The Effect of Tourism Investments on Tourism Income in Turkey: Panel VAR Approach

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Abstract
        Tourism is rapidly developing around the world and it effects the economic, social and cultural development of the country. In this study based on the effect of tourism on the economic growth, the effect of tourism investments on tourism income was examined using Panel VAR model. The yearly data from the period 2001-2014 on the most popular touristic towns in Turkey, namely, Antalya, Mugla, Izmir, Aydin and Nevsehir, was used. When the results of the analysis are examined, it can be said that tourism investments have stimulating effect on tourism income, but it was noticed that the tourism investments from the last year had a decreasing effect on tourism income.

Keywords: Tourism investments, Panel Cointegration, Panel Vector Autoregression

Introduction

        Tourism is one of the most important sectors in world economy. Tourism industry is rapidly developing and, besides stimulating all the economic and socio-cultural development of the country, it has a great potential for creating new work places and providing foreign currency

income. Sustainable economic growth is the main goal of the macroeconomic policies in many developing countries. One of the ways of providing it is international tourism. The importance given to tourism's effect on economic growth is steadily increasing (Cortés-Jiménez, 2008). For this reason, it is necessary to examine the dynamics of the relation between the development of tourism sector and the economic growth (Mishra, Rout and Mohapatra, 2011).

It has been widely excepted in all the countries that the period of economic growth, investments and the forming of capital are closely related. Both neoclassical and Marxist economists emphasized the importance of investments in providing economic growth. Investments increase the production of capital-intensive commodities, while the consumption of these commodities generally increases with the income growth (Sundrum, 1993). In growth models, investments are among the most decisive factors of economic growth (Anwer and Sampath, 1999). Similar to many other developing countries, Turkey is giving priority to the development of tourism industry in its economic growth strategy (Gunduz and Hatemi-J, 2005). While Turkey was a country with attention drawing historical locations earlier as well, during the 1990's it started to grow in demand as a holiday location in world tourism market (Kar, Zorkirişçi and Yıldırım, 2004). The goal of this study is to determine the relation between tourism investments and tourism incomes using panel vector autoregression (VAR) models and yearly data from 2001-2014 on Antalya, Mugla, Izmir, Aydin and Nevsehir, the most popular touristic towns in Turkey. As far as we know, there are no other studies examining tourism investments and tourism incomes in Turkey from the perspective of the most popular touristic towns. From this aspect, this study will contribute to the literature.

After the introduction chapter comes the second chapter in which literature is examined, the methodology will be shortly explained in the third chapter, the data and variables are given in the forth and the fifth chapters respectively, followed by the conclusion chapter.

Literature

Even if there are studies examining the relation between economic growth and tourism incomes (Dritsakis, 2004; Gunduz and Hatemi-J, 2005; Cortés-Jiménez, 2008; Çetintaş and Bektaş, 2008; Akinboade and Braimoh, 2010; Barquet, Brida and Risso 2010; Mishra, Rout and Mohapatra, 2011; Yamak, Tanrıöver and Güneysu, 2012), there are not a lot of studies examining the relation between tourism incomes and tourism investments (Kar, Zorkirişçi and Yıldırım, 2004; Tang, Selvanathan and Selvanathan; 2007).

Firstly, the studies examining the relation between economic growth and tourism incomes will be included. Dritsakis (2004) studied the long term effect of tourism in Greece on economic growth by examining the relation between real GDP, real effective exchange rate and international tourism incomes. He predicted a multivariate VAR model by using the three-month data from the period 1960-2000. As a result of a cointegration analysis, it was found that there is no cointegration vector between variables, while as a result of Granger causality test that relies on error recovery model it was found that there is a strong causality between both international tourism incomes and economic growth; and between exchange rate and economic growth. In the study by Gunduz and Hatemi-J (2005) examining if tourism really contributes to the economic growth, the results supported the tourism-led growth hypothesis in Turkey. Cortés-Jiménez (2008) examined the effect of tourism on economic growth in Spain and Italy. Both international and domestic tourism were analyzed and geographical location criteria was considered as well. Dynamic panel data techniques were applied. Even if the effects show variety according to different regions, the study showed that the international and domestic tourism in Spain and Italy both significantly and positively affected the economic growth. Çetintaş and Bektaş (2008) examined the short term and long term relations between tourism and economic growth in Turkey in the period 1964-2006 using ARDL causality method. As a result of the analysis, it was found that there is no short term relation between variables, but long term unilateral causality from tourism to economic growth was established. The findings verified that tourism-led growth hypothesis for Turkey is valid in the long term. Akinboade and Braimoh (2010) examined the causality relation between international tourism incomes and GDP variables for the period 1980-2005 and found there is a short term and long term unilateral causality from tourism incomes to real GDP. The relation between variables was examined using multivariate VAR analysis as well, by adding the real effective exchange rate and export variables. Monterubbianesi and Brida (2009) examined the long term effects between tourism expenses and economic growth in Antioquia, Bolivar, Bogota, Magdalena and San Andres areas in Columbia using yearly data from the period 1990-2005. The existence of error recovery mechanism between real GDP per capita, tourism expenses and real exchange rates variables was examined using cointegration analysis. The causality was positive and unilateral for all areas. However, elasticity values were significantly different depending on the area. Barquet, Brida and Risso (2010) examined the causality between tourism growth, relative prices and economic development variables in Trentino-Altı Adige/Südtirol, the area in north-east Italy on the borders with Swiss and Austria. Johansen cointegration analysis showed there is a single cointegrating vector between

real GDP, tourism and relative prices. Unilateral causality from tourism to real GDP was found as a result of the causality test developed by Toda and Yamamoto. Action-reaction analysis showed that one standard deviation shock in tourism expenses will have an immediate positive effect on the growth. Mishra, Rout and Mohapatra (2011) examined the relation between tourism activities in India and economic growth for a period between 1978-2009. A long term unilateral causality from tourism activities to economic growth was established. Yamak, Tanrıöver and Güneysu (2012) examined the short term effect of total and per tourist tourism incomes on real GNP, agriculture, industry and service sectors for the period between 1968-2006 using Granger (1969) causality test, while the long term effects were examined using Engle-Granger (1987) and Johansen-Juselius (1990) cointegration method. As a result of the cointegration analysis, no long term relation between variables was found, but a significant short term statistical relation between real tourism incomes, industry and service sector was established.

Kar, Zorkirişçi and Yıldırım (2004) and Tang, Selvanathan and Selvanathan (2007) can be regarded as studies examining the relation between tourism incomes and tourism investments. Kar, Zorkirişçi and Yıldırım (2004) examined the relation between tourism investments and the number of foreign tourists, tourism incomes and the number of tourism operating licensed beds in Turkey for the period 1980-2000 using total logarithmic regression predictive model. As a result of the predictive modelling, it was implied that the most important factors determining tourism incomes are variables concerning tourism investments, the number of visiting tourists and the number of beds. Tand, Selvanathan and Selvanathan (2007) examined the causality relation between foreign direct capital investments and tourism in China using Granger causality test and VAR analysis technique introduced by Zapata and Rambaldi (2007). In the end, unilateral causality from foreign capital investments to tourism was established. This situation explains the rapid expansion of tourism market in China.

Eugenio-Martin, Morales and Scarpa (2004), Çağlayan, Şak and Karymshakov (2012), Tiwari, Ozturk and Aruna (2013), Başarır and Çakir (2015), Ozturk (2016) can be regarded as studies in which tourism is analyzed with panel approach. Eugenio-Martin, Morales and Scarpa (2004) examined the relation between tourism and economic growth in Latin America for the period 1985-1998 based on panel data approach and Arellano-Bond estimator for dynamic panel models. They demonstrated that tourism sector is appropriate for stimulating economic growth in average and low income countries, while it is not essential in developed countries. Çağlayan, Şak and Karymshakov (2012) examined the causality relation

between tourism incomes and GDP in 135 countries using panel data from the period 1995-2008. Panel Granger causality analysis was conducted on 11 country groups. The results demonstrated that there is a bilateral causality between tourism incomes and GDP in Europe and a unilateral causality from GDP to tourism incomes in America, Latin America, Caribbean and world countries. However, in East Asia, South Asia and Oceania the causality relation was found to be from tourism incomes to GDP. Causality relation was not found in Asia, Middle East and North Africa, Middle Asia and Sub Saharan Africa. Tiwari, Ozturk and Aruna (2013) examined the relational dynamics between variables concerning tourism, energy consumption and climate change in 25 OECD countries for the period 1995-2005 using panel VAR (PVAR) model. Panel unit root tests demonstrated that tourism is not first-level stable, but dynamically stable instead. Bivariate model analysis revealed that the results are susceptible to measurement changes in tourism variables, to sequencing of variables and to inclusion of a third variable. Tervarient model did not show susceptibility to measurement changes in tourism variables or to sequencing of variables. While the analysis of action-reaction functions revealed that tourism responded positively to climate changes and energy consumption in a one standard deviation shock, the response of climate changes to tourism were positive as well. Başarır and Çakir (2015) examined the causality relation between tourism, financial development, energy consumption and carbon emission in Turkey and in its major rival European Union countries, namely, France, Spain, Italy and Greece for the period 1995-2010. According to the results, statistically significant feedback effects were found between the variables for the entire panel. Unilateral causality relation was found between the number of visiting tourists and financial development. Also, bilateral causality relation was found between carbon dioxide emission, financial development, energy and the number of visiting tourists. Ozturk (2016) examined the factors effecting tourism development in 34 developed and developing countries for the period 2005-2013 using FMOLS (fully modified ordinary least quares). In conclusion, it was determined that variables concerning energy consumption, air pollution, health expenses and economic growth play crucial role as indicators of tourism development.

Methodology

Vector autoregression (VAR) model developed by Sims (1980) is designed to reveal the relation between variables based on its own lag values and lag values within all the other variables. VAR model is a theory-free method and the internal-external distinction of variables is not performed. For this reason, it has been developed as an alternative to system of simultaneous equations.

VAR models, which were applied on time series, were used for panel data by Holtz-Eakin, Newey and Rosen (1988) for the first time. Love and Zicchino (2006) used panel vector autoregression methodology by combining traditional VAR approach in which all the variables are considered internal and panel-data approach in which unobserved individual heterogeneity is included. Panel VAR model can be expressed in the following way:

$$y_{it} = \mu_0 + A_1 y_{it-1} + \cdots + A_k y_{it-k} + \alpha_i + \lambda_t + u_{it}$$

Here A_j expresses parameter matrix, α_i expresses unit effect and λ_t expresses time effect (Güriş, 2015). Since lagged dependent variables in panel VAR models will serve as explanatory variables as well, fixed effect will be related to explanatory variables. Arellano and Bond (1991) determined that intra-group transformation used to eliminate fixed effects will cause the parameters to deviate. In this study lag variables will be used as a tool and parameters will be predicted using Generalized Method of Moments (GMM) (Arellano and Bover, 1995).

Data and Results

In order to reveal the relation between investments and tourism incomes using panel VAR model, tourism investments (million TL) and tourism incomes ($1000) data from the most popular touristic towns in Turkey, namely, Antalya, Mugla, Izmir, Aydin and Nevsehir between 2001-2014 was obtained from the web pages of Ministry of Economy of the Republic of Turkey and Turkish Statistical Institute. Tourism investments data was converted into dollars, while the logarithmic form of variables was used in the analysis.

Before the panel VAR model can be formed it needs to be determined to which order the variables are stationary. When the variables are stationary to the same order, the long run equilibrium can be examined using cointegration analysis. For this purpose, firstly the stationarity of the variables needs to be determined using panel unit root tests. If the variables are not cointegrated, the panel VAR approach can be applied with the causality data between variables obtained from causality analysis.

In order to conduct the panel unit root analysis of the variables, Pesaran (2004) Cross- Section Dependence (CD) Test, Breusch-Pagan (1980) LM Test, Pesaran (2004) Scaled LM Test and Baltagi, Feng and Kao (2012) Bias-Corrected scaled LM test were conducted to examine if there is dependence between cross-sections. The test results from variables concerning tourism investments ($LTINV_{it}$) and tourism incomes ($LTINC_{it}$) can be seen below in Table 1.

Table 1. Cross-Section Dependence Tests

Test	Variables	
	$LTINV_{it}$	$LTINC_{it}$
Pesaran CD	5.92	5.28
	(0.00)	(0.00)
Breusch-Pagan LM	38.69	54.46
	(0.00)	(0.00)
Pesaran scaled	5.29	8.82
	(0.00)	(0.00)
Bias-corrected scaled LM	5.10	8.63
	(0.00)	(0.00)

Notes: (i) In the Table, the values in parenthesis express
the obtained probability values; (ii) Test statistics were
compared to 10 degrees of freedom χ^2 table values.

As it can be seen from Table 1, null hypothesis that states there is no cross-section dependence for both tourism investments variables and tourism incomes variables was rejected according to 1% confidence level and it was decided that cross-section dependence is present for both variables. In this case, the CADF (cross-sectionally augmented Dickey Fuller) test considering cross-section dependence proposed by Pesaran (2007) needs to be conducted. The results of this test are shown below in Table 2.

Table 2. The Results of the Pesaran (2007) CADF Test

	Variables	Test Statistic	p-value
Level	$LTINV_{it}$	-1.173	0.985
	$LTINC_{it}$	-2.564	0.264
First Difference	$\Delta LTINV_{it}$	-4.303[***]	0.000
	$\Delta LTINC_{it}$	-3.621[***]	0.000

Notes: (i)***states that test statistics are not unit rooted according to
1% significance level; (ii) Both fix and trend were included in test
equation established for level data

CADF Test statistics in Table 2 were compared with critical values obtained from Pesaran (2007) table. When the results were examined, null hypothesis stating that both $LTINV_{it}$ and $LTINC_{it}$ variables are not stationary was not rejected, however, when the first variations are considered, it was observed that they are stationary within 1% significance level. Appropriate lag length in the models was set as 2 for AIC and level series and as 1 for variation series. Since both series are stationary to order one, they can be expressed as $I(1)$ and the existence of long term relation between variables can be examined using cointegration analysis. Since cross-section dependence between variables was previously determined, Westerlund (2007) cointegration test considering cross-section dependence will be conducted. Four test statistics needs to be calculated for this test and the analysis results are shown below in Table 3.

Table 3. The Results of Westerlund (2007) Cointegration Test

Statistic	Value	P-value
G_t	-1.260	0.271
G_a	-1.884	0.827
P_t	-2.786	0.079
P_a	-1.903	0.249

When G_t,G_a (group mean) and P_t, P_a (panel) test statistics in Table 3 were examined, the null hypothesis stating that cointegration, or, in other words, long term relation does not exist was rejected. Since cross-section dependence is present, calculated test statistics were compared with bootstrap critical values proposed by Chang (2004). There is no long run equilibrium relation between variables. Panel Causality relation between variables was predicted using GMM (generalized method of moments) proposed by Arellano and Bond (1991). The test was conducted on the stationary conditions of variables and the results can be seen below on Table 4.

Table 4. The Results of Panel Causality Test

Direction of Casuality	Wald Test Statistics	Probabilities	Decision
$\Delta ltinv_{it} \rightarrow \Delta ltinc_{it}$	11.51	0.0032[***]	$ltinv_{it}$ Granger cause $ltinc_{it}$
$\Delta ltinc_{it} \rightarrow \Delta ltinv_{it}$	12.66	0.0018[***]	$ltinc_{it}$ Granger cause $ltinv_{it}$

Notes: (i)Test statistics were compared to χ^2 table; (ii)[***] indicates significance at 1 % level;

(iii) $ltinv_{it}$, $ltinc_{it}$ and constant factor used as instrumental variables in the analysis

When Table 4 was examined, null hypothesis stating there is no causality was discarded based on the causality test conducted on both variables. There is bilateral causality between tourism investments and tourism incomes. The effects between these variables were examined in detail by predictive panel VAR model using GMM. The appropriate lag length is 1, the minimal lag length of "coefficient of determination" value (Abrigo and Love, 2016). The results of panel VAR model are shown below in Table 5.

Table 5. Main Results of 2-variable panel VAR Model

Response to	Response of	
	$\Delta ltinc_{it-1}$	$\Delta ltinv_{it-1}$
$\Delta ltinc_{it}$	-0.0572 (0.378)	-0.0264 (0.064)
$\Delta ltinv_{it}$	0.212 (0.621)	-0.385 (0.137)[***]
N obs	55	
N panels	5	

Notes: (i) In the Table, the values in parenthesis express standard errors; (ii)[***] indicates significance at 1 % level.
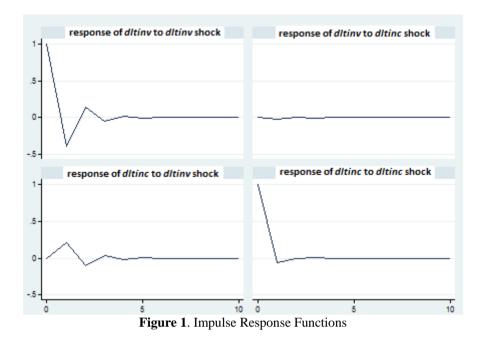
When Table 5 was examined, the lagged one period value coefficient of tourism incomes in an equation in which tourism investments are dependent variable was 0,212. In other words, there was a positive effect of the lag variables of tourism incomes on tourism investments. It can be said that the effect of tourism incomes on tourism investments is stimulating. The lagged one period value coefficient of tourism investments in an equation in which tourism incomes are dependent variable was -0.0264. In other words, the last year tourism investments had a decreasing effect on tourism incomes.

The stability condition of panel VAR model states that the model is invertible and represents the infinite-order vector moving average (Abrigo and Love, 2015). The stability properties of the predictive panel VAR model are shown below in Table 6. When the table is examined, it can be seen that the modulus values of eigen values are lower than 1. All eigen values are within the unit circle. For this reason, it can be said that the predictive panel VAR model provided the stability condition.

Table 6. Eigenvalue stability condition.

Eigenvalue		
Real	Imaginary	Modulus
-0.367	0.000	0.367
-0.075	0.000	0.075

In order to determine direct and indirect effects between tourism investments and tourism incomes impulse-response functions were calculated. Impulse-response charts express present and future reaction of a given variable to the increase of one standard deviation shock in the error term of a system (Lütkepohl, 2009). The impulse-response charts of the predictive panel VAR model are shown below in Figure 1.

Figure 1. Impulse Response Functions

Each depict in Figure 1 shows (i) the response of dltinv to a 1% shock in dltinv ; (ii) the response of dltinv to a 1% shock in dltinc; (iii) the response of dltinc to a 1% shock in dltinv; (iv) the response of dltinc to a 1% shock in dltinc. Interpretation of impulse-responses is conducted under assumption that the error terms are unrelated. Tourism investments increase in response to one standard deviation shock occurring in tourism incomes, however, this increase is quite small. Tourism incomes firstly increase, then decrease, then show tendency to increase again in response to one standard deviation shock occurring in tourism investments.

In order to examine the change in variants of the variables Forecast error variance decompositions 10 periods ahead is shown below in Table 7.

Table 7. Results of Variance Decompositions

Response Variable	Impulse variable	
	Δltinv	Δltinc
Δltinv	0.950	0.049
Δltinc	0.009	0.990

When the results in Table 7 are examined, 95% of variability in tourism investments resulted from its own innovations, while 4.9% resulted from the innovations in tourism incomes. 99% of the variability in tourism incomes resulted from its own innovations, while 0.9% of variability resulted from innovations in tourism investments.

Conclusion

Tourism has great potential both from the perspective of providing work possibilities and from the perspective of stimulating economic and socio-cultural development of the country. Providing sustainable economic growth is the main goal of macroeconomic policies in many developing countries. One of the ways of providing this sustainable growth is international tourism. Tourism is rapidly developing and the importance given to its effect on economic growth is increasing.

The goal of this study was to examine the effect of tourism investments on tourism incomes based on the effect of tourism on the economic growth. For this purpose, the relation between tourism investments and tourism incomes was examined using panel vector autoregression (VAR) models and yearly data on Antalya, Mugla, Izmir, Aydin and Nevsehir, the most popular touristic towns in Turkey, from the period 2001-2014. Before the panel VAR model was formed it was determined to which order the variables were stationary. By paying attention to cross-section dependence as well, it was determined that the variables are stationary to first order. Long run equilibrium states of these variables were examined using cointegration analysis and it was determined that the variables are not cointegrated. Causality relation between variables was examined and bilateral causality was found between tourism investments and tourism incomes. As a result of the predictive panel vector autoregressive model it can be said that the effect of tourism incomes on tourism investments is stimulating. The last year tourism investments had a decreasing effect on tourism incomes.

As far as we know, there are no other studies examining tourism investments and tourism incomes in Turkey from the perspective of the most popular touristic towns. From this perspective, this study will contribute to the literature and light the way for the future studies.

References:
1. Abrigo, M. R., & Love, I. (2016). Estimation of panel vector autoregression in Stata. *Stata Journal*, *16*(3), 778-804.
2. Akinboade, O. A., & Braimoh, L. A. (2010). International tourism and economic development in South Africa: A Granger causality test. *International Journal of Tourism Research*, *12*(2), 149-163.
3. Anwar, Muhammad S., Sampath, R.K. (1999). Investment and Economics Growth, Western Agricultural Economics Association Annual Meeting, July 11-14, 1999, Fargo, ND.
4. Arellano, M., & Bond, S. (1991). Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The review of economic studies*, *58*(2), 277-297.

5. Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of econometrics*, *68*(1), 29-51.
6. Baltagi, B. H., Feng, Q., & Kao, C. (2012). A Lagrange Multiplier test for cross-sectional dependence in a fixed effects panel data model. *Journal of Econometrics*, *170*(1), 164-177.
7. Basarir, C., & Cakir, Y. N. (2015). Causal Interactions Between CO2 Emissions, Financial Development, Energy and Tourism.
8. Bektas, H. Ç. Ç. (2008). Turkiye'de turizm ve ekonomik büyüme arasındaki kısa ve uzun dönemli ilişkiler. Anatolia: Turizm Araştırmaları Dergisi, Cilt 19, Sayı 1, Bahar: 37-44.
9. Breusch, T.S., and A. R. Pagan (1980). The Lagrange Multiplier test and its application to model specifications in econometrics. *Review of Economic Studies 47*, 239-53.
10. Chang, Y. (2004). Bootstrap unit root tests in panels with cross-sectional dependency. *Journal of Econometrics*, *120*(2), 263-293.
11. Cortés-Jiménez, I. (2008). Which type of tourism matters to the regional economic growth? The cases of Spain and Italy. *International Journal of Tourism Research*, *10*(2), 127-139.
12. Çaglayan, E., Sak, N., & Karymshakov, K. (1998). Relationship Between Tourism And Economic Growth: A Panel Granger Causality Approach. *Asian Economic and Financial Review*, *2*(5), 518-529.
13. 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.
14. Eugenio-Martin, J. L., Martín Morales, N., & Scarpa, R. (2004). Tourism and economic growth in Latin American countries: A panel data approach.
15. Gunduz, L., & Hatemi-J, A. (2005). Is the tourism-led growth hypothesis valid for Turkey?. *Applied Economics Letters*, *12*(8), 499-504.
16. Guris, B. (2015) Panel Vektor Otoregresif Modeller ve Panel Nedensellik in Stata İle Panel Veri Modelleri, Der Yayınları, Editör: Guris, Selahattin, 1 st edition, ISBN:978-975-353-433-8.
17. Holtz-Eakin, D., Newey, W., & Rosen, H. S. (1988). Estimating vector autoregressions with panel data. *Econometrica: Journal of the Econometric Society*, 1371-1395.
18. Kar, M., Zorkirisci, E., & Yıldırım, M. (2004). Turizmin Ekonomiye Katkısı Uzerine Ampirik Bir Değerlendirme. *Akdeniz University Faculty of Economics & Administrative Sciences Faculty*

Journal/Akdeniz Universitesi Iktisadi ve Idari Bilimler Fakultesi Dergisi, *4*(8).

19. Love, I., & Zicchino, L. (2004). Financial Development and Dynamic Investment Behavior: Evidence from Panel Vector Autoregression. *World Bank Policy Research Working Paper*, (2913).

20. Lutkepohl, H. 2009, Econometric analys s w th vector autoregressive models. *In Handbook of Computat onal Econometrics.* Eds: D.A. Belsley and E.J. Kontogh orghes, John W ley and Sons, Ltd., UK.

21. Mishra, P. K., Rout, H. B., & Mohapatra, S. S. (2011). Causality between tourism and economic growth: Empirical evidence from India. *European Journal of Social Sciences*, *18*(4), 518-527.

22. Monterubbianesi, P. D., & Brida, J. G. (2009). Causality Between Economic Growth and Tourism Expansion: Empirical Evidence from Some Colombian Regions.

23. Ozturk, I. (2016). The relationships among tourism development, energy demand, and growth factors in developed and developing countries. *International Journal of Sustainable Development & World Ecology*, *23*(2), 122-131.

24. 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.

25. Pesaran, M.H. (2004). General diagnostic tests for cross section dependence in panels. *Cambridge Working Papers in Economics No. 0435*, Faculty of Economics, University of Cambridge.

26. Risso, W. A., Barquet, A., & Brida, J. G. (2010). Causality between economic growth and tourism expansion: empirical evidence from Trentino-Alto Adige. *Tourismos: an international multidisciplinary journal of tourism*, *5*(2), 87-98.

27. Sims, C. A. (1980). Macroeconomics and reality. *Econometrica: Journal of the Econometric Society*, 1-48.

28. Sundrum, R.M. (1993). Development Economics: A Framework for Analysis and Policy,i John Wiley & Sons.

29. Tang, S., Selvanathan, E. A., & Selvanathan, S. (2007). The relationship between foreign direct investment and tourism: empirical evidence from China. *Tourism economics*, *13*(1), 25-39.

30. Tiwari, A. K., Ozturk, I., & Aruna, M. (2013). Tourism, energy consumption and climate change in OECD countries. *International Journal of Energy Economics and Policy*, *3*(3), 247.

31. Westerlund, J. (2007). Testing for error correction in panel data. *Oxford Bulletin of Economics and statistics*, *69*(6), 709-748.

32. Yamak, N., Tanrıover, B., & Guneysu, F. (2012). Turizm–Ekonomik Büyüme Iliskisi: Sektor Bazinda Bir Inceleme. *Ataturk Universitesi Iktisadi ve Idari Bilimler Dergisi*, *26*(2).

33. Zapata, H. O., & Rambaldi, A. N. (1997). Monte Carlo evidence on cointegration and causation. *Oxford Bulletin of Economics and statistics*, *59*(2), 285-298.