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# DO TOURISM MARKETS OF TURKEY CONVERGE?

## Abstract:

We aim to analyze the stochastic convergence hypothesis for 14 major tourist source markets of Turkey using monthly data over the period January 1996 to December 2012. To this aim, we use recently developed the two-step LM (Lagrange multiplier) unit root test that allow for two structural breaks in data. Our findings indicate that 10 out of 14 markets are stochastically converging, meaning that tourism polices and strategies directed at these markets are successful. In other words, the presence of convergence in the tourism market indicates that the difference between total visitor arrivals to Turkey and visitor arrivals from any one of the converging source markets is not drifting apart.

## Keywords:

tourism market, convergence hypothesis, structural breaks, unit root tests

## 1. Introduction

Tourism has become one of the largest and fastest growing economic sectors in the world due to its continued expansion and diversification. As a main component of the services sector, the tourism sector is called as the "industry without a roof" given its huge contribution to economic growth and development. The importance of the tourism sector in the world economy is increasing day by day. As stated by Aslan et al. (2009), thanks to the creation of the commercial airline industry and the advent of the jet airplane in the 1950s, the tourism industry has started to follow a sustainable growth path.

Based on the improvements in the world tourism market, all governments try to adopt new strategies for revitalizing their tourism sectors (Yilanci and Eris, 2012). Furthermore, scholars have started to evaluate the different aspects of the tourism sector in their empirical studies. For instance, the convergence hypothesis is one of these aspects and was derived from the neoclassical growth model of Solow (1956). Solow (1956) aimed to test the income convergence among a group of countries. Since then, the convergence hypothesis is discussed for many macroeconomic variables such as per capita income (Carlino and Mills, 1993; Loewy and Papell, 1996; Li and Papell, 1999; Cellini and Scorcu, 2000), per capita energy consumption (Meng et al., 2013), and inflation rate (Holmes, 2002; Das and Bhattacharya, 2004; Drine and Rault, 2006).

Based on its increasing importance, we aim to analyze the convergence hypothesis for Turkey's major tourist source markets. Additionally, there are few studies testing for the convergence hypothesis in the major tourism markets of Turkey. We use a state-of-the-art unit root test developed by Lee et al. (2012). There is no study applying it for the convergence issue in tourism markets.

## 2. An Overview of the Tourism Industry in Turkey

Turkey has seven regions consisting of historical and touristic places, namely, the Mediterranean Region, the Black Sea Region, East Anatolia, the Aegean Sea, Central Anatolia, South East Anatolia and the Marmara Region. There are traces of old civilizations in these regions. In particular, the Aegean Sea and Mediterranean Regions have tourist specialties such as spectacular coastal beauty and rich sunlight.
In this context, it could be asserted that tourism is one of the leading industries in the Turkish economy with its contribution as one quarter of Turkey's GDP (Abbott et al., 2012). In particular, the contribution of the tourism sector on the Turkish economy has started to rise since the Tourism Encouragement Law in 1982, which was a milestone for the tourism industry of Turkey. Turkey has started to initiate liberal policies in its foreign trade regime. Before 1980, according to data from the Ministry of Development (2012), the share of tourism revenue in export revenue was about 0.8% in 1950, 2.4% in 1960, and 8.7% in 1970. However, it has started to increase to double digits since 1980, such as 11%, 18%, 24%, 27%, 24%, 21% and 19% in 1980, 1985, 1990, 2000, 2005, 2010 and 2012, respectively.
Over time, especially, since 2000, Turkey has started to take its place among major tourism destinations. It is now among the top 10 countries in respect of international tourist arrivals. For instance, Turkey ranked sixth with respect to international tourist arrivals in 2012 with 35.7 million. However, due to decreases in tourism receipts, it ranked 12th in receipts with US $25,653 million in 2012 (UNWTO, 2013).

## 3. Literature Review

The pioneering study in the related literature was by Narayan (2006), who applied the univariate and panel LM unit root tests developed by Lee and Strazicich (2003, 2004) and Im et al. (2005), respectively, to examine the convergence hypothesis in 13 major tourist source markets of Australia over the period January 1991 to September 2003. He obtained strong results favorable to convergence in cases of unit root tests with two breaks. In another study, Narayan (2007) examined the presence of convergence in Fiji's eight tourism markets using Pesaran et al.'s (2001) ARDL bounds testing approach to cointegration and univariate and panel unit root tests for the period 1970 to 2003, and obtained strong evidence of convergence. Furthermore, Lean and Smyth (2008) and Tang (2011) for Malaysia's 10 major markets, Lorde and Moore (2008) for the Caribbean region,
Lee (2009) and Tan and Tan (2013) for Singapore's major markets and Solarin (2014) for 16 tourism markets of South Africa, tested for the convergence hypothesis.
Regarding Turkey's tourism markets, there are only three studies analyzing convergence issue in tourist source markets. First, Yilanci and Eris (2012) investigated the convergence hypothesis in 14 major markets of Turkey applying a Fourier stationary test. Their results indicated that 10 out of 14 tourism markets are converging. Second, Abbott et al. (2012) obtained non-convergence results among 20 major tourist source markets of Turkey employing the pairwise approach. Last, Samirkas and Bahar (2011) supported non-convergence in 39 provinces and 2 regions of Turkey using the ordinary least squares estimator.

## 4. Methodology and Empirical Results
### 4.1. Data
We employed monthly international tourist arrivals to Turkey from each of Turkey's 14 major markets over the period January 1996 to December 2012. The data come from the Turkish Statistical Institute (2014). These 14 markets are Austria, Belgium, Bulgaria, France, Germany, Greece, Iran, Israel, Italy, Netherlands, Romania, Russia, the United Kingdom (UK), and the United States of America (USA).

To test for the stochastic convergence hypothesis, we examined whether or not the natural log of the difference between total international visitor arrivals to Turkey and international visitor arrivals from a specific market $i$ is stationary based on equation (1)[1].

$$Y_{it} = \ln(VA_{t,Turkey} / VA_{it})$$
(1)

where $\ln$ denotes natural logarithm, $VA_{t,Turkey}$ and $VA_{it}$ are the total international visitor arrivals to Turkey at time $t$, and visitor arrivals to Turkey from country $i$ at time $t$, respectively. $Y_{it}$ is the observed difference in the log of visitor arrivals at time $t$. We analyzed the stochastic convergence by examining the stationarity of $Y_{it}$ in the framework of unit root tests developed by Lee et al. (2012).

### 4.2. Methodology

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[1] Our definition of visitor arrivals involves only foreign visitors, not citizens.

The following data generating process (DGP) is considered based on the unobserved component representation:

$$y_t = \delta' Z_t + e_t, \quad e_t = \beta e_{t-1} + \varepsilon_t,$$

(2)

where $Z_t$ includes exogenous variables. When $Z_t = [1, t, D_t, DT_t^*]'$, the most general model with a level and trend break is obtained. Here, to allow for multiple breaks, additional dummy variables can be included such that:

$$Z_t = [1, t, D_{1t}, \ldots\ldots\ldots, D_{Rt}, DT_{1t}^*, \ldots\ldots\ldots, DT_{Rt}^*]',$$

(3)

where $D_{it}^* = 1$ for $t \geq T_{Bi} + 1$, $i = 1, \ldots\ldots, R$, and zero otherwise, and $DT_{it}^* = t - T_{Bi}$ for $t \geq T_{Bi} + 1$ and zero otherwise. $T_{Bi}$ Stands for the break date. The null restriction $\beta = 1$ is imposed based on the LM (score) principle and the following regression in differences is considered in the first step:

$$\Delta y_t = \delta' \Delta Z_t + u_t,$$

(4)

where $\delta = [\delta_1, \delta_2, \delta_{3i}', \delta_{4i}']'$, $i = 1, \ldots\ldots, R$. After that, the unit root test statistics are attained from the regression (5):

$$\Delta y_t = \delta' \Delta Z_t + \phi \tilde{S}_{t-1} + e_t,$$

(5)

where $\tilde{S}_t$ indicates the de-trended series as

$$\tilde{S}_t = y_t - \tilde{\psi} - Z_t \tilde{\delta}$$

(6)

Here, the coefficient $\tilde{\delta}$ is obtained in regression (4) using the first differenced data and $\tilde{\psi} = y_1 - Z_1 \tilde{\delta}$. To do so, the dependency on nuisance parameters is removed in the crash model. However, this de-trending procedure does not remove the dependency on nuisance parameters in the model with trend breaks. According to Lee *et al.* (2012), the asymptotic distribution of the test statistic for the trend break model depends on the nuisance parameters, $\lambda_i^*$, indicating the fraction of subsamples in each regime such that $\lambda_1^* = T_{B1}/T$, $\lambda_i^* = (T_{Bi} - T_{Bi-1})/T$, $i = 2, \ldots\ldots, R$, and $\lambda_{R+1}^* = (T - T_{BR})/T$. The dependency of the test statistic on the nuisance parameter is removed by the following transformation as stated in Lee *et al.* (2012).

$$\tilde{S}_t^* = \begin{cases} \dfrac{T}{T_{B1}} \tilde{S}_t & \text{for } t \leq T_{B1} \\[2mm] \dfrac{T}{T_{B2} - T_{B1}} \tilde{S}_t & \text{for } T_{B1} \prec t \leq T_{B2} \\[2mm] \vdots & \\[2mm] \dfrac{T}{T - T_{BR}} \tilde{S}_t & \text{for } T_{BR} \prec t \leq T \end{cases}$$

(7)

Then, $\tilde{S}_{t-1}$ in equation (5) is replaced with $\tilde{S}_{t-1}^*$ as shown in equation (8):

$$\Delta y_t = \delta' \Delta Z_t + \phi \tilde{S}_{t-1}^* + \sum_{j=1}^{k} d_j \Delta \tilde{S}_{t-j} + e_t.$$

(8)

where t-statistic for $\phi = 0$ is denoted by $\tilde{\tau}_{LM}^*$. Thanks to this transformation, the unit root test statistic $\tilde{\tau}_{LM}^*$ no longer depends on the nuisance parameter $\lambda_i^*$ in the model with a trend break. In this case, because the distribution is given as the sum of R+1

independent stochastic terms, the asymptotic distribution of $\tilde{\tau}_{LM}^{*}$ depends only on the number of trend breaks.

## 4.3. Empirical Results

In the first step of the two-step LM unit root test, a maximum structural break number R    is

| Country | $\tau_{LM}^{*}$ | $\hat{T}_B$ | | $\hat{k}$ |
|---|---|---|---|---|
| **Austria** | -5.82706[a] | 2004:10 | 2007:06 | 7 |
| **Belgium** | -6.89598[a] | 1998:02 | 1999:03 | 4 |
| **Bulgaria** | -6.66495[a] | 1998:12 | 1999:03 | 7 |
| **England** | -7.54394[a] | 2001:10 | 2005:05 | 0 |
| **France** | -3.10692 | 1999:07 | 1999:10 | 4 |
| **Germany** | -8.57999[a] | 1999:05 | 2003:01 | 0 |
| **Greece** | -6.43977[a] | 1999:01 | 2002:04 | 1 |
| **Iran** | -3.17826 | 2005:09 | 2005:12 | 4 |
| **Israel** | -4.98988[a] | 2010:04 | 2010:07 | 8 |
| **Italy** | -2.86499 | 1998:09 | 1999:01 | 8 |
| **Netherlands** | -3.97359[c] | 2009:03 | 2009:06 | 4 |

defined, and the max F test is applied for the aim of identification of the break locations and testing the significance of each break with optimal lags. We turn back to the beginning of the first step with break numbers equal to R-1, when the null of no trend break isn't rejected or when one of the break dummy variables isn't significant in case of rejection of no trend break. This procedure continues until the break number equals to zero or all the identified break dummy variables are significant. In the second step, if the null of no break cannot be rejected, the no-break LM unit root test developed by Schmidt and Phillips (1992) is used. However, if the null of no break is rejected, the one-break (or R breaks) LM unit root tests of Amsler and Lee (1995) and Lee and Strazicich (2003) are employed. After that, the LM statistic, denoted as $\tau_{LM}^{*}$, is obtained.

The results of the two-break LM unit root test are presented in Table 1.

**Table 1.** *The Results of Two-Break LM Unit Root Test*

| Romania | -7.26018[a] | 2004:02 | 2004:05 | 2 |
|---|---|---|---|---|
| Russia | -4.93522[a] | 1998:07 | 1998:10 | 8 |
| USA | -3.17127 | 2001:07 | 2001:11 | 7 |

***Notes:*** $\tau^*_{LM}$ is the test statistic for the LM test and $\hat{k}$ is the optimal number of lagged first-differenced terms. $\hat{T}_B$ denotes the estimated break point. The test statistics are invariant to the location of trend breaks because transformed tests are implemented. The critical values are -4.723, -4.205 and -3.937 at 1%, 5% and 10% levels, respectively. [a], [b] and [c] denote that test statistic is significant at 1%, 5% and 10% levels, respectively.

Given the results in Table 1, the unit root null hypothesis in the natural log of the tourist arrivals ratio could be rejected in 10 out of 14 countries. We cannot reject the unit root null hypothesis only for France, Iran, Italy and the United States. In other words, the stochastic convergence hypothesis does not hold only for tourism markets of France, Iran, Italy and the United States. Given the results of the two-break LM test, it could be asserted that the tourism policy of Turkey for these 10 convergent major tourist markets is successful and effective with the exceptions of France, Iran, Italy and the United States. It could be fine to follow a different route in tourism policy for these four non-convergent markets.

Concerning the break dates, the first break dates mostly correspond to the second half of the 1990s. For instance, the first and second break dates in Bulgaria correspond to the Kosova War, which lasted from February 1998 until June 1999. During the war period, a conflict occurred between Bulgarian politicians, who wished to appear cooperative with the West's key military, and security organizations due to the decision of NATO to bomb Yugoslavia over Kosovo. The second break dates of Belgium and Bulgaria coincide with the capturing of Abdullah Ocalan, one of the founding members of the militant organization the Kurdistan Workers' Party (PKK), on February 15, 1999, in Kenya, while being transferred from the Greek embassy to Kenyata International Airport.

With respect to Iran, the presidential election in June 2005, ending with the victory of Ahmadinejad, appears to have important effects on tourist arrivals from Iran. Besides, the avian flu, seen in Turkey in 2005, might have affected tourist arrivals from Iran. Regarding Israel, 2010 was the year in which the relationship between Israel and Turkey was strained, and therefore, the first and second break dates occurred in 2010. Especially, it appears that the Mavi Marmara event (the Blue Marmara Event) on May 31, 2010, had a significant effect on tourist arrivals from Israel. Also, it seems that the Russian financial crisis, also called the Ruble crisis, which started in August 1998, had significant impacts on tourist arrivals from Russia as its first break date is considered a forerunner of the crisis, and its second break date was just two months after the Russian crisis.

## 5. Conclusion and Policy Implications

In this study, our aim was to test for stochastic convergence in 14 major tourism markets of Turkey within the framework of the recently developed two-step LM and three-step RALS-LM unit root tests. The obtained results provide strong support for the convergence hypothesis, indicating that 10 major tourism markets of Turkey are

making a contribution to the increase in tourist arrivals to Turkey, with the exceptions of France, Iran, Italy and the United States. As such, policies based on the purpose of attracting tourists from converging markets will eventually have success because they will increase the number of international tourist arrivals to Turkey. In other words, the presence of convergence in the tourism market indicates that the difference between total visitor arrivals to Turkey and visitor arrivals from any one of the converging source markets is not drifting apart.

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