

## **Tourism Revenue and Economic Growth Relation in Turkey: Evidence of Symmetrical, Asymmetrical and the Rolling Window Regressions**

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Tourism industry is one of the important determinants of economic growth in the Turkish economy. Tourism industry also comes into prominence as one of the key factors in economic growth due to its foreign currency inflow effect and its multiplier effect being higher compared to other industries. Previous studies show that increase in tourism revenues has a direct positive contribution to economic growth in developed and developing countries. In this study we investigated the 1995-2017 period, tourism income by the method parameter estimates relationship between economic growth in Turkey's economy. Autoregressive distributed lag (ARDL) regression models, and bootstrap rolling window causality parameter tests were used in the empirical analysis. As a result of the empirical analysis, positive contribution to economic growth from the positive component of tourism income in symmetrical regression and asymmetric regression, asymmetric regression was found to be a negative contribution to economic growth from the negative component of tourism income. According to rolling window regression from tourism income to economic growth there is a positive effect between 2010-2015 and negative effect between 2016-2017.

**Keywords:** tourism income, economic growth, asymmetry, rolling window

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### **1. Introduction**

Tourism mobility contributes to the national economy in different ways. The inflow of foreign currencies (Archer, 1995), the invisible item effect

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## 2 Tourism Revenue and Economic Growth Relation in Turkey: Evidence of Symmetrical, Asymmetrical and the Rolling Window Regressions

on exports (Değer, 2006), the preservation of cultural and natural assets to tourism (Craik, 2002) and its contribution to the labour market (Clancy, 1999) are main features of the tourism industry. That features results tourism industry to become one of the fastest growing industries in the world. In order to stand out from the competition and to compete in international competition due to the nature of tourism industry, investments such as infrastructure, health, communication and transportation contribute directly to the economy and welfare of the region. On the other hand because of the employment opportunities it creates tourism has a indirect effect on the growth of the economy (Skerritt & Huybers, 2005). The contribution of tourism sector to economic growth is in the form of regional development and the high multiplier effect is reflected in the overall economy of the country. In addition, there are studies suggesting that tourism activities will be transformed into international trade activities and contribute to economic growth. (Shan, Wilson, 2001, Çeken, 2008). Unlike these views, it is clear that the direct relationship of economic growth with the tourism industry is contrary to economic principles, since according to findings, economic growth can be possible with sectors and industries requiring high R & D, and that the tourism industry is by nature a labour intensive sector away from R & D. (Sequeira ve Maçãs Nunes, 2008).

In 2018, international tourism activity grew by 6% to 1.4 billion people (UNWTO, 2018). Countries are realizing the necessary infrastructure and superstructure works in order to increase their share of this growing cake. Turkey is one of these countries. However, the political and foreign political problems experienced in the last few years have given the Turkish tourism industry a very challenging test. As a result of the Russian warplanes fall in November 2015, the Russian government imposed sanctions for its citizens. That policy resulted as obstructing the flow of tourists from Russia to Turkey. Just then experienced in 2016, the July 15 coup attempt in Turkey broke the "safe destination" perception that was generated a result of long efforts. Those damage resulted the political crises to be converted as a tourism crisis. The Turkish tourism industry lived a shock in 2016 and 2017 and started to recover until 2018. In 2018, the number of tourists increased by 21.84% compared to the previous year and a total of 39.5 million foreign tourists visited Turkey. In 2018, 190.6 million overnights were realized with an increase of 22.38% compared to the previous year and 29.5 billion dollars of revenue was obtained from these overnights (YİGM, 2018). These developments

in the Turkish tourism industry resulted Turkey to be the 14<sup>th</sup> country worldwide; according to the income obtained. The main purpose of this study unique is one of the major causes of economic growth in Turkey's economy. The studies examining the relation between previous tourism revenue in Turkish economy and overall economic growth mostly hired cointegration and causality tests. The main contribution of this study to the literature is hiring a different analysis developed by Shin et al. (2014) and Granger and Yoon (2002); delayed regression model on latent cointegration (separation of positive and negative components). Also Balcılar et al. (2010) will be followed for the Rolling window regression based on the use of parameter estimation.

In the first part, the theoretical framework of the relationship between tourism income and economic growth and descriptive analysis of the Turkish tourism sector will be summarized. Following that, in the second part will the empirical studies in the economic literature will be listed. In the last section, empirical findings will be evaluated to test the relationship between tourism income and economic growth according to our dataset.

## **2. Literature Review**

The tourism industry is one of the most important determinants of economic growth in Turkey's economy. The tourism industry is one of the key points in economic growth due to the fact that the multiplier effect is higher compared to other industries and the foreign exchange gain effect, and studies have shown that an increase in tourism income directly contributes to economic growth in developed and developing countries. (Nissan et al. 2011., Lee and Chien, 2008., Proença and Soukiazis, 2008., He and Zheng 2011., Balaguer and Cantavella-Jorda 2002., Sak and Karymshakov, 2012, Kızılgöl and Erbayraklar, 2008, Çoban and Özcan 2013). Turkish economy; as a developing country, is subject to many studies that examine the relationship between economic growth and the tourism income. Studies listed below supports the tourism income as a determinant of economic growth; Gündüz and Hatemi J (2005) in the period 1960-2000 with bootstrap Toda-Yamamoto (1995) causality test, Değer (2006) with Johansen cointegration model in 1980-2005, Özdemir and Öksüzler (2006) with Johansen cointegration model in 1963-2003, Aslan (2008) Johansen cointegration model in 1992: Q1-2007: Q2 period, Çetintaş and Bektaş (2008) with distributed autoregressive delay in 1964-

2006 period, Zortuk (2009) Error correction model in 1990:Q1-2008:Q3 period, Işık (2009) in the 1970-2000 period with cointegration and Granger causality test, Arslantürk et al. (2011) Rolling window causality test in 1963-2006 period, Polat and Günay (2012) by Johansen cointegration method in 1969-2009 period, Kara et al. (2012) Engle-Granger cointegration, vector autoregression model in 1992-2011, Bozkurt and Topçuoğlu (2013) with error correction model in 1970-2010, Çoban and Özcan (2013) with vector auto regression and cointegration model in 1963-2010, Pahani et al. (2015) In the period of 1970-2011, Kalman filtering method, Kızılkaya et al. (2016) obtained a causality relationship from tourism income to economic growth with the delayed autoregressive model in the 1980-2014 period.

On the other hand, there is also some other studies suggesting that the tourism income is not a determinant of economic growth. Yavuz (2006) Granger causality test with period 1992: Q1-2004: Q4, Öztürk and Acaravcı (2009) with distributed autoregressive delay in 1987-2007 period, Katircioğlu (2009) with cointegration model in 1960-2006, Hepaktan and Çınar (2010) Granger causality test in 1980-2008 period, Akkemik (2012) sectoral social calculations in 1996-2002 period, Yamak (2012) Engle-Granger and Johansen cointegration model in 1968-2006 period. All mentioned studies cannot prove a statistically significant causality relation between tourism income and economic growth.

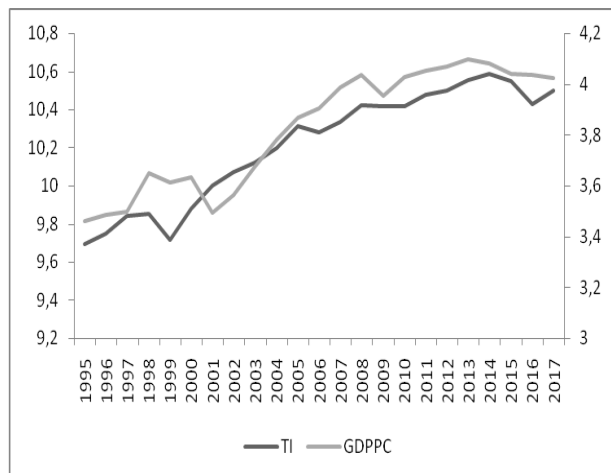
### **3. Data and Methodology**

In order to observe the possible relation between tourism income and economic growth the data within the 1995-2017 period annual data is collected. Eeckels et al. (2012), Chatziantoniou et al. (2013) and Belloumi (2010) are followed and for the tourism income variable annual tourism income is considered in billion dollars, (TI) and for economic growth; per capita national income in GDP (GDPPC) is considered. Data were obtained from the World Bank data distribution system. The natural logarithm of both variables was taken against the changing variance problem. In empirical analyses first descriptive statistics are introduced. Then Dickey-Fuller (1979, 1981) and Phillips and Perron (1988) unit root tests, symmetric and asymmetric delay distributed regression (ARDL) models and Balcılar et al. (2010) parameter estimators' model which are based on floating window regressions are hired respectively.

#### 4. Findings

In Figure 1, the left axis shows tourism income and the right axis shows national income per capita as logarithms. National income per capita experienced a contraction in November 2000-February 2001 in the domestic currency crises and 2008 due to the impact of global crises. However, it is seen that the empirical analysis period is in an increasing trend if the start and end points are considered. On the other hand, tourism income decreases with short intervals between 1998-2000 and 2014-2016 periods but if the whole period is considered, it is in a growth trend. According to the correlation coefficient, there is a positive and strong correlation between tourism income and economic growth.

**Figure 1:** Tourism Income and Development of Gross Domestic Product Per Person



**Table 1:** Correlation Analysis

	GDPPC	T
GDPPC	1	
TI	0.946	1

Descriptive applications are given in Table 2. The standard deviation is higher in tourism income. The coefficient of variation is higher because it is the more decisive factor in national income per capita. Both variables are left skewed and flattened. For the Jarque-Bera normality test, the null hypothesis that the normal distribution is valid for two variables is accepted.

**Table 2:** Descriptive Statistics

	GDPPC	TI
Mean	8.814	23.522
Median	8.991	23.756
Maximum	9.436	24.383
Minimum	7.971	22.324
Standart Deviation	0.535	0.692
Coefficient of Variation	0.060	0.029
Skewness	-0.353	-0.473
Kurtosis	1.487	1.763
Jarque-Bera	2.670	2.324
Probability	0.263	0.312

Note: \*\*\*,\*\* and \* values stands for the statistically significance levels for %1, %5 and %10 significance levels. The coefficient of variation the mean value of the standard deviation.

Empirical analysis should determine the effect of economic shocks on macroeconomic variables and purify the effect, if any. Unit root tests developed by Dickey-Fuller (1979,1981) and Phillips and Perron (1988) were implemented for this purpose. When the probability values are considered, it is seen that both variables carry unit roots at level value in both unit root tests and are stationary when the first difference is taken. Threshold-valued error correction model (Balke and Fomby, 1997, TVEC), error correction model taking into account regime change linked to the Markov chain (Psaradakis et al., 2004, MSVEC), threshold-valued error correction model based on soft transition (Kapetanios et al., 2006, STVEC) models that explore long-term relationship between regimes to predict transitions and thresholds have been introduced. In this study, a delay distributed regression model was applied on the stored cointegration model (separation into positive and negative components) developed by Shin et al. (2014), Granger, and Yoon (2002).

**Table 3:** ADF (1979, 1981) and PP (1988) Unit Root Test Results

		<i>Variables</i>				
		PP	ADF	PP	ADF	
<i>Level</i>	<i>Constant</i>	<b>GDPPC</b>	-1.383 (1) [0.571]	-1.382 (0) [0.571]	-4.303 (1) [0.00]***	-4.304 (0) [0.00]***
		<b>TI</b>	-1.976 (9) [0.293]	-1.579 (0) [0.475]	-4.484 (6) [0.00]***	-4.456 (0) [0.00]***
	<i>Constant+Trend</i>	<b>GDPPC</b>	-1.349 (1) [0.847]	-1.255 (0) [0.872]	-4.427 (1) [0.0108]**	-4.428 (0) [0.0108]**
		<b>TI</b>	-1.134 (3) [0.899]	-1.268 (0) [0.869]	-5.562 (11) [0.00]***	-4.441 (1) [0.011]**

**Not:** \*\*\*, \*\* and \* values stands for the statistically significance levels for %1, %5 and %10 significance levels. The values in parentheses indicate the optimal delay length relative to the Schwarz information criterion. In case the delay length is zero, illustrates the "Dickey-Fuller (1981) unit Root Test". The values in square brackets represent the probability values. For ADF testing: Mac Kinnon (1996) critical values at constant 1%. The values for 5% and 10% are 3.485, -2.885, -2.579, respectively. For constant + trend 1%, 5% and 10% probability values, respectively -3.483, -2.884, -2.579. For PP testing: Mac Kinnon (1996) critical values at constant 1%, 5% and 10% values for 3.485, -2.885, -2.579 and 1% for constant + trend, respectively. For 5% and 10% probability values, respectively -4.033, -3.446 and -3.148.

According to static symmetrical regression results, the 1% increase in tourism revenues increases the national income per capita by 0.931%. Besides tourism income, the ratio of macroeconomic variables affecting national income per capita is approximately 13,498%. Static asymmetric regression results show that this ratio is lower with 7.801%. When the positive component of tourism income (increase of tourism income) increases by 1%, national income per capita increases by 0.82%, and when the negative component of tourism income (decrease of tourism income) increases by 1%, national income per capita decreases by 0.87%. Despite significant value losses in the national currency in the Turkish economy, tourism revenues do not have a multiplier effect on economic growth according to static symmetrical and static asymmetric regression results. Keynes' prediction that the increase in exports will create an expansion in the volume of production through the foreign trade multiplier is not valid. According to Kizilkaya et al (2016), the main reason for not creating a multiplier effect is due to the significant differences between the number of international tourists coming to the country and the tourism income and the fact that low budget based tourism activities are weighted. According to Lundberg et al (1995), because of high intake of goods and services that do not generate income for the

touristic area, which is within the multiplier effect of tourism, low consumption tendency of tourists on abroad (high tendency to consume imported goods) and residents' low tendency of foreign currency consumption in marginal consumption tendencies, tourism revenues cannot create a multiplier effect on economic growth.

**Table 4:** Symmetric and Asymmetric Parameter Estimation Results <sup>4</sup>

Static Symmetric Regression		Static Asymmetric Regression	
Fixed Term	13.498 (0.032)**	Fixed Term	7.801 (0.00)****
TI	0.931 (0.00)***	TI <sup>+</sup>	0.826 (0.00)***
R <sup>2</sup>	0.980	TI <sup>-</sup>	-0.877 (0.045)**
$\chi^2_{SC}$	0.306 (0.742)	R <sup>2</sup>	0.970
$\chi^2_H$	0.871 (0.543)	$\chi^2_{SC}$	1.295 (0.340)
$\chi^2_{FF}$	2.497 (0.142)	$\chi^2_H$	0.731 (0.675)
$\chi^2_N$	0.551 (0.759)	$\chi^2_{FF}$	1.625 (0.148)
		$\chi^2_N$	0.776 (0.678)
		W <sub>inf+=inf-</sub>	8.170 (0.00)***

**Note:** \*\*\*, \*\* and \* values stands for the statistically significance levels for %1, %5 and %10 significance levels. The values in parentheses indicate probability values.  $\chi^2_{SC}$ ,  $\chi^2_H$ ,  $\chi^2_{FF}$  and  $\chi^2_N$  indicate serial correlation, (Breusch-Pagan-Godfrey) varying variance test, Ramsey RESET test and normality test respectively. Results on the limit test, short term results, The Engle-Granger maximum value of the error term-based ADF test, and optimal delay lengths selected by the Akaike information criterion can be requested from the authors.

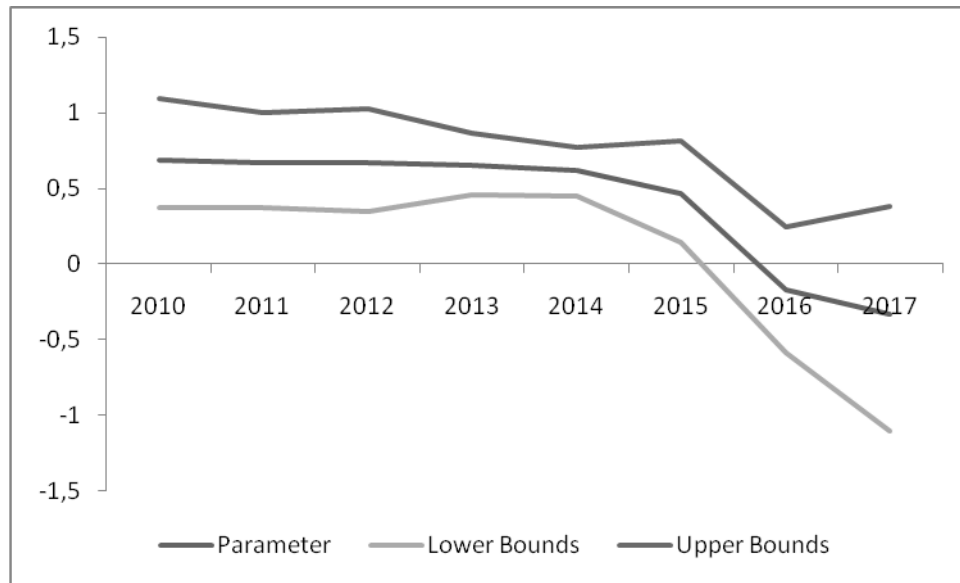
The first 15 observations were used for the test systematics of Rolling window regression and parameter estimation is considered since 2010. Accordingly, the increase in tourism income between 2010 and 2014 contributed positively to economic growth in the range of 0.65-0.68, and this ratio decreased to 0.46 in 2015. Between 2016 and 2017, however, it is increasing in negative contribution. It is observed that there is no multiplier and spreading effect in each period. The reason for the decline in 2015 and the continued negative contribution seen in 2016-2017 is thought to be the tourism crisis experienced by Turkey. Both strained relations with Russia and the military coup attempt have an impact on economic growth as well as tourism demand. In this context, it is observed that political instability and uncertainties in foreign policy negatively

<sup>4</sup> For details about Asymmetric ARDL test process please see Shin et al. (2014)



affect tourism revenues and therefore economic growth, and that a decline in tourism revenues reflects negatively on economic growth.

**Figure 2:** Balcılar et al. (2010) Contribution of Tourism Income to Economic Growth by Rolling Window Regressions <sup>5</sup>



## 5. Conclusion and Policy Recommendations

Political stability is one of the major factors on macroeconomics variables. This connection also valid in the tourism industry. Depending of the features of tourism such as high rate of substitution, definite and increasing international competition and easy dispensability, tourism demands are highly elastic. When the confidence environment is destroyed, tourism demand retreats and a perception of unsafe destination will not last for many years. In this study, the relationship between tourism income and economic growth in the Turkish economy in 1995-2017 was investigated using current time series methods. Empirical analysis found that there was a positive correlation between tourism income and economic growth. Variables have unit roots and are stationary

<sup>5</sup> For details about Sliding Window Regression process please see Balcılar et al. (2010). For sliding window regression test codes, we appreciate to Prof. Dr. Mehmet Balcılar. Asymmetric ARDL test and Sliding Window Regression testing data used in empirical analyses can be requested from authors for replication purposes.

in the first level. The reason for the unit root is explained with the dates November 2000 February 2001 and 2008 due to the global economic crisis. It was determined that in symmetric regression and asymmetric regression, the positive component of tourism income has a positive contribution to economic growth, while in asymmetric regression the negative component of tourism income has a negative contribution to economic growth. In rolling window regression, tourism income contributes positively to economic growth in the 2010-2015 periods and negatively in the 2016-2017 periods.

The loss of volume and competition in the international tourism market of the Turkish tourism industry prevents the use of economies of scale. The mentioned negative impact is a big burden due to the fact that tourism is a very competitive sector and cost minimizing is quite important. Also this situation is a barrier for the spreading impact and for possible positive externalities. Measures should be taken to increase marginal tourism revenues in order to ensure the expected contribution of tourism income to economic growth.

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