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# THE CAUSAL RELATIONSHIP WITH NEW VARIABLES IN TOURISM: EVIDENCE FROM TURKEY

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*In this study, the relationship between tourism revenues and variables like tourism index in Borsa İstanbul & tourism advertising duration which have not been used previously in the literature was investigated in Turkey. In order to determine the stationary levels of series, ADF (1979) and Zivot Andrews (1992) unit root tests were used in this study spanning the period Aug 2004 till Dec 2012. Tourism revenues and advertising durations have been found stationary at level, while tourism index was stationary at first difference. According to Toda-Yamamoto (1996) causality test there have been determined no causality between these three variables. However, there was observed one-way causality from tourism index to tourism advertisements by the aid of Hacker Hatemi-J (2010) causality test which can determine critical values by bootstrap simulation with the purpose of to reduce the possibility of potential non-normal dispersion of errors. By this new test more reliable and advanced results have been obtained. As a result, index which can be considered the fundamental performance scale of tourism sector has a vital effect on tourism advertisement.*

***Keywords:*** Tourism Advertising, Tourism Index, Unit Root Test, Bootstrap Causality Test

JEL Classification: *L83, M1, O1*

## INTRODUCTION

Tourism by its positive contribution to balance of employment provider tax income and payment of personal income increaser, especially faced with the problems of declining terms of trade for agricultural products and high levels of protection against manufactures (Proença and Soukiazis, 2005; Lau et al., 2008; Tse, 2001; Wang, 1998). Within this respect, tourism in developing countries plays a fundamental role on economic growth and development. (Sinclair, 1998; Wang et al., 2012; Eugenio-Martín et al., 2004). In these countries, obtained one unit of means contributes to, as well as in tourism sector, investments on other sectors (Wang et al., 2012), and these are used in order to create more employment (Tse, 2001).

Tourism sector has been one of the most important factors of economic development in recent years in Turkey by creating new employment opportunities and positive effect on GDP and balance of payments. In 2009, Tourism sector created 7.2% of total employment and 10.2% of GDP. Number of tourists and tourism revenue has increased in recent years and growth rate of tourism sector in Turkey has observed higher than global growth rate of sector. While the share of foreign tourists coming to Turkey in global total was 1.1% in 1990, this number reached 2.7% in 2008; while the share of tourism revenue in global tourism GDP was 1.2% in 1990, this number achieved 2.3% in 2008 (www.invest.gov.tr). Between the years 2009 and 2012, visitor number and tourism revenue was 14.9% and 17.1, respectively and 0.019$ revenue growth per visitor was provided (www.tüik.gov.tr).

## BACKGROUND AND LITERATURE REVIEW

In tourism literature, there are studies to measure the effect of tourism on economic growth. Most of the studies focus on whether there was a long-run relationship between tourism revenue and economic growth and the direction of this relationship. Some studies taking into account the direction of relationship between tourism revenue and economic growth are (Belloumi, 2010; Lee and Chang 2008; Balaguer and Cantavella-Jorda, 2002; Vanegas, 2012) showing relationship from tourism revenue to economic growth in long term; (Kızılgöl and Erbaykal, 2008; Oh, 2005) showing relationship from economic growth to tourism revenue in one-way. In some studies, (Lee and Chien, 2008; Kim et al., 2006; Lee and Chang, 2008; Gunduz and Hatemi-J, 2005) put

forward there was reciprocal relationship. On the other hand, there were studies such as (Katircioglu, 2009) showing no relationship between tourism and economic growth in long run.

Tourism is one of the main sources of foreign exchange earnings. In order to gain necessary exchange earnings via tourism, tourism policy-makers should understand the response of tourists to price changings before and during accommodation periods. But it is difficult to obtain accurate tourist prices. Generally, people are more aware of nominal exchange rates than the costs of living at their destinations during determining decisions about travel. Therefore, exchange rates have been used widely in the empirical literature as a proxy for tourism prices. At the same time in studies, it is suggested to use consumer price indices to measure relative prices between tourist origin country and destination. (Yap, 2010; Webber, 2001). In other words, tourism revenue of countries can increase and decrease depending on real exchange rate. In studies examining the relationship between tourism revenue and exchange rate, (Dritsakis, 2004) observed causality relationship between exchange rate and tourism revenue; (Toh et al., 2006) found Japanese tourists to Singapore are sensitive to exchange rate and revenue. Similarly, (Webber, 2001) announced changes in exchange rate affects tourism demand in long-run. Also, (Tang, 2013) found unidirectional causality running from real exchange rates to real tourism revenue and real income in both short- and long-run. (Eilat and Einav, 2004) realized exchange rates matter mainly for tourism to developed country. On the other hand, (Santana et al., 2010) found that less flexible exchange rates promote tourism. In their study (Mervar and Payne, 2007) observed exchange rate was not one of the determinants of tourism demand, (Eugenio-Martin et al., 2004) determined exchange rate was not an important variable in the growth of tourism.

Countries organize promotional activities about their general characteristics in order to inform prospective tourists, exhibit positive image about themselves and gain a share from international tourism market. In this respect, promotional & advertising activities is one of factors affecting the demand of a country in international tourism market. Promotional & advertising activities as well as have an impact to increase current tourism demand have power to stimulate potential tourism demand. Therefore, countries devote much more sources and time to promotional & advertising activities.

In the studies about tourism, variables of advertisement and promotion were emphasized as a significant factor affecting tourism revenue. However, these factors were not included into established

models. Çuhadar (2006:53). In order to compensate for this lack in the literature, advertising numbers of tourism was considered as a variable in our study and its effect on other variables was investigated.

The contribution of this study to current literature is to expose the interaction between tourism revenue, advertising duration and tourism index in the terms of Turkey tourism by including tourism index, which is calculated by BIST and not included into established models of current studies, & average advertising durations as two new variables in the terms of Turkey tourism.

## MODEL

Compared with Toda-Yamamoto (1995) causality test, the most significant difference in Hacker Hatemi-J (2010) causality test is that critical values are determined according to Monte Carlo simulation method.

Unlike Toda-Yamamoto (1995), Hacker-Hatemi-J (2010) does not ignore possible normal dispersion of errors and there is no difference between these tests except acquisition of critical values by bootstrap in Hacker-Hatemi-J (2010). In this test, the causality relationship between two series is tested via delayed Vector Autoregressive Model (VAR):

$$y_t = \alpha + A_1 y_{t-1} + ... + A_p y_{p-1} + u_t$$

Here, $y_t$ represents variable vector in 2x1 dimension and A state parameter vector. In order to gain Wald statistics which will be used test main hypothesis showing no Granger-causality between series, VAR model represented in this equation is as following:

$$Y = DZ + \delta$$

This model can be expressed as:

$$Y := \left( y_1^+, y_2^+, y_3^+, \ldots, y_T^+ \right)$$

$$D := \left( \alpha, A_1, A_2, A_3, \ldots, A_p \right)$$

$$Z := \left( Z_0, Z_1, Z_2, \ldots, Z_{T-1} \right)$$

$$Z_t := \begin{bmatrix} 1 \\ y_t^+ \\ y_{t-1}^+ \\ . \\ . \\ y_{t-p+1}^+ \end{bmatrix}$$

$$\delta := \left( u_1^t, u_2^t, u_3^t, \ldots, u_T^t \right)$$

Main hypothesis showing no Granger causality can be tested following Wald test statistics:

$$W = (C\beta)I\,[C(ZIZ) - 1 \text{ x } Su)\ CI)\ CI] - 1\ (C\beta)$$

Here, $\otimes$ represents the Kronecker multiplier and C shows the indicator function containing restrictions. Also β is of the form β=vec(D) and vec refers to column stacking operator. q shows the number of lags in each VAR equality, Su represents the calculated variance-covariance matrix for the unrestricted VAR model as $(\hat{\delta}_U' \hat{\delta}_U)/(T - q)$.

## DATA

In this study monthly data in Turkey between periods from Aug 2004 till Dec 2012 was investigated. Data of Istanbul Stock Market Tourism Index was derived from www.borsaistanbul.com which is official web site of BIST, numbers of tourism revenue per capita was obtained from www.kultur.gov.tr which is official website of Ministry of Culture and Tourism, average tourism advertising durations were provided by Media Monitoring Center (MTM). Before analysis, logarithmic forms of three series were calculated in order to avoid problem of heteroscedasticity.

## EMPIRICAL RESULTS

In our study, ADF (1979) unit root test and Zivot Andrews (1992) unit root test which allows structural breaks were used in order to clarify the stationary levels of the series. According to results of ADF (1979) unit root test which does not into account structural breaks, tourism revenue & tourism index had a unit root and advertising durations were stationary at level. However, according to Zivot Andrews (1992) unit root test which allows structural breaks at both level and trend, only tourism index were stationary at first difference. Break dates for tourism revenue was Feb-2009, for tourism index was Dec-2008 (mortgage crises period) and for tourism advertising duration was Jan-2007.

**Table1.** Results of ADF Unit Root Test

| | **Level** | **1st Diff.** |
|---|---|---|
| **Ln (Tourism Revenue)** | -2.02 (0.57) | -13.59(0.00)*** |
| **Ln (Tourism Index)** | -1.99 (0.59) | -7.63(0.00)*** |
| **Ln (Tourism Ad. Duration)** | -7.89(0.00)*** | - |

*Optimal lag length was determined according to Schwarz information criterion. *** represents significance level of 1%.*

**Table 2.** Results of Zivot Andrews Unit Root Test

| | Level | 1st Diff. | Break Date |
|---|---|---|---|
| **Ln (Tourism Revenue)** | -5,87 (0.06)** | - | Feb-2009 |
| **Ln (Tourism Index)** | -3,51(0.55) | -9.05(0.00)*** | Dec-2008 |
| **Ln (Tourism Ad Duration)** | -5,32 (0.03)** | - | Jan-2007 |

**** and ** represents 1% and 5% significance levels, respectively. Critical value for 1% is -5.57, for 5% -5.08 and for 10% is -4.82.*

Next step after determination of stationary levels is investigation of causality relationship between series. According to Toda-Yamamoto (1995) causality test which can examine the relationship between series stationary at different levels, there was no causality relationship between these three series.

**Table 3.** Results of Toda-Yamamoto Causality Test

| Dependent Variable | Independent Variable | | |
|---|---|---|---|
| | **Ln (Tourism Revenue)** | **Ln (Tourism Index)** | **Ln (Tourism Ad Duration)** |
| **Ln (Tourism Revenue)** | - | 0.94 | 0.61 |
| **Ln (Tourism Index)** | 0.50 | - | 0.83 |
| **Ln (Tourism Ad Duration)** | 0.82 | 0.94 | - |

*1 lag was chosen according to Schwarz information criterion.*

There was observed causality from tourism index to advertising durations according to Hacher-Hatemi (2010) bootstrap causality test which can obtain critical values with monte-carlo bootstrap simulation despite of possible normal non-dispersal of errors and can investigate relationship between series stationary at different levels like Toda-Yamamoto (1996) causality test. Stock market index of countries accepted fundamental are generally considered as variables which represent changes in market-wide. Tourism index is an important scale showing the performances of businesses in tourism sector. Therefore, all the performance scales whether positive or negative have an effect on

tourism advertising duration. Compared with Toda-Yamamoto (1996) test, Hacker-Hatemi (2010) yielded new results.

**Table 4.** Results of Hacker-Hatemi-J Bootstrap Causality Test

| Dependent Variable | Independent Variable | |
|---|---|---|
| | **Ln (Tourism Index)** | **Ln (Tourism Ad Duration)** |
| **Ln (Tourism Revenue)** | 0.12 | 1.21 |
| Bootstrap at 1% | 6.91 | 7.23 |
| Bootstrap at 5% | 3.93 | 3.83 |
| Bootstrap at 10% | 2.75 | 2.68 |
| | **Ln (Tourism Revenue)** | **Ln (Tourism Ad Duration)** |
| **Ln (Tourism Index)** | 0.29 | 0.04 |
| Bootstrap at 1% | 6.86 | 7.09 |
| Bootstrap at 5% | 3.86 | 4.03 |
| Bootstrap at 10% | 2.75 | 2.78 |
| | **Ln (Tourism Revenue)** | **Ln (Tourism Index)** |
| **Ln (Tourism Ad Duration)** | 0.41 | 3.25* |
| Bootstrap at 1% | 7.07 | 7.05 |
| Bootstrap at 5% | 3.95 | 3.85 |
| Bootstrap at 10% | 2.73 | 2.72 |

## CONCLUSION

Tourism is an important sector in economic growth and development of developing countries by its positive contribution on employment & balance of payments and its expansionist effect upon other sectors. Therefore, there are many studies on tourism in the literature. These studies generally focus on the relationship between tourism and economic growth, tourism demand, tourism revenue and exchange rates.

In this study, unlike other studies, variables like tourism index which represents businesses in tourism sector and tourism advertising durations were used. The relationship between tourism index, tourism advertisings and tourism revenue was examined with first Toda-Yamamoto (1996) causality test, then with Hacker-Hatemi (2010) bootstrap causality test which eliminates the problem of possible normal non-dispersal of errors

and obtains critical values by bootstrap simulation. More advanced and reliable findings were gained through Hacker-Hatemi (2010) test for these variables that there was no relationship according to results of Toda-Yamamoto test (1996).

While many one-way and two-way causality relationships were discovered between GDP and tourism income in literature, there was no causality between tourism index which is a fundamental scale of economic performance and tourism income according to our study.

As a result of study, one-way causality from tourism indices, which is an important indicator representing all positive and negative performances of businesses in tourism sector, to advertising durations was detected. These new variables, which have not been used before, and these new results were thought as contribution to literature.

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