ON THE CAUSALITY BETWEEN TOURISM GROWTH AND ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM TURKEY

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Abstract

This study investigates the long-run relationship between the real GDP and international tourism in Turkey during the time period 1987-2007. For this purpose, tourism-led growth hypothesis (TLG) is tested by using two different methods: a vector error correction model (VEC) and an autoregressive distributed lag model (ARDL). The results of the Johansen cointegration test as well as of the ARDL bound test show that there is no unique long-term or equilibrium relationship between the real GDP and international tourism. Therefore, the TLG hypothesis cannot be inferred for the Turkish economy because no cointegration exists between international tourism and the real GDP. Moreover, Granger causality test and error correction model cannot be run any further in the long-term period.

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1. Introduction

Similar to other developing countries, Turkey has also focused its attention upon the economic policies aimed at promoting international tourism expansion as a potential source of the country's economic growth. However, the relationship between tourism and economic growth is the subject of many ongoing debates. In a more traditional sense, it should be argued that tourism brings in foreign exchange, which can be used to import capital goods in order to produce goods and services that would lead in turn to economic growth (McKinnon, 1964). In addition, as it happens in Turkey, tourism growth provides a remarkable share of the finances necessary for the country to import more products than to export.

It is widely acknowledged that tourism growth contributes to economic growth through its various impacts, such as employment generation, foreign exchange earnings, government revenues, multiplier effects, development of infrastructure, and development of entrepreneurial and other skills. Because tourism is a multidisciplinary activity that involves several industries and draws upon a variety of skills, its benefits are spread over a wider section of society comparatively to other sectors of the economy (Telce and Schroenn, 2006). The stronger the linkage to other domestic sectors, the greater is the positive impact of tourism on the development of a destination (Tisdell and Roy, 1998; Ashley and Mitchell, 2006b). Some recent researches and policies have increasingly recognised the potential of tourism to benefit poor people in particular, introducing the concept of "pro-poor tourism". A recent study established that tourism has an exceptional capacity to create, for several reasons, opportunities for the poors (Ashley and Mitchell, 2006a).

Balaguer and Cantavella-Jordà (2002) were the first authors to mention tourism-led growth hypothesis (TLGH) concept. Since then, increasing attention has been paid to this issue. Firstly, international tourism can be considered a non-traditional export since it implies a source of receipts. Secondly, international tourism has experienced such an enormous increase that nowadays it is considered a potential strategic factor of development and economic growth; it seems straightforward to understand the derivation of the TLGH from the export-led growth hypothesis (ELGH). At present, only empirical papers can be found and there is a clear lack of theoretical literature about TLGH. In this context, several researchers are interested in demonstrating that tourism can be considered a main factor of economic growth for developing countries (Cortes-Jimenez and Pulina, 2006, pp.3-4).

The most recent papers on the relationship between tourism and growth are found in Balaguer and Cantavella-Jordà (2002) for Spain, Dritsakis (2004) for Greece, Gunduz and Hatemi-J (2005), as well as Ongan and Demiroz (2005) for Turkey, Oh (2005) for Korea, Cortes-Jimenez and Pulina (2006) for Spain and Italy, and Kim *et al.* (2006) for Taiwan. Balaguer and Cantavella-Jordà (2002) have confirmed the tourism-led growth hypothesis for Spain. Dristakis (2004) established an evidence of bidirectional causality between international tourism and economic growth in Greece. Ongan and Demiroz (2005) have examined the impact of international tourism receipts on the long-term economic growth in Turkey. In their study, they have revealed the bidirectional causality between tourism and economic growth. Oh (2005) found out that the one-way causal relationship between economic-driven tourism growth and TLGH cannot be confirmed in the Korean economy. Gunduz and Hatemi-J (2005) found a unidirectional causality between the international tourist arrivals and the economic growth of Turkey, and empirically confirmed the TLGH. Kim *et al.* (2006) pointed to the bidirectional causality between international tourism and economic growth in Taiwan. Cortes-Jimenez and Pulina (2006) supported the TLGH for Spain but rejected it for Italy.

The objective of this paper aims to examine to what extent the Turkish economic growth responded to the evolution of external international tourism activity during the period 1987-2007. The paper emphasizes the importance of the economic growth and international turism, because the recognition of the existence of a causal relationship between international tourism and economic growth will have important implications for the development of different tourism marketing and policy decisions. The theoretical background on tourism-led growth hypothesis (TLGH) is referred in the literature on the export-led growth hypothesis (ELGH) and in the most recent theoretical methods. As in the case of the export-led growth hypothesis, a tourism-led growth hypothesis would postulate various arguments on which basic tourism would become one of the main determinants of the overall long-run economic growth (Dristakis, 2004).

The present paper attempts to make a step further in the TLGH scrutiny. The main objective of this study is to assess whether the TLGH, when employed in a trivariate context, is valid for Turkey's reality for last twenty years. The main contributions of the present research can be found in the following aspects: the estimated model, the applied methodology and the variables included in the model. In addition, the present paper investigates as well the long-run relationship between the real GDP and international tourism in Turkey using both the Johansen cointegration test and the ARDL bound test.

The paper is organised as follows. The second section gives some brief information about the Turkish economy and the world tourism. The third section describes the model, the data and the methodology. The fouth section presents the results of this empirical analysis. Finally, the last section summarizes the paper.

2. A General Overview of the Turkish Economy and World Tourism

Undoubtedly, the importance of tourism for Turkey was significant during the last decades. Nowadays, Turkey is one of the most important countries in the Mediterranean area regarding the international tourism. In 2005, it ranked the nineth in the classification of the top ten tourism destinations worldwide, based on the international tourism receipts (UNWTO, 2006). Taking into consideration the criteria of the tourism receipts, USA, Spain, France and Italy ranked the first.

The table below provides relevant economic data for Turkey between 1970 and 2007. Turkey is widely mentioned as a success case with regard to the expansion of tourism and the ways of taking advantage of this activity in order to enhance the development of the economic performance. It has been argued that during the last years the foreign currency receipts generated by tourism have enourmously contributed to the financing of the imports of goods, which were necessary to carry out the industrialization. Thus, the international tourism expansion has played a relevant role for Turkey in the process of becoming a developed country.

Table 1. Main Macroeconomic Indicators for Turkey

	1970	1975	1980	1985	1990	1995	2000	2005	2006	2007
Per Capita GDP (US$)	519	1205	1570	1356	2712	2784	2987	5008	5477	6830
GNP Growth Rate	4.4	6.1	-2.8	4.3	9.4	8.0	6.3	7.6	6.0	4.6
Export (Billions of US$)	0.6	1.4	2.9	8.0	13.0	21.6	30.7	73.4	85.3	107.2
Tourism Revenues (Billions of US$)	0.1	0.2	0.3	1.1	3.2	5.0	7.6	18.2	16.9	18.5
Number of Tourist Arrivals (in Millions)	0.7	1.1	1.1	2.2	5.4	7.7	10.4	21.1	20.0	23.3

Source: State Planning Organization, http://www.dpt.gov.tr; State Institute of Statistics, http://www.tuik.gov.tr.

Tourism is one of the world's fastest growing industries. According to the World Tourism Organisation, in 2007, global international tourist arrivals reached 903 millions and US$856 billions spendings, having increased from 394 millions and US$204 billions spendings, in 1988. Arrivals are predicted to reach 1,006 millions by 2010 and over 1.6 billions by 2020 (UNWTO, 2008). The travel and tourism economy accounts for around 10% of the global production, employment, consumer spending and capital investment, and provides a major source of foreign exchange and tax revenue for many countries (WTTC, 2002). However, not all regions and countries benefit equally from tourism: the developed world reaps by far the largest gains. The highest share of international tourist arrivals is received by Europe (54.3%), followed by Asia and the Pacific (19.9%), the Americas (16.2%), Africa (4.9%) and the Middle East (4.7 %) (UNWTO, 2008).

3. Model, Data and Methodology

Gunduz and Hatemi-J (2005) have discussed the alternative measurements for international tourism including tourism receipts and international tourist arrivals. Gunduz and Hatemi-J (2005) pointed out that a multicollinearity problem emerges when tourism receipts are used. In addition, Oh (2005), Gunduz and Hatemi-J (2005), and Balaguer and Cantavella-Jordá (2002) suggested that the real exchange rates should be included in the discussion of international tourism in order to deal with potential omitted variable problems.

According to the most recent literature, two different models (GDP-NT-RER and GDP-TR-RER) are constructed in a trivariate system used for the empirical investigation of the tourism output in the long-run relationship. Variables used in these models are the real gross domestic product (GDP, 1987=100), the total number of international tourists (NT), the real tourism receipts (TR, 1987=100) and the real exchange rates (RER, 1987=100). The quarterly time series data consists of Turkish observations during 1987:1-2007:3. The data source is the electronic data delivery system of the Central Bank of the Turkish Republic (available at http://www.tcmb.gov.tr). The TR and RER are dependent variables in our calculations. All series are seasonally adjusted by using Census X-12 quarterly seasonal adjustment method, and then natural logarithm is taken.

Two different methods are used for testisng the Granger causality: a vector error correction model (VEC) and an autoregressive distributed lag model (ARDL).

3.1. The Vector Error Correction Model (VEC)

Johansen (1988) and Johansen and Juselius (1990) have modelled the time series as reduced rank regression in which they computed the ML estimates in the multivariate cointegration model with Gaussian errors. Once the cointegrating relationships have been determined, the next step was to estimate a VEC model, i.e. with the variables in first differences and including the long-run relationships as error-correction terms in the system.

In our case, the VEC trivariate systems take the following forms:

$$\begin{aligned} \Delta GDP_t &= \beta_1 + \alpha_{11}\Delta GDP_{t-1} + \alpha_{21}\Delta NT_{t-1} + \alpha_{31}RER_{t-1} + \alpha_{41}EC_{t-1} + \varsigma_{1t} \\ \Delta NT_t &= \beta_2 + \alpha_{12}\Delta GDP_{t-1} + \alpha_{22}\Delta NT_{t-1} + \alpha_{32}RER_{t-1} + \alpha_{42}EC_{t-1} + \varsigma_{2t} \\ \Delta RER_t &= \beta_3 + \alpha_{13}\Delta GDP_{t-1} + \alpha_{23}\Delta NT_{t-1} + \alpha_{33}RER_{t-1} + \alpha_{43}EC_{t-1} + \varsigma_{3t} \end{aligned} \tag{1}$$

$$\begin{aligned} \Delta GDP_t &= \theta_1 + \alpha_{11}\Delta GDP_{t-1} + \alpha_{21}\Delta TR_{t-1} + \alpha_{31}RER_{t-1} + \alpha_{41}EC_{t-1} + \zeta_{1t} \\ \Delta TR_t &= \theta_2 + \alpha_{12}\Delta GDP_{t-1} + \alpha_{22}\Delta TR_{t-1} + \alpha_{32}RER_{t-1} + \alpha_{42}EC_{t-1} + \zeta_{2t} \\ \Delta RER_t &= \theta_1 + \alpha_{13}\Delta GDP_{t-1} + \alpha_{23}\Delta TR_{t-1} + \alpha_{33}RER_{t-1} + \alpha_{43}EC_{t-1} + \zeta_{3t} \end{aligned} \tag{2}$$

The error-correction (EC) is the estimated error correction term in the cointegration analysis. Residual terms are independently and normally distributed with zero mean and constant variance.

Granger causality can be examined in three ways: a) by observing the significance of the lagged differences of the variables in the above mentioned equations through a joint Wald; this is a measure of the short-run or weak Granger causality; b) by reviewing the significance of the error-correction term in the above equations as a sufficient measure of the long-run causality; the t-statistic and coefficients; c) by testing the joint significance of the error-correction term and the lagged variables in each VEC variable through a joint Wald or F-test, sometimes mentioned as a measure of the "strong Granger causality" (Oh and Lee, 2004).

3.2. The Autoregressive Distributed Lag Model (ARDL)

Autoregressive distributed lag (ARDL) cointegration procedure was recently developed by Pesaran and Shin (1999) and Pesaran *et al.* (2001). For three variables, an ARDL model can be presented in the following form:

$$\Delta Y_t = \mu + \sum_{i=1}^{k}\phi_i \Delta Y_{t-i} + \sum_{j=0}^{l}\beta_j \Delta X_{t-j} + \sum_{h=1}^{m}\gamma_h \Delta Z_{t-h} + \delta_1 Y_{t-1} + \delta_2 X_{t-1} + \delta_3 Z_{t-1} + \upsilon_t \tag{3}$$

where Δ is the first difference operator. An appropriate lag selection is based on a criterion such as Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion

(SBC). The null of no cointegration, $H_0 : \delta_r = 0$ is tested against the alternative of $H_1 : \delta_r \neq 0$, r=1,2,3. Two sets of critical values are generated, the upper bound critical values refers to the I(1) series and the lower bound critical values to the I(0) series. If the calculated *F*-statistics lies above the upper level of the band, the null is rejected, indicating cointegration. If the calculated *F*-statistics is below the upper critical value, we cannot reject the null hypothesis of no cointegration. Finally, if it lies between the bounds, a conclusive inference cannot be made without knowing the order of integration of the underlying regressors.

The upper limit of the critical values for the F-test (all I(1) variables) can be obtained from Pesaran *et al.* (2001). Recently, the set of critical values for the limited data (30 observations to 80 observations) were developed originally by Narayan (2004).

In our case, the Granger causality tests can be undertaken in the ARDL environment (Fatai *et al.*, 2004):

$$\begin{aligned}
\Delta GDP_t &= \beta_1 + \sum_{i=1}^{k} \phi_i \Delta GDP_{t-i} + \sum_{j=1}^{l} \beta_j \Delta NT_{t-j} + \sum_{h=1}^{m} \gamma_h \Delta RER_{t-h} + \varsigma_{1t} \\
\Delta NT_t &= \beta_2 + \sum_{i=1}^{k} \phi_i \Delta GDP_{t-i} + \sum_{j=1}^{l} \beta_j \Delta NT_{t-j} + \sum_{h=1}^{m} \gamma_h \Delta RER_{t-h} + \varsigma_{2t} \qquad (4) \\
\Delta RER_t &= \beta_3 + \sum_{i=1}^{k} \phi_i \Delta GDP_{t-i} + \sum_{j=1}^{l} \beta_j \Delta NT_{t-j} + \sum_{h=1}^{m} \gamma_h \Delta RER_{t-h} + \varsigma_{3t}
\end{aligned}$$

$$\begin{aligned}
\Delta GDP_t &= \theta_1 + \sum_{i=1}^{k} \phi_i \Delta GDP_{t-i} + \sum_{j=1}^{l} \beta_j \Delta TR_{t-j} + \sum_{h=1}^{m} \gamma_h \Delta RER_{t-h} + \zeta_{1t} \\
\Delta TR_t &= \theta_2 + \sum_{i=1}^{k} \phi_i \Delta GDP_{t-i} + \sum_{j=1}^{l} \beta_j \Delta TR_{t-j} + \sum_{h=1}^{m} \gamma_h \Delta RER_{t-h} + \zeta_{2t} \qquad (5) \\
\Delta RER_t &= \theta_3 + \sum_{i=1}^{k} \phi_i \Delta GDP_{t-i} + \sum_{j=1}^{l} \beta_j \Delta TR_{t-j} + \sum_{h=1}^{m} \gamma_h \Delta RER_{t-h} + \zeta_{3t}
\end{aligned}$$

The tests of whether NT (or TR) causes GDP, depend on the results of the null hypothesis that are $H_0 : \beta_j = 0$ and $H_0 : \Phi_i = 0$. An appropriate lag selection based on a criterion such as AIC and SBC. The rejection of the null hypotheses indicates that NT (or TR) does Granger cause GDP and GDP does Granger cause NT (or TR), respectively.

4. Empirical Results

The time series of univariate properties were examined using two unit root tests: Augmented Dickey and Fuller (ADF, 1979) test and Zivot and Andrews (ZA, 1992) test. It has been observed that the size and power properties of the unit root tests are sensitive to the number of lagged terms (k) used.

Several guidelines have been suggested for the choice of k. The optimal lags for unit root tests have to include lags that are sufficient to remove any serial correlation in the residuals; *k* is determined according to the recursive t-statistics procedure proposed by Hall (1994). As discussed by Campbell and Perron (1991) and Ng and Perron (1995), this procedure has better size and power properties than the alternative methods. For the ADF and the ZA unit root tests, *k* is determined according to the recursive t-statistics procedure proposed with a significance level of asymptotic normal distribution determined at 5%. T_B is break point and is determined endogenously. Neither of these tests rejects the I(1) null for any of the variables (Table 2). The ZA unit root test determined the Turkish financial crisis in 2001 as a break point and the 2001 dummy variable is added into models.

Table 2. Unit Roots Tests Results

	The ADF Unit Root Test		The ZA Unit Root Test	
Series	Levels	1st Differences	Level	1st differences
GDP	- 2.07 (4)	- 6.22 (3)	- 4.78 (4) [2001Q1]	- 6.78 (3) [1998Q2]
NT	- 3.37 (1)	- 13.77 (1)	- 4.57 (1) [1999Q1]	- 14.29 (0) [1999Q4]
TR	- 3.27 (7)	- 14.42 (1)	- 3.75 (7) [2003Q3]	- 14.82 (0) [1999Q3]
RER	- 1.89 (4)	- 6.82 (3)	- 4.86 (4) [1994Q1]	- 7.32 (3) [1995Q2]
Critical values at 1%	- 4.04	- 3.51	- 5.57	- 5.34
Critical values at 5%	- 3.45	- 2.89	- 5.08	- 4.80

Notes: Number of lags, k, and break point, T_B, are in ( ) and [ ], respectively.

The findings of the Johansen cointegration test as well as the ARDL bound test show that there is no unique long-term or equilibrium relationship between variables (Table 3). Therefore, the TLG hypothesis cannot be inferred for the Turkish economy because no cointegration exists between international tourism and the real GDP. Moreover, error correction modeling and Granger causality tests cannot be run any further in the long-term period.

Table 3. Cointegration Tests Results

Model 1. (GDP-NT-RER)					
	Johansen Cointegration Test, k=2				The ARDL (1,0,2)
r	Trace Statistics	5 % Critical Value	λ-max Statistics	5 % Critical Value	F- Statistics
r=0	21.20	29.80	15.51	21.13	0.26
r≤1	5.69	15.49	5.40	14.26	
r≤2	0.30	3.84	0.30	3.84	
Model 2. (GDP-TR-RER)					
	Johansen Cointegration Test, k=2				The ARDL (1,0,2)
r	Trace Statistics	5 % Critical Value	λ-max Statistics	5 % Critical Value	F- Statistics
r=0	17.01	29.80	9.94	21.13	0.48
r≤1	7.06	15.49	6.76	14.26	
r≤2	0.31	3.84	0.31	3.84	

Notes: For Johansen Cointegration Test Results: k is based on FPE, AIC, SIC and HQ information criterias test results. R is # of Cointegrating Vectors. Critical values used are taken from Osterwald-Lenum (1992).
For the ARDL model k=1 (based on SIC), F is the ARDL cointegration test. The upper limit of the critical value based on Narayan (2004) is 4.306 for the 5% significance levels, respectively.
GDP (real gross domestic product), NT (total number of international tourists visiting), TR (real tourism receipts) and RER (real exchange rates).

5. Conclusions

The main objective of this study consists in testing if the tourism-led growth (TLG) hypothesis holds for Turkey. Tourism-led growth hypothesis is tested by using two different methods: a vector error correction model (VEC) and an autoregressive distributed lag model (ARDL). The results of the Johansen cointegration test as well as of the ARDL bound test show that there is no unique long-term or equilibrium relationship between the real GDP and international tourism. Therefore, the TLG hypothesis cannot be inferred for the Turkish economy because no cointegration exists between international tourism and the real GDP. Moreover, Granger causality test and error correction model cannot be run any further in the long-term period.

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