data are used. However, for different countries different time lags were used as autoregressive order and time lags introduction was chosen on the basis of the Akaike Information Criterion. The estimations of the ARDL test are based on the following equation:

$$\Delta \ln q_{it} = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta \ln q_{i(t-1)} + \sum_{i=0}^{n} \beta_{2i} \Delta \ln y_{i(t-1)} + \sum_{i=0}^{n} \beta_{3i} \Delta \ln p_{i(t-1)} + \sum_{i=0}^{n} \beta_{4i} \Delta \ln p_{js(t-1)} + \beta_5 \ln q_{i(t-1)} + \beta_6 \ln y_{i(t-1)} + \beta_7 \ln p_{i(t-1)} + \beta_8 \ln p_{js(t-1)} + \varepsilon_t \quad (5)$$

The null hypothesis of no cointegration is H_0: $\beta_5=\beta_6=\beta_7=\beta_8=0$ and the alternative hypothesis of cointegration is H_0: $\beta_5\neq\beta_6\neq\beta_7\neq\beta_8\neq0$.

The Johansen methodology is based on the following VAR:

$$z_t = A_1 z_{t-1} + A_2 z_{t-2} + \ldots + A_k z_{t-k} + B x_t + u_t \quad (6)$$

Where z_t is (nx1) vector of non-stationary variables, x_t is (nx1) vector of deterministic variables, A_i is (nxn) (i=1,2,…k) matrix of unknown parameters to be estimated, and u_t is the (nx1) vector of error terms. Following the Johansen methodology equation (6) can be rewritten as vector error correction model:

$$\Delta z_t = \Pi z_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta y_{t-1} + B x_t + u_t \quad (7)$$

where

$$\Pi = \sum_{i=1}^{k} A_i - I \qquad \text{and} \quad \Gamma_i = -\sum_{j=i+1}^{k} A_j$$

I is an (nxn) identity matrix, Γ_j and Π are (nxn) matrices of parameters representing the short-run and the long-run impacts, respectively. Reducing the rank of Π matrix to *r* it can be rewritten as the product of two (nxr) matrixes λ and β: $\Pi = \lambda\beta'$, where λ reflects the speed of adjustment toward equilibrium, while β is a matrix of long-run coefficients. Johansen methodology consists in estimating Π matrix from equation (7). However, the JOH-ML method is sensitive to the number of lags included and this method does not perform very well in small samples.

a. Cointegration Test Result

The cointegration relationships are estimated by using different estimation procedures such as the OLS, FM-OLS, DOLS, ARDL and JOH-ML. It is common in the literature to include two lags and two leads in DOLS estimates (Stock and Watson, 1993). In the ARDL, we decided the appropriate autoregressive order by using the Akaike Information Criterion. In the JOH-ML estimates, one important thing is the selection of lag order. We focus mainly on two selection criteria that are commonly used in the literature: the Sims (1980) sequential modified likelihood ratio test and the Schwarz criterion. We used a maximum lag order of 10, and modified likelihood ratio. It selects

eight lags for Bulgaria, seven lags for Russia and six lags for the United Kingdom. While four lags were chosen for Belgium, three lags were preferred for Austria, France, Holland and Italy. Two lags were chosen for Denmark, Germany, Sweden and the United States and one lag was preferred for Greece and Switzerland. We tested autocorrelation by using the Lagrange Multiplier for lags up to six and tested for White heteroskedasticity. We relied on modified likelihood ratio for the reason that there is no evidence for heteroskedasticity and no serial autocorrelation for these lag orders.

As mentioned before in this section, we report the cointegration test results for the selected countries in order to find out whether the residuals of the tested variables are stationary. For all selected countries except Bulgaria, Holland and Italy, all of the considered variables, q_{it}, y_{it}, p_{it}, p_{jst} (in equation 2), are nonstationary; however, their linear combination might be stationary. Specifically, we need to test the following equation:

$$u_t = q_{it} - \alpha_0 - \alpha_1 y_{it} - \alpha_2 p_{it} - \alpha_3 p_{jst} \quad (8)$$

and to find if u_t, regression residuals are stationary I(0). In order to find this, we need to estimate the cointegrating relationship $q_{it} = \alpha_0 + \alpha_1 y_{it} + \alpha_2 p_{it} + \alpha_3 p_{jst}$ while for Bulgaria, Holland and Italy, according to the unit root test results (see Table 1), we will estimate the following cointegrating relationship $q_{it} = \alpha_0 + \alpha_1 y_{it} + \alpha_2 e_{it} + \alpha_3 p_{jst}$, where as a proxy of the relative price of Turkey, the exchange rate was taken – e_{it}.

Table 2 presents cointegration test results by using the OLS, FM-OLS, DOLS, ARDL and JOH-ML tests, as discussed earlier. We used alternative tests to find cointegrating relationships in order to control their results and to maximize the power of the found evidence. Based on the results, we found strong evidence of the cointegrating relationship between considered variables in all selected countries, as all five presented test estimations confirmed cointegration with a one percent significance level. Therefore, we can conclude that there is strong support for long-run tourist demand relationships in the model. Thus without the exclusion of any considered country we can proceed with the tests of cointegration coefficients for finding long-run elasticities and further with the test of the vector error correction model in order to find short-run adjustment dynamics to the long-run equilibrium of the tourism demand model.

Table 2. Cointegration Test Results

Country	**OLS**[a]	**L**	**FM-OLS**[a]	**L**	**DOLS**[a]	**L**	**ARDL**[a]	**L**	**JOH**[b]
Austria	-0.54*** (0.06)	3	-0.53*** (0.06)	3	-0.51*** (0.06)	3	-0.50*** (0.09)	1	91.29 ***
Belgium	-0.62*** (0.05)	3	-0.63*** (0.06)	3	-1.01*** (0.12)	6	-0.46 (0.23)	6	80.14 ***
Bulgaria	-0.18** (0.05)	1	-0.26*** (0.06)	1	-0.28*** (0.07)	1	-1.09*** (0.13)	1	40.15 ***
Denmark	-0.69*** (0.07)	4	-0.68*** (0.07)	4	-0.53*** (0.05)	3	-0.49 (0.19)	5	79.47 ***
UK	-0.57*** (0.12)	6	-0.65*** (0.13)	6	-1.00*** (0.10)	5	-0.24 (0.16)	6	62.15 ***
US	-0.36*** (0.06)	2	-0.37*** (0.06)	2	-0.34*** (0.06)	1	-1.12*** (0.13)	1	63.41 ***
France	-0.73*** (0.08)	4	-0.81*** (0.08)	4	-0.75*** (0.08)	4	-1.09*** (0.13)	1	94.03 ***
Germany	-0.52***	3	-0.43***	2	-0.41***	2	-1.02***	1	69.65

	(0.07)		(0.06)		(0.06)		(0.13)		***
Greece	-0.39*** (0.08)	1	-0.39*** (0.08)	1	-0.38*** (0.08)	1	-0.96*** (0.13)	1	32.01 **
Holland	-0.69*** (0.06)	3	-0.92*** (0.10)	4	-0.63*** (0.06)	3	-0.40 (0.20)	6	109.59 ***
Italy	-0.41*** (0.06)	2	-0.41*** (0.06)	2	-0.42*** (0.06)	2	-1.19*** (0.13)	1	68.20 ***
Russia	-0.57*** (0.13)	6	-1.00*** (0.19)	6	0.42*** (0.09)	1	-0.53*** (0.14)	2	35.02 **
Sweden	-0.56*** (0.11)	6	-0.69*** (0.07)	4	-0.38 *** (0.09)	6	-0.59* (0.19)	4	83.83 ***
Switzerland	-0.32*** (0.07)	1	-0.34*** (0.07)	1	-0.31*** (0.07)	1	-0.88*** (0.12)	1	41.65 ***

*, **, *** indicate significance at 10%, 5% and 1% levels, respectively; standard errors for the coefficient estimate are given in parenthesis. [a] OLS, FM-OLS, DOLS and ARDL tests of H_0: No cointegration, significance based on MacKinnon (1991). [b] Johansen one-sided upper-tail test of H_0: No cointegration; 10, 5, and 1 percent critical values equal -27.07, -29.8, and -35.46 respectively. Numbers of cointegration equation(s) at the 5 percent significance level are shown

b. Cointegration Coefficient Estimates

Tables 3a, 3b and 3c report coefficient estimates for chosen cointegration tests which represent the long-run elasticities of income and relative prices in Table 3a, long-run elasticities of income, relative prices and relative prices in a substitute destination. Greece, in Table 3b, and finally Table 3c, represents long-run elasticities; Spain represents income, relative prices, and relative prices in a substitute destination. We assumed that $a_1>0$, $a_2<0$ and $a_3>0$ (equation 2), which are income and relative price at the substitute destination are positively related to the tourist arrivals variable, while the relative prices variable is supposed to be negatively related to the tourist demand. For the cases of Bulgaria, Holland and Italy the exchange rate was accepted as a proxy of relative prices variable and it is assumed to be negatively dependent on tourist arrivals variable.

From Table 3a, where the compact tourism model was estimated (relative price of substitute destinations is not included here) we can see that income elasticities for all selected countries produced positive sign and all of the estimates show significance at a one percent level, which confirm positive relations between tourists' income and their demand for Turkey. Only one exception was found in these estimations, which is Holland, where the majority of reported tests presented negative sign of income elasticity and none of them was found to be significant. The high magnitude of income coefficients suggests that holidays from selected countries' residents to Turkey are luxuries. The highest value of long-run elasticity of income was reported for Italy (between 13.44 and 25.13) and for Switzerland (between 12.82 and 15.71). Such high elasticities for these two countries could be explained by already existing favorable natural and climatic conditions in tourist-generating countries; therefore, Turkey can be attractive for these countries in terms of different culture or heritage. Only the JOH-ML test provided opposite signs for all examined countries. However, as was discussed before, especially the JOH-ML test is very sensitive to lags choice and may not be reliable in small samples.

Table 3a. Cointegration Coefficient Estimates

Country	**OLS**		**FM-OLS**		**DOLS**		**ARDL**		**JOH-ML**	
Austria	7.01 ***	(1.42)	6.49 ***	(1.42)	6.25 ***	(1.69)	5.18 ***	(1.02)	-5.24 ***	(1.14)
	-2.44 ***	(0.74)	-2.32 ***	(0.74)	-2.25 **	(0.97)	-1.09 **	(0.52)	1.14 **	(0.62)
Belgium	8.96 ***	(1.41)	8.33 ***	(1.40)	7.17 ***	(1.60)	6.79 ***	(0.66)	-6.27 ***	(0.77)
	-1.83 ***	(0.77)	-1.60 **	(0.77)	-0.88	(0.96)	-0.38	(0.38)	-0.03	(0.45)
Bulgaria	3.22 ***	(0.28)	2.85 ***	(0.29)	4.10 ***	(0.41)	1.55 ***	(0.23)	-1.57 **	(0.83)
	0.25 ***	(0.07)	0.30 ***	(0.07)	0.21 **	(0.08)	0.05	(0.12)	-0.65 ***	(0.15)
Denmark	10.28 ***	(2.31)	9.22 ***	(2.32)	10.04 ***	(2.99)	7.40 ***	(1.39)	-7.00 ***	(2.66)
	-3.21 ***	(1.09)	-2.82 ***	(1.09)	-3.11 **	(1.52)	-1.33 **	(0.67)	1.19	(1.29)
UK	5.36 ***	(1.55)	4.89 ***	(1.59)	3.94 **	(1.89)	2.62 ***	(0.37)	-1.64 ***	(0.52)
	-1.71 *	(1.09)	-1.40	(1.10)	-0.07	(1.41)	0.86 ***	(0.28)	-1.61 ***	(4.19)
US	3.48 ***	(0.65)	3.29 ***	(0.66)	3.07 ***	(0.89)	2.71 ***	(1.02)	-1.30	(1.06)
	-0.87 ***	(0.37)	-0.72 **	(0.37)	-0.33	(0.49)	-0.52	(0.49)	-0.42	(0.59)
France	5.69 ***	(1.06)	5.11 ***	(1.06)	3.39 ***	(1.37)	4.39 ***	(0.67)	-3.61 ***	(0.97)
	-1.21 **	(0.59)	-0.97 *	(0.59)	-0.01	(0.81)	-0.22	(0.39)	-0.33	(0.57)
Germany	10.56 ***	(1.72)	9.56 ***	(1.72)	9.66 ***	(2.30)	8.08 ***	(1.73)	-5.85 ***	(2.44)
	-1.91 ***	(0.56)	-1.71 ***	(0.56)	-1.71 **	(0.79)	-0.95 **	(0.54)	0.00	(0.81)
Greece	4.02 ***	(0.25)	3.99 ***	(0.25)	4.16 ***	(0.28)	3.98 ***	(0.46)	-4.23 ***	(0.56)
	-0.58 **	(0.28)	-0.56 **	(0.28)	-0.79 **	(0.34)	-0.35	(0.44)	0.13 **	(0.62)
Holland	-1.41	(3.89)	-0.88	(4.00)	-0.71	(4.79)	-0.24	(2.72)	0.98	(3.02)
	0.75 ***	(0.29)	0.64 **	(0.30)	0.70 **	(0.39)	0.65 ***	(0.20)	-0.65 ***	(0.24)
Italy	17.47 ***	(5.16)	18.17 **	(5.28)	25.13 ***	(6.78)	13.44 **	(5.82)	-26.42 ***	(6.58)
	-0.40 **	(0.23)	-0.47 **	(0.24)	-0.78 ***	(0.32)	-0.26	(0.27)	0.92 ***	(0.31)
Russia	5.16 ***	(0.41)	4.52 ***	(0.39)	4.22 ***	(0.30)	3.93 ***	(0.25)	-3.39 ***	(0.66)
	-0.65 ***	(0.08)	-0.59 ***	(0.08)	-0.53 ***	(0.05)	-0.45 ***	(0.05)	0.09	(0.11)
Sweden	8.78 ***	(1.96)	7.93 ***	(1.95)	7.66 ***	(2.57)	5.11 ***	(1.17)	-3.99 **	(2.19)
	-3.59 ***	(1.11)	-3.21 ***	(1.10)	-2.90 **	(1.53)	-1.26 **	(0.68)	0.63	(1.26)

Switzerland	14.87***	(1.83)	14.12***	(1.83)	15.71***	(2.31)	12.82***	(3.34)	-19.11***	(4.35)
	-2.50***	(0.66)	-2.35***	(0.67	-2.93***	(0.94)	-2.07**	(0.96)	5.15***	(1.59)

*, **, *** indicate significance at 10%, 5% and 1% levels, respectively; standard errors for the coefficient estimate are given in parenthesis. For each country the 1st row corresponds to α_1 and the 2nd to α_2. α_1 α_2 are elasticities of income and relative prices from equation 3 (for Bulgaria, Holland, Greece and Italy - exchange rate was taken instead of the relative price index due to its stationarity, see Unit Root)

Table 3b. Cointegration Coefficient Estimates - **Greece**

Country	**OLS**		**FM-OLS**		**DOLS**		**ARDL**		**JOH-ML**	
Austria	7.47***	(1.76)	7.19***	(1.75)	7.85***	(2.62)	5.51***	(1.15)	-2.43	(2.03)
	-3.76	(3.06)	-4.39*	(3.15)	-6.41	(5.38)	-2.13	(1.76)	-5.60*	(3.88)
	1.32	(2.97)	2.04	(3.06)	3.62	(4.96)	1.04	(1.76)	6.16**	(3.71)
Belgium	10.34***	(1.67)	9.82***	(1.65)	9.05***	(2.22)	6.85***	(0.90)	-7.19***	(1.59)
	-6.69**	(3.27)	-7.11**	(3.39)	-7.38*	(5.12)	-0.36	(1.64)	2.53	(3.49)
	4.81*	(3.15)	5.39*	(3.26)	5.91	(4.69)	0.05	(1.55)	-1.84	(3.31)
Bulgaria	2.95***	(0.28)	2.59***	(0.29)	3.74***	(0.39)	1.59***	(0.26)	-2.83***	(0.47)
	0.28***	(0.06)	0.33***	(0.07)	0.24***	(0.08)	0.12	(0.13)	-0.49***	(0.09)
	1.16***	(0.31)	0.96***	(0.32)	0.16	(0.35)	0.05	(0.38)	1.17***	(0.35)
Denmark	8.25***	(2.83)	6.97***	(2.82)	6.84**	(4.05)	3.41***	(2.49)	-0.77	(2.91)
	0.44	(3.12)	1.26	(3.12)	2.64	(4.21)	5.56***	(1.44)	-8.25***	(3.18)
	-3.46	(2.78)	-3.88*	(2.77)	-5.46*	(3.33)	-6.32***	(1.44)	8.21***	(2.72)
UK	5.43***	(1.55)	4.83***	(1.59)	3.16*	(2.07)	2.68***	(0.36)	-3.46***	(0.47)
	-1.07	(1.29)	-0.75	(1.31)	1.28	(1.60)	1.31***	(0.29)	-0.83***	(0.34)
	-1.07	(1.14)	-1.08	(1.15)	-1.51	(1.23)	-0.54***	(0.23)	0.59***	(0.19)
US	2.98***	(0.71)	2.79***	(0.71)	2.15**	(0.99)	2.59***	(1.01)	2.76***	(0.91)
	-0.98***	(0.37)	-0.84**	(0.37)	-0.32	(0.47)	-0.63	(0.53)	-2.15***	(0.39)
	0.88**	(0.49)	0.93**	(0.49)	1.29**	(0.59)	0.39	(0.62)	-1.32***	(0.50)
France	6.81***	(1.43)	6.18***	(1.42)	2.88*	(2.08)	5.19***	(0.89)	8.42***	(2.39)
	-4.33*	(2.76)	-4.09*	(2.82)	0.57	(4.03)	-2.57*	(1.76)	-21.18***	(4.31)
	3.09	(2.67)	3.04	(2.72)	-0.43	(3.69)	2.29*	(1.67)	17.46***	(3.77)
Germany	8.99***	(2.24)	8.49***	(2.23)	5.19*	(3.31)	6.14***	(1.93)	0.62	(4.62)

	0.23	(2.06)	-0.19	(2.08)	3.32	(2.93)	2.05	(1.66)	-6.94 *	(4.33)
	-2.13	(1.98)	-1.47	(1.99)	-4.42 **	(2.60)	-3.01	(1.59)	6.51 *	(4.14)
Holland	8.19 *	(5.66)	8.27 *	(5.86)	9.14	(7.31)	1.78	(4.07)	3.77	(17.65)
	0.17	(0.38)	-0.13	(0.39)	-0.25	(0.51)	0.53 **	(0.27)	1.01	(1.20)
	-2.48 **	(1.08)	-2.55 **	(1.11)	-2.27 *	(1.45)	-0.51	(0.76)	-3.32	(3.29)
Italy	28.71 ***	(5.90)	29.23 ***	(6.11)	41.34 ***	(7.79)	17.61 ***	(6.57)	-27.89 ***	(5.96)
	-0.78 ***	(0.25)	-0.99 ***	(0.26)	-1.53 ***	(0.34)	-0.41 *	(0.29)	1.01 ***	(0.26)
	-2.37 ***	(0.68)	-2.66 ***	(0.69)	-3.49 ***	(0.91)	-0.86	(0.72)	0.94 *	(0.69)
Russia	5.17 ***	(0.43)	4.53 ***	(0.42)	4.38 ***	(0.33)	3.91 ***	(0.27)	-3.29 ***	(0.37)
	-0.66 ***	(0.10)	-0.60 ***	(0.10)	-0.60 ***	(0.07)	-0.45 ***	(0.06)	0.44 ***	(0.08)
	0.04	(0.56)	0.10	(0.54)	0.58 *	(0.39)	-0.04	(0.32)	-0.26	(0.44)
Sweden	10.00 ***	(3.26)	8.88 ***	(3.24)	5.54	(5.04)	1.17	(1.88)	1.83	(3.77)
	-4.84 **	(2.87)	-4.21 *	(2.87)	-0.98	(4.37)	2.64 *	(1.63)	-5.09 *	(3.29)
	1.14	(2.43)	0.92	(2.42)	-1.33	(3.20)	-3.38 ***	(1.29)	4.71 **	(2.62)
Switzer land	11.97 ***	(1.95)	11.26 ***	(1.95)	12.15 ***	(2.49)	11.05 ***	(3.56)	-20.67 ***	(4.89)
	0.95	(1.20)	1.15	(1.21)	2.13 *	(1.57)	0.23	(2.13)	3.62	(3.05)
	-3.92***	(1.16)	-3.99 ***	(1.16)	-5.98 ***	(1.37)	0.69 ***	(0.07)	4.25 *	(2.91)

*, **, *** indicate significance at 10%, 5% and 1% levels, respectively; standard errors for the coefficient estimate are given in parenthesis. For each country rows 1st, 2nd and 3rd correspond, respectively to α_1 α_2 α_3, which are elasticities of income, relative prices and relative prices of substitution destination from equation 3 (for Bulgaria, Holland, Greece and Italy - exchange rate was taken instead of the relative price index due to its stationarity, see Unit Root)

Table 3c. Cointegration Coefficient Estimates **- Spain**

Country	**OLS**		**FM-OLS**		**DOLS**		**ARDL**		**JOH-ML**	
Austria	6.46 ***	(1.63)	6.54 ***	(1.61)	5.64 ***	(1.76)	5.27 ***	(1.08)	-5.26 ***	(1.75)
	0.84	(4.76)	-2.33	(4.71)	-0.61	(6.06)	-1.77	(2.57)	5.64	(5.68)
	-3.39	(4.86)	-0.04	(4.81)	-1.66	(6.42)	0.72	(2.68)	-5.23	(5.87)
Belgium	8.63 ***	(1.49)	8.51 ***	(1.46)	7.44 ***	(1.56)	6.69 ***	(0.81)	-6.17 ***	(1.41)
	1.97	(5.30)	-3.19	(5.24)	-1.99	(7.06)	2.08	(2.27)	2.41	(5.85)
	-3.91	(5.39	1.59	(5.32	0.82	(7.51	-2.51	(2.34	-2.72	(6.04)

		)		)		)		)		
Bulgaria	2.73 ***	(0.27)	2.41 ***	(0.29)	3.61 ***	(0.42)	1.61 ***	(0.26)	-3.10 ***	(0.53)
	0.29 ***	(0.06)	0.35 ***	(0.07)	0.24 ***	(0.08)	0.15	(0.13)	-0.45 ***	(0.09)
	1.59 ***	(0.29)	1.42 ***	(0.32)	0.59 *	(0.39)	0.20	(0.39)	1.46 ***	(0.43)
Denmark	5.81 **	(3.14)	4.61 *	(3.16)	-1.08	(4.01)	1.35	(1.21)	1.77	(3.17)
	7.98*	(5.49)	8.15 *	(5.49)	15.19 ***	(6.41)	13.11 ***	(1.95)	-16.91 ***	(5.42)
	-10.64 **	(5.11)	-10.55 **	(5.13)	-17.95 ***	(5.75)	-13.72 ***	(1.77)	17.27 ***	(4.98)
UK	5.62 ***	(1.56)	4.78 ***	(1.58)	2.39	(2.08)	2.74 ***	(0.36)	-2.02 ***	(0.34)
	-0.79	(1.33)	-0.31	(1.36)	2.31 *	(1.65)	1.18 ***	(0.30)	-1.81 ***	(0.27)
	-1.50	(1.25)	-1.75	(1.39)	-2.89 **	(1.44)	-0.61 **	(0.26)	0.65 ***	(0.21)
US	3.11 ***	(0.73)	2.73 ***	(0.73)	2.09 **	(1.07)	2.54 ***	(1.02)	-2.03 **	(1.13)
	-0.99	(0.38)	-0.84 **	(0.38)	-0.37	(0.48)	-0.69	(0.56)	0.31	(0.56)
	0.61	(0.54)	0.76 *	(0.54)	1.18 **	(0.66)	0.48	(0.70)	-1.17 *	(0.80)
France	4.98 ***	(1.26)	5.14 ***	(1.23)	3.72 ***	(1.31)	4.23 ***	(0.74)	-2.81 ***	(0.76)
	2.57	(3.61)	-0.69	(3.52)	2.59	(4.02)	0.81	(2.13)	0.87	(2.42)
	-3.88	(3.66)	-0.41	(3.56)	-3.77	(4.29)	-1.09	(2.22)	-1.68	(2.61)
Germany	8.24 ***	(2.54)	8.86 **	(2.47)	6.63 **	(3.04)	6.22 ***	(2.15)	-7.70 **	(4.55)
	2.44	(3.57)	-0.38	(3.46)	4.36	(4.21)	2.89	(2.82)	0.89	(6.58)
	-4.38	(3.55)	-1.43	(3.43)	-6.54 *	(4.20)	-3.97 *	(2.89)	0.64	(6.54)
Greece	3.99 ***	(0.29)	3.89 ***	(0.29)	4.25 ***	(0.36)	4.20 ***	(0.52)	-9.52 ***	(1.98)
	-0.74	(1.15)	-1.58*	(1.17)	-1.05	(1.56)	1.75	(1.74)	-25.96 ***	(8.04)
	0.17	(1.20)	0.99	(1.22)	-0.18	(1.77)	-2.23	(1.81)	35.49 ***	(8.44)
Holland	8.23*	(5.41)	8.23 *	(5.28)	9.80 *	(6.39)	1.12	(3.86)	-5.95	(13.49)
	0.21	(0.36)	-0.14	(0.35)	-0.41	(0.44)	0.57 **	(0.25)	1.38	(0.91)
	-2.68 ***	(1.07)	-3.29 ***	(1.04)	-3.37 ***	(1.41)	-0.38	(0.77)	1.14	(2.66)
Italy	26.89 ***	(5.56)	28.01 ***	(5.51)	40.39 ***	(6.56)	18.47 ***	(6.32)	-30.82 ***	(6.36)
	-0.67 ***	(0.24)	-0.94 ***	(0.24)	-1.63 ***	(0.29)	-0.42 *	(0.28)	1.26 ***	(0.28)
	-2.42 ***	(0.66)	-3.00 ***	(0.65)	-4.16 ***	(0.88)	-1.23 **	(0.74)	1.59 **	(0.81)

Russia	5.09***	(0.42)	4.47***	(0.41)	4.27***	(0.32)	3.89***	(0.26)	-3.24***	(0.36)
	-0.61***	(0.11)	-0.56***	(0.10)	-0.57***	(0.07)	-0.43***	(0.06)	0.44***	(0.08)
	-0.38	(0.57)	-0.19	(0.55)	0.37	(0.42)	-0.20	(0.34)	-0.32	(0.45)
Sweden	9.42***	(3.53)	8.98***	(3.49)	8.69**	(5.07)	2.63*	(1.95)	-2.41	(3.03)
	-4.43	(3.56)	-4.37	(3.52)	-3.78	(4.94)	1.58	(1.92)	-1.67	(2.97)
	0.69	(3.16)	1.01	(3.13)	0.33	(4.11)	-2.67*	(1.69)	2.77	(2.52)
Switzerland	10.89***	(2.09)	10.25***	(2.10)	10.19***	(2.56)	9.79***	(3.84)	-12.09***	(4.32)
	3.05**	(1.77)	3.03**	(1.73)	5.59***	(2.12)	2.19	(3.07)	-3.29	(3.60)
	-6.03***	(1.74)	-5.83***	(1.75)	-9.23***	(2.07)	-4.59*	(3.13)	8.00**	(3.62)

Notes: See table 3b).

The estimates of relative price variables almost in all cases exhibited negative sign with high significance level. The magnitude of the long-run elasticity of relative prices varies between -4.0 and -0.4. Tourists from Austria, Belgium, Denmark, Germany, Sweden and Switzerland seem very sensitive to changes in the relative prices of Turkey, while estimations for Bulgaria, Greece, Holland, Italy and Russia exposed price inelasticity to tourism in Turkey. It is difficult to examine the price elasticity of tourists from the United Kingdom, the United States and France as there is not enough evidence on the significance of estimates. It could be suggested that the price of tourism in Turkey does not play an important role for these countries when they are making holidays decisions.

Tables 3b and 3c show the results of the cointegration coefficients estimates for equation (2), where Greece in the first case and Spain in the second case were included as substitute destinations. The long-run elasticities of income in both cases are similar to the results obtained in Table 3a. In all cases, the sign is positive at the high level of significance. However, price elasticity was found significant at high confidence levels only for Bulgaria, Italy and Russia in both tables for Greece and Spain, substitute choices. The long-run price elasticities for Italy and Russia in both cases are negative and inelastic, or close to unity in the case of Italy. However, the long-run price elasticity of Turkey for Bulgarian tourists is inelastic with positive sign. The positive sign of the long-run price elasticity can be explained by a very fast increase in the tourist number from this country, thus in the 10 considered years the number of tourists from Bulgaria increased more than eight times, from 139,000 in 1996 to more than one million in 2006. At the same time, the “all inclusive” type of tourism is quite popular, in the case of advance payment for the forthcoming holiday, the effect of price change on the tourism demand can be decreased significantly. For other selected countries not enough evidence was found for the significance of long-run price elasticities. It means that in making a choice between holiday destinations, the price of tourism in Turkey does not play an important role for these countries.

In Table 3b cross-price elasticities were found significant only in the cases of five countries: Bulgaria, the United States, Holland, Italy, and Switzerland. For Bulgaria and the United States, the long-run cross-price elasticities are positive and close to unity, meaning that this countries are aware of the price of tourism in Greece. Therefore, an increase in the cost of tourism in Greece will increase with the same percentage demand for tourism in Turkey from the tourists of Bulgaria and the United States. However, the cross-price elasticities obtained for Denmark, Holland, Italy and Switzerland appeared to be elastic, but with negative sign. The high cost of tourism in substitute destination Greece significantly reduces demand for tourism in Turkey. It could be explained by the fact that some tourists are not choosing one country as their holiday destination, but taking tours of the neighboring countries as well, which includes historical sightseeing and different cultures discovery. As a result the high relative prices of Greece can reduce demand from tourists for this type of tour and Turkey is considered as a complimentary good to Greece.

Very similar results were obtained in Table 3c, where Spain was chosen as the substitute destination. The long-run cross-price elasticity for Bulgaria was found elastic with positive sign. The tourists of Bulgaria are as well aware of the tourism costs in Spain in choosing a holiday destination as they are for Turkey. The cross-price elasticities for tourists of Denmark, Holland, Italy and Switzerland were found to be highly elastic with negative sign, as in the case of Greece as substitute destination. Once more we found evidence that tourist from these European countries are more interested in the cultural and historical attractions of the Mediterranean region than in its favorable natural factors. At the time of increase in the relative price of one Mediterranean country, tourists from Denmark, Holland, Italy and Switzerland prefer not to visit any of the countries of this region. The highest magnitude of the cross-price elasticity belongs to Denmark. Thus in the case of Greece as the substitution destination, the cross- price elasticity for Denmark changed from -6.32 to -3.88 value, while in the case of Spain cross-price elasticity was found even more elastic with values varying between -17.95 and -10.64 for different cointegration tests. Therefore, we can conclude that for Denmark prices in the region play a very important role in making the decision for Turkey as the holiday destination.

c. Error Correction Model

The vector error correction model is designed only for cointegrated series. It specifies short-run adjustment dynamics which play an important role in the long-run relationships of variables. The deviations from long-run equilibrium are gradually adjusted by defined short-run dynamics. A vector error correction model applied the Johansen approach and was presented by equation (7), where estimated coefficients λ_1, λ_2, λ_3 and λ_4 from matrix $\Pi = \lambda\beta'$ reflect the speed of adjustment of number of tourist arrivals, the income of tourist generating country, relative Turkish prices and the relative prices of substitution destinations variables, respectively, toward the long-run equilibrium in the tourism demand model. In Table 2, we found strong evidence of the cointegrating relationship between the income of tourist generating country, relative prices in Turkey and relative prices in substitute destination variables in all selected countries, as all five presented test estimations that confirmed cointegration with a one percent significance level.

Tables 4a, 4b and 4c present results for vector error correction model estimates. Table 4a presents estimates of the speed of adjustment of the tourism demand for Turkey by income of the tourists' generating country and by relative prices in Turkey. The error correction terms of λ_2 - income and λ_3 - relative prices for tourism demand in Turkey were not found statistically significant in any selected country. At the same time the error correction terms λ_1 for the number of tourists were found to be highly statistically significant in all considered countries. Strong support was found for concluding that in the short-run more than 50% of disequilibrium in the dynamic model is adjusted by the number of tourist arrivals, while income and relative price index do not play important role in long-run adjustments.

Table 4a. Vector Error Correction

Country	***k***	λ_1	λ_2	λ_3	**Country**	***k***	λ_1	λ_2	λ_3
Austria	2	-0.56***	0.00	0.01	Germany	2	-0.42***	-0.00	0.01
		(0.06)	(0.00)	(0.01)			(0.06)	(0.00)	(0.01)
Belgium	2	-0.74***	-0.00	0.02	Greece	1	-0.37***	-0.00	-0.01
		(0.08)	(0.00)	(0.01)			(0.08)	(0.00)	(0.01)
Bulgaria	8	-0.23*	0.02	0.09	Holland	3	-0.68***	-0.00	-0.00
		(0.07)	(0.01)	(0.04)			(0.06)	(0.00)	(0.01)
Denmark	2	-0.38***	0.00	0.00	Italy	3	-0.46***	-0.00	-0.02
		(0.04)	(0.00)	(0.00)			(0.07)	(0.00)	(0.01)
UK	6	-0.99***	0.00	0.02	Russia	7	-0.26**	-0.02	0.05
		(0.15)	(0.00)	(0.02)			(0.08)	(0.01)	(0.02)
US	2	-0.35***	-0.00	0.00	Sweden	2	-0.39***	-0.00	0.01
		(0.05)	(0.00)	(0.01)			(0.04)	(0.00)	(0.00)
France	3	-0.59***	-0.00	0.01	Switzerland	1	-0.25**	0.00	-0.01
		(0.07)	(0.00)	(0.01)			(0.07)	(0.00)	(0.01)

*, **, *** indicate significance at 10, 5, and 1 percent levels, respectively, (Banerjee, A., Dolado, J.J. and R. Mestre (1992)). Standard errors in parenthesis. *k* – lag, chosen according to modified LR test results. λ_1 , λ_2 , λ_3 - measure the speed of adjustment of the tourism demand of selected countries, income and relative prices, respectively towards the equilibrium.

Table 4b and 4c present the results of vector error correction estimations in the cases when as substitution destinations for tourism in Turkey, Greece and Spain were included. Almost in all of the cases λ_1 – the error correction term for tourism demand for Turkey was found significant, except for Greece in Table 4c. In contrast to the previous case, when the relative price for substitute destination was not considered,

Table 4b and 4c presented results of significant error correction terms for income, relative prices for Turkey and relative prices for substitute destinations. Thus, in the case of considering Greece as a substitution destination, it was found that about one percent of the disequilibrium in the tourism demand model of the United States, France, Germany, Holland and Italy every month is corrected by the income of these countries. However, despite the fact that the long-run income elasticities of tourism demand were found negative for the considered countries (Table 3b), the error correction terms were found

with positive sign. Similar tendencies were found in other tourism studies as well (see Dritsakis, 2004).

Table 4b. Vector Error Correction- Greece

Country	***k***	λ_1	λ_2	λ_3	λ_4	**Country**	***k***	λ_1	λ_2	λ_3	λ_4
Austria	2	-0.42***	-0.00	0.01	0.00	Germany	1	-0.28***	-0.00**	0.01	0.00
		(0.04)	(0.00)	(0.01)	0.01			(0.05)	(0.00)	(0.01)	(0.01)
Belgium	2	-0.47***	-0.00*	0.00	0.00	Holland	1	-0.13***	-0.001***	-0.01***	0.00
		(0.08)	(0.00)	(0.01)	(0.01)			(0.03)	(0.00)	(0.00)	(0.00)
Bulgaria	10	-0.32***	0.05***	0.19***	-0.05*	Italy	4	-0. 76***	-0.001**	-0.01	0.02**
		(0.13)	(0.02)	(0.06)	(0.03)			(0.08)	(0.00)	(0.01)	(0.01)
Denmark	2	-0.40***	0.00	0.00	0.00	Russia	2	-0.68***	-0.01	-0.01	0.01
		(0.04)	(0.00)	(0.00)	(0.00)			(0.07)	(0.01)	(0.02)	(0.01)
UK	10	-1.23***	-0.00	-0.09**	-0.08*	Sweden	2	-0.38***	-0.00	0.01*	0.00
		(0.27)	(0.01)	(0.05)	(0.05)			(0.04)	(0.00)	(0.00)	(0.00)
US	10	-0.52***	-0.01***	0.02	0.02	Switzerland	1	-0.18***	0.00	-0.02***	-0.01**
		(0.15)	(0.00)	(0.02)	(0.03)			(0.06)	(0.00)	(0.01)	(0.01)
France	10	-0.19*	-0.01***	0.01	-0.00						
		(0.13)	(0.00)	(0.02)	(0.02)						

λ_1 , λ_2 , λ_3 **and** λ_4 - measure the speed of adjustment of the tourism demand of selected countries, income, relative prices and relative prices at the substitute destination respectively towards the equilibrium.

Table 4c. Vector Error Correction - Spain

Country	***k***	λ_1	λ_2	λ_3	λ_4	**Country**	***k***	λ_1	λ_2	λ_3	λ_4
Austria	3	-0.42***	-0.00	0.01*	0.01**	Germany	1	-0.32***	-0.00	0.00	0.00
		(0.04)	(0.00)	(0.01)	0.01			(0.06)	(0.00)	(0.01)	(0.01)
Belgium	4	-0.43***	-0.00*	0.01	0.01	Greece	1	-0.01	0.00	-0.01	-0.01***
		(0.04)	(0.00)	(0.01)	(0.01)			(0.03)	(0.00)	(0.00)	(0.00)
Bulgar	1	-	0.05*	0.17*	-	Holland	1	-	-	-	0.001

ia	0	0.31***	**	**	0.05**			0.15***	0.001***	0.01**	*
		(0.12)	(0.02)	(0.05)	(0.03)			(0.04)	(0.00)	(0.00)	0.00
Denmark	2	-0.40***	0.00	0.01*	0.01	Italy	4	-0.56***	-0.00	-0.01**	0.02**
		(0.05)	(0.00)	(0.00)	(0.0)			(0.07)	(0.00)	(0.01)	(0.01)
UK	8	-1.61***	-0.00	0.05*	0.02	Russia	2	-0.68***	-0.01	-0.01	0.01
		(0.23)	(0.00)	(0.04)	(0.04)			(0.07)	(0.01)	(0.02)	(0.01)
US	3	-0.38***	-0.00	0.00	0.00	Sweden	3	-0.53***	0.00	0.01	0.01
		(0.06)	(0.00)	(0.01)	(0.01)			(0.06)	(0.00)	(0.01)	(0.01)
France	10	-0.86***	-0.00	0.02	0.02	Switzerland	1	-0.31***	-0.00	-0.01**	-0.01**
		(0.11)	(0.00)	(0.01)	(0.02)			(0.07)	(0.00)	(0.01)	(0.01)

In general, income plays an important role in the choosing of holiday destination and in the holiday making decision. However, some groups of tourists with high levels of income, with increase in their income, may prefer destinations other than Turkey that may be more luxurious in terms of service and safety. Especially after the growing risk of terrorist attacks in the world some tourists prefer less crowded and less attractive holiday destinations with high standards of service. Naturally, such destinations would be less attractive for tourists with lower levels of income due to their high price level. The error correction terms of relative price in Turkey were found significant in the case of the United Kingdom, Holland and Switzerland with expected negative sign, while at the same time in the case of the United Kingdom and Switzerland, the error correction term for the relative prices of substitute destination Greece were found significant with negative sign, which once more supports the hypothesis that some groups of tourists from these countries prefer multi-destination package holidays.

Thus about nine percent of the tourism model disequilibrium in the long run is corrected by relative Turkish prices and about eight percent by the relative price of Greece as substitute destination in the case of United Kingdom tourists. While in the case of Switzerland, two and one percent of the disequilibrium in the long-run demand model for Turkey is corrected by the relative Turkish prices and by the relative prices of Greece, respectively. In the case of Bulgaria, all of variables were found significant; therefore, we can conclude that about 32% of disequilibrium is corrected by tourist arrivals every month, five percent is corrected by the income of Bulgaria, 19% is adjusted by the relative prices of Turkey and five percent is corrected by relative prices in Greece.

However, the sign of relative prices in Turkey was found positive while the sign of relative prices of Greece was found negative. Higher prices in Greece could be considered by Bulgarian tourists as a sign of future increase in prices in Turkey; however, at the same time positive sign of the relative prices in Turkey variable can be explained by the long-term advanced arrangement of holidays for Turkey where considerable discount price is implied and especially in the case of "all inclusive" packages, change in the relative price of Turkey would not play important role.

Table 4c presents the results of the vector error correction estimations where Spain was included as the substitute destination. The relative price of Spain as substitute destination for Turkey was found significant in more countries when compared to the case of Greece. Thus, about one percent of the disequilibrium is corrected by the relative prices of Spain in the cases of Austria, Greece, Holland, Italy and Switzerland. While five percent of disequilibrium is adjusted by the relative prices of Spain in the case of Bulgaria, this result is in line with the case of Greece as the substitute destination. The relative prices of Turkey were found significant in the cases of Austria, Bulgaria, Denmark, the United Kingdom, Holland, Italy and Switzerland with about one percent adjustment speed. In other words, when deviations from the long-run equilibrium occur in the tourism demand for Turkey, it is primarily the number of tourist arrivals that adjusts to restore the long-run equilibrium each month, rather than income or relative prices in Turkey. In the case of Greece as the substitute destination in addition to the number of tourist arrivals it is rather income than the relative prices of Turkey and Greece that corrects equilibrium each month. However, in the case of Spain as substitute destination to Turkey, the relative prices of Turkey and relative prices of Spain play a more important role than income in the adjustment process to the long-run equilibrium.

5. Conclusion

This paper attempted to find the long-run economic relationships in the tourism demand model for Turkey among variables such as tourist arrivals, income of tourist generating country, the relative prices of Turkey and, in two different cases, the relative prices of substitution destinations, Greece and Spain, were added to the tourism model as well. The tourism demand for Turkey was measured by tourist arrivals from 14 different countries, which account for about 70% of the total tourist arrivals in Turkey. In this study a vector auto regression model was used in order to measure the elasticities of income and relative prices in demand for Turkey from the considered countries. Independent variables for the demand model for Turkey were chosen on the basis of previous studies (see Lim, 1999; Lee et al., 2005), where variables such as income of tourist generating country, relative cost of living and relative price of substitute destination were found to be the most important variables of tourism demand modeling.

Prior to testing for cointegration among a set of variables, the ADF, the Phillips-Perron, and the DF-GLS tests of non-stationarity and the KPSS test of stationarity were performed to test the integration properties of variables. The cointegration relationships were estimated by using different estimation procedures such as the OLS, FM-OLS, DOLS, ARDL and JOH-ML tests. Based on the results, we found strong evidence of the cointegrating relationship between considered variables in all selected countries. Thus we found strong support for long-run tourist demand relationships in the model. The estimates of the demand models show that almost in all considered countries the income

elasticity of demand was found to be highly significant with high magnitude in value, which indicates that the tourism demand for Turkey from considered countries is a luxury good. Price elasticity was found elastic in many countries with expected negative sign except for Greece, Holland, Italy and Russia, where price elasticity was found inelastic. For these countries, income is the most important factor in tourism demand, while change in the relative cost of living in Turkey does not affect the destination decision.

The inclusion of substitution destinations to the demand model decreased the degree of significance of price elasticities. However, from the model in which Greece was added as the substitution destination, we found evidence of the significance of the cross-price elasticities for Bulgaria, the United States, Holland, Italy and Switzerland. The cross-price elasticities for Holland, Italy and Switzerland were found elastic, but with negative sign, which could be explained by the multi-destination holiday choice. Similar results were obtained from the model where Spain was added as the substitution destination. In this case, cross-price elasticities for the tourists of Holland, Italy and Switzerland were found to be highly elastic and with negative sign as well. These results provide evidence that tourists from these countries do not come to Turkey for its nature favorable for holiday conditions (extensive sea coast, sun; for them heritage is the attraction. These types of holidays can be chosen as complementary travel with visits to other neighboring countries.

Following the cointegration test, the vector error correction model was estimated in order to specify the short-run adjustment dynamics that play an important role in the long-run relationships of variables. In the compact demand model no evidence supporting the existence of an equilibrium long-run relationship among considered economic variables in the demand model was found. However, in cases where Greece and Spain were added as substitution destinations, we found evidence of the existence of the equilibrium long-run relationships in such countries as Bulgaria, the United Kingdom, Holland, Italy and Switzerland in the case of Greece substitute destination. In the demand models of the United States, France and Germany, long-run equilibrium relations were found only between tourism demand and these countries' incomes.

In the tourism demand model for Turkey when Spain was included as substitution destination we found evidence of the existence of an equilibrium long-run relationship between main independent variables in Austria, Bulgaria, Holland, Italy and Switzerland. This study estimated the long-run elasticities of the tourism demand model and measured the speed of adjustment to restore the long-run equilibrium of the considered model. However, further research on this model would be useful. Different stability tests could be utilized in order to examine the existence of a stable tourism demand function in every considered country. This type of test was applied on the aggregate level, by Halicioglu (2004), with positive results. At the same time it is planned to generate forecasts for the considered in this paper time-series.

References:

Akal, M. (2004). Forecasting Turkey's tourism revenues by ARMAX model. *Tourism Management*, 25(5), 565-580.

Akis, S. (1998). A compact econometric model of tourism demand for Turkey. *Tourism Management*, 19 (1), 99-102.

Barhoumi, K. et al. (2008). Short-term forecasting of GDP using large monthly datasets: A pseudo real-time forecast evaluation exercise. European Central Bank, *Occasional Paper Series*, 84.

Box, G. E. P. & Jenkins, G. M. (1970). *Time series analysis, forecasting and control*. San Francisco: Holden Day.

Bulgarian National Bank. *http://www.bnb.bg/bnb/home.nsf/fsWebIndex?OpenFrameset*, statistics.

Central Bank of the Republic of Turkey. *http://www.tcmb.gov.tr/yeni/eng/*, statistics.

Central Bank of the Russian Federation. *http://www.cbr.ru/eng/*, statistics.

Crouch, I. (1994). The study of international tourism demand: a review of the findings. *Journal of Travel Research*, 32, 12-23.

Dickey D.A. and W.A. Fuller (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association* 74: 427-431.

Dritsakis, N. (2004). Cointegration analysis of German and British tourism demand for Greece. *Tourism Management*, 25, 111-119.

Economic Time Series Page *http://economagic.com/*.

Elliot, G. and T.J. Rothenberg, Stock, J.H., (1996). Efficient tests for an autoregressive unit root. *Econometrica* 64, 813-836.

Gezici, F. (2006). Components of sustainability: Two cases from Turkey. *Annals of Tourism Research*, 33(2), 442-455.

Göymen, K. (2000). Tourism and governance in Turkey. *Annals of Tourism Research*, 27(4), 1025-1048.

Icoz, O., Var, T. & Kozak, M. (1998). Tourism demand in Turkey. *Annals of Tourism Research*, 25 (1), 236-240.

Kim, S. & Song, H. (1998). Analysis of tourism demand in South Korea: a cointegration and error correction approach. *Tourism Economics*, 3, 25-41.

Kulendran, N. (1996). Modeling quarterly tourist flows to Australia using cointegration analysis. *Tourism Economics*, 2, 203-222.

Kulendran, N., & Wilson, K. (2000). Modeling business travel. *Tourism Economics*, 6, 47-59.

Kwiatkowski, D., P.C.B. Phillips, P. Schmidt, and Y. Shin, (1992). Testing the null of stationarity against the alternative of a unit root: How sure are we that economic time series have a unit root? *Journal of Econometrics*, 54, 159-178.

Li, G., Song, H. & Witt, S. F. (2005). Recent developments in econometric modeling and forecasting. *Journal of Travel Research*, 44, 82-89.

Lim, C. (1999). A meta analysis review of international tourism demand. *Journal of Travel Research*, 37, 273-284.

Lim, C. & McAleer M. (2002). A cointegration analysis of annual tourism demand for Malaysia for Australia. *Mathematics and Computers in Simulation*, 59(1-3), 197-2005.

Martin, C.A. & Witt, S.F. (1989). Accuracy of econometric forecasts of tourism. *Annals of Tourism Research*, 16, 407-428.

Organization for Economic Cooperation and Development, OECD. Stat website of metadata *http://stats.oecd.org/wbos*.

Phillips, P.C.B. (1995). Fully modified least squares and vector autoregression. *Econometrica*, 63, 1023-1078.

Phillips, P.C.B. & Hansen, B.E. (1990). Statistical Inference in Instrumental Variables Regression with I(1) Processes. *Review of Economic Studies*, 57, 99-125.

Phillips, P.C.B. & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, 75, 335-346.

Salazar, E. & Weale, M. (1999). Monthly data and short-term forecasting: An assessment of monthly data in a VAR model. *Journal of Forecasting*, 18, 447-462.

Sims, C.A. (1980). Macroeconomics and reality. *Econometrica*, 48 (1): 1-48.

Smeral, E., Witt, S. F. & Witt, C. A. (1992). Econometric forecasts: tourism trends to 2000. *Annals of Tourism Research*, 19(3), 450-466.

Song, H & Witt, S.F. (2006). Forecasting international tourist flows to Macau. *Tourism Management*, 27, 214-224.

Song, H. & Witt, S.F. (2000). *Tourism demand modeling and forecasting: Modern econometric approaches.* Cambridge: Pergamon.

Song, H., Witt, S.F. & Jensen, T.C. (2003). Tourism forecasting: accuracy of alternative econometric models. *International Journal of Forecasting*, 19, 123-141.

Stock J. H. & M. W. Watson (1993). A simple estimator of cointegrating vector in high order integrated systems. *Econometrica* 61 (4): 783-820.

Tosun, C. (2001). Challenges of sustainable tourism development in the developing world: the case of Turkey. *Tourism Management*, 22, 289-303.

Turkish Statistical Institute - TurkStat website *http://www.turkstat.gov.tr/Start.do*, statistics and tables extracted by the TurkStat for individual orders.

Turnar, L., Kulendran, N. & Fernando, H. (1997). The use of composite national indicators for tourism forecasting. *Tourism Economics*, 3, 309-317.

Witt, S. F., Song, H. & Wanhill, S.P. (2004). Forecasting tourism-generated employment: The case of Denmark. *Tourism Economics*, 10,167-176.

World Travel and Tourism Council (2008). The 2008 travel and tourism economic research: Turkey. London, United Kingdom.

Annex on line at the journal Website: http://www.usc.es/econo met/eaa.htm

Annex

Table1. Unit Root Test Results

Country	*Variables*	ADF(a)				Phillips-Perron(a)				DF GLS(a)				KPSS(b)			
		c	S	*ct*	S	*c*	S	*ct*	S	*c*	S	*ct*	S	*c*	S	*ct*	S
Austria	Tourist	-1.35	*I*(1)	-2.31	*I*(1)	-4.56	*I*(0)	-4.69	*I*(0)	0.11	*I*(1)	-1.95	*I*(1)	0.55	*I*(1)	0.04	*I*(0)
	GDP	-0.52	*I*(1)	-1.20	*I*(1)	-0.35	*I*(1)	-1.47	*I*(1)	3.15	*I*(0)	-0.99	*I*(1)	1.37	*I*(1)	0.22	*I*(1)
	CPI	-3.08	*I*(0)	-3.59	*I*(0)	-2.41	*I*(1)	-2.82	*I*(1)	-1.06	*I*(1)	-3.28	*I*(0)	0.63	*I*(1)	0.15	*I*(1)
Belgium	Tourist	-1.51	*I*(1)	-2.47	*I*(1)	-4.61	*I*(0)	-4.98	*I*(0)	1.22	*I*(1)	-1.22	*I*(1)	0.94	*I*(1)	0.05	*I*(0)
	GDP	-0.59	*I*(1)	-2.34	*I*(1)	-0.58	*I*(1)	-2.23	*I*(1)	3.37	*I*(0)	-2.11	*I*(1)	1.39	*I*(1)	0.19	*I*(1)
	CPI	-3.21	*I*(0)	-3.69	*I*(0)	-2.49	*I*(1)	-2.86	*I*(1)	-1.09	*I*(1)	-3.33	*I*(0)	0.60	*I*(1)	0.15	*I*(1)
Bulgaria	Tourist	-1.70	*I*(1)	-4.65	*I*(0)	-1.37	*I*(1)	-4.54	*I*(0)	-0.40	*I*(1)	-4.62	*I*(0)	1.36	*I*(1)	0.13	*I*(0)
	GDP	0.64	*I*(1)	-1.58	*I*(1)	-1.79	*I*(1)	-4.22	*I*(0)	2.84	*I*(0)	-1.14	*I*(1)	1.36	*I*(1)	0.12	*I*(0)
	CPI	-3.50	*I*(0)	-4.53	*I*(0)	-2.56	*I*(1)	-3.49	*I*(0)	-3.41	*I*(0)	-4.27	*I*(0)	0.79	*I*(1)	0.10	*I*(0)
	ER	-0.89	*I*(1)	-3.29	*I*(1)	-1.14	*I*(1)	-3.27	*I*(1)	-0.81	*I*(1)	-1.02	*I*(1)	0.97	*I*(1)	0.12	*I*(0)
Denmark	Tourist	-0.18	*I*(1)	-2.13	*I*(1)	-3.51	*I*(0)	-3.50	*I*(0)	0.90	*I*(1)	-2.98	*I*(1)	0.48	*I*(1)	0.07	*I*(0)
	GDP	-0.89	*I*(1)	-2.79	*I*(1)	-0.84	*I*(1)	-2.58	*I*(1)	1.96	*I*(0)	-2.37	*I*(1)	1.36	*I*(1)	0.18	*I*(1)
	CPI	-3.12	*I*(0)	-4.11	*I*(0)	-2.44	*I*(1)	-3.20	*I*(1)	-1.20	*I*(1)	-3.99	*I*(0)	0.80	*I*(1)	0.13	*I*(0)
UK	Tourist	0.46	*I*(1)	-1.62	*I*(1)	-3.85	*I*(0)	-3.85	*I*(0)	2.38	*I*(0)	-3.09	*I*(0)	0.41	*I*(0)	0.05	*I*(0)
	GDP	-0.67	*I*(1)	-2.10	*I*(1)	-1.16	*I*(1)	-3.54	*I*(0)	1.57	*I*(1)	-1.72	*I*(1)	1.42	*I*(1)	0.24	*I*(1)
	CPI	-2.78	*I*(1)	-4.31	*I*(0)	-2.10	*I*(1)	-3.36	*I*(1)	-2.80	*I*(0)	-3.54	*I*(0)	0.90	*I*(1)	0.13	*I*(0)
US	Tourist	-1.83	*I*(1)	-2.06	*I*(1)	-4.46	*I*(0)	-4.57	*I*(0)	0.17	*I*(1)	-1.40	*I*(1)	0.47	*I*(1)	0.10	*I*(0)
	GDP	-2.66	*I*(1)	-2.36	*I*(1)	-2.00	*I*(1)	-2.30	*I*(1)	1.03	*I*(1)	-1.12	*I*(1)	1.39	*I*(1)	0.22	*I*(1)
	CPI	-1.26	*I*(1)	-2.16	*I*(1)	-1.30	*I*(1)	-2.22	*I*(1)	-1.27	*I*(1)	-1.86	*I*(1)	0.70	*I*(1)	0.24	*I*(1)
France	Tourist	-1.89	*I*(1)	-3.59	*I*(0)	-4.29	*I*(0)	-4.93	*I*(0)	0.52	*I*(1)	-1.41	*I*(1)	0.82	*I*(1)	0.02	*I*(0)
	GDP	-1.81	*I*(1)	-0.97	*I*(1)	-1.46	*I*(1)	-1.16	*I*(1)	2.08	*I*(0)	-0.82	*I*(1)	1.38	*I*(1)	0.30	*I*(1)
	CPI	-3.03	*I*(0)	-3.60	*I*(0)	-2.36	*I*(1)	-2.82	*I*(1)	-1.10	*I*(1)	-3.37	*I*(0)	0.66	*I*(1)	0.15	*I*(1)
Germany	Tourist	-1.01	*I*(1)	-2.03	*I*(1)	-4.36	*I*(0)	-4.20	*I*(0)	0.48	*I*(1)	-1.87	*I*(1)	0.95	*I*(1)	0.06	*I*(0)
	GDP	-1.08	*I*(1)	-2.05	*I*(1)	-1.10	*I*(1)	-1.93	*I*(1)	2.30	*I*(0)	-1.56	*I*(1)	1.33	*I*(1)	0.25	*I*(1)
	CPI	-2.96	*I*(0)	-3.63	*I*(0)	-2.30	*I*(1)	-2.86	*I*(1)	-1.40	*I*(1)	-3.37	*I*(0)	0.74	*I*(1)	0.15	*I*(1)
Greece	Tourist	-1.00	*I*(1)	-5.77	*I*(0)	-2.80	*I*(1)	-5.95	*I*(0)	0.04	*I*(1)	-5.77	*I*(0)	1.27	*I*(1)	0.13	*I*(0)
	GDP	0.05	*I*(1)	-4.59	*I*(0)	0.63	*I*(1)	-4.75	*I*(0)	4.01	*I*(0)	-4.05	*I*(0)	1.43	*I*(1)	0.27	*I*(1)
	CPI	-3.11	*I*(0)	-3.38	*I*(1)	-2.48	*I*(1)	-2.76	*I*(1)	-2.36	*I*(0)	-3.36	*I*(0)	0.43	*I*(0)	0.16	*I*(1)
Holland	Tourist	-1.31	*I*(1)	-1.68	*I*(1)	-4.13	*I*(0)	-4.38	*I*(0)	0.96	*I*(1)	-1.24	*I*(1)	1.33	*I*(1)	0.08	*I*(0)
	GDP	-2.18	*I*(1)	-1.80	*I*(1)	-2.69	*I*(1)	-2.07	*I*(1)	2.16	*I*(0)	-0.68	*I*(1)	1.32	*I*(1)	0.31	*I*(1)
	CPI	-3.19	*I*(0)	-3.48	*I*(0)	-2.56	*I*(1)	-2.77	*I*(1)	-1.75	*I*(1)	-3.22	*I*(0)	0.44	*I*(0)	0.14	*I*(0)
	ER	-2.98	*I*(0)	-0.55	*I*(1)	-3.33	*I*(0)	-0.58	*I*(1)	1.22	*I*(1)	-0.47	*I*(1)	1.33	*I*(1)	0.33	*I*(1)
Italy	Tourist	-1.58	*I*(1)	-2.98	*I*(1)	-3.51	*I*(0)	-4.25	*I*(0)	-0.20	*I*(1)	-2.71	*I*(1)	0.95	*I*(1)	0.05	*I*(0)
	GDP	-0.60	*I*(1)	-1.64	*I*(1)	-0.59	*I*(1)	-1.65	*I*(1)	1.91	*I*(1)	-1.65	*I*(1)	1.32	*I*(1)	0.28	*I*(1)
	CPI	-3.33	*I*(0)	-3.69	*I*(0)	-2.52	*I*(1)	-2.85	*I*(1)	-1.99	*I*(0)	-3.71	*I*(0)	0.44	*I*(0)	0.14	*I*(0)
	ER	-3.18	*I*(0)	-0.74	*I*(1)	-4.17	*I*(0)	-0.85	*I*(1)	1.20	*I*(1)	-0.45	*I*(1)	1.33	*I*(1)	0.33	*I*(1)
Russia	Tourist	-1.10	*I*(1)	-2.27	*I*(1)	-3.16	*I*(0)	-3.24	*I*(1)	-1.14	*I*(1)	-1.37	*I*(1)	0.46	*I*(0)	0.18	*I*(1)

	GDP	0.72 *I*(1)	-2.26 *I*(1)	-1.12 *I*(1)	-3.51 *I*(0)	1.24 *I*(1)	-1.71 *I*(1)	1.34 *I*(1)	0.29 *I*(1)
	CPI	-1.77 *I*(1)	-1.64 *I*(1)	-1.71 *I*(1)	-1.41 *I*(1)	0.22 *I*(1)	-1.49 *I*(1)	1.17 *I*(1)	0.26 *I*(1)
Sweden	Tourist	-0.29 *I*(1)	-1.93 *I*(1)	-3.61 *I*(0)	-4.31 *I*(0)	0.82 *I*(1)	-2.76 *I*(1)	0.43 *I*(0)	0.07 *I*(0)
	GDP	0.71 *I*(1)	-1.44 *I*(1)	0.61 *I*(1)	-2.18 *I*(1)	0.54 *I*(1)	-1.28 *I*(1)	1.40 *I*(1)	0.17 *I*(1)
	CPI	-2.12 *I*(1)	-4.03 *I*(0)	-1.90 *I*(1)	-3.20 *I*(1)	-0.61 *I*(1)	-3.94 *I*(0)	1.11 *I*(1)	0.16 *I*(1)
Switzerland	Tourist	-1.20 *I*(1)	-2.06 *I*(1)	-3.94 *I*(0)	-4.66 *I*(0)	0.09 *I*(1)	-1.97 *I*(1)	1.19 *I*(1)	0.12 *I*(0)
	GDP	0.05 *I*(1)	-1.93 *I*(1)	0.10 *I*(1)	-2.00 *I*(1)	2.90 *I*(0)	-2.00 *I*(1)	1.36 *I*(1)	0.14 *I*(1)
	CPI	-2.69 *I*(1)	-3.85 *I*(0)	-2.06 *I*(1)	-3.01 *I*(1)	-0.68 *I*(1)	-3.55 *I*(0)	0.89 *I*(1)	0.13 *I*(0)
Spain	CPI	-3.51 *I*(0)	-3.94 *I*(0)	-2.72 *I*(1)	-3.03 *I*(1)	-1.47 *I*(1)	-3.66 *I*(0)	0.58 *I*(1)	0.16 *I*(1)

Critical values are used from MacKinnon (1996) one-sided p-values. *c*- intercept includes constant, *ct*- constant with trend *(a)* Null of non-stationarity (unit root), *(b)* Null of stationarity. S-Stationarity defines the level of integration where *I*(0) shows stationary series (no unit root), *I*(1)-nonstationary series (unit root).