Tourism Management xxx (2017) 1–10

Contents lists available at ScienceDirect

Tourism Management

journal homepage: www.elsevier.com/locate/tourman

# Is tourism an engine for economic recovery? Theory and empirical evidence

Tarik Dogru [a, *], Umit Bulut [b]

[a] Boston University, School of Hospitality Administration, 928 Commonwealth Avenue, Boston, MA 02215, USA
[b] Ahi Evran University, Faculty of Economics and Administrative Sciences, Department of Economics, 40100 Kirsehir, Turkey

## HIGHLIGHTS

- Major European countries have experienced negative average economic growth.
- Tourism has surpassed economic growth in European countries.
- Tourism is a significant component of economic activities in these countries.
- Economic growth and tourism development are strongly dependent.
- Tourism development can help these countries to recover from economic crisis.

ARTICLE INFO

*Article history:*
Received 11 March 2017
Received in revised form
4 June 2017
Accepted 14 June 2017
Available online xxx

*Keywords:*
Tourism development
Economic growth
Crisis
Europe
Panel causality

ABSTRACT

The purpose of this study is to examine the causal relationships between tourism development and economic growth. For this purpose, the Dumitrescu and Hurlin (2012) technique was employed to analyze the casual link between tourism development and economic growth in seven European countries. The results showed that there is bidirectional causality between growth in tourism receipts and economic growth, suggesting that economic growth and tourism development are interdependent and that tourism development stimulates economic growth and vice versa in these countries. Theoretical and practical implications are discussed within the realms of growth, conservation, feedback, and neutrality hypotheses.



## 1. Introduction

Major countries in Europe have been struggling with economic difficulties since the most recent global financial crisis in 2007–2008. Greece, for instance, was one of the countries in the world that experienced significant adverse impacts of the most recent global financial crisis, *2007–2008* (Gibson, Hall, & Tavlas, 2012). Although the global financial crisis happened almost a decade ago, Greece has not yet recovered from the severe economic downturn (Smith, 2016). Similarly, countries like Croatia, Italy, and Spain are still in a period of economic recession. The economic hurdles have further caused notable political outcomes in the European Union (EU), one of which has led to a referendum in the United Kingdom (UK), the so-called Brexit, where the UK voted to leave the EU (Bourne, 2016). Indeed, most countries in Europe were not immune to the severe effects of global financial crisis and were affected by the crisis (Stylidis & Terzidou, 2014). Nevertheless, the impacts were relatively lower in most countries, and some have already recovered.

The economic downturn has been encountered in all sectors of the economy, including tourism. Interestingly, however, the tourism industry showed a remarkable recovery after the economic downturn and resilient growth in the past two decades in major European countries that have a coastline in the Mediterranean Basin. Fig. 1 presents the average percentage growth of overall economy in terms of real gross domestic product (GDP) and the average percentage growth of tourism industry in terms of tourism receipts between 2007 and 2014.

This figure clearly shows that the average growth rate in tourism receipts is greater than the average economic growth rate in all

* Corresponding author.
*E-mail addresses:* tdogru@bu.edu (T. Dogru), ubulut@ahievran.edu.tr (U. Bulut).

http://dx.doi.org/10.1016/j.tourman.2017.06.014
0261-5177/

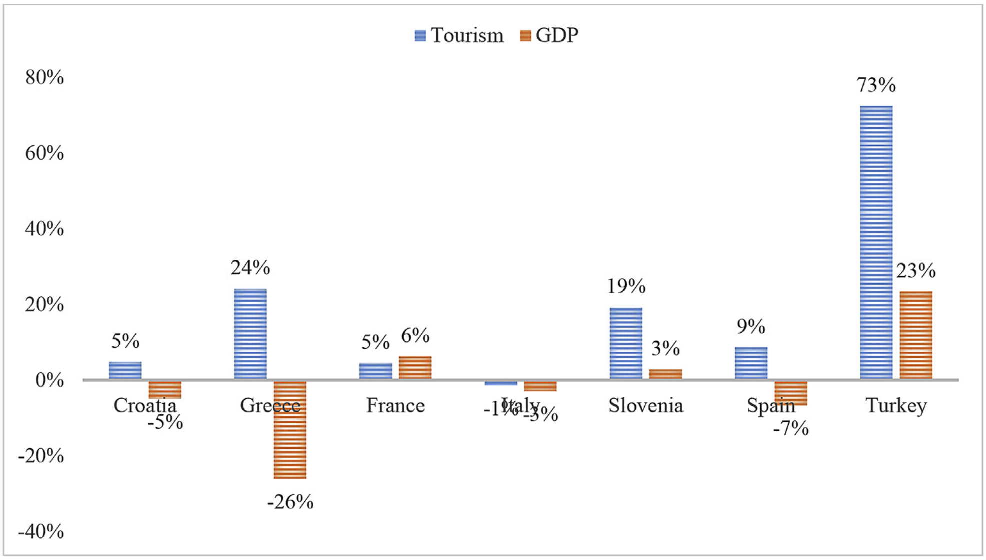



**Fig. 1.** Tourism and GDP growth rates 2007–2014.

countries with the exception of France, in which GDP growth was marginally higher relative to growth in the tourism industry (i.e., 5% vs. 6%). More strikingly, Croatia, Greece, and Spain have experienced negative average economic growth, whereas the tourism industry has grown 5%, 24%, and 9% in these countries, respectively. Despite the better performance of the tourism industry compared to overall economic growth, Italy has not yet recovered from the most recent global crisis. The slower growth of the tourism industry in Italy could be due to major structural problems, such as regulations, bureaucracy, and corruption (Das, 2016). Nevertheless, the tourism industry shows more robust growth relative to the overall economy in Croatia, Greece, Spain, and Italy.

The current overall economic conditions in these countries show a promise of revitalization of the economy, especially in the long-run, considering the weight of tourism in overall economic activities. Fig. 2 depicts the weight of the tourism industry in the overall economy of these countries in 2014.

Accordingly, the tourism industry accounts for up to 18% of the economic activities. Undeniably, tourism has been a safe harbor industry for both developing and developed countries in terms of economic growth, as tourism development creates new direct and indirect jobs, reduces current account deficit, and increases tax revenues (Dogru & Sirakaya-Turk, 2017). Therefore, the question becomes whether tourism can help these countries to overcome economic difficulties and achieve sustainable economic growth.

The purpose of this study is to examine the causal relationships between tourism development and economic growth in seven European countries that have coastline along the Mediterranean Basin, namely Croatia, Greece, France, Italy, Slovenia, Spain, and Turkey. In its methodology, the study used the Dumitrescu and Hurlin (2012) panel causality test, which deals with two stationary series and considers the heterogeneity of causal relationships. Thus, this contemporary causality model provides more robust estimates of the causal relationships between economic growth

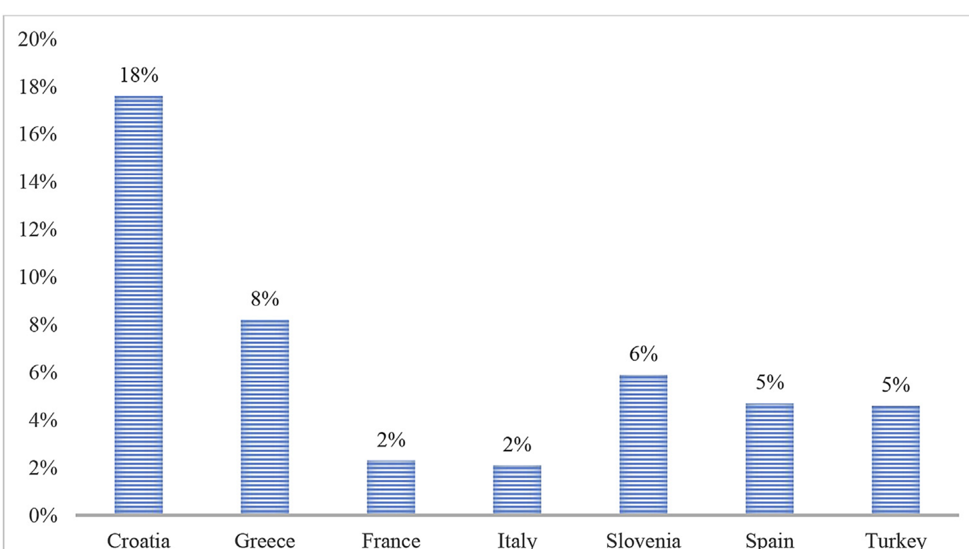



**Fig. 2.** Tourism's weight in overall economy in 2014.

Please cite this article in press as: Dogru, T., & Bulut, U., Is tourism an engine for economic recovery? Theory and empirical evidence, *Tourism Management* (2017), http://dx.doi.org/10.1016/j.tourman.2017.06.014

and tourism development.

Although the causality between economic growth and tourism development has been previously examined for different sets of countries, the extant literature reports conflicting evidence regarding the relationship between tourism development and economic growth (see e.g., Aslan, 2013; Balaguer & Cantavella-Jordá, 2002; Cortes-Jimenez & Pulina, 2010; Gunduz & Hatemi-J, 2005; Tugcu, 2014). The conflicting results from previous studies might be due to different empirical methodologies and/or varying data periods applied in these studies, as Brida, Cortes-Jimenez, and Pulina (2016) showed that a variety of empirical techniques have been applied to investigate the causal relationship between tourism development and economic growth. In this study, we employ a contemporary empirical technique, Dumitrescu and Hurlin (2012) panel causality test that produces efficient outcomes by taking the cross-sectional dependence and heterogeneity in a panel data. Most importantly, we examine the extent to which tourism development can help countries to recover from major economic crisis similar to those of 2008–2009 in a more pertinent time period, 1996–2014, that includes and goes beyond the most recent global financial crisis. Therefore, this study aims to contribute to tourism economics literature by providing more robust estimates compared to those of fragmented and inconclusive findings.

Fig. 3 presents the growth trends of tourism and overall economy in terms of growth in tourism receipts and real GDP for the countries in the panel of this study as a whole (i.e., *Croatia, Greece, France, Italy, Slovenia, Spain, and Turkey*) for the period of 1996–2014.

The figure clearly illustrates that tourism has grown more than the overall economy after the financial crisis. Therefore, the findings of this study are further expected to contribute to tourism literature by providing suggestions to policymakers and other stakeholders in these European countries regarding tourism strategies for recovery and sustainable economic growth, where tourism development can positively affect long-term economic growth rates.

## 2. Literature review

The relationship between economic growth and tourism development has been broadly examined in tourism economics literature (Brida, Lanzilotta, 2016; Brida, Cortes-Jimenez, 2016; Gunduz & Hatemi-J, 2005; Kim, Chen, & Jang, 2006; Mérida & Golpe, 2016; Tugcu, 2014). The main question that scholars studying the intersection of tourism and economics seek to answer is whether and the extent to which tourism development contributes to overall economic development. In other words, researchers have sought to explore and define the causal relationship between overall economic growth and tourism growth in particular countries or regions. Nevertheless, the results remain inconclusive despite the extensive examination of these propositions in tourism economics literature (for a detailed review of literature please see Brida, Lanzilotta (2016); Brida, Cortes-Jimenez (2016)). A number of studies reported evidence of a relationship between economic growth and tourism development that supports unidirectional causality from tourism development to economic growth (see e.g., Brida, Lanzilotta, & Pizzolon, 2016; Clerides & Adamou, 2010; Cortes-Jimenez & Pulina, 2010; De Vita & Kyaw, 2016; Husein & Kara, 2011), and others showed support from economic growth to tourism development (see e.g., Aslan, 2013; Payne & Mervar, 2010). There is also support for bidirectional causality (see e.g., Brida, Lanzilotta, Pereyra, & Pizzolon, 2015; Demiröz & Ongan, 2005; Lee & Chang, 2008; Tang & Ozturk, 2017), and some studies have found no causality between economic growth and tourism development (see e.g., Mérida & Golpe, 2016; Tugcu, 2014). While a variety of empirical techniques have been applied to investigate the causal relationship between tourism and economic growth, there are four complementary theoretical arguments that offer postulations on the relationship between tourism and economic growth (Tugcu, 2014). In general, these hypotheses are known as growth or so-called tourism-led growth, conservation, feedback, and neutrality hypotheses.

According to the tourism-led growth hypothesis, tourism development stimulates economic growth. Increases in tourist arrivals and/or tourism receipts subsequently lead to an increase in economic growth, suggesting that investments in the tourism industry will induce economic growth by increasing the income of the current workforce and creating new jobs within and beyond the tourism industry. At the same time, the tourism-led growth hypothesis also suggests that a decrease in tourism activities may lead to an economic recession, since in this model tourism is a major

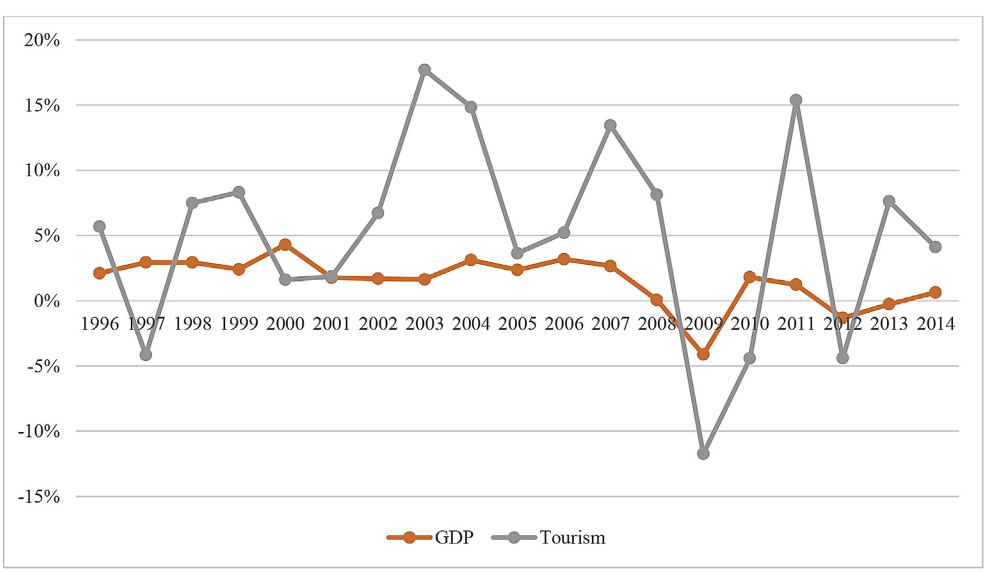



**Fig. 3.** Tourism and GDP trends.

component of the overall economy. Thus, countries should capitalize on the tourism industry in order to improve their economy. Studies of Balaguer and Cantavella-Jordá (2002); Cortes-Jimenez and Pulina (2010); Dritsakis (2004); Gunduz and Hatemi-J (2005); Husein and Kara (2011); and Tugcu (2014) provide evidence supporting the tourism-led growth hypothesis.

The conservation hypothesis, on the other hand, postulates that economic growth causes tourism development; in other words, surges in economic activities stimulate tourism growth and demand. Although the conservation hypothesis posits that economic growth induces tourism development, and hence growth in the overall economy increases tourism demand, this hypothesis also suggests that a decline in economic activities will substantially reduce tourism demand. Accordingly, capital investments in other sectors of the economy will increase income, create new jobs, and ultimately lead to an increase in tourism demand. Among others, studies that provide support for the conservation hypothesis include Payne and Mervar (2010) and Aslan (2013).

The feedback hypothesis posits that economic growth and tourism development are strongly interdependent and may serve as complementary. Put differently, the growth in the overall economy of a country stimulates growth in tourism development and vice versa. The feedback hypothesis suggests that capital investments in other sectors of the economy lead to tourism development, and investments in the tourism industry induce overall economic growth. Among others, Al-mulali, Fereidouni, Lee, and Mohammed (2014); Aslan (2013); Demiröz and Ongan (2005); Lee and Chang (2008); Massidda and Mattana (2012); and Tugcu (2014) are some of the studies that report evidence supporting the feedback hypothesis.

Lastly, the neutrality hypothesis postulates a completely contrasting argument to the above theories, as it suggests that there is no causal relationship between tourism development and economic growth at all. According to the neutrality hypothesis, overall economic and tourism development are independent from each other—that is to say, growth in tourism does not cause growth in the overall economy, and vice versa. This hypothesis suggests that tourism development policies or incentives for tourism investments will have little or no effect on economic growth, because tourism is not a significant component of overall economic activities. Studies of Aslan (2013), Katircioglu (2009), and Tugcu (2014) found evidence of no causal link between tourism development and economic growth.

Researchers have applied a variety of empirical techniques to test the causal relationship between tourism development and economic growth (for a detailed review of the methods applied in the relevant literature please see Brida, Lanzilotta (2016); Brida, Cortes-Jimenez (2016)). The most commonly applied empirical techniques include but are not limited to: Johansen co-integration and time series analysis based on Autoregressive Distributed Lag (ARDL) (Katircioglu, 2009); Granger causality techniques based on Vector Error Correction Model (VECM) (Cortes-Jimenez & Pulina, 2010; Husein & Kara, 2011); and panel co-integration and panel Granger causality based on VECM (Al-mulali et al., 2014). Brida, Lanzilotta (2016); Brida, Cortes-Jimenez (2016) presented the advantages and disadvantages these empirical techniques in details. While an empirical technique should be chosen based on the study purpose, panel data models gained popularity due to the fact that such models allow the concurrent examinations of cross-sectional and temporal dimensions. However, the cross-sectional dependence and heterogeneity need to be analyzed prior to testing the causal relationship between variables in a panel data.

Despite the wide range of empirical techniques applied to investigate the causal relationship between tourism development and economic growth within a similarly broad sampling of countries, previous studies have reported mixed and inconclusive results mainly because former studies did not examine the cross-sectional dependence and heterogeneity. While studies of Balaguer and Cantavella-Jordá (2002), Cortes-Jimenez and Pulina (2010), and Tugcu (2014) provided evidence in favor of the tourism-led growth hypothesis for Spain, Aslan (2013) reported evidence supporting the conservation hypothesis. More recently, Mérida and Golpe (2016) examined the causality between economic growth and tourism development in Spain and found support for the conservation hypothesis for the period prior to 1985, but support for the feedback hypothesis for the period after 2000. While Gunduz and Hatemi-J (2005), Husein and Kara (2011), and Aslan (2013) found evidence of the tourism-led growth hypothesis for Turkey, Demiröz and Ongan (2005) concluded that there is bidirectional causality between tourism development and economic growth, which supports the feedback hypothesis. However, a separate study by Katircioglu (2009) showed that there is no causal link between economic growth and tourism development in Turkey, thereby supporting the neutrality hypothesis. The results from a recent study by Tugcu (2014) further complicate the conception and definition of the causal relationship between tourism development and economic growth in Turkey, as Tugcu (2014) found support for the neutrality hypothesis using tourism receipts as a proxy for tourism development—but he also found support for the tourism-led growth hypothesis using tourism expenditures as a proxy for tourism development.

Similar to results found in the cases of Spain and Turkey, researchers reported mixed results for Greece (Aslan, 2013; Dritsakis, 2004; Tugcu, 2014), Croatia (Aslan, 2013; Payne & Mervar, 2010; Tugcu, 2014), Italy (Cortes-Jimenez & Pulina, 2010; Massidda & Mattana, 2012), and Slovenia and France (Tugcu, 2014). The likely reason for different outcomes from the studies that examine the causal relationship between tourism development and economic growth is that previous studies did not test for the cross-sectional dependence and heterogeneity issues in their panel models and hence reported mixed results. However, the cross-sectional dependence and heterogeneity need to be tested to produce efficient and unbiased estimates. This study aims to resolve the conflicting results from previous studies by applying a contemporary empirical technique, which takes the cross-sectional dependence and heterogeneity into consideration, to examine the causal relationship between economic growth and tourism development. It follows in the vein of Brida, Lanzilotta (2016); Brida, Cortes-Jimenez (2016), which is a seminal paper for an extended and inclusive review of the relevant literature and has noted that, in general, international tourism causes economic stimulus. It should be noted that domestic and inbound tourism segments are independent from each other and hence should be separately examined. However, following previous studies and due to the lack of domestic tourism data, this study only examines the causal relationships between inbound tourism and economic growth. Thus, this study seeks to answer whether the tourism industry (i.e., inbound tourism) can help Europe's struggling economies to recover from the global financial crisis and achieve sustainable economic development.

## 3. Methodology

### 3.1. Data

The variables are economic growth rates that refer to real GDP growth and growth rates in tourism receipts, where $g_{gdp}$ and $g_{tourism}$ refer to real GDP growth (or economic growth) and growth in tourism receipts, respectively. The data set includes seven Mediterranean countries, namely Croatia, Greece, France, Italy, Slovenia, Spain, and Turkey. The annual data covering the period 1996–2014 are obtained from the World Bank Database (The World Bank, 2016). Thus, the sample of this study consists of 133 country-year observations.

### 3.2. Summary statistics

Table 1 presents the descriptive statistics for the countries in our panel. These results show that all descriptive statistics except minimum of $g_{tourism}$ are greater than those of $g_{gdp}$.

Descriptive statistics provide researchers with some initial inspection. However, to obtain efficient output, one needs to employ some statistical methodologies, such as unit root and causality tests, beyond table analyses.

### 3.3. Empirical approach

The Dumitrescu and Hurlin (2012) panel causality test was employed to test the causal relationship between economic growth and tourism development. Prior to examining the causality in a panel data model, the cross-sectional dependence and the slope homogeneity issues must be addressed. First, the cross-sectional dependence states that a shock that affects a cross-section unit may also affect other units in the panel data model. The Monte Carlo experiments performed by Pesaran (2006) show the substantial bias and size distortions that may occur if cross-sectional dependence is ignored by researchers. Second, the slope homogeneity issue suggests that the slope coefficients may not be homogeneous across the sample of units. Granger (2003) noted that a variable causes changes in another variable in all units of the panel (in notation $X_{jt} \rightarrow Y_{jt-1}$, for every j) is a strong hypothesis. Simply put, assuming that GDP causes tourism growth (or vice versa) for all units in the panel may be biased. Also, the homogeneity assumption may mask unit-specific characteristics (Menyah, Nazlioglu, & Wolde-Rufael, 2014). Therefore, testing for cross-sectional dependence and slope homogeneity is a critical step when examining a causal relationship in a panel data model.

Previous studies that examined the causal relationship between tourism development and economic growth, however, did not analyze the cross-sectional dependence and heterogeneity in the panel model. Biased and inefficient estimates of causality may be found if the cross-sectional dependence and heterogeneity in a panel data model are not taken into account. This study therefore starts by examining whether there are cross-sectional dependence and/or heterogeneity across the countries before unit root and causality tests. To test for cross-sectional dependence, Breusch and Pagan (1980) produced the Lagrange multiplier (hereafter LM) test statistic (see Appendix 1 for technical details). The existence of cross-sectional dependence between the countries in the panel was detected and hence the Dumitrescu and Hurlin (2012) technique was employed as a causality test. Therefore, the results from the causal relationship between tourism development and economic growth are expected to yield unbiased and efficient estimates.

Pesaran (2007) previously developed a panel unit root test allowing cross-sectional dependence and heterogeneity. He extends the standard Dickey Fuller (DF) (or augmented Dickey Fuller (ADF)) regressions with the cross-section averages of the lagged levels and first differences of the individual series, rather than basing the unit root tests on deviations from the estimated factors. Thus, new asymptotic results are obtained both for the individual cross-sectionally augmented DF (hereafter CADF) statistics and for their simple averages. The small sample properties of the tests are explored through Monte-Carlo experiments, and the simulations reveal that CADF panel unit root tests have satisfying size and power even if $N$ and $T$ are relatively small. When test statistics are greater than critical values, the null hypothesis of a unit root is rejected (see Appendix 1 for technical details).

A panel causality test based on the individual Wald statistic of Granger non-causality has been produced by Dumitrescu and Hurlin (2012), and this test considers cross-sectional dependence and heterogeneity. Dumitrescu and Hurlin (2012) deal with two stationary series, and the testing procedure considers the heterogeneity of causal relationships. When Wald statistic is greater than the critical values, the null hypothesis of no causality is rejected (see Appendix 1 for technical details).

**Table 1**
Descriptive statistics.

| | Variables | Mean | Median | Maximum | Minimum | Std. deviation |
|---|---|---|---|---|---|---|
| Croatia | $g_{gdp}$ | 2.03 | 3.43 | 6.64 | −7.38 | 3.64 |
| | $g_{tourism}$ | 12.65 | 9.79 | 64.80 | −19.93 | 19.52 |
| France | $g_{gdp}$ | 1.57 | 1.95 | 3.87 | −2.94 | 1.56 |
| | $g_{tourism}$ | 4.56 | 3.20 | 28.07 | −14.60 | 10.41 |
| Greece | $g_{gdp}$ | 0.92 | 3.07 | 5.79 | −9.13 | 4.61 |
| | $g_{tourism}$ | 9.73 | 8.22 | 63.09 | −13.53 | 18.35 |
| Italy | $g_{gdp}$ | 0.47 | 1.28 | 3.71 | −5.48 | 2.07 |
| | $g_{tourism}$ | 2.43 | 1.33 | 16.19 | −12.59 | 7.96 |
| Slovenia | $g_{gdp}$ | 2.55 | 3.30 | 6.94 | −7.79 | 3.40 |
| | $g_{tourism}$ | 5.67 | 5.77 | 23.87 | −10.92 | 10.58 |
| Spain | $g_{gdp}$ | 2.05 | 3.16 | 5.29 | −3.57 | 2.62 |
| | $g_{tourism}$ | 5.01 | 6.93 | 23.67 | −13.46 | 8.78 |
| Turkey | $g_{gdp}$ | 4.14 | 5.26 | 9.36 | −5.69 | 4.64 |
| | $g_{tourism}$ | 12.40 | 13.19 | 46.76 | −27.50 | 16.24 |
| Panel | $g_{gdp}$ | 1.96 | 2.36 | 9.36 | −9.13 | 3.51 |
| | $g_{tourism}$ | 7.49 | 6.94 | 64.80 | −27.50 | 14.05 |

## 4. Empirical results

The results presented in Table 2 indicate that the null hypothesis of no cross-sectional dependence is rejected at 1% statistical significance level. This finding indicates that a shock occurring in one country may be transmitted to other countries in the data set.

In addition, Table 2 reports that the results from the slope homogeneity tests cannot reject the null hypothesis of slope homogeneity. In other words, the countries in the panel appear to have same characteristics in terms of the causal relationship between economic growth and tourism development. Based on these results, analyses of the whole panel are taken into consideration when performing unit root and causality tests. Nevertheless, findings of the unit root test for the countries are depicted in Appendix 2.

Table 3 reports the results of the CADF panel unit root test. Accordingly, CIPS statistics point out that the null hypothesis of a unit root can be rejected at a 1% level of significance for both variables. In other words, both variables are stationary at levels. Hence,

**Table 2**
Cross-sectional dependence and heterogeneity tests.

| Test | Statistic | p-value |
|---|---|---|
| Cross-sectional dependence tests | | |
| LM | 153.05[a] | 0.00 |
| $CD_{LM}$ | 20.37[a] | 0.00 |
| CD | 11.09[a] | 0.00 |
| $LM_{adj}$ | 17.34[a] | 0.00 |
| Heterogeneity tests | | |
| $\tilde{\Delta}$ | −1.52 | 0.93 |
| $\tilde{\Delta}_{adj}$ | −0.12 | 0.55 |

Note:
[a] Denotes 1% statistical significance.

Please cite this article in press as: Dogru, T., & Bulut, U., Is tourism an engine for economic recovery? Theory and empirical evidence, *Tourism Management* (2017), http://dx.doi.org/10.1016/j.tourman.2017.06.014

**Table 3**
CADF panel unit root test.[a]

| | Test statistic | |
|---|---|---|
| | ggdp | gtourism |
| Panel (CIPS) | −2.94[b] | −3.26[b] |

Notes:
[a] 1%, 5%, and 10% critical values for the whole panel are −2.60, −2.34, and −2.21, respectively. Critical values are obtained from Pesaran (2007).
[b] Illustrates 1% statistical significance.

the level values can be used while performing Dumitrescu and Hurlin (2012) panel causality test.

Table 4 presents the findings of the Dumitrescu and Hurlin (2012) panel causality test for the whole panel and Appendix 3 reports the results of the test for the individual countries. The results show that the null hypothesis of no causality running from growth in tourism receipts to economic growth can be rejected at a 5% level of significance, while the null hypothesis of no causality running from economic growth to growth in tourism receipts can be rejected at a 1% level of significance. This output implies that there is a feedback mechanism between economic growth and growth in tourism receipts for the countries in this data set, suggesting that economic growth and tourism development are strongly linked.

Feedback hypothesis suggest that investments in the tourism industry lead to a growth in overall economic conditions and that investment in other sectors of the economy stimulates further tourism development. Croatia, Greece, France, Italy, Slovenia, Spain, and Turkey may develop strategic policies to facilitate improvement in different sectors of tourism industry. Investments in tourism sectors do not only increase direct employment in tourism but also increase employments in other sectors of the economy through indirect and induced impacts (Dogru & Sirakaya-Turk, 2017). Although these countries have advanced in tourism industries, there might be some sectors of the tourism industry that these countries are structurally disadvantaged. Thus, strengthening these tourism sectors can further boost overall economic growth through investments in infrastructure, transportation, and other sectors of the public and private economy.

Overall, the results show that the causal relationship between economic growth and tourism development is a two-way street, where economic growth attracts tourists and thus causes an increase in tourism receipts, *and* tourism development stimulates economic growth. The findings of this paper are consistent with those of Demiröz and Ongan (2005), Lee and Chang (2008), Massidda and Mattana (2012), Aslan (2003), Tugcu (2014), and Al-mulali et al. (2014) in finding evidence that supported the feedback hypothesis. While the results are also consistent with the findings of earlier studies that investigated the causal link between economic growth and tourism development for countries in the panel of this study (Demiröz & Ongan, 2005; Mérida & Golpe, 2016), the findings of this study conflict with those of Balaguer and Cantavella-Jordá (2002); Cortes-Jimenez and Pulina (2010); Gunduz and Hatemi-J (2005); Husein and Kara (2011); Aslan (2013); Katircioglu (2009); and Tugcu (2014), where the causal link between economic growth and tourism development was also examined in the context of Croatia, Greece, Spain, and Turkey.

**Table 4**
Dumitrescu and Hurlin (2012) panel causality test.

| State | Null hypotheses | | | |
|---|---|---|---|---|
| | $H_0$: gtourism does not cause ggdp | | $H_0$: ggdp does not cause gtourism | |
| | Wald stat. | Decision | Wald stat. | Decision |
| Panel | 2.08[b] | 0.04 | 5.54[a] | 0.00 |

Notes:
[a] Illustrates 1% statistical significance.
[b] Illustrates 5% statistical significance.

## 5. Discussions and conclusion

Global economy is yet to recover from the most recent global financial crisis, which caused severe impacts on the global economy. Just as the vast majority of world economies were affected by this financial crisis, countries in Europe also were adversely hit and suffered from the crisis. Although the financial crisis critically affected most, if not all, sectors of the economy, these sectors seem to have different recovery periods. In particular, tourism has quickly recovered from the financial crisis and has shown an exceptional ex-post performance. That is, tourism growth has surpassed the economic growth in European countries. It is a stylized fact that tourism supports socioeconomic development by means of stimulating job creation, lowering unemployment rate, and generating new tax revenues (Dogru & Sirakaya-Turk, 2017). In particular, tourism development can contribute to the economic growth of a country by improving the account balance of a country, which subsequently makes the financing of imports for capital goods easier, increases the numbers of full-time and part-time jobs, and increases tax revenues of the government (Sinclair, 1998). Moreover, tourism development stimulates economic growth through the accumulation of physical capital as well as human capital due to the need for educated and skilled labor in the tourism sector (Lee & Chang, 2008). In other words, tourism not only creates new jobs through investment in tangible assets, but tourism also helps to create a well-educated and skilled employment.

The positive attributes of tourism and contributions of tourism to socioeconomic development have made tourism an attractive industry to many countries, whether they be less developed, developing, or developed. Therefore, the question becomes whether tourism can help *Croatia, Greece, France, Italy, Slovenia, Spain, and Turkey*, in which tourism is a significant component of economic activities and that growth in tourism has surpassed economic growth, to achieve a sustainable economic growth. To answer this question, we examined the causal relationship between tourism development and economic growth in these European countries that have a coastline in the Mediterranean Basin utilizing the Dumitrescu and Hurlin (2012) panel causality test, which takes the cross-sectional dependence and heterogeneity into account and hence produce efficient and unbiased estimates.

The results showed evidence supporting the feedback hypothesis, which suggests that economic growth and tourism development are strongly dependent and they may serve as complementary. In other words, economic growth of a country and its tourism development is interdependent and a growth in overall economy stimulates growth in tourism development and vice versa. While the findings from previous studies also provided some support for the feedback hypothesis for some of the countries in our panel, the majority of former studies found support for growth, neutrality, and conservation hypotheses. For example, studies of Cortes-Jimenez and Pulina (2010) and Aslan (2013) provided evidence in favor of the tourism-led growth hypothesis and conservation hypothesis, respectively, whereas Mérida and Golpe (2016) found support for the feedback hypotheses in the case of Spain. Tugcu (2014), for example, presented evidence for feedback and growth hypotheses in France; neutrality and growth hypotheses in Turkey; conservation and neutrality hypotheses in Slovenia; and feedback and neutrality hypotheses in Greece. Similar conflicting

Please cite this article in press as: Dogru, T., & Bulut, U., Is tourism an engine for economic recovery? Theory and empirical evidence, *Tourism Management* (2017), http://dx.doi.org/10.1016/j.tourman.2017.06.014

results were reported for the countries in our panel in other studies (see e.g., Demiröz & Ongan, 2005; Dritsakis, 2004; Katircioglu, 2009; Massidda & Mattana, 2012; Payne & Mervar, 2010). Previous studies reported mixed and inconclusive results on the causal relationship between tourism development and economic growth because the cross-sectional dependence and heterogeneity of the panel model were not tested. Therefore, our study may serve as a conclusive evidence on the relationships between tourism development and economic growth.

### 5.1. Theoretical and policy implication

The findings of this study have theoretical and policy implications. Theoretically, we found evidence supporting the feedback hypothesis on the relationship between tourism development and economic growth for the countries in the panel of this study. Feedback hypothesis postulates that capital investments in other sectors of the economy lead to tourism development, and in turn, investments in the sectors of tourism industry, including physical and human capital induce overall economic growth. Biased and inefficient outputs may be found if the cross-sectional dependence and heterogeneity in a panel data model is not taken into account. We employed the Dumitrescu and Hurlin (2012) technique as a causality method, which take cross-sectional dependence and heterogeneity into account. Therefore, this paper contributes to the tourism economics literature by presenting efficient output in regards to the relationship between tourism development and economic growth.

From policy and managerial standpoint, policymakers and other stakeholders in the tourism industry can exploit opportunities that the industry has to offer for sustainable economic growth in their countries, as tourism development promotes economic growth through new jobs, tax revenues, capital investments, and other socioeconomic factors. Countries in the panel of this study should increase the trade opportunities with the countries in which they receive majority of their tourists, as increased trade opportunities will increase economic growth and hence will further stimulate tourism development (Massidda & Mattana, 2012). Furthermore, initiations of novel tourism niches in these countries within the context of developing tourism markets could further enhance economic growth and recovery (Dritsakis, 2004). That is, these countries can attract more tourists by creating new tourism segments and increase inbound tourism demand and hence boost their economic growth. For example, focusing on ecotourism, medical tourism, food tourism, and other trending tourism segments can help attract new tourists to these countries. Also, these countries have coastline in the Mediterranean Sea and hence might be mainly focused on sun, sand, and summer tourism. Thus, developing strategies to attract tourists in different times of the year are also recommended (Dogru, Sirakaya-Turk, & Crouch, 2017; Song & Li, 2008). Based on the findings of the present study, capitalizing on tourism could quite feasibly help these countries to recover from the most recent global financial crisis. These countries have geographic and historical advantages that help attract tourists from around the world. Therefore, policymakers in these countries should develop strategies that focus on tourism industry during the times of global crisis to bypass or quickly recover from the effects of the crisis. Also, a developed tourism industry could make these countries more resilient against possible global or regional economic crises that might occur in the future.

### 5.2. Limitations and recommendations for future research

Despite its contributions to the tourism economics literature, this study has limitations. Government officials and private sector investors need to know the strength, composition, and performance of industries in an economy relative to overall economy and other sectors. Thus, future studies should conduct analyses that measure the strength, composition, and performance of the tourism industry relative to those of other industries. Determining these attributes of the tourism industry can help policymakers to devise better policies and strategies to stimulate sustainable economic development. In this study, we analyzed the causal relationship between tourism development and economic growth using a linear model. Future studies may examine these relationship utilizing nonlinear approaches similar to those of used in the studies of Brida et al. (2015), Brida, Lanzilotta (2016); Brida, Cortes-Jimenez (2016), and Chiu and Yeh (2016). Also, policy recommendations in regards to domestic tourism cannot be made without establishing the causal link between domestic tourism and economic growth. Our analyses were limited to the relationship between inbound tourism development and economic growth because of lack of domestic tourism data. Future studies may examine the causal relationship between domestic tourism development and economic growth. Additionally, the analyses are limited to seven European countries that have a coastline in the Mediterranean Sea. Therefore, replication of this study in different geographic settings may corroborate these findings.

## Appendix 1. Methodology

### Cross-sectional dependence and slope homogeneity

To test for cross-sectional dependence, Breusch and Pagan (1980) produced the Lagrange multiplier (hereafter LM) test statistic. To compute the LM test, the following panel data model is estimated:

$$y_{it} = \alpha_i + \beta_i x_{it} + \varepsilon_{it} \text{ for } i = 1,\ 2,\ \ldots,\ N;\ t = 1,\ 2,\ \ldots,\ T \quad (1)$$

where $i$ is the cross-section dimension, t is the time dimension, $x_{it}$ is *kx1* vector explanatory variables, and $\alpha_i$ and $\beta_i$ are respectively the intercepts and slope coefficients. The LM test is calculated as the following:

$$LM = T\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}^2 \sim \chi^2_{N(N-1)/2} \quad (2)$$

where $\hat{\rho}_{ij}$ is the sample estimate of pairwise correlation of the residuals obtained from individual ordinary least squares (OLS) estimation of Equation (1). The null hypothesis of no cross-sectional dependence ($H_0: Cov(\varepsilon_{it}\varepsilon_{jt}) = 0$ *for all* $t,\ i \neq j$) is tested against the alternative hypothesis of cross-sectional dependence ($H_1: Cov(\varepsilon_{it}\varepsilon_{jt}) \neq 0$ *for at least one pair of* $i \neq j$). Pesaran (2004) clarifies that this test is not applicable when N is large. For large panels where $T \to \infty$ first and then $N \to \infty$, Pesaran (2004) propounds the scaled version of the $LM$ test defined as

$$CD_{lm} = \sqrt{\frac{1}{N(N-1)}\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\left(T\hat{\rho}_{ij}^2 - 1\right)} \sim N(0,1) \quad (3)$$

This test may present substantial size distortions when $N$ is large and $T$ is small. Pesaran (2004) produces a test for panels where $T \to \infty$ and $N \to \infty$. This test is based on pairwise correlation coefficients rather than their squares used in the LM test. The regarded test statistic is as follows:

$$CD = \sqrt{\left(\frac{2T}{N(N-1)}\right)}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}\right) \sim N(0,1) \quad (4)$$

Please cite this article in press as: Dogru, T., & Bulut, U., Is tourism an engine for economic recovery? Theory and empirical evidence, *Tourism Management* (2017), http://dx.doi.org/10.1016/j.tourman.2017.06.014

Pesaran, Ullah, and Yamagata (2008) argued that the *CD* test will lack power in certain situations where the population average pair-wise correlations are non-zero. Therefore, for large panels where $T \rightarrow \infty$ first and then $N \rightarrow \infty$, Pesaran et al. (2008) develop a bias adjusted version of the *LM* test that uses the exact mean and variance of the LM statistic. The bias-adjusted LM test is stated as follows:

$$LM_{adj} = \sqrt{\left(\frac{2}{N(N-1)}\right)} \sum_{i=1}^{N-1} \sum_{j=i+1}^{N} \hat{\rho}_{ij} \frac{(T-k)\hat{\rho}_{ij}^2 - \mu_{Tij}}{\sqrt{\upsilon_{Tij}^2}} \sim N(0,1) \quad (5)$$

where k is the number of regressors, $\mu_{Tij}$ and $\upsilon_{Tij}^2$ are respectively the exact mean and variance of $(T-k)\hat{\rho}_{ij}^2$ (see Pesaran et al., 2008 for details).

To test for slope homogeneity, Pesaran and Yamagata (2008) propound delta ($\tilde{\Delta}$) tests. The null hypothesis of slope homogeneity ($H_0: \beta_i = \beta \; for \; all \; i$) is tested against the alternative hypothesis of slope heterogeneity ($H_1: \beta_i \neq \beta \; for \; a \; non-zero \; fraction \; of \; pair-wise \; slopes \; for \; i \neq j$). When the error terms are normally distributed, the $\tilde{\Delta}$ tests are valid as $(N,T) \rightarrow \infty$ without any restrictions on the relative expansion rates of *N* and *T*. To produce $\tilde{\Delta}$ tests, firstly, the following modified version of the Swamy (1970) test is calculated:

$$\tilde{S} = \sum_{i=1}^{N} \left(\hat{\beta}_i - \tilde{\beta}_{WFE}\right)' \frac{X_i' M_\tau X_i}{\tilde{\sigma}_i^2} \left(\hat{\beta}_i - \tilde{\beta}_{WFE}\right) \quad (6)$$

where

$$\tilde{\sigma}_i^2 = \frac{\left(y_i - X_i\hat{\beta}_i\right)' M_\tau \left(y_i - X_i\hat{\beta}_i\right)}{(T-k-1)} \quad (7)$$

where $M_\tau$ is an identity matrix of order *T* and $\hat{\beta}_{WFE}$ is the weighted fixed effect pooled estimator defined as

$$\tilde{\beta}_{WFE} = \left(\sum_{i=1}^{N} \frac{X_i' M_\tau X_i}{\tilde{\sigma}_i^2}\right)^{-1} \sum_{i=1}^{N} \frac{X_i' M_\tau y_i}{\tilde{\sigma}_i^2} \quad (8)$$

Under the null hypothesis, with the condition that the error terms are normally distributed, $(N,T) \rightarrow \infty$, and as long as $\sqrt{N}/T \rightarrow 0$, the standard dispersion statistic is described as the following:

$$\tilde{\Delta} = \sqrt{N}\left(\frac{N^{-1}\tilde{S} - k}{\sqrt{2k}}\right) \quad (9)$$

The small sample properties of the $\tilde{\Delta}$ test can be improved under the normally distributed errors by using the following mean and variance bias adjusted version of $\tilde{\Delta}$.

$$\tilde{\Delta}_{adj} = \sqrt{N}\left(\frac{N^{-1}\tilde{S} - E(\tilde{z}_{iT})}{\sqrt{Var(\tilde{z}_{iT})}}\right) \quad (10)$$

where

$$E(\tilde{z}_{iT}) = k, \quad Var(\tilde{z}_{iT}) = \frac{2k(T-k-1)}{T+1} \quad (11)$$

*CADF unit root test*

Pesaran (2007) previously developed a panel unit root test allowing cross-sectional dependence and heterogeneity. He extends the standard Dickey Fuller (DF) (or augmented Dickey Fuller (ADF)) regressions with the cross-section averages of the lagged levels and first differences of the individual series, rather than basing the unit root tests on deviations from the estimated factors. Thus, new asymptotic results are obtained both for the individual cross-sectionally augmented DF (hereafter CADF) statistics and for their simple averages. The small sample properties of the tests are explored through Monte-Carlo experiments, and the simulations reveal that CADF panel unit root tests have satisfying size and power even if *N* and *T* are relatively small.

When $y_{it}$ is the observation on the $i_{th}$ cross-section unit at time t and is generated with regard to the simple dynamic linear heterogeneous panel data model, CADF test statistic is defined as the following:

$$y_{it} = (1-\Phi_i)\mu_i + \Phi_i y_{i,t-1} + u_{it}, \quad i = 1, \ldots, N; \; t = 1, \ldots T \quad (12)$$

where initial value, $y_{i0}$, has a given density function with a finite and mean variance. The error term, $u_{it}$, has the single-factor structure

$$u_{it} = \gamma_i f_t + \varepsilon_{it} \quad (13)$$

where $f_{it}$ stands for the observed common effect, and $\varepsilon_{it}$ is the individual-specific error.

Pesaran (2007) points out that it is available to write Equation (12) and Equation (13) as below:

$$\Delta y_{it} = \alpha_i + \beta_i y_{i,t-1} + \gamma_i f_t + \varepsilon_{it} \quad (14)$$

where $\alpha_i = (1-\Phi_i)\mu_i$, $\beta_i = -(1-\Phi_i)$ and $\Delta y_{it} = y_{it} - y_{i,t-1}$. The null hypothesis of a unit root, $\Phi_i$, is stated as follows:

$$H_0: \beta_i = 0 \;\text{ for all } i \quad (15)$$

The alternative hypothesis is expressed as below:

$$H_1: \beta_i < 0, \; i = 1, 2, \ldots, N_1, \; \beta_i = 0, \; i = N_1 + 1, \; N_1 + 2, \ldots, N \quad (16)$$

Pesaran (2007) builds on the test of the unit root hypothesis, Equation (15), on the t-ratio of the ordinary least squares (OLS) estimate of $b_i$ ($\hat{b}_i$) in the following CADF regression:

$$\Delta y_{it} = a_i + b_i y_{i,t-1} + c_i \bar{y}_{t-1} + d_i \Delta\bar{y}_t + e_{it} \quad (17)$$

This t-ratio, $t_i(N, T)$, is computed as follows:

$$t_i(N, T) = \frac{\Delta y_i' \overline{M}_w y_{i,-1}}{\hat{\sigma}_i \left(y_{i,-1}' \overline{M}_w y_{i,-1}\right)^{1/2}} \quad (18)$$

Pesaran (2007) also calculate cross-sectionally augmented IPS (CIPS) statistic by way of the average of individual CADF test statistics for the whole panel. The CIPS statistic is as the following:

$$CIPS(N, T) = t-bar = N^{-1}\sum_{i=1}^{N} t_i(N, T) \quad (19)$$

where $t_i(N, T)$ is the CADF statistic for the $i_{th}$ cross-section unit (see Pesaran (2007) for further information about notations). When test statistics are greater than critical values, the null hypothesis of a unit root is rejected.

Please cite this article in press as: Dogru, T., & Bulut, U., Is tourism an engine for economic recovery? Theory and empirical evidence, *Tourism Management* (2017), http://dx.doi.org/10.1016/j.tourman.2017.06.014

### Dumitrescu and Hurlin (2012) panel causality test

A panel causality test based on the individual Wald statistic of Granger non-causality has been produced by Dumitrescu and Hurlin (2012), and this test considers cross-sectional dependence and heterogeneity. Dumitrescu and Hurlin (2012) deal with two stationary series, and the testing procedure considers the heterogeneity of causal relationships. They first regard the following linear model:

$$y_{i,t} = \alpha_i + \sum\nolimits_{k=1}^{K} \gamma_i^{(k)} y_{i,t-k} + \sum\nolimits_{k=1}^{K} \beta_i^{(k)} x_{i,t-k} + \varepsilon_{i,t} \quad (20)$$

$$x_{i,t} = \delta_i + \sum\nolimits_{k=1}^{K} \theta_i^{(k)} x_{i,t-k} + \sum\nolimits_{k=1}^{K} \lambda_i^{(k)} y_{i,t-k} + \varepsilon_{i,t} \quad (21)$$

For simplicity, the individual effects $\alpha i$ and $\delta i$ are assumed to be fixed in the time dimension. Initial conditions $(y_{i,-K}, \ldots, y_{i,0})$ and $(x_{i,-K}, \ldots, x_{i,0})$ of both individual processes $yi,t$ and $xi,t$ are given and observable. They suppose that lag orders K are identical for all cross-section units of the panel and the panel is balanced. In addition, they let the autoregressive parameters $\gamma_i^{(k)}$ and $\theta_i^{(k)}$ and the regression coefficients slopes $\beta_i^{(k)}$ and $\lambda_i^{(k)}$ differ across groups.

They propose to test the Homogeneous Non Causality (HNC) hypothesis by taking into account both the heterogeneity of the regression model and that of the causal relationship. Under the alternative, they allow for a subgroup of individuals for which there is no causal relationship and a subgroup of individuals for which there is a causal relationship. For example, in order to test whether x Granger causes y, the null hypothesis of HNC is stated as follows:

$$H_0 = \beta_i = 0 \quad \Lambda i = 1, \ \ldots, \ N \quad (22)$$

with $\beta_i = (\beta_i^{(1)}, \ldots, \beta_i^{(K)})'$. In addition, $\beta_i$ can differ across groups under the alternative (model heterogeneity). They also let for some, but not all, of the individual vectors $\beta_i$ be equal to 0 (non-causality assumption). They suppose under $H_1$, there are $N_1<N$ individual processes with no causality from $x$ to $y$. It follows that their test is not a test of non-causality assumption against causality from $x$ to $y$ for all the individuals in a panel data model. They can observe non causality for some units under the alternative:

$$\begin{aligned} H_1:\ & \beta_i = 0 \quad \Lambda i = 1, \ \ldots, \ N_1 \\ & \beta_i \neq 0 \quad \Lambda i = N_1 + 1, \ N_1 + 2, \ \ldots, \ N \end{aligned} \quad (23)$$

where $N_1$ is unknown and meets condition $0 \leq N_1/N<1$. The rejection of the null hypothesis with $N_1 = 0$ indicates that x Granger causes y for all the units of the panel, while the rejection of the null hypothesis with $N_1 > 0$ indicates that the causal relationship is heterogeneous: the regression model and the causal relationships are different from one individual from the sample to another. Within this scope, they propose to use the average of individual Wald statistics associated with the test of the non-causality hypothesis for units $i = 1, \ldots, N$. The average statistic $W_{N,T}^{Hnc}$ associated with the null HNC hypothesis is expressed as

$$W_{N,T}^{Hnc} = \frac{1}{N} \sum\nolimits_{i=1}^{N} W_{i,T} \quad (24)$$

where $W_{i,T}$ stands for the individual Wald statistics for the $i$th cross section unit.

Let one denote by $Z_i$ the $(T,2K+1)$ matrix $Z_i = [e{:}Y_i{:}X_i]$, where e denotes a $(T,1)$ unit vector, and by $\theta_i = (\alpha_i \ \gamma_i' \ \beta_i')'$ the vector of parameters of the model. The rest for the HNC hypothesis can now be expressed as $R\theta_i = 0$ where R is a $(K,2K+1)$ matrix with $R = [0{:}I_K]$. The Wald statistic $W_{i,T}$ corresponding to the individual test $H_0{:}\ \beta_i = 0$ is defined for each $i = 1, \ldots, N$ as follows:

$$W_{i,T} = \hat{\theta}_i' R' \left[ \hat{\sigma}_i^2 R \left( Z_i' Z_i \right)^{-1} R' \right]^{-1} R \hat{\theta}_i = \frac{\hat{\theta}_i' R' \left[ R \left( Z_i' Z_i \right)^{-1} R' \right]^{-1} R \hat{\theta}_i}{\hat{\varepsilon}_i' \hat{\varepsilon}_i / (T - 2K - 1)} \quad (25)$$

where $\hat{\theta}_i$ is the estimate of parameter $\theta_i$ obtained under the alternative hypothesis, and $\hat{\sigma}_i^2$ remarks the estimate of the variance of the residuals. This Wald statistic can also be defined as the following:

$$W_{i,T} = (T - 2K - 1) \left( \frac{\tilde{\varepsilon}_i' \Phi_i \tilde{\varepsilon}_i}{\tilde{\varepsilon}_i' M_i \tilde{\varepsilon}_i} \right), \quad i = 1, \ldots, N \quad (26)$$

Under the null hypothesis of non-causality, each individual Wald statistic converges to a chi-squared distribution with K degrees of freedom for $T \to \infty$:

$$W_{i,T} \to \chi^2(K), \Lambda i = 1, \ \ldots, \ N \quad (27)$$

When Wald statistic is greater than the critical values, the null hypothesis of no causality is rejected.

## Appendix 2. CADF unit root test for countries

| Country | Test statistic | |
|---|---|---|
| | $g_{gdp}$ | $g_{tourism}$ |
| Croatia | −3.29[e] | −3.23[e] |
| France | −2.83 | −3.12[e] |
| Greece | −3.51[d] | −4.35[c] |
| Italy | −1.64 | −4.69[c] |
| Slovenia | −1.05 | −2.12 |
| Spain | −4.02[d] | −2.37 |
| Turkey | −4.19[d] | −2.93 |

Notes:
[a] 1%, 5%, and 10% critical values are −4.35, −3.43, and −3.00, respectively. Critical values are obtained from Pesaran [79].
[b] Δ is the first difference operator.
c Illustrates 1% statistical significance.
d Illustrates 5% statistical significance.
e Illustrates 10% statistical significance.

## Appendix 3. Dumitrescu and Hurlin (2012) panel causality test for countries

| Country | Null hypothesis | | | |
|---|---|---|---|---|
| | $H_0$: $g_{tourism}$ does not cause $g_{gdp}$ | | $H_0$: $g_{gdp}$ does not cause $g_{tourism}$ | |
| | Wald stat. | Decision | Wald stat. | Decision |
| Croatia | 1.88 | Fail to reject | 9.19[b] | Reject |
| France | 0.25 | Fail to reject | 5.17 | Fail to reject |
| Greece | 1.52 | Fail to reject | 10.67[a] | Reject |
| Italy | 0.47 | Fail to reject | 2.93 | Fail to reject |
| Slovenia | 1.30 | Fail to reject | 1.93 | Fail to reject |
| Spain | 0.53 | Fail to reject | 4.93 | Fail to reject |
| Turkey | 8.64[b] | Reject | 3.96 | Fail to reject |

Notes:
a Illustrates 5% statistical significance.
b Illustrates 10% statistical significance.

## References


Al-mulali, U., Fereidouni, H. G., Lee, J. Y. M., & Mohammed, A. H. (2014). Estimating the tourism-led growth hypothesis: A case study of the Middle East countries. *Anatolia, 25*(2), 290–298.

Aslan, A. (2013). Tourism development and economic growth in the Mediterranean countries: Evidence from panel granger causality tests. *Current Issues in Tourism, 17*(4), 363–372. http://dx.doi.org/10.1080/13683500.2013.768607.

Balaguer, J., & Cantavella-Jordá, M. (2002). Tourism as a long-run economic growth factor: The Spanish case. *Applied Economics, 34*(7), 877–884. http://dx.doi.org/10.1080/00036840110058923.

Bourne, R. (2016). Why did the British Brexit? and what are the implications for classical liberals? *Economic Affairs, 36*(3), 356–363.

Breusch, T. S., & Pagan, A. R. (1980). The Lagrange multiplier test and its applications to model specification in econometrics. *The Review of Economic Studies, 47*(1), 239–253.

Brida, J. G., Cortes-Jimenez, I., & Pulina, M. (2016). Has the tourism-led growth hypothesis been validated? A literature review. *Current Issues in Tourism, 19*(5), 394–430.

Brida, J. G., Lanzilotta, B., Pereyra, J. S., & Pizzolon, F. (2015). A nonlinear approach to the tourism-led growth hypothesis: The case of the MERCOSUR. *Current Issues in Tourism, 18*(7), 647–666.

Brida, J. G., Lanzilotta, B., & Pizzolon, F. (2016). Dynamic relationship between tourism and economic growth in MERCOSUR countries: A nonlinear approach based on asymmetric time series models. *Economics Bulletin, 36*(2), 879–894.

Chiu, Y. B., & Yeh, L. T. (2016). The threshold effects of the tourism-led growth Hypothesis: Evidence from a cross-sectional model. *Journal of Travel Research, 56*(5), 625–637.

Clerides, S., & Adamou, A. (2010). Prospects and Limits of Tourism-Led Growth: The International Evidence. *Review of Economic Analysis, 2*(3), 287–303.

Cortes-Jimenez, I., & Pulina, M. (2010). Inbound tourism and long-run economic growth. *Current Issues in Tourism, 13*(1), 61–74.

Das, S. (2016). Why Italy's economy is about to collapse. *The Independent*. Retrieved from http://www.independent.co.uk/voices/why-italy-s-economy-is-about-to-collapse-a7091221.html.

De Vita, G., & Kyaw, K. S. (2016). Tourism development and growth. *Annals of Tourism Research, 60*, 23–26.

Demiröz, D. M., & Ongan, S. (2005). The contribution of tourism to the long-run Turkish economic growth. *Ekonomický Časopis, 53*(09), 880–894.

Dogru, T., & Sirakaya-Turk, E. (2017). Engines of tourism's growth: An examination of efficacy of shift-share regression analysis in South Carolina. *Tourism Management, 58*, 205–214. http://dx.doi.org/10.1016/j.tourman.2016.10.021.

Dogru, T., Sirakaya-Turk, E., & Crouch, G. I. (2017). Remodeling international tourism demand: Old theory and new evidence. *Tourism Management, 60*, 47–55.

Dritsakis, N. (2004). Tourism as a long-run economic growth factor: An empirical investigation for Greece using causality analysis. *Tourism Economics, 10*(3), 305–316.

Dumitrescu, E. I., & Hurlin, C. (2012). Testing for Granger non-causality in heterogeneous panels. *Economic Modelling, 29*(4), 1450–1460.

Gibson, H. D., Hall, S. G., & Tavlas, G. S. (2012). The Greek financial crisis: Growing imbalances and sovereign spreads. *Journal of International Money and Finance, 31*(3), 498–516. http://dx.doi.org/10.1016/j.jimonfin.2011.10.009.

Granger, C. W. (2003). Some aspects of causal relationships. *Journal of Econometrics, 112*(1), 69–71.

Gunduz, L., & Hatemi-J, A. (2005). Is the tourism-led growth hypothesis valid for Turkey? *Applied Economics Letters, 12*(8), 499–504. http://dx.doi.org/10.1080/13504850500109865.

Husein, J., & Kara, S. M. (2011). Research note: Re-examining the tourism-led growth hypothesis for Turkey. *Tourism Economics, 17*(4), 917–924.

Katircioglu, S. T. (2009). Revisiting the tourism-led-growth hypothesis for Turkey using the bounds test and Johansen approach for cointegration. *Tourism Management, 30*(1), 17–20.

Kim, H. J., Chen, M.-H., & Jang, S. S. (2006). Tourism expansion and economic development: The case of Taiwan. *Tourism Management, 27*(5), 925–933. http://dx.doi.org/10.1016/j.tourman.2005.05.011.

Lee, C.-C., & Chang, C.-P. (2008). Tourism development and economic growth: A closer look at panels. *Tourism Management, 29*(1), 180–192. http://dx.doi.org/10.1016/j.tourman.2007.02.013.

Massidda, C., & Mattana, P. (2012). A SVECM analysis of the relationship between international tourism arrivals, GDP and trade in Italy. *Journal of Travel Research, 52*(1), 93–105. http://dx.doi.org/10.1177/0047287512457262.

Menyah, K., Nazlioglu, S., & Wolde-Rufael, Y. (2014). Financial development, trade openness and economic growth in African countries: New insights from a panel causality approach. *Economic Modelling, 37*, 386–394.

Mérida, A., & Golpe, A. A. (2016). Tourism-led growth revisited for Spain: Causality, business cycles and structural Breaks. *International Journal of Tourism Research, 18*(1), 39–51. http://dx.doi.org/10.1002/jtr.2031.

Payne, J. E., & Mervar, A. (2010). Research note: The tourism–growth nexus in Croatia. *Tourism Economics, 16*(4), 1089–1094.

Pesaran, M. H. (2004). *General diagnostic tests for cross section dependence in panels*.

Pesaran, M. H. (2006). Estimation and inference in large heterogeneous panels with a multifactor error structure. *Econometrica, 74*(4), 967–1012.

Pesaran, M. H. (2007). A simple panel unit root test in the presence of cross-section dependence. *Journal of Applied Econometrics, 22*(2), 265–312.

Pesaran, M. H., Ullah, A., & Yamagata, T. (2008). A bias-adjusted LM test of error cross-section independence. *The Econometrics Journal, 11*(1), 105–127.

Pesaran, M. H., & Yamagata, T. (2008). Testing slope homogeneity in large panels. *Journal of Econometrics, 142*(1), 50–93.

Sinclair, M. T. (1998). Tourism and economic development: A survey. *The Journal of Development Studies, 34*(5), 1–51.

Smith, H. (2016). A year after the crisis was declared over, Greece is still spiralling down. *The Guardian*. Retrieved from https://www.theguardian.com/business/2016/aug/13/greek-economy-still-spiralling-down-year-after-crisis-declared-over.

Song, H., & Li, G. (2008). Tourism demand modelling and forecasting—a review of recent research. *Tourism Management, 29*(2), 203–220.

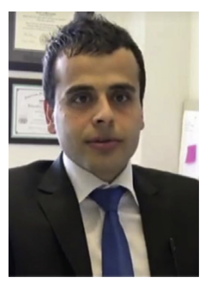
Stylidis, D., & Terzidou, M. (2014). Tourism and the economic crisis in Kavala, Greece. *Annals of Tourism Research, 44*, 210–226. http://dx.doi.org/10.1016/j.annals.2013.10.004.

Swamy, P. A. (1970). Efficient inference in a random coefficient regression model. *Econometrica, 38*(2), 311–323.

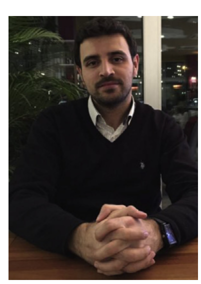
Tang, C. F., & Ozturk, I. (2017). Is tourism a catalyst of growth in Egypt? Evidence from Granger non-causality and the generalised variance decomposition analysis. *Anatolia, 28*(2), 173–181.

Tugcu, C. T. (2014). Tourism and economic growth nexus revisited: A panel causality analysis for the case of the Mediterranean region. *Tourism Management, 42*, 207–212. http://dx.doi.org/10.1016/j.tourman.2013.12.007.

The World Bank, World Development Indicators. (2016). *GDP, tourism receipts*. Retrieved from http://data.worldbank.org/.

**Tarik Dogru** is an assistant professor of hospitality finance and accounting in the School of Hospitality Administration at Boston University. He received his BS (2008) and MSc (2010) degrees from Zonguldak Karaelmas University in Turkey. Prior to joining Boston University, Dr. Dogru worked as a Research Assistant at Ahi Evran University in Turkey. His research interests include hospitality finance, corporate finance, behavioral finance, Hotel-REITs, franchising, hotel investments, tourism economics, and climate change. His research interests include hospitality accounting and finance, investment, mergers and acquisitions, corporate governance, franchising, tourism economics, revenue management, and climate change.



**Umit Bulut** is a research assistant of economics in Faculty of Economics and Administrative Sciences at Ahi Evran University in Turkey. He received his PhD (2014) degree from Gazi University in Turkey. His research interests include monetary economics, energy economics, tourism economics, and applied econometrics.