An Econometric Analysis of Aggregate Outbound Tourism Demand of Turkey

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Abstract

This study attempts to examine empirically aggregate tourism outflows in the case of Turkey using the time series data for the period 1970-2005. As far as this article is concerned, there exists no previous empirical work dealing with the tourist outflows from Turkey. The previous tourism studies in the case of Turkey, by and large, focus on the inbound tourism demand analyses. As a developing country and an important tourism destination, Turkey has also been a significant source for generating a substantial number of tourists in recent years. Therefore, the tourist outflows from Turkey deserve to be analysed empirically too.

The total tourist outflows from Turkey are related to real income and relative prices. The bounds testing to cointegration procedure proposed by Pesaran *et al.* (2001) is employed to compute the short and long-run elasticities of income and relative prices. An augmented form of Granger causality analysis is conducted amongst the variables of outbound tourist flows, income and relative prices to determine the direction of causality. In the long-run, causality runs interactively through the error correction term from income and relative prices to outbound tourist flows. However, in the short-run, causality runs only from income to outbound tourism flows. The aggregate tourism outflows equation is also checked for the parameter stability via the tests of cumulative sum (CUSUM) and cumulative sum of the squares (CUSUMSQ).

The empirical results suggest that income is the most significant variable in explaining the total tourist outflows from Turkey and there exists a stable outbound tourism demand function. The results also provide important policy recommendations.

Keywords: outbound tourism demand; cointegration; Granger causality; stability tests; Turkey.

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Introduction

Outbound tourism in developing countries is regarded as a waste of valuable foreign reserves. Therefore, the authorities tend to restrict the outbound tourism demand via different forms of obstacles and policies, such as excess exit taxes, restrictions on issuing passports, limiting the amount of foreign currency to take abroad and multiple rates for the different purposes of foreign country visits. All these outbound tourism restrictions are aimed at preserving the foreign reserves for essential imports and foreign debt reductions. Turkey also resorted to the outbound demand restriction policies until the 1980s because Turkey pursued an import substitution policy as a development strategy until 1980. However, this development policy failed in the late 1970s causing massive bottlenecks in industries and foreign reserves deficits. In the last three decades, Turkey adopted the export-led growth development policy with the implementation of several major economic reforms in the fields of foreign trade, monetary and fiscal institutions, competition, state public enterprises, privatization, FDI, etc. The major aims of these economic reforms are to increase the efficiency of the economic resources and, hence, to close the economic development gap between Turkey and the developed countries. As of 2005, Turkey ranked the 17th biggest economy in the World with a population of over 73 million. Turkey's economic integration into the world economy has been growing at a rapid rate since the early 1980s. To this end, the openness ratio, which is measured broadly as total imports and exports to gross domestic product, increased from 8.37% in 1970, to 15.51% in 1980 and to 46.4% in 2005. Although, the average per capita income is far below that of the developed countries, the real per capita rose to $ 3390 in 2005, from $1896 in 1980 and from $1650 in 1970[1]. Easing the travelling restrictions abroad and the relatively faster economic development in Turkey have stimulated significantly the outbound tourist demand since the 1980s. As a consequence, the outbound tourism demand increased from 515,000 people with an expenditure of $12 million in 1970, to 1.65 million people with an expenditure of $104 million in 1980 and to 8.02 million people with an expenditure of $ 2.87 billion in 2005. The share of tourism expenditures in GDP appears to be very minimal, which is only 0.77% in 2005. These tourism expenditure ratios are 0.06% and 0.14% for 1970 and 1980, respectively. Nevertheless, the average growth rate of outbound tourism demand in the period of 1970-2005 is 9.38% whilst the real GDP growth in the same period is just 4.06%, indicating that there exists a substantially strong outbound tourism demand[2]. It seems that the current upward trend in the outbound tourism demand is likely to continue to grow faster, as Turkey becomes a full member of the European Union in the next decade.

Tourism demand models have been used extensively to analyse the demand behaviour and demand management issues in addition to forecast the future levels of tourism demand. The empirical estimates of income and relative price elasticities have particular relevance for designing appropriate income and pricing policies in the tourism sector.

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[1] These macroeconomic figures are obtained from *international financial statistics* of IMF. The ratios are my own calculations from the same source.

[2] Outbound tourist numbers and tourism expenditure figures come from *annual tourism statistics* of TSI (Turkish Statistical Institute). The ratios and growth figures are my own calculations from the same source.

There is extensive literature examining the tourism demand functions in the context of developing and developed countries using the single and multivariate cointegration techniques of the 1980s and 1990s. The results and implications of these studies clearly depend on the underlying variables, the econometric methods, data frequency, and the development stage of a country. Crouch (1994), Lim (1997), and Li *et al.* (2005) provide very comprehensive surveys of empirical tourism demand studies for the last four decades. These surveys reveal that most of the existing studies tend to use the tourist arrivals/departures and tourism revenues/expenditures as a dependent variable. The surveys also point out that the most widely used explanatory variables are income and price/relative prices. The theoretical basis for the selection of these explanatory variables is related to the consumer theory. However, many empirical studies also use additional explanatory variables ranging from transportation costs to time trends. The tourism demand equations are generally estimated in double logarithmic forms so that researchers obtain a direct estimate of elasticity of the dependent variable with respect to the explanatory variables. Recent econometric studies appear to present both the short-run and long-run estimates of the explanatory variables.

A large number of empirical papers on international tourism demand are found in the literature and are divided into two main categories.
The first category consists of studies that use modern time series and cointegration techniques in an attempt to model and forecast the dependent variable between one or several pairs of countries. See, for example, Kulendran (1996), Wong (1997), Kim and Song (1998), Kulendran and Witt (2001), Seddighi and Theocharous (2002), Song *et al.* (2003) and Dritsakis (2004), Charalambos (2006), and Li *et al.* (2006).
The second category includes papers that estimate the determinants of international tourism demand using classical multivariate regressions. For a detailed survey of this literature, see Crouch (1994), Witt and Witt (1995), and Lim (1997).
The vast majority of international tourism demand studies are based on the inbound of tourist flows rather than the outbound tourist flows. However, a few recent studies on international tourism demand have presented empirical estimations of outbound tourism demand, see for example Song *et al*. (2000) for UK; Lim (2004) for Korea and Coshall (2006) for UK.

On researching the literature, one finds that there exist several empirical research studies dealing with the inbound tourism demand for Turkey using both the traditional and modern econometric techniques; see for example, Uysal and Crompton (1984), Var *et al*. (1990), Ulengin (1995), Icoz *et al*. (1998), Akis (1998), Akal (2004), and Halicioglu (2004). However, no study has attempted to model the outbound tourism demand for Turkey. Thus, this study seizes the opportunity to fill the gap in the literature.

The motivation of this study is two fold: an increasing number of Turks are holidaying abroad which provides a good rationale to identify the determinants of the outbound tourism demand of Turkey at an aggregate level and the bounds testing procedure to cointegration has not been used previously in the literature to estimate any outbound tourism demand. However, one should point out that the bounds testing procedure was recently employed to estimate the inbound tourism demand equations, see for example Kumar (2004) for Fiji; Halicioglu (2004) for Turkey; and Mervar and Payne (2007) for Croatia.

The objectives of this study are as follows: i) to estimate the income and relative price elasticities of the outbound tourism demand both in the short-run and long-run using the ARDL approach to cointegration; ii) to establish the direction of causal relationships between outbound tourism demand, income and relative prices; and iii) to implement parameter stability tests of Brown *et al.* (1975) to ascertain stability or instability in the outbound tourism demand function.

The remainder of this paper is organized as follows: the next section describes the study's model and methodology. The third section discusses the empirical results, and the last section concludes.

Model and econometric methodology

Following the empirical literature in tourism economics, an aggregate outbound tourism demand regression model for Turkey in double logarithmic form is constructed as:

$$f_t = a_0 + a_1 y_t + a_2 p_t + \varepsilon_t \qquad (1)$$

where f_t is aggregate tourist flows from Turkey, y_t is real aggregate income, p_t is exchange rate adjusted relative prices and ε_t is the regression error term .

As for the expected signs in equation (1), one expects that $a_1 > 0$ because higher real income should result in greater economic activity and stimulate outbound tourism demand. The aforementioned empirical tourism demand surveys indicate that income elasticity estimates vary a great deal, but generally exceed unity and below 2.0 confirming that international travel is a luxury item.

The coefficient of the exchange rate adjusted relative price levels is expected to be less than zero for the usual economic reasons, therefore, $a_2 < 0$. The estimation results found in the tourism demand surveys regarding prices are rather uneven since there seems to be no agreement about the appropriate range of this coefficient. Estimated price elasticities vary dramatically both within and across papers. For example, they are in the range of –0.05 to –6.36.

In the last two decades, several econometric procedures were employed to investigate the tourism demand functions. With regards to univariate cointegration approaches, there are several examples including Engle and Granger (1987) and the fully modified OLS procedures of Phillips and Hansen (1990). There are also many examples of multivariate cointegration procedures of Johansen (1988), Johansen and Juselius (1990), and Johansen's (1996) full information maximum likelihood technique. Song and Li (2008) provides an excellent survey of the econometric procedures applied in the recent empirical studies of tourism demand. A recent single cointegration approach, known as autoregressive-distributed lag (ARDL) of Pesaran *et al.* (2001), has become popular amongst researchers. Pesaran *et al.* cointegration approach, also known as bounds testing, has certain econometric advantages in comparison to other single cointegration procedures. They are as follows: i) endogeneity problems and inability to test hypotheses on the estimated coefficients in the long-run associated with the Engle-Granger method are avoided; ii) the long and short-run parameters of

the model in question are estimated simultaneously; iii) the ARDL approach to testing for the existence of a long-run relationship between the variables in levels is applicable irrespective of whether the underlying regressors are purely $I(0)$, purely $I(1)$, or fractionally integrated; iv) the small sample properties of the bounds testing approach are far superior to that of multivariate cointegration, as argued in Narayan (2005).
An ARDL representation of equation (1) is formulated as follows:

$$\Delta f_t = a_0 + \sum_{i=1}^{m} a_{1i}\Delta f_{t-i} + \sum_{i=0}^{m} a_{2i}\Delta y_{t-i} + \sum_{i=0}^{m} a_{3i}\Delta p_{t-i} + a_4 f_{t-1} + a_5 y_{t-1} + a_6 p_{t-1} + v_t \qquad (2)$$

Given that Pesaran *et al.* cointegration approach is a relatively recent development in the econometric time series literature, a brief outline of this procedure is presented as follows. The bounds testing procedure is based on the F or Wald-statistics and is the first stage of the ARDL cointegration method. Accordingly, a joint significance test that implies no cointegration hypothesis, (H_0: $a_4 = a_5 = a_6 = 0$), against the alternative hypothesis, (H_1: $a_4 \neq a_5 \neq a_6 \neq 0$) should be performed for equation (2). The F test used for this procedure has a non-standard distribution. Thus, Pesaran *et al.* compute two sets of critical values for a given significance level with and without a time trend. One set assumes that all variables are $I(0)$ and the other set assumes they are all $I(1)$. If the computed F-statistic exceeds the upper critical bounds value, then the H_0 is rejected. If the F-statistic falls into the bounds then the test becomes inconclusive. Lastly, if the F-statistic is below the lower critical bounds value, it implies no cointegration. This study, however, adopts the critical values of Narayan (2005) for the bounds F-test rather than Pesaran *et al.* (2001). As discussed in Narayan (2005) given relatively a small sample size in this study (36 observations), the critical values produced by Narayan (2005) are more appropriate than that of Pesaran *et al.* (2001).

Once a long-run relationship has been established, equation (2) is estimated using an appropriate lag selection criterion. At the second stage of the ARDL cointegration procedure, it is also possible to perform a parameter stability test for the selected ARDL representation of the error correction model.

A general error correction model (ECM) of equation (2) is formulated as follows:

$$\Delta f_t = a_0 + \sum_{i=1}^{m} a_{1i}\Delta f_{t-i} + \sum_{i=0}^{m} a_{2i}\Delta y_{t-i} + \sum_{i=0}^{m} a_{3i}\Delta p_{t-i} + \lambda EC_{t-1} + \mu_t \qquad (3)$$

where λ is the speed of adjustment parameter and EC_{t-1} is the residuals that are obtained from the estimated cointegration model of equation (1).
The Granger representation theorem suggests that there will be Granger causality in at least one direction if there exists a cointegration relationship among the variables in equation (1), providing that they are integrated order of one. Engle and Granger (1987) cautions that the Granger causality test, which is conducted in the first-differences variables by means of a vector autoregression (VAR), will be misleading in the presence of cointegration. Therefore, an inclusion of an additional variable to the VAR system, such as the error correction term would help us to capture the long-run relationship. To this end, an augmented form of the Granger causality test

involving the error correction term is formulated in a multivariate *p*th order vector error correction model.

$$(1-L)\begin{bmatrix} f_t \\ y_t \\ p_t \end{bmatrix} = \begin{bmatrix} c_1 \\ c_2 \\ c_3 \end{bmatrix} + \sum_{i=1}^{p}(1-L)\begin{bmatrix} d_{11i}d_{12i}d_{13i}d_{14i} \\ d_{21i}d_{22i}d_{23i}d_{24i} \\ d_{31i}d_{32i}d_{33i}d_{34i} \end{bmatrix}\begin{bmatrix} f_{t-i} \\ y_{t-i} \\ p_{t-i} \end{bmatrix} + \begin{bmatrix} \lambda_1 \\ \lambda_2 \\ \lambda_3 \end{bmatrix}\left[EC_{t-1}\right] + \begin{bmatrix} \omega_{1t} \\ \omega_{2t} \\ \omega_{3t} \end{bmatrix} \qquad (4)$$

$(1-L)$ is the lag operator. EC_{t-1} is the error correction term, which is obtained from the long-run relationship described in equation (1), and it is not included in equation (4) if one finds no cointegration amongst the vector in question. The Granger causality test may be applied to equation (4) as follows: i) by checking statistical significance of the lagged differences of the variables for each vector; this is a measure of short-run causality; and ii) by examining statistical significance of the error-correction term for the vector that there exists a long-run relationship. As a passing note, one should reveal that equation (3) and (4) do not represent competing error-correction models because equation (3) may result in different lag structures on each regressors at the actual estimation stage; see Pesaran *et al*. (2001) for details and its mathematical derivation. All error-correction vectors in equation (4) are estimated with the same lag structure that is determined in unrestricted VAR framework; see for example, Narayan and Singh (2006). This study utilizes the latter procedure.

The existence of a cointegration derived from equation (2) does not necessarily imply that the estimated coefficients are stable, as argued in Bahmani-Oskooee and Chomsisengphet (2002). The stability of coefficients of regression equations are, by and large, tested by means of Chow (1960), Brown *et al*. (1975), Hansen (1992), and Hansen and Johansen (1993). The Chow stability test requires *a priori* knowledge of structural breaks in the estimation period and its shortcomings are well documented, see for example Gujarati (2003). In Hansen (1992) and Hansen and Johansen (1993) procedures, stability tests require $I(1)$ variables and they check the long-run parameter constancy without incorporating the short-run dynamics of a model into the testing - as discussed in Bahmani-Oskooee and Chomsisengphet (2002). Hence, stability tests of Brown *et al*. (1975), which are also known as cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests based on the recursive regression residuals, may be employed to that end. These tests also incorporate the short-run dynamics to the long-run through residuals. The CUSUM and CUSUMSQ statistics are updated recursively and plotted against the break points of the model. Provided that the plots of these statistics fall inside the critical bounds of 5% significance, one assumes that the coefficients of a given regression are stable. These tests are usually implemented by means of graphical representation.

Empirical results

Annual data over the period 1970-2005 were used to estimate equation (2) by the Pesaran *et al*. procedure. Data definition and sources of data are cited in the Appendix A.

All the series in equation (1) appear to contain a unit root in their levels but stationary in their first differences, indicating that they are integrated at order one i.e., $I(1)$ and visual inspections show no structural breaks in the time series. For brevity of presentation, they are not reported here.

Equation (2) was estimated in two stages. In the first stage of the ARDL procedure, the long-run relationship of equation (1) was established in two steps. Firstly, the order of lags on the first–differenced variables for equation (2) was obtained from unrestricted VAR by means of Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC). The results of this stage are not displayed here to conserve space. Secondly, a bounds F test was applied to equation (2) in order to establish a long-run relationship between the variables.

Narayan and Smyth (2006) presents a detailed procedure to explain if one needs to implement the bounds F test with or without a time trend. It is possible that at the end of this testing procedure, one may end up with more than one possible cointegration relationship: one with a time trend and one without a time trend. As Narayan and Smyth (2006, p.116) argues that "in the spirit of the bounds test, model two with a time trend is invalid because for the model to be valid there should be only one long-run relationship". In order to avoid a possible selection problem at this stage, one may follow the procedure of Bahmani-Oskooee and Goswami (2003) which sequentially test the long-run cointegration relationship in equation (2) on the basis of different lag lengths. This study adopts the second approach which implicitly assumes that equation (2) is free from a trend due to the differenced variables. In summary, the F tests indicate that there exists only one cointegrating relationship without a time trend in which the dependent variable is outbound tourism demand. The procedures of this stage and the results of the bounds F testing are outlined and presented in the Appendix B.

Given the existence of a long-run relationship, in the next step the ARDL cointegration procedure was implemented to estimate the parameters of equation (2) with maximum order of lag set to 2 to minimize the loss of degrees of freedom. This stage involves estimating the long-run and short-run coefficients of equations (1) and (2). In search of finding the optimal length of the level variables of the short-run coefficients, several lag selection criteria such as $\overline{R}^2$, AIC, SBC and Hannan-Quinn Criterion (HQC) were utilized at this stage. The long-run results of equation (2) based on several lag criteria are reported in Panel A of Table 1 along with their appropriate ARDL models. The results from model selection criteria of $\overline{R}^2$ and AIC are identical. Similarly, the results of SBC and HQC are exactly the same. As can be seen from Table 1, the long-run results are quite similar with regard to coefficient magnitudes and statistical significance. On the basis of estimated models, short-run income and relative price elasticities are computed, and the results are reported in Panel B of Table 1. The short-run elasticities, as expected, are smaller than the long-run values. However, the magnitudes of elasticities are very close in all the models.

The diagnostic test results of equation (2) for short-run estimations are also displayed in the respective columns of each selection criterion in Panel C of Table 1. All the estimated models display the expected signs for the regressors and they are statistically significant. All short-run models pass a series of standard diagnostic tests such as serial correlation, functional form, and heteroscedasticity, except normality.

Table 1. ARDL results for the 1970-2005 time span				
Panel A: the long-run elasticities Dependent variable f				
	Model Selection Criterion			
Regressors	$\bar{R}^2$ ARDL (1,2,1)	AIC ARDL (1,2,1)	SBC ARDL (1,0,1)	HQC ARDL (1,0,1)
y	1.69 (17.23)*	1.69 (17.23)*	1.67 (17.00)*	1.67 (17.00)*
p	-0.25 (1.79)**	-0.25 (1.79)**	-0.22 (1.58)*	-0.22 (1.58)*
Constant	-35.87 (13.01)*	-35.87 (13.01)*	-35.60 (12.81)*	-35.60 (21.81)*
Panel B: the short-run computed elasticities				
y	0.81	0.81	0.82	0.82
p	-0.12	-0.12	-0.11	-0.11
Panel C: the short-run diagnostic test statistics				
	$\chi^2_{SC}(1)=0.53$ $\chi^2_{FC}(1)=1.83$ $\chi^2_{N}(2)=9.53$ $\chi^2_{H}(1)=1.80$	$\chi^2_{SC}(1)=0.53$ $\chi^2_{FC}(1)=1.83$ $\chi^2_{N}(2)=9.53$ $\chi^2_{H}(1)=1.80$	$\chi^2_{SC}(1)=0.95$ $\chi^2_{FC}(1)=1.74$ $\chi^2_{N}(2)=6.16$ $\chi^2_{H}(1)=1.75$	$\chi^2_{SC}(1)=0.95$ $\chi^2_{FC}(1)=1.74$ $\chi^2_{N}(2)=6.16$ $\chi^2_{H}(2)=1.75$

Notes for Panel B: Own calculations from above models.

Notes for Panel C: The absolute value of t-ratios is in parentheses. χ^2_{SC}, χ^2_{FC}, χ^2_{N}, and χ^2_{H} are Lagrange multiplier statistics for tests of residual correlation, functional form mis-specification, non-normal errors and heteroskedasticity, respectively. These statistics are distributed as Chi-squared variates with degrees of freedom in parentheses. * and ** indicate 5 % and 10 % significance levels, respectively

In search of finding the short-run dynamics of the above models, their error-correction representations were estimated as auxiliary models. The estimation results and the respective appropriate optimal lag length selection criteria with some selected diagnostics are displayed in Table 2. The error-correction models were only estimated in the case of AIC and SBC since the other model selection criteria displayed the identical results. Both the error-correction terms are statistically significant and their magnitudes are very close to each other. Considering the reported diagnostic test results and the statistical significance of the coefficients estimated in the long run and short-run, on average, the AIC model appears to be statistically more acceptable than the SBC criterion. The AIC model performs relatively better in terms of dynamics of the short-run variables, goodness of fit and RSS values. Therefore, it is quite plausible to accept the AIC based results as the preferred model for the evaluation of results and inference from there.

The income elasticity is 1.69 in the long run and is consistent with the idea that the tourism demand is a luxury good. The high income elasticity also indicates that income policies will have stronger impacts on the outbound tourism demand. The computed income elasticity is above unity, therefore income growth results in a more than proportional increase in outbound tourism demand. The own relative price elasticity is –0.25 in the long-run and is within the range of previous studies. This result indicates a price inelastic demand for the outbound tourism demand, implying that the level of outbound tourism demand cannot be regulated extensively through price policies.

The error-correction term is –0.48 with the expected sign, suggesting that when demand is above or below its equilibrium level, demand adjusts by almost 50% within the first year. The full convergence process to its equilibrium level takes after about two years. Thus, the speed of adjustment is significantly fast in the case of any shock to the outbound tourism demand equation.

Table 2. ECM results for the 1970-2005 time span

Dependent variable Δf_t

	Model Selection Criterion	
Regressors	AIC ARDL (1,2,1)	SBC ARDL (1,0,1)
Δy_t	1.20 (2.68)*	0.82 (5.33)*
Δy_{t-1}	-0.62 (1.61)	-
Δp_t	0.16 (1.42)	0.087 (0.88)
Constant	-17.38 (3.11)*	-17.56 (4.74)*
EC_{t-1}	-0.48 (5.71)*	-0.49 (5.86)*
$\overline{R}^2$	0.55	0.53
F-statistics	12.52	14.80
DW-statistics	1.77	1.68
RSS	0.257	0.288

Notes: The absolute values of t-ratios are in parentheses. RSS stands for residual sum of squares. Since the AIC and HQC criteria produce exactly the same error correction results, the latter estimation, therefore, is not reported here. * and ** indicate 5 % and 10 % significance levels, respectively.

Having a cointegrating relationship among [f_t, y_t, p_t] on the basis of the results of the bounds test, the Granger causality test was conducted to equation (4) as such that only the outbound tourism demand equation was estimated with an error- correction term. However, the Granger causality tests were applied to other models without the error-correction terms, since one could not ascertain any long-run relationship for the other vectors. Table 3 summarizes the results of the long run and short-run Granger causality. According to the coefficient on the lagged error-correction term, there exists a long run relationship among the variables in the form of equation (1) as the error-correction term is statistically significant, which also confirms the results of the bounds test. In the long run, income and relative prices Granger cause outbound tourism demand and the direction of causality runs interactively through the error-correction term from income and relative prices to outbound tourism demand. In the case of short-run causality tests, Table 3 reveals that income Granger causes outbound tourism demand because only the F statistic for the income variable is statistically significant at the 5% level in the outbound tourism demand vector. As for the short run Granger causality tests of other equations in Table 3, it seems that only causality runs from income to outbound tourist flows but there exists no other Grange cause in the system.

Table 3. Results of Granger causality				
	F-statistics (probability)			
Dependent Variable	Δf_t	Δy_t	Δp_t	EC_{t-1} (*t*-statistics)
Δf_t	-	3.06* (0.04)	1.48 (0.24)	-0.32* (2.41)
Δy_t	0.19 (0.82)	-	0.11 (0.89)	-
Δp_t	0.10 (0.90)	0.07 (0.92)	-	-
Causality inference : $y \rightarrow f$				

Notes: * indicates 5 % significance level. The probability values are in brackets. The optimal lag length is 2 and is based on SBC.

Table 2 enables us to select the most appropriate model of implementing the stability test for the outbound tourism demand equation. According to the reported diagnostic tests results, the AIC based error-correction model of equation (2) seems to be a relatively better fit than others. Therefore, the CUSUM and CUSUMSQ stability tests were applied to the AIC based error-correction model and the graphs representing the tests are presented in Figures 1 and 2. As can be seen from Figures 1 and 2, the plots of CUSUM and CUSUMSQ statistics are well within the critical bounds, implying that all coefficients in the error-correction model are stable. Therefore, the preferred model can be used for policy decision-making purposes such that the impact of policy changes considering income and price will not cause major distortion in the level of outbound tourism demand, since the parameters in this equation seems to follow a stable pattern during the estimation period.

Figure 1. Plot of CUSUM

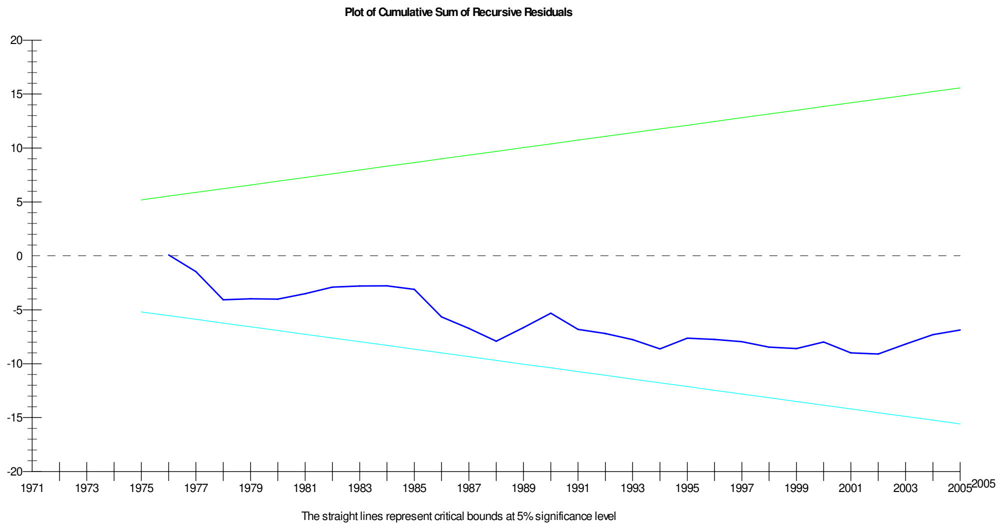
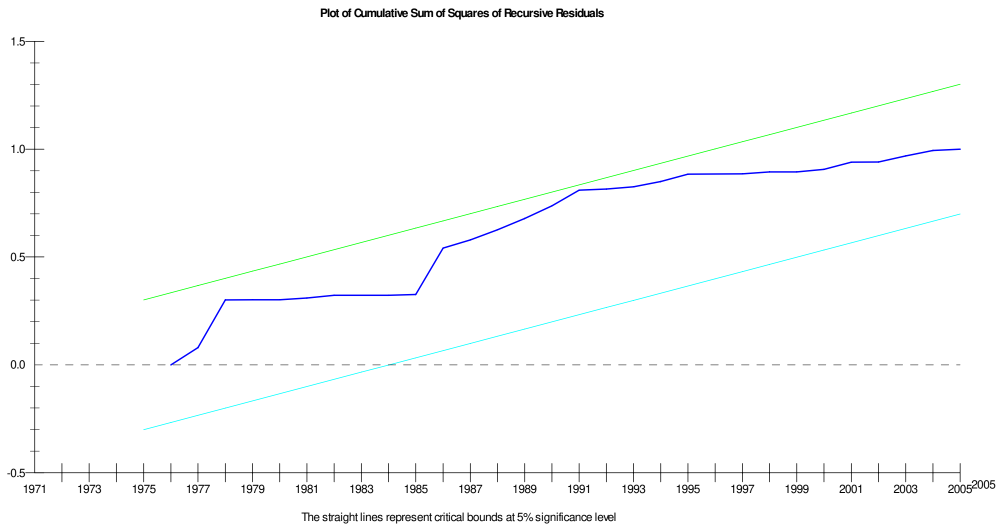


Figure 2. Plot of CUSUMSQ



Conclusions

Like many developing countries, Turkey has been contributing to the growth of international tourism demand. The extent of this contribution in the coming years is expected to be more apparent once the travel restrictions such as harsh visa procedures imposed on Turkish citizens are lifted in the course of Turkey's becoming a full member of the European Union. The number of Turkish people travelling abroad for holidays will double in less than a decade if the current average growth rate for the outbound tourism demand holds. The outbound tourism expenditures, however, will not be a significant burden in the foreign reserves since the share of the outbound tourism expenditures in GDP is rather low[3]. Thus, the tourism policies to design to restrict the outbound tourism demand may not produce the desired effects. In order to measure the extent of the economic policy decisions on the outbound tourism demand, this study computed the elasticities of the outbound tourism demand equation with respect to income and relative prices both in the short-run and long-run by employing the ARDL cointegration procedure. The computed ranges of elasticities are in line with the previous studies in the tourism demand literature. As expected, the long-run elasticities are greater than the short-run elasticities. These results may be utilized in managing the aggregate outbound tourism demand. For example, relatively low price elasticities in both the short-run and long-run indicate that the tourism policies to restrict outbound tourism demand would not be very effective, whilst the income policies will have a stronger impact on demand. The results of augmented Granger causality test suggest that the direction of causality runs interactively through the error-correction term from income and relative prices to the outbound tourism demand in the long-run. In the short-run, causality runs only from income to outbound tourism flows. Thus, the prediction of the level of the outbound tourism demand is possible by using income and relative prices variables. The parameter stability tests of the CUSUM and CUSUMSQ revealed that the outbound tourism demand equation is stable. Therefore, the suggested econometric model of the outbound tourism demand may be adopted for policy simulations and forecasting purposes.

[3] The prediction of the total tourist outflows from Turkey is based on the average growth rate of the outbound tourist flows, which is estimated as 9.38% per year during 1970-2005. It is assumed that this rate holds for the next decade. Thus, one expects over 16 millions of Turks having foreign holidays in 2015. The similar prediction is revealed for the share of the outbound tourist expenditures in GDP. Therefore, this ratio is expected to be less than 2% of GDP in 2015.

Appendix A

Data definition and sources

All data are collected from International Financial Statistics of (IMF), Turkish Statistical Institute (TSI), and Ministry of Tourism and Culture of Turkey (MTCT),

f is total tourist outflows in thousands, in logarithm. The total tourist outflows data discontinued in the years of 1977, 1978 and 1979. The missing years were completed by extrapolation. Sources: TSI and MTCT.
y is real gross domestic product in thousands of Turkish Lira (TL), in logarithm. Gross domestic production is deflated by the consumer price index (CPI) of 2000=100. Source: IMF.
p is exchange rate adjusted relative prices between USA and Turkey, which is measured as: $p = \left(\dfrac{CPIUSA}{CPITurkey \times ER} \right)$, where CPIUSA is consumer price index of USA, CPITurkey is consumer price index of Turkey, and ER is the nominal exchange rates between USA and Turkey. Consumer price indexes are based on 2000=100. Source: IMF.

Appendix B

Bounds Test for Cointegration

A bounds F test was applied to equation (2) in order to test the existence of a long-run relationship by using lags from two to four following Bahmani-Oskooee and Goswami (2003), as they have shown that the results of this stage are sensitive to the order of VAR. Equation (2) was also estimated three more times in the same way but the dependent variable each time was replaced by one of the explanatory variables in search of other possible long-run relationship in any other form than it had already been described in equation (1). Summary results of bounds tests are presented in Table 4. Table 4 indicates only one plausible long-run relationship in which *f* is the dependent variable. Evidence of cointegration among variables also rules out the possibility of estimated relationship being “spurious”.

Table 4. The Results of F-test for Cointegration

	Calculated F-statistics for different lag lengths		
	2 lags	4 lags	6 lags
$F_C(f \mid y, p)$	8.65	7.57	7.35
$F_C(y \mid f, p)$	2.82	1.46	1.35
$F_C(p \mid f, y)$	0.89	1.13	0.36

The critical value ranges of F-statistics with two explanatory variables are 6.14– 7.60, 4.18 – 5.33 and 3.93 – 4.41 at 1%, 5% and 10% level of significances, respectively. See Narayan (2005), p.1988, Case III.

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