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TOURISM'S EFFECT ON THE HOUSING PRICES IN TURKEY: THE ARDL BOUND TESTING APPROACH

Türkiye'de Turizmin Konut Fiyatlarına Etkisi: ARDL Sınır Testi Yaklaşımı

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Abstract

The goal of this study is to determine the effect of tourism on housing prices in Turkey both nationally and regionally. It is important for countries to increase their recognition in the international arena through efficient marketing and promotional activities in order to achieve the economic benefits that are expected from tourism. This recognition may cause an increase in the number of arriving foreign tourists. The increase in the number of incoming foreign tourists may affect the housing prices of the relevant countries naturally. In this context, the effect of tourism on housing prices in the long term has been researched by using the Autoregressive Distributed Lag (ARDL) bound testing approach through monthly data belonging to the 2010:01-2018:12 period. The findings acquired indicated that the number of foreign tourists coming from Europe and the Middle East created a positive effect on the housing prices of the Mediterranean region in the long term while the number of foreign tourists coming from Asia and Commonwealth Independent States created a negative effect on the housing prices in the Mediterranean region. Moreover, it has been

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determined that the number of foreign tourists coming from Europe and the Commonwealth Independent States had a negative effect on the housing prices in the Black Sea region in the long run, while the number of foreign tourists coming from Asia created a positive effect on the housing prices in the Black Sea region. The number of foreign tourists coming from Asia also created a positive effect on the housing prices in Marmara2 region in the long run.

Keywords: Tourism, housing price, ARDL, Turkey, regional

Jel Codes: Z3; R3; C1

Öz

Bu çalışmanın amacı Türkiye geneli ve bölgesel olarak turizmin konut fiyatları üzerindeki etkisini belirlemektir. Ülkelerin turizmden beklenen ekonomik faydaları elde edebilmesi açısından etkin pazarlama ve tanıtım faaliyetleri ile uluslararası arenada tanınırlığını artırmak önemlidir. Bu tanınırlık ülkelerden gelen yabancı turist sayısında artışa neden olabilir. Ülkelere gelen yabancı turist sayısındaki artışlar ise doğal olarak söz konusu ülkelerin konut fiyatlarını etkileyebilir. Bu doğrultuda çalışmada uzun dönemde turizmin konut fiyatları üzerindeki etkisi 2010:01-2018:12 dönemine ait aylık verilerle Gecikmesi Dağıtılmış Otoregresif (ARDL) sınır testi yaklaşımı kullanılarak araştırılmıştır. Elde edilen bulgular, uzun dönemde Avrupa ve Ortadoğu'dan gelen yabancı turist sayısının Akdeniz bölgesi konut fiyatları üzerinde pozitif etki yaratırken, Asya ve Bağımsız Devletler Topluluğu ülkelerinden gelen yabancı turist sayısının negatif etki yarattığını göstermiştir. Ayrıca, uzun dönemde Avrupa ve Bağımsız Devletler Topluluğu ülkelerinden gelen yabancı turist sayısı Karadeniz bölgesi konut fiyatları üzerinde negatif etkiye sahipken, Asya'dan gelen yabancı turist sayısının Karadeniz bölgesi konut fiyatları üzerinde pozitif etki yarattığı belirlenmiştir. Asya'dan gelen yabancı turist sayısı da Marmara2 bölgesi konut fiyatları üzerinde uzun dönemde pozitif etki meydana getirmiştir.

Anahtar Kelimeler: Turizm, konut fiyatları, ARDL, Türkiye, bölgesel

Jel Kodları: Z3, R3, C1

1. Introduction

There is a common consensus that tourism provides significant benefits to the economies of countries. Therefore, the tourism sector is adopted as a development strategy by many countries and plays an active role in the socio-economic development of countries. One of the

most distinctive features of tourism is the spillover effects that it creates on other sectors of the economy.

Countries compete with each other to attract more foreign tourists, as it increases the mobility between the sectors along with the added-values that it provides to the economy by booming the markets. One of the important factors that increase the number of incoming foreign tourists is specific touristic places in the cities. In this context, it is important for the cities to engage in urban marketing and branding efforts for tourism by differentiating themselves from the others, in order to increase tourism activities. Thus, the level of recognition is increased through branding, which shapes demand and provides ease of choice. In this way, branding activities in the cities will encourage foreign tourists to travel to these cities, and this process will cause tourism activities and the demand for tourism products to increase consequently.

In this context, transportation sector (such as taxis, cruise ships and airlines), housing and building sectors (such as residences, housing estates and hotels) and entertainment sector (such as theatres, shopping malls, amusement parks and casinos) are the essential industries that boost the economy by developing, with the increase in the demand for tourism products. To sum up, it can be said that tourism causes a growth in the mentioned sectors in host countries and significant increases that reflect on income level, and it supports the economic growth consequently. The relationship between price changes in the housing sector, which is one of these sectors, and tourism is subject to our research. When considering the relationship between the housing market and other sectors, it is possible to say that it is a dynamic sector in terms of the economy. It has been observed that the housing market is getting larger in many developed countries, and developing countries like Turkey. At this point, it is also possible to say that the housing prices tend to increase in parallel with the developments in the relevant market. The increase in housing demand moves together with the increase in housing prices. The high share of countries' housing investments in the national income causes the changes in the housing prices to be effective on economic dynamics at

a significant level, and to affect many sectors, the construction sector being in the first place.

It is possible to say that efficient tourism efforts affect the increase in housing demand in touristic cities. Thus, this impact of tourism on the housing demand reflects on the housing prices. In this context, the development of tourism which cause an increase in the demand for tourism goods and services would create a multiplier effect on the country's economy as a whole, by booming the construction sector as well. It can be said that this multiplier effect would increase the national income directly and indirectly. When the studies related to housing prices are examined, it is seen that factors such as physical appearance of houses (number of rooms, bathroom or balcony), location of houses (proximity to pharmacy, school, hospital, center) and the macroeconomic variables (money supply, employment, costs of building, economic growth, rates of interest, income, inflation, etc.) are taken into consideration in general. When the studies that analyze the factors affecting the housing prices are considered as a whole, it is seen that researchers confirm the impact of tourism activities on local lands and the housing sector, and the domestic literature and foreign literature that focus on the impact of tourism on the housing prices are limited. That is why, this study aims to contribute to this gap on this subject in the literature in Turkey by examining the relationship between tourism, which is thought to have an impact on the housing demand, and the housing prices.

When the tourism sector in Turkey examined specifically, Turkey ranks 6th among the countries that attract foreign tourists the most in the world, according to the December 2019 data of the World Tourism Organization (UNWTO). It is seen that foreigners have purchased approximately 23 thousand houses in the past 3 years, from various cities in Turkey. The construction and housing sectors are in the position of the leading sector in the economic growth, in terms of the Turkish economy. Furthermore, it can be said that there is an expectation in the direction that the local housing markets of the countries should benefit from the existence of the tourism industry. In line with this expectation and considering the importance of the added value which the tourism activities would create on the country's

economy by triggering other sectors as well through the housing prices, this study aims to determine the impact of tourism on the housing prices throughout Turkey and regionally, by using the monthly data of the 2010:01-2018:12 period. In line with this objective, general information about the tourism and housing sectors is given in the introduction part of the study. The literature review related to the housing market takes place in the second part of the study. In the third and fourth parts, the data set and econometric method used in the research are introduced and the findings are presented. In the last part, the results acquired from the study are revealed and evaluations are made.

2. Literature Review

Many theoretical and empirical studies examining the tourism-led growth hypothesis confirm the positive impacts of tourism on local, regional and national economies along with various sectors (Yıldırım and Öcal, 2004; Yamak, Tanrıöver and Güneysu, 2012; Brida and Pulina, 2010; Paci and Marrocu, 2014; Genç and Tandoğan, 2016).

It is seen that the first studies on the housing market focus on the factors which affect the housing demand in general (Duesenberry and Kistin, 1953; Lee, 1963; Winger, 1968; Carliner, 1973; Mankiw and Weil, 1989) take place among these studies in question. In the later studies, it is seen that the factors which affect the housing prices are also examined together with the housing demand (Englund and Ioannides 1997; Holly and Jones, 1997; Chen and Patel, 1998; Capello, 2002; Jud and Winkler, 2002; Abelson et al., 2005; Egert and Mihaljek, 2007; Badurlar, 2008; Yu, 2010; Kargı, 2013; Kördiş, Işık ve Mert, 2014; Erdem and Yamak, 2018; Kolcu and Yamak, 2018; Demirel and Koçak, 2019; İslamoğlu and Nazlıoğlu 2019; Sağlam and Abdioğlu, 2020). A review of the researches related to the relationship between the factors which affect the housing prices, and tourism and the housing prices is given in Table 1.

Table 1. Literature Review

Author	Country	Period/Method	Findings
Factors Which Affect the Housing Prices			
Englund and Ioannide (1997)	15 OECD countries	1970-1992 Panel Data Analysis	It was concluded that economic growth had a positive impact on housing prices, while interest rates had a negative impact.
Holly and Jones (1997)	England	1939-1994 Johansen Cointegration	The most significant determiner of the real housing prices was determined to be the real income.
Chen and Patel (1998)	Taipei	1973-1994 Granger Causality	There was a uni-directional causality found from the short-run interest rate, household income and construction costs towards the housing prices, while a bi-directional causality found between the housing prices and the stock quote index.
Jud and Winkler (2002)	130 large cities in the USA	1984-1998 Cross Sectional	It was determined that the value increases in the real housing prices are strongly affected by the population growth, real changes in income, construction costs and interest rates.
Abelson et al., (2005)	Australia	1970-2003 Johansen Cointegration and Stock-Watson Dynamic Ordinary Least Squares Method	It was determined that the real housing prices and the consumer price index, unemployment rate, real disposable income, real mortgage rates, stock quotes, and housing demand were related in the long run. The consumer price index, unemployment rate, real disposable income, real mortgage rates, stock quotes and housing demand were found to have an impact on the real housing prices. Moreover, it was revealed that there was a positive relationship between the real housing prices, and real disposable income and consumer price index, while there was a negative relationship between the real housing prices, and the unemployment rate, real mortgage rates, stock quotes, and the housing demand.

Egert and Mihaljek (2007)	8 Central and Eastern Europe transition countries and 19 OECD countries	1975-1994 Panel data analysis	A strong positive relationship was detected between the housing prices and per capita income. Moreover, interest rates, housing loans, and demographic factors were also determined to have a meaningful effect on housing prices.
Badurlar (2008)	Turkey	1990-2006 Johansen Cointegration, Granger Causality	The housing prices and gross domestic product, money supply, the short-run interest rates, and exchange rate were found to be related in the long-run. In the long run, there was a positive relationship determined between the housing prices, and Gross Domestic Product, and exchange rates, while there was a negative relationship determined between the money supply and the interest rates. Also, there was a bi-directional causal relationship determined between the housing prices, and interest rates and exchange rates while there was a uni-directional causal relationship from Gross Domestic Product and money supply towards the housing prices.
Kargı (2013)	Turkey	2000:01-2012:03 Granger Causality	There was a bi-directional causality found between the housing prices, and the economic growth and inflation.
Erdem and Yamak (2018)	Turkey and 5 region levels in Turkey	2010:01-2017:07 ARDL	The hedonic housing price index and the consumer price index were found to be related in the long run. In addition, the consumer prices throughout Turkey and in 5 region levels in Turkey were found to have a positive impact on the hedonic housing prices.
Kolcu and Yamak (2018)	Turkey	2010:01-2017:09 ARDL	The housing prices and the housing loan interest rate were found to be related in the long run. It was determined that income had a positive impact on the housing prices in the long run, and the housing loan interest rates did not have an impact on the housing prices in the long run. Moreover, the housing loan interest

			rates were determined to have a negative effect on the housing prices in the short run.
İslamoğlu and Nazlıoğlu (2019)	3 provinces in Turkey (İstanbul, Ankara ve İzmir)	2010:01-2018:04 Panel Data Analysis	Inflation was determined to affect the housing prices positively.
Sağlam and Abdioğlu (2020)	26 regions in Turkey	2010:01-2018:02 Panel Data Analysis	It was determined that the hedonic housing price index and the consumer price index moved together in the long run. On the other hand, it was determined that the consumer prices affected the hedonic housing prices positively in the short and long run.
Tourism and Housing Prices			
Biagi and Faggian (2004)	Italy (Sardinia island)	Regression Analysis	It was determined that the housing prices were affected positively by tourism.
Biagi, Brandano and Lambiri (2015)	103 Italian cities	1996-2007 GMM-SYS	Tourism was determined to have a positive impact on the housing prices.
Biagi, Brandano and Caudill (2016)	Italy	1996-2007 Regression Analysis	It was determined that tourism had a positive impact on the housing prices, especially in mountain destinations, while it had a negative impact on the housing prices in beach destinations.

When the studies regarding both the tourism economy and the housing market are examined, it is possible to say that the tourism activities can affect the housing markets directly and indirectly. The direct effect appears through the demand of foreign tourists for the houses and lands, which are available in tourism regions. On the other hand, the indirect effect reveals itself through the capital flow generated by the advantages and disadvantages that affect the housing price and value in tourism-related sectors (Biagi, Brandano and Lambiri, 2015: 502). However, the number of the studies testing tourism's impact on the housing market, and the relationship between

tourism and the housing prices is limited (Biagi and Faggian, 2004; Biagi, Brandano and Lambiri, 2015; Biagi, Brandano and Caudill, 2016). Biagi and Faggian (2004) revealed that the housing prices in the Sardinia island of Italy were affected positively by tourism, in their study. Biagi, Brandano and Lambiri. (2015) researched the effect of tourism on the housing prices in cities, for 103 Italian cities in the 1996-2007 period. The acquired findings showed that tourism created a positive effect on housing prices. Biagi, Brandano and Caudill (2016) examined the relationship between tourism and the housing prices for the Italian economy. As a result of the study, it was determined that tourism had a positive effect on the housing prices especially in the mountain destinations, and a negative effect in the beach destinations.

3. Data Set and Econometric Method

In order to examine the impact of the number of foreign tourists on the housing prices, Turkey's nationwide housing price index (PNTN); the Mediterranean Region housing price index (PMDT); the Black Sea Region housing price index (PBS); the Eastern and Southeastern Anatolia Region housing price index (PEAST); the (Izmir-TR31) housing price index (PAEG1), and the (Aydın, Denizli and Muğla-TR32) housing price index (PAEG2) for the Aegean Region; and the (İstanbul-TR10) housing price index (PMR1), and the (Bolu, Kocaeli, Sakarya, Yalova and Düzce-TR42) housing price index (PMR2) for the Marmara Region were used as the housing price indicators in the study. The number of foreign tourists coming from Asia (TASI), Europe (TEUR), Middle East (TME), and Commonwealth of Independent States (TCIS), and the total number of incoming foreign tourists (TNTN) were included as the indicator of tourism. When determining the number of foreign tourists coming from these regions, the top five countries where tourists come from the most were taken into consideration for each region, for the 2010-2018 period. Data set of variables were at a monthly frequency and include the period of 2010:01-2018:12. All the variables used in the study were analyzed by taking their natural logarithms and seasonally adjusting them. The housing price index data was taken from the TCMB Electronic Data Delivery System (EVDS). The tourism data set was acquired from the

database of the Turkish Statistical Institute (TUIK). Descriptions regarding the data set used are presented in Table 2.

Table 2. Data Descriptions

Data	Description	Source
LPNTN	Seasonally adjusted Logarithmic housing price index	EVDS
LPMDT	Seasonally adjusted Logarithmic housing price index of the Mediterranean Region	
LPBS	Seasonally adjusted Logarithmic housing price index of the Black Sea Region	
LPEAST	Seasonally adjusted Logarithmic housing price index of the Eastern and Southeastern Anatolia Region	
LPAEG1	Seasonally adjusted Logarithmic housing price index of the Aegean1 Region	
LPAEG2	Seasonally adjusted Logarithmic housing price index of the Aegean2 Region	
LPMR1	Seasonally adjusted Logarithmic housing price index of the Marmara1 Region	
LPMR2	Seasonally adjusted Logarithmic housing price index of the Marmara2 Region	
LTASI	Seasonally adjusted Logarithmic number of foreign tourists coming from Asia	TUİK
LTEUR	Seasonally adjusted Logarithmic number of foreign tourists coming from Europe	
LTCIS	Seasonally adjusted Logarithmic number of foreign tourists coming from Commonwealth of Independent States	
LTME	Seasonally adjusted Logarithmic number of foreign tourists coming from the Middle East	

In the study, the Augmented Dickey-Fuller (ADF) test developed by Dickey and Fuller (1979), and the Phillips-Perron (PP) unit root test developed by Phillips and Perron (1988) has been used to analyze whether the series had a unit root, in order to determine the effect of tourism on the housing prices. However, the existense of significant structural breaks in the series have been examined by using the Zivot and Andrews (1992) (ZA) unit root test, and the results are given in Table 3, 4 and 5. Dummy variables for the models are created by assigning the zero value to the period up to the date of break, and the one value to the other period. While the optimal lag length has been determined by the Schwarz information criterion in the ADF test, the

optimal bandwidth has been determined by Newey-West in the PP test.

3.1. Bound Testing

As the variables are stationary at different levels, it is possible to determine their short and long run relationships by the ARDL (Autoregressive Distributed Lag) approach developed by Pesaran et al., (2001). In this context, firstly, the Bound testing approach developed by Pesaran et al., (2001) is used to test the cointegration relationship among the variables in the analysis. The cointegration relationship is researched on the unrestricted error correction model presented in the equation (1).

$$\Delta \ln y_t = \beta_0 + \beta_1 \mathrm{D1} + \sum_{i=1}^{k} \beta_{21i} \Delta \ln y_{t-i} + \sum_{i=0}^{l} \beta_{22i} \Delta \ln x_{1_{t-i}} + \sum_{i=0}^{m} \beta_{23i} \Delta \ln x_{2_{t-i}} + \sum_{i=0}^{n} \beta_{24i} \Delta \ln x_{3_{t-i}} + \sum_{i=0}^{p} \beta_{25i} \Delta \ln x_{4_{t-i}} + \sum_{i=0}^{r} \beta_{26i} \Delta \ln x_{5_{t-i}} + \beta_3 \ln y_{t-1} + \beta_4 \ln x_{1_{t-1}} + \beta_5 \ln x_{2_{t-1}} + \beta_6 \ln x_{3_{t-1}} + \beta_7 \ln x_{4_{t-1}} + \varepsilon_t \quad (1)$$

Here, y_t, indicates the dependent variable (lnpntn, lnpmdt, lnpbs, lnpaeg1, lenpaeg2, lnpmr1, lnpmr2, lnpeast); x_1, x_2 ,x_3, x_4 indicate the independent variables (lntasi, lnteur, lntme, lntcis); β_0 indicates the fixed term; Δ indicates the difference operator; and k,l,m,n,p,r indicate the optimal lag lengths. In the determination of the cointegration relationship, the null hypothesis is formed as no cointegration relationship $\beta_1=\beta_3=\beta_4=\beta_5=\beta_6=\beta_7=0$ and tested by the F test. The bound test optimal lag length is determined with the help of the AIC information criterion.

If the f-statistic values, found as a result of applying the Wald test on the variables at the level, are higher than the table critical values of Pesaran et al., (2001), the cointegration between the series is determined by rejecting the null hypotheses and accepting the alternative hypothesis. In other words, the presence of the cointegration relationship is determined if the f-statistic value is higher

than the I(0) lower and the I(1) upper bounds calculated in the error correction parameter of variables.

3.2. ARDL Model

ARDL test is a method that can be applied if the variables are stationary at the level or the first difference. The model is estimated through Equation 2.

$$\ln y_t = \beta_0 + \beta_1 \text{trend} + \sum_{i=1}^{k} \beta_{21i} \Delta \ln y_{t-i} + \sum_{i=0}^{l} \beta_{22i} \Delta \ln x_{1_{t-i}} + \sum_{i=0}^{m} \beta_{23i} \Delta \ln x_{2_{t-i}} + \sum_{i=0}^{n} \beta_{24i} \Delta \ln x_{3_{t-i}} + \sum_{i=0}^{p} \beta_{25i} \Delta \ln x_{4_{t-i}} + \varepsilon_t \quad (2)$$

ARDL Long-Run Coefficient

$$\Delta \ln y_t = \beta_0 + \beta_1 \text{trend} + \sum_{i=1}^{k} \beta_{21i} \Delta \ln y_{t-i} + \sum_{i=0}^{l} \beta_{22i} \Delta \ln x_{1_{t-i}} + \sum_{i=0}^{m} \beta_{23i} \Delta \ln x_{2_{t-i}} + \sum_{i=0}^{n} \beta_{24i} \Delta \ln x_{3_{t-i}} + \sum_{i=0}^{p} \beta_{25i} \Delta \ln x_{4_{t-i}} + \tau \, \text{ECT}_{t-1} + U_t \quad (3)$$

In Equation 3, it is determined that there is a convergence to the long-run equilibrium if the τ coefficient of the error correction term takes a value between 0 and -1, while it is determined that there is a divergence from the long-run equilibrium if it takes a positive value. The fact that whether there is any causality among the variables in the short run is determined by the Wald test applied to the β_{21i}, β_{221i}, β_{23i}, β_{241i}, β_{251i}, β_{261i}, coefficients.

4. Results

Table 3. ADF Unit Root Test Results

	ADF (Stationary)		ADF (Stationary and Trend)	
Variable	**Level**	**1st Difference**	**Level**	**1st Difference**
LPNTN	-1.208	-3.348**	-0.721	-3.111
LPMDT	0.874	-5.364***	-2.233	-5.473***
LPBS	1.599	-4.658***	-0.716	-4.900***
LPEAST	-1.952	-7.995***	-0.444	-8.315
LPAEG1	2.485	-8.119***	-3.409*	-8.352***
LPAEG2	1.857	-8.120***	-2.690	-8.304***
LPMR1	-1.657	-2.400	-3.755**	-2.687
LPMR2	0.047	-2.560	-1.814	-2.470
LTASI	-1.870	-13.370***	-3.004	-13.300***
LTEUR	-1.598	-17.356***	-1.822	-17.275***
LTCIS	-2.438	-9.091***	-2.706	-9.051***
LTME	-1.911	-17.757***	-2.584	-17.707***

Note: ***, ** and * indicate the significance level at 1%, 5%, and 10% respectively.

As seen in Table 3, the LPMR1, LPAEG1 and LTNTN series are stationary at the level, and the variables except for LPMR2 are stationary at the 1st cycle difference.

Table 4. PP Unit Root Test Results

	PP (Stationary)		PP (Stationary and Trend)	
Variable	**Level**	**1st Difference**	**Level**	**1st Difference**
LPNTN	0.537	-6.276***	-2.339	-6.191***
LPMDT	1.179	-8.870***	-2.591	-9.015***
LPBS	2.612	-8.823***	-1.887	-9.264***
LPEAST	-2.363	-9.701	-1.066	-10.480***
LPAEG1	1.958	-8.352***	-3.085	-8.485
LPAEG2	1.752	-8.057***	-2.714	-7.992***
LPMR1	-0.776	-6.098***	-0.579	-6.007***
LPMR2	1.515	-10.425***	-2.114	-10.718***
LTASI	1.776	-13.370***	-3.039	-13.300***
LTEUR	-2.169	-17.657***	-2.651	-17.568***
LTCIS	-2.543	-9.047***	-2.928	-9.005***
LTME	-3.429**	-18.963***	-4.294	-18.992***

Note: ***, ** and * indicate the significance level at 1%, 5%, and 10% respectively.

According to the findings stated in Table 4, the LTME series is stationary at the level while the other series are stationary at the 1st cycle difference. According to the PP unit test results, it is seen that the LPMR2 series becomes stationary at the 1st cycle difference. When the mentioned series is examined, it is observed that it has error terms with weak dependence and heterogeneous distribution.

Table 5. ZA Unit Root Test Results

	Model A		Model C	
Variable	**t**	**TB**	**T**	**TB**
LPNTN	-3.4119 (8)	2014:06	-2.3528 (8)	2016:07
LPMDT	-3.898 (7)	2015:01	-4.0859* (7)	2015:01
LPBS	-4.6969** (12)	**2016:07**	-4.8830* (12)	2015:05
LPEAST	-1.7999 (3)	2016:10	-5.2472** (3)	2014:07
LPAEG1	-2.8341 (5)	2016:02	-2.7140 (5)	2012:03
LPAEG2	-4.1737 (5)	2015:01	-3.4050 (5)	2012:01
LPMR1	-4.9118* (10)	2014:04	-3.6600 (9)	2014:06
LPMR2	-4.2667 (8)	2015:01	-2.9993 (8)	2012:08
LTASI	-4.5162 (3)	2015:10	-4.8145 (3)	2015:11
LTEUR	-5.7102*** (11)	2016:01	-4.3746 (11)	2016:01
LTCIS	-3.7028 (1)	2016:10	-4.4609 (1)	2015:12
ΔLPNTN	-2.8973 (7)	2016:01	-4.3953 (7)	2014:06
ΔLPMDT	-5.2896** (6)	**2016:02**	-4.9088 (6)	2016:02
ΔLPAEST	-9.3249*** (2)	**2015:03**	-9.3476*** (2)	2015:03
ΔLPAEG1	-2.3413 (5)	2017:08	-4.1498 (5)	2017:01
ΔLPAEG2	-5.0866** (4)	**2012:12**	-5.0949** (4)	2015:11
ΔLPMR1	-5.8990*** (1)	**2016:09**	-3.8742 (12)	2014:04
ΔLPMR2	-3.9661 (4)	2014:04	-5.1858** (4)	**2015:01**
ΔLTASI	-13.8576*** (0)	2016:09	-14.2037*** (0)	2017:07
ΔLTEUR	-4.4210 (6)	2017:04	-5.3287** (6)	2016:01
ΔLTCIS	-9.9135*** (0)	2016:07	-10.4100*** (0)	2016:07

Note: Table critical values for Model A are 1%; 5.34, %5;-4.80, and for Model C are %1; -5.57, %5;-5.08. ***, ** and * indicate that the series is stationary at the 1%, 5% and 10% level of significancy respectively. TB represent the period of break. Dates of significant structural break are given in bold font. The dummy variables are included in the models by assigning the zero value to the period until the date of break and the one value to the other period.

As seen in Table 5, the ZA unit root test results has shown that there is no significant structural break in question for both LPNTN and LPAEG1 series. When the test statistic calculated for LPBS becomes a stationary series when a structural break at the 5% significance level is considered. As LTME sseries has been determined as stationary at the level, the presence of a structural break has nt been tested (Mert and Çağlar, 2019: 133). Each of the LPMDT, LPEAST, LPAEG2, LPMR1 and LPMR2 series are stationary at the first difference according to the ZA unit root test.

Table 6. ARDL Bound Testing Results

Model	Variables Dependent, Independent	Bound Test f-statistics	Lower Bound	Upper Bound	Result
1	LPMDT, (Dependent) LTASI LTEUR LTCIS LTME LTNTN	**8.148*****	2.68 (%10) 3.05 (%5) **3.81 (%1)**	3.53 (%10) 3.97 (%5) **4.92 (%1)**	**Cointegrated**
2	LPEAST, (Dependent) LTASI LTEUR LTCIS LTME LTNTN	0.809	2.68 (%10) 3.05 (%5) 3.81 (%1)	3.53 (%10) 3.97 (%5) 4.92 (%1)	Not Cointegrated
3	LPAEG1, (Dependent) LTASI LTEUR LTCIS LTME LTNTN	**5.517*****	2.68 (%10) 3.05 (%5) 3.81 (%1)	3.53 (%10) 3.97 (%5) 4.92 (%1)	**Cointegrated**
4	LPAEG2, (Dependent) LTASI LTEUR LTCIS LTME LTNTN	**5.536****	3.03 (%10) 3.47 (%5) 4.4 (%1)	4.06 (%10) 4.57 (%5) 5.72 (%1)	**Cointegrated**

5	LPBS, (Dependent) LTASI LTEUR LTCIS LTME LTNTN	**9.270*****	2.2 (%10) 2.56 (%5) 3.29 (%1)	3.09 (%10) 3.49 (%5) 4.37 (%1)	**Cointegrated**
6	LPNTN, (Dependent) LTASI LTEUR LTCIS LTME LTNTN	**3.180***	2.2 (%10) 2.56 (%5) 3.29 (%1)	3.09 (%10) 3.49 (%5) 4.37 (%1)	**Cointegrated**
7	LPMR1, (Dependent) LTASI LTEUR LTCIS LTME LTNTN	**5.110****	2.2 (%10) 2.56 (%5) 3.29 (%1)	3.09 (%10) 3.49 (%5) 4.37 (%1)	**Cointegrated**
8	LPMR2, (Dependent) LTASI LTEUR LTCIS LTME LTNTN	**3.241***	2.2 (%10) 2.56 (%5) 3.29 (%1)	3.09 (%10) 3.49 (%5) 4.37 (%1)	**Cointegrated**

Note: ***, **, and * indicate the significance level at 1%, 5%, and 10% respectively.

As seen in Table 6, the presence of cointegration between the series is found out since the f-statistics of Model 1, 3, 4, 5, 6, 7 and 8 exceed both of the table critical values in the scope of the predicted percentage probabilities. In other words, there is a long-run relationship determined between the housing prices in the Mediterranean region, Aegean1 region, Aegean2 region, Black Sea region, Marmara1 region, Marmara2 region, total house price; and the number of foreign tourists coming from Asia, Europe, the Middle East and the Commonwealth of Independent States; and the total number of the incoming foreign tourists.

The diagnostic test results of the ARDL models that are determined to have a cointegration relationship and have significant long-run coefficients are presented in Table 7.

Table 7. ARDL models diagnostic test results

ARDL Models	Breusch-Godfrey LM Testing	Breusch-Pagan-Godfrey Heteroscedasticity Testing	Jarque-Bera Statistic	ECT (-1)
Model 1	1.524(0.16)	17.630(0.28)	1.023 (0.60)	-0.083***
Model 2	1.240(0.27)	0.814(0.62)	2.899(0.23)	0.004**
Model 3	2.201(0.02)	1.967(0.03)	5.573(0.06)	-0.146***
Model 4	0.626(0.81)	0.876(0.64)	9.778(0.01)	-0.174***
Model 5	1.235(0.28)	1.343(0.15)	2.008(0.37)	-0.169***
Model 6	1.217(0.29)	1.275(0.24)	1.831(0.40)	0.004***
Model 7	0.901(0.55)	0.627(0.84)	1.468(0.48)	0.018***
Model 8	0.549(0.87)	1.436(0.16)	5.88(0.05)	-0.015***

According to the results indicated in Table 7, there is not any autocorrelation or heteroscedasticity problem encountered in the ARDL equation estimated for Model 1, 2, 4, 5, 6, 7 and 8. However, there is autocorrelation or heteroscedasticity in Model 3. Except for Model 4, Error terms of the mentioned models are normally distributed, and Model 3 is statistically significant at 5% and Model 8 is statistically significant at %1 while Model 1, 2, 5, 6 and 7 are statistically significant at 10%. When examining the error correction results, the fact that the ECT(-1) coefficient, calculated in the scope of Model 1, 3, 5 and 8, has the expected sign and is statistically significant indicates that the deviations from equilibrium in the short run will level out after 12.05, 6.8, 5.9 and 66.7 months respectively, and reach the long-run equilibrium. The fact that ECT(-1) coefficient in Model 4, which has been determined to have similar qualities, is -0.174 shows that the deviations from equilibrium in the short run will level out after 5.7 months and reach the long-run equilibrium. According to these results, it is determined that the speed of convergence of the long-run equilibrium of the short-run deviations in the Aegean2 region is higher compared to the Mediterranean, Aegean1, Black Sea and Marmara2 region. However, the ECT(-1) coefficient of Model 2, 6 and 7 are

positive. A positive error-correction coefficient indicates that the short-term disequilibriums are moving away from equilibrium rather than turning towards it again (Bozdağlıoğlu, 2007; Bozkurt, 2010).

The coefficients of the determined long-run relationship are shown in Table 8.

Table 8. The Long-Run Coefficients of ARDL Models

ARDL Models	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
Coeff.	(4,0,1,4,0)	(4,0,0,0,0)	(1,0,1,2,4)	(1,1,3,8,8)	(6,6,1,0,3)	(5,0,0,0,5)	(5,4,0,0,0)	(6,0,0,2,0)
LTASI	**-0.074***	3.498	0.027	**-0.158*****	**0.513*****	**0.184**	**0.682*****	**0.450****
LTEUR	**0.238*****	-4.770	**-0.178*****	**0.323*****	**-0.834*****	**-1.721*****	**-0.948*****	-0.021
LTCIS	**-0.232*****	0.365	0.008	**-0.325*****	**-0.120****	**0.652**	**-0.460*****	-0.161
LTME	**0.133*****	-1.286	**0.102*****	**0.406*****	-0.017	0.664	0.251	-0.483
D1	**-0.012*****	**-0.015****	-	**0.024*****	**-0.010***	**-**	**-0.010*****	**0.010*****

According to the long run results specified in Table 8, the number of incoming foreign tourists from Asia, which has been used as the independent variable in Model 1, has been found statistically significant at the 10% level, while the number of incoming foreign tourists from Europe, the Commonwealth of Independent States and Middle East has been found statistically significant at the 1% level. If the number of incoming foreign tourists from Asia and the Commonwealth of Independent States increases 1%, housing prices in the Mediterranean region decrease 0.07% and 23% respectively, while the number of incoming foreign tourists from Europe and the Middle East increases 1%, housing prices in the Mediterranean region increase 24% and 13% respectively. The number of incoming foreign tourists from Asia and Europe, which has been used as the independent variable in Model 5, has been found statistically significant at the 1% level, and the number of incoming foreign tourists from the

Commonwealth of Iındependent States countries has been found statistically significant at the 5% level. When the number of incoming foreign tourists from Asia increases 1%, housing prices in the Black Sea region decrease 83% and 12% respectively. Finally, the number of incoming foreign tourists only from Asia, which has been used as the independent variable in Model 8, has been found statistically significant at the 5% level. According to this coefficient, when the number of incoming foreign tourists from Asia increases 1%, housing prices in the Marmara2 region increase 45%.

The Cusum and Cusum-Q tests developed by Brown et al., (1975) are used in measuring the stability of the long-run coefficients used in acquiring the error correction term in relation to the short-run dynamics. The Cusum test is based on the cumulated error terms related to the n observation cluster and is drawn between two critical lines showing a significance at 5%. It can be said that the estimated coefficients are stable in the long-run since the curves obtained from the Cusum and Cusum-Q test statistics, which are shown in Figure 1, 4, 5, 6, 7 and 8 regarding the error terms in the ARDL analysis, are between the critical confidence intervals showing significance at 5%. Nonetheless, from the curves obtained by the Cusum and Cusum-Q test statistics shown in Figure 2 and 3, it is seen that Model 2 and 3 are unstable.

Figure 1. Model 1

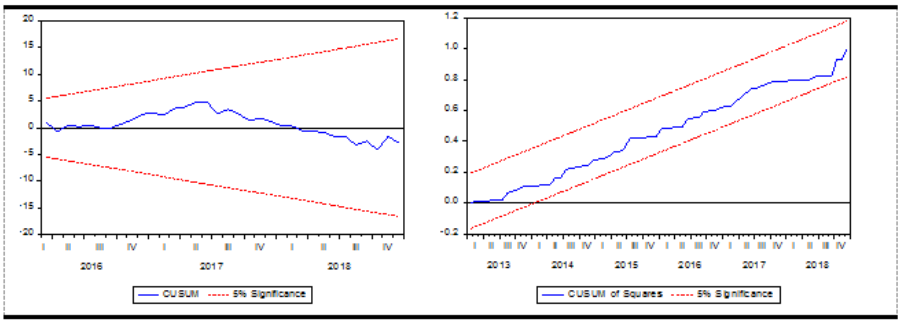


Figure 2. Model 2

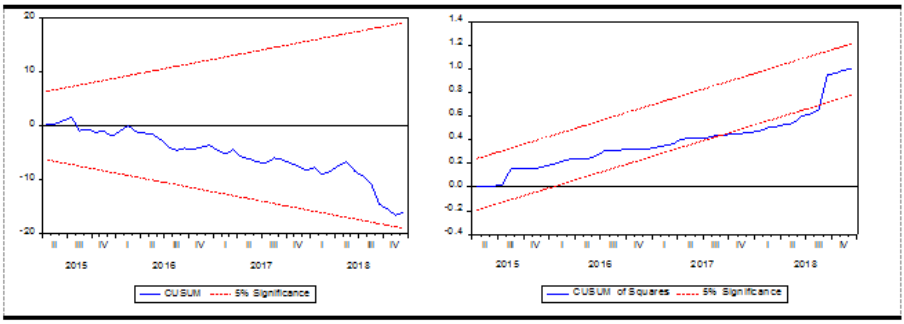


Figure 3. Model 3

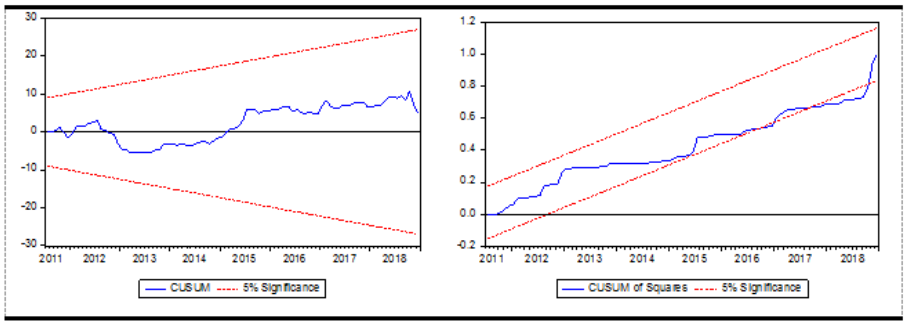


Figure 4. Model 4

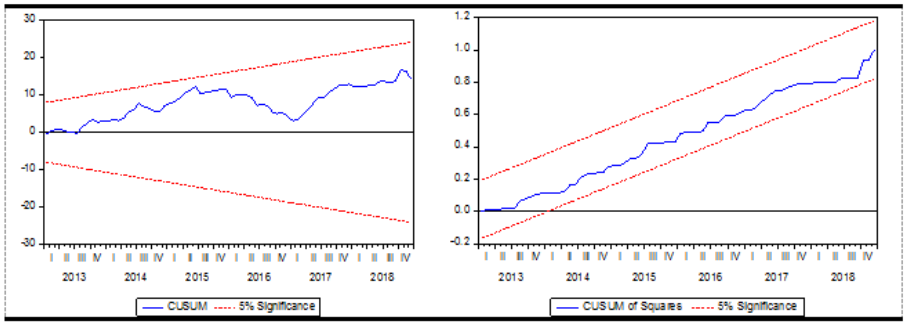


Figure 5. Model 5

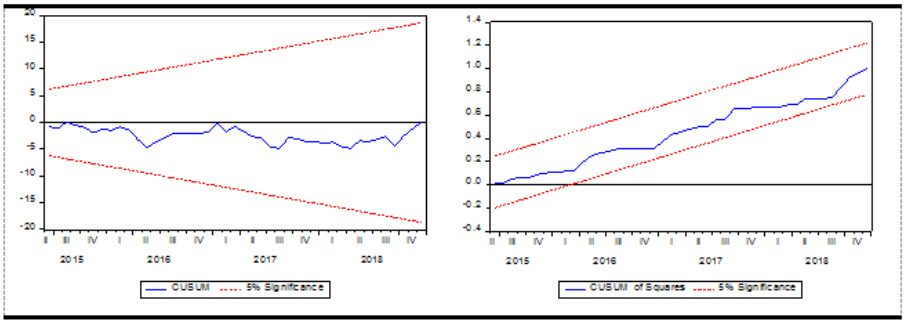


Figure 6. Model 6

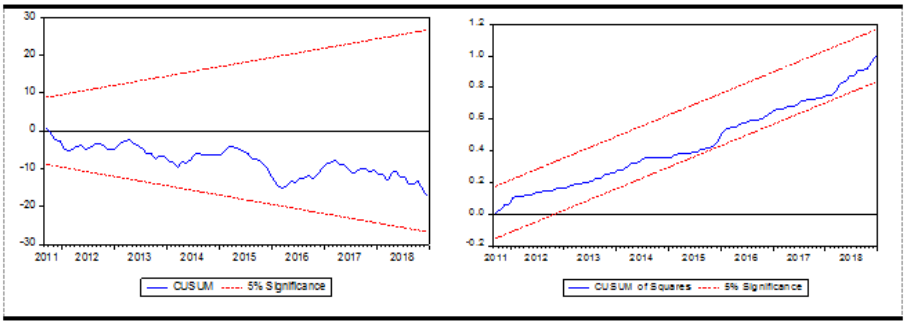


Figure 7. Model 7

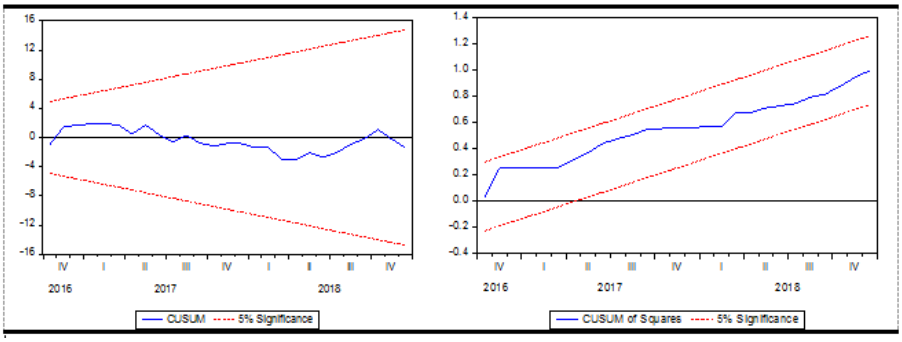
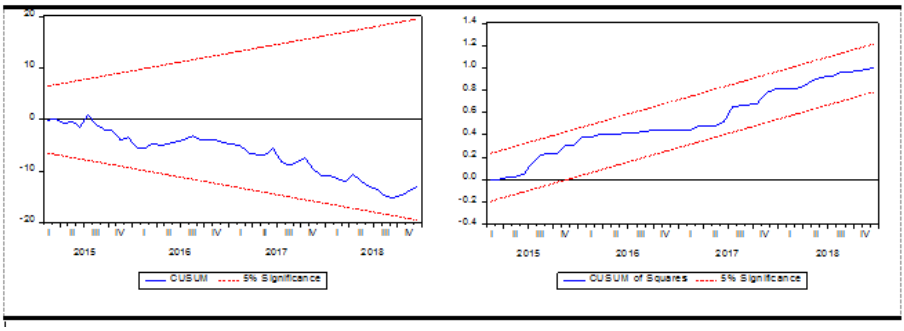


Figure 8. Model 8



5. Conclusion

Tourism is a sector in which it is vital to take fast and appropriate decisions that can keep pace with change in terms of the social and economic outcomes that it creates for countries. While taking these decisions, the marketing and communication efforts in tourism regions and cities should be taken into consideration. Cities in tourism regions, that include branding efforts which are the focal point of their marketing activities in their strategies, experience the positive effects of the payments done by tourists for the goods and services in these regions, in the simplest term. On the other hand, the tourism sector creates positive effects on the economy by providing employment opportunities in the related sectors (such as transportation, entertainment, housing, and building) as well.

In this study, the tourism's effect on the housing prices has been researched on the national and regional level, through the ARDL bound testing approach by using the monthly data belonging to the 2010:01 – 2018:12 period in Turkey. The results acquired from the ARDL bound test revealed that there is a cointegration relationship between the housing prices of the Mediterranean region, Aegean1 and 2 regions, Marmara1 and 2 regions, and the Black Sea region, total house price, and the number of tourists coming from the countries of Asia, Europe, the Middle East and the Commonwealth of Independent States. According to this result, the variables in question moved together in the long run. According to the analysis results, it has been determined that the number of tourists coming from Europe and the

Middle East affected the Mediterranean housing prices positively in the long run. On the other hand, it has been determined that the number of tourists coming from Asia and the Commonwealth of Independent States affected the Mediterranean housing prices negatively. This result in question confirmed the expectation that the housing market would be affected by tourism. Furthermore, it has concluded that the number of foreign tourists coming from Europe and the Commonwealth of Independent States had a negative effect on the housing prices of the Black Sea region in the long run while the number of foreign tourists coming from the Asia had a positive effect on the housing prices of the Black Sea region. Finally, it has been determined that the number of foreign tourists coming from Asia had positive effect on the housing prices of Marmara region in the long run. The acquired analysis results revealed that tourism is effective on the housing prices only in the Mediterranean, Black Sea and Marmara1 regions, which are the regions that are located on the shore.

Finding a significant relationship between tourism and the housing prices is good news in terms of touristic cities. Thus, it also draws attention to the effect of foreigners' purchases of housing in the development of urban economies in the touristic cities of the countries. It is an important fact that turning the cities, where tourism is important, into the centres of attention and the activities to be made in order to support these cities economically can be possible through collaborations with the marketing and branding sectors. The attention and support of all the stakeholders of the city should be attracted to this fact.

In summary, when considering the huge international mobility in tourism, it is not a surprise that tourism has become a key resource for the local economic growth despite the economic uncertainties in the world. Thanks to the guidance of tourism in Turkey, one of the industries which contribute to the development of the cities that can keep pace with globalization is the housing sector. The housing demand in the cities that try to become a brand, especially in the coastal regions of our country, and the changes in the housing prices are important. It is also possible to understand from the news coming from the real estate market that the mobility in question, which occurs in the

housing market in these regions, shows parallelism with the developments in tourism. Thus, the fact that the competitive strategies in the marketing processes of the cities branded with the contributions of tourism would bring success to entrepreneurs, and positive contributions to the urban economy. Finally, it is noteworthy that investments are directed to sectors such as construction and real estate in the regions where foreign tourists come in order to provide new housing, in addition to the existing housing demand in the housing markets. It is obvious that the developments in the tourism and housing industries form a basis in terms of the boom in the economies. That is why the arrangements and incentives by the countries in order to support the entrepreneurs in the sectors in question and increase their competitive power are significant both for today and future periods.

Etik Beyanı: Bu çalışmanın tüm hazırlanma süreçlerinde etik kurallara uyulduğunu yazarlar beyan eder. Aksi bir durumun tespiti halinde BİİBFAD Dergisinin hiçbir sorumluluğu olmayıp, tüm sorumluluk çalışmanın yazarlarına aittir.
Yazar Katkıları: Çiğdem Karış, çalışmada konunun belirlenmesi, literatür, veri analizi ve raporlama bölümlerinde katkı sağlamıştır. Derya Altıntaş, literatür ve verilerin toplanması aşamalarında katkı sağlamıştır. 1. yazarın katkı oranı yaklaşık olarak %60, 2. yazarın katkı oranı ise %40'tır
Çıkar Beyanı: Yazarlar arasında çıkar çatışması yoktur.
Teşekkür: Gösterdikleri yoğun ilgi ve emeklerinde dolayı BİİBFAD Dergisi Editör Kurulu'na ve sağladıkları katkılarında dolayı hakemlere teşekkür ederiz.

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