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Tourism and Economics of Transportation: A Macroeconomic Perspective

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Abstract

The paper examines the nexus between tourism and economics of transportation with a new asymmetric panel causality test, developed by Hatemi-J et al (2015) for BRIC-T countries during 1995 and 2017. After some preliminary (homogeneity, cross-section dependence, unit root tests) and co-integration test some selected variables such as real exchange rate, inflation rate and trade are added to the empirical model. The purpose here is to determine the contribution of macroeconomic indicators on tourism growth.

The results show that there is a co-integration between number of tourist arrivals and tourism receipts as well as transportation costs. Also, negative cumulative tourism shock causes positive tourist arrivals shocks and positive cumulative tourism receipts shocks cause negative transportation costs. Hence, there is a causality between variables only in these conditions. Contribution of inflation rate and number of tourist arrivals have the biggest effect on tourism growth. We may say that from a macroeconomic perspective demand side is more dominant than supply side of tourism sector.

1. Introduction

Tourism industry is an important economic source for emerging and developing countries and it has crucial effects on their macroeconomic indicators and economic performance. However, the current written literature examines only or tourism demand or tourism supply sides of the industry. The empirical literature can be divided into three main frames such as; studies on the nexus between transportation and tourism, tourism and the economic development or transportation and the economic growth. However, there is just few papers taking into account both demand and supply sides of tourism within economics of transportation for the major emerging markets.

The purpose of this study is to examine the causality between tourism and economics of transportation with Hatemi-J et al. (2015) asymmetric panel causality test, which considers different reactions of agents to the shocks and the asymmetric information in the market. The major emerging markets (Brazil, India, Russia, China and Turkey) have been chosen for the analysis not only because of their rising economies but also due to their developing tourism industries. Two reasons make this paper innovative and informative compared to the existing literature on the topic. First, theoretically it accounts for the potential impact of both supply as well as demand factors, unlike the main stream literature that usually examines one side of the sector. Second, the methodology that is chosen accords well with the reality because the behavior of economic agents are usually more powerful in negative conditions compared to the positive ones. This asymmetric potential property is accounted which helps considering cross-sectional spillover effects more efficiently when causality tests are implemented within a panel framework. In addition, the relationship between transportation costs and number of tourist arrivals; the relationship between tourism receipts and transportation costs is tested separately. Estimating the coefficients for inflation rate, real exchange rate, trade (TRD), tourism receipts and number of arrivals with CCE (common correlated effects), the model will help us to see the topic from a macroeconomic perspective. The paper is divided into four parts; the second section gives information about the written literature, the third section explains the methodology and includes the tables of application and the last section is about the conclusion with further research ideas.

2. Related Literature

Transportation (accessibility) is important for tourism economics because it links supply (origin) and demand (destination) explicitly. Accessibility is directly connected with the transportation infrastructure and tourist services. Better transportation (easy and comfortable one) means new tourist destinations and

arrivals. But it is possible to express that they have an inverse effect on each other. Alternative determinants of the supply side of tourism sector are; tourist attractions, information, promotions, etc. It means that certain supply elements can raise the number of arrivals. Transportation cost is a major demand indicator for a destination and includes both cost of travel and living with other services. Also, it is a macroeconomic indicator due to two different reasons. Firstly; the role of transportation, because it has an effect on travel and logistic costs and can change the demand-supply curves of some industries. Secondly; transportation investments stimulate the economic growth and can be the cause of rising inflation (prices). From the economic perspective, regional strategies of governments also identify the competitiveness of tourism destination with other countries (Bimonte et al., 2015). Improvements in infrastructure can reduce the costs of transportation and can increase accessibility (to the markets) of the destination, so it fosters the growth in tourism sector and in other sectors of the economy. Demand side of tourism has been mostly examined by tourist arrivals or tourist expenditures but it is also affected by needs to be deleted other factors such as; exchange rates, trade volume, prices, stability of the country (politically or economically) and transportation costs and inflation (prices).

Truong and Shimizu (2017), analyzed the impact of transportation on tourism sector with computable general equilibrium model with several published articles in this topic. According to all of the studies reviewed by Truong and Shimizu (2017) via Google Scholar, Web of Science and Scopus showed that transportation has crucial impact on tourism via oil prices, direct or indirect relevant factors of transportation and accessibility.

Kovacic and Milosevic (2016), defined that transportation is not only the accessibility of destination but also the feeling of joy. Tourism is a journey which carries out economic and social purpose. Nowadays, the role of transport differs than in the past and it depends on tourist (short and long term) stays as well. Sustainable tourism such as: cycling and hiking promotes national and regional economies with its capacity, efficiency and the collaboration between national authorities. Lumsdon (2010), focused on reducing energy with sustainable tourism transport facilities especially cycle tourism and offered a model with four-stage approach for the United Kingdom. The paper approached transport not as a component of tourism but as a mean of evaluating.

Sorupia (2005), claims that travel and transportation can be discussed with ignoring tourism because the study of him re-considers the role of transportation not only in tourism but also in diversified areas such as; ecology, economy, tourist experience and management resources. According to him tourism expands due to development of transportation and the growth of tourism fosters the industry to search for new markets with biodiversity. Hence, the role of transportation should re-arranged between accessibility of a destination and a state of environment.

Erkan and Erkan Şimşek (2015), explained that the contribution of travel and tourism industry to the economic growth of Turkey has higher potential than Europe for the period between 2013 to 2023. They have conducted a survey at the airports with different airlines and airport operators. According to the results, the price policy of Turkish Airlines effects domestic tourism negatively and the competition is really intense in the international area. Government's intervention to the prices of airlines is making the reason out something even slower. The related paper recommends new airports, new flight connections to local tourism destinations, and raising the number of trained people in this area.

According to Proenca and Souzakis (2008), international tourism development in particular has both direct and indirect spillover effects on many economic activities. Chan et al. (2005) states that tourism industry has an extensive influence on many sectors of the economy but it is still open to the shocks and depending to the political and economical stability of the countries such as; terrorism and national security issues, natural disasters, epidemics and infectious diseases, imbalances in exchange rates and energy prices (Gunduz and Hatemi, 2005).

Kizilkaya et al. (2016), tested annual data from 1980 to 2014 to examine the relationship between tourism revenues, tourist arrivals and economic growth in Turkey. ARDL methodology developed by Pesaran et al. (2001) has been chosen and the cointegration coefficients have been estimated. The results gained from the study showed that in the short and the long term, there is a positive effect observed from tourism revenues to economic growth for Turkey but the number of tourist arrivals are not directly related with tourism revenues, because Turkey is famous as a low budget tourism destination and the fluctuations in exchange rate is an important indicator for the Turkish tourism industry.

Jeganathan and Sirinivasulu (2017), examined the impact of tourism on international tourist arrival and receipt, international tourism expenditure, and the employment and economic growth for BRICS countries. They also drawn attention to characteristics of these countries such as; Brazil is a carnival capital world with Rio and Salvador carnivals. The Russian Federation is famous with her lakes (Baikal and Lagoda), India is known with cultural, traditional and religious diversity, China is the major economic power in the world and South Africa is a multi-ethnic society. After the comparison of selected macroeconomic indicators, results show that China is substantially growing with tourist arrivals and international tourism expenditures and receipts for the period between 2003 to 2013, which makes more contribution to the GDP compare to other BRICS countries. China and India together created more employment opportunities during the period 2004 to 2014. Russia and China are the leaders of outbound tourism expenditures. Pop (2014), clarified the role of tourism in BRICS economies and the analysis shows a direct contribution of tourism and travel to the GDP of selected countries. Because GDP

is generated by industries (as a macroeconomic variable) and linked with hotel, travel agents, transport services and etc. (cointegrated with tourism development). Also, the authors mentioned the contribution of mega events such as: South Africa hosted FIFA World Cup in 2010, Russia hosted Olympic Winter Games in 2014, China hosted Olympics Summer Games in 2008 and finally Brazil hosted FIFA World Cup in 2014 and Olympics Summer Games in 2016.

3. Methodology and Findings

The variables have been chosen according to the literature readings. International Tourism Receipts (ITR) are used as a proxy to represent the growth of the tourism sector. According to Martinez-Zarzosso and Nowak-Lehmann (2007), real distance is not a good proxy for transportation costs (TC). Barry and O'Hagan (1972), claims that travel is an inverse function of real prices and tourism prices are rarely available, similarly Crouch (1992) implies that the CPI-Consumer Price Index represents transportation costs better than distance and it is often used by researchers as a proxy. Exchange rates (RER) have a crucial effect on demand for international tourism. If there are depreciation of destination country's currency, the country will be cheaper and more attractive for tourists and it will foster international tourism. Trade (% GDP – TRD) is simultaneously effecting and influenced by transportation costs and tourism growth. Transportation investments stimulate the economic growth and can be the reason of rising inflation (prices-(GDP deflator annual %).

The variables mentioned above is downloaded from World Bank Development Indicators for the period between 1995 to 2017 in annual base. The previous years could not be included due to lack of data. The analysis of the empirical model is conducted by using Eviews-8 and Gauss-10 econometric programs. Except international tourism, number of arrivals (TA) and international tourism receipts (current US$) the others used with their natural logarithmic forms and the logarithm of these two have been calculated before testing the econometric model.

Hatemi-J et al. (2015) panel causality test helps researchers to increase the degrees of freedom especially for developing and emerging market studies where the time dimension (T) is shorter than the number of observations (N) or taking into account spillover effects between cross-sections. This is why combining asymmetric causality with panel data analysis is much more efficient in a globalized era where all the economies are linked to each other and crossed the borders (Hatemi-J, 2011: 2-3). Also, the empirical studies show that a potential asymmetry in the causality testing has crucial indirect effects for the underlying causal inference between related variables. Determining the direction of the causality between variables is the basis of the empirical part. However, it is not sufficient alone, to see which variables are contributing more to the tourism growth. In the long term, coefficients estimated. The Common Correlated Effect (CCE) model, which has been developed as a new prediction approach by Pesaran (2006), because of panel data models include unobserved common factors hence, it is necessary to consider this

multifactorial error structure of given external individual regressors. The main idea is to filter the individual-specific regressors by means of cross-section averages such that asymptotically as the cross-section dimension tends to infinity, the differential effects of unobserved common factors are eliminated (Pesaran 2006, 967).

We can assume that tourism growth is a function of number of tourist arrivals, transportation costs, real exchange rate, inflation rate and trade.

$$ITR = f(TA, TC, RER, INF, TRD) \quad (1)$$

Also, the co-integration and causality between tourism receipts and number of tourist arrivals with transportation of costs can be shown as an equation:

$$ITR_t = \alpha + \beta TA_t + u_t \quad \text{and} \quad ITR_t = \alpha - \theta TC_t + e_t \quad (2)$$

α shows constant and β and θ are the slope coefficients. According to the equations written above an increase in the number of tourist arrivals (demand side) will increase tourism growth too but the opposite is accepted for the increases in transportation costs (supply side).

According to the Delta test which is developed by Pesaran and Yamagata (2008), null hypothesis claims ($H_0: \beta_0 = \beta$) that the series are homogeneous. If the null hypothesis is rejected, then the series are heterogeneous.

Table 1: Homogeneity Test

Delta Test	*Test Stats.*	*Prob.*
$\tilde{\Delta}$	2.288	0.011*
$\tilde{\Delta}_{adj}$	2.719	0.003*

(*) indicates significance in % 5. $\tilde{\Delta}$ represents delta test statistic for small samples and $\tilde{\Delta}_{adj}$ shows augmented Delta tests statistic for big samples. According to table 1 series is heterogeneous because the given probability value is under 0.05 and statistically significant.

To determine the cross-section dependency CD_{LM} test ran for each individual. The test is developed by Pesaran (2004) and the null hypothesis claims that ''there is no cross-sectional dependence – $H_0: p_{ij} = p_{ji} = cor\,(\varepsilon_{2,it}, \varepsilon_{2,jt}) = 0$''.

Table 2: Cross-Section Independency Test for All Variables

	ITR		***TA***		***TC***	
	Test stat.	Prob.	Test stat.	Prob.	Test stat.	Prob.
CD_{LM} (BP, 1980)	16.911	0.076*	38.020	0.000*	30.520	0.001*
CD_{LM} (Pesaran, 2004)	-2.770	0.003*	-2.540	0.006*	-2.057	0.020*
	RER		***INF.***		***TRD***	
	Test stat.	Prob.	Test stat.	Prob.	Test stat.	Prob.
CD_{LM} (BP, 1980)	27.949	0.002*	25.636	0.004*	19.283	0.036*
CD_{LM} (Pesaran, 2004)	-3.321	0.000*	-2.802	0.003*	-3.080	0.001*

(*) represents significance in % 5. According to table 2, probability values of all variables are significant so the null hypothesis is rejected and there is a cross section dependency.

Multifactor unit root test is developed by Pesaran et al. (2013). The purpose of this test is to eliminate the error structure of common factors (autocorrelation) for empirical studies in macroeconomic theory. Multifactor Error Structure is a must do pretest before applying CCE (Common Correlated Effects) Model. There are two different test statistics that are estimated: cross-sectional augmented panel (CIPS) unit root test introduced by Pesaran (2007) and later expanded with a new CSB (simple average of cross-sectional augmented Sargan-Bhargava) statistics (Pesaran et al. 2013, 96). Null hypothesis claims that for all i's (1,2,3, … , N) ''H_0: βi'' cross section units have unit root). CSB test statistic has been calculated with stochastic simulation method. Therefore, series whether or not linear, or even in the existence of autocorrelation, the calculated test statistics are reliable and superior than CIPS statistics in this respect (Pesaran et al. 2013, 99).

Table 3: Multifactor Unit Root Test for ITR, TA and TC

		Constant		Constant and Trend	
	Lags	Stat.	Critical Value (k=2)(%10)	Stat.	Critical Value (k=2) (%10)
$CIPSm$	0	-2.497	-2.53	-2.900	-2.79
ITR	1	-	-2.42	-	-2.73
	2	-	-2.21	-	-2.57
	3	-	-2.07	-	-2.48
	4	-	-1.85	-	-2.54
$CSBm$	0	0.054	0.320	0.035	0.114
ITR	1	0.437	0.258	0.056	0.097
	2	0.192	0.207	0.049	0.079
	3	0.150	0.151	0.042	0.058
	4	0.089	0.102	0.028	0.038
$CIPSm$	0	-3.030	-2.53	-3.903	-2.79
TA	1	-2.640	-2.42	-	-2.73
	2	-	-2.21	-	-2.57
	3	-	-2.07	-	-2.48
	4	-	-1.85	-	-2.54
$CSBm$	0	0.054	0.320	0.045	0.114
TA	1	0.313	0.258	0.081	0.097
	2	0.211	0.207	0.067	0.079
	3	0.256	0.151	0.077	0.058
	4	0.257	0.102	0.049	0.038
$CIPSm$	0	-2.553	-2.53	-3.366	-2.79
TC	1	-3.798	-2.42	-	-2.73
	2	-	-2.21	-	-2.57
	3	-	-2.07	-	-2.48
	4	-	-1.85	-	-2.54
$CSBm$	0	0.034	0.320	0.037	0.114
TC	1	0.239	0.258	0.072	0.097
	2	0.108	0.207	0.052	0.079
	3	0.120	0.151	0.039	0.058
	4	0.136	0.102	0.028	0.038

CIPS and CSB statistic's critical values are calculated by Pesaran et al. (2013) in their paper and taken from table B1 and B2; table B3 and B4 in order (*) indicates calculated statistical values greater than the table critical values in 10 % significance level and k symbols the number of independent variables of the regression. So, variables contain unit roots at their level and but the first difference of them is stationary, I (1).

Westerlund Error Correction Mechanism (ECM) co-integration test is developed by Westerlund in 2007. This test gives effective results even when the number of observations (N) is shorter than the time dimension (T) and assumes that each unit is stationary and orders in one. There are four different (two group, two panel) test statistics estimated with error correction mechanism in three different levels (Westerlund, 2007: 218). Nazlıoğlu (2010); Westerlund (2007) co-integration test assumes that there is no cross-section dependence between cross-section units this is why it is recommended by Chang (2004) to compare test statistics with bootstrap critical values.

Table 4: Westerlund Co-integration Test for ITR, TA and TC variables

Co-integration between ITR and TA	***Test Stats.***	***Prob.***
DH_g *(group)*	-15.915	0.031*
DH_p*(panel)*	-6.673	0.110
Co-integration between ITR and TC	***Test Stats.***	***Prob.***
DH_g *(group)*	-62.558	0.000*
DH_p*(panel)*	-8.514	0.201

(*) represents significance in % 5. Table 4 shows that the probability of group test indicators is less than 0.05; so, the tourism receipts and the number of tourist arrivals are co-integrated and moving together. Also, there is a co-integrated relationship between tourism costs and the growth of tourism. The null hypothesis is rejected for cross-units.

Table 5: Hatemi-J et al. (2015) Causality Test Results

Countries	Null Hypothesis	MWALD	Prob.	Null Hypothesis	MWALD	Prob.
Brazil	$ITR^- \neq> TA^+$	0.035	0.852	$ITR^- \neq> TC^+$	3.143	0.076**
	$ITR^- \neq> TA^-$	0.159	0.690	$ITR^- \neq> TC^-$	0.014	0.905
	$ITR^+ \neq> TA^+$	0.956	0.328	$ITR^+ \neq> TC^+$	0.041	0.839
	$ITR^+ \neq> TA^-$	12.012	0.001*	$ITR^+ \neq> TC^-$	0.039	0.843
China	$ITR^- \neq> TA^+$	13.028	0.000*	$ITR^- \neq> TC^+$	2.376	0.123
	$ITR^- \neq> TA^-$	0.601	0.438	$ITR^- \neq> TC^-$	0.847	0.357
	$ITR^+ \neq> TA^+$	0.716	0.397	$ITR^+ \neq> TC^+$	0.205	0.651
	$ITR^+ \neq> TA^-$	33.542	0.000*	$ITR^+ \neq> TC^-$	11.496	0.001*
Russia	$ITR^- \neq> TA^+$	199.395	0.000*	$ITR^- \neq> TC^+$	11.622	0.001*
	$ITR^- \neq> TA^-$	1.486	0.223	$ITR^- \neq> TC^-$	1.902	0.168
	$ITR^+ \neq> TA^+$	0.001	0.971	$ITR^+ \neq> TC^+$	0.003	0.959
	$ITR^+ \neq> TA^-$	4.333	0.037*	$ITR^+ \neq> TC^-$	0.033	0.856
India	$ITR^- \neq> TA^+$	12.608	0.000*	$ITR^- \neq> TC^+$	1.560	0.213
	$ITR^- \neq> TA^-$	0.048	0.827	$ITR^- \neq> TC^-$	0.533	0.465
	$ITR^+ \neq> TA^+$	0.937	0.333	$ITR^+ \neq> TC^+$	0.109	0.741
	$ITR^+ \neq> TA^-$	1078.9	0.000*	$ITR^+ \neq> TC^-$	7.995	0.005*
Turkey	$ITR^- \neq> TA^+$	3.479	0.062**	$ITR^- \neq> TC^+$	34.398	0.000*
	$ITR^- \neq> TA^-$	0.098	0.755	$ITR^- \neq> TC^-$	0.853	0.356
	$ITR^+ \neq> TA^+$	0.474	0.491	$ITR^+ \neq> TC^+$	0.434	0.510
	$ITR^+ \neq> TA^-$	1.374	0.241	$ITR^+ \neq> TC^-$	0.001	0.973

(*) represents significance in % 5 and (**) represent in % 10. The demonstration of $ITR \neq> TA$ means that tourism growth does not cause number of tourist arrivals. $ITR \neq> TC$ means that tourism receipts do not cause transportation costs. The vectors (ITR^+, TA^+) and (ITR^+, TC^+) show the cumulative positive shocks and (ITR^-, TA^-) and (ITR^-, TC^-) represent the cumulative negative shocks. According to table 5 non-asymmetric causality ($ITR \neq> TA$) can be rejected for all selected countries but in Brazil, China, Russia and India positive cumulative shocks is the reason of decreasing number of tourist arrivals. The opposite effect is acceptable for China, Russia, India and Turkey, as well. Non-asymmetric causality ($ITR \neq> TC$) can be rejected for all BRIC-T countries but in Brazil, Russia and Turkey negative cumulative tourism shocks are increasing the costs of transportation but in China and in India the reverse effect is existed.

Table 6: Causality for All Panel Series

Null Hypoth.	Panel Fisher	Prob.	Null Hypoth.	Panel Fisher	Prob.
$ITR^- \neq> TA^+$	242.936	0.000*	$ITR^- \neq> TC^+$	65.540	0.000*
$ITR^- \neq> TA^-$	6.337	0.786	$ITR^- \neq> TC^-$	9.424	0.492
$ITR^+ \neq> TA^+$	7.753	0.653	$ITR^+ \neq> TC^+$	3.241	0.975
$ITR^+ \neq> TA^-$	1148.4	0.000*	$ITR^+ \neq> TC^-$	25.967	0.004*

(*) represent significance in % 5. Table 6 supports the individual results of table 5. Only negative tourism shocks cause positive tourist arrivals and positive tourism receipts cause negative transportation costs. So, there is causality between variables only in these conditions.

The Common Correlated Effect (CCE) Model is based on a new prediction approach developed by Pesaran (2006), because it includes unobserved common factors. The main idea is to filter the individual-specific regressor by means of cross-section averages such that asymptotically as the cross-section dimension tends to infinity, the differential effects of unobserved common factors are eliminated (Pesaran, 2006: 967). It estimates two different test statistics such as: CCE (Panel) estimator which is superior than the CCE (Mean Group) one under the condition of homogeneity and vice versa (Pesaran, 2006: 992). It is possible to calculate long-term coefficients of each cross-section units individually.

Table 7: CCE (Mean Group) Results

Dependent variable: ITR

Variables	Co-efficient	Standard Deviation	T- statistics
TRD	0.0014	0.0075	0.1990
INF	1.2234	0.0158	7.7048*
RER	0.7478	0.7242	1.0326
TA	0.8299	0.2262	3.6686*
TC	0.0018	0.0009	1.8887*

(*) represent significance in % 5. Table 7 reports only mean group coefficients because the series is heterogeneous. The significance of standard deviation (SE) and Newey west (NW) type t-statistics (for N x T = 5 x 23, bias: 0.12, RMSE: 8.55, size: 6.45, power: 12.55 with rank deficiency) can be seen from Table 4, experiment 2b in Pesaran (2006) page 997. It has seen that in the long term there are a positive relationship between tourism growth and all other independent variables (except trade and real exchange rate). When transportation costs increase 1%, the tourism growth rate increases 0.0018% or while the number of tourist arrivals increases by 1%, the tourism receipts increase 0.82%, as it is expected. But the contribution of the inflation rate is highest in contrast to the theory.

Table 8: Coefficient Estimations with CCE Model

Countries	**RER**	**SE.**	**TA**	**SE.**	**TC**	**SE.**
Brazil	0.006	0.001	0.474	0.094	-0.009	0.002
China	0.004	0.001	1.510	0.109	0.008	0.004
Russia	0.002	0.004	0.169	0.146	-0.008	0.003
India	1.656	0.394	0.371	0.155	0.001	0.001
Turkey	-0.357	0.100	0.764	0.084	0.003	0.002
Countries	**INF**	**SE.**	**TRD**	**SE.**	T_1	T_N
Brazil	0.544	0.151	0.010	0.007	1995	2017
China	1.130	0.136	-0.005	0.001	1995	2017
Russia	0.590	0.191	-0.011	0.003	1995	2017
India	0.645	0.098	0.007	0.003	1995	2017
Turkey	1.040	0.124	0.001	0.001	1995	2017

SE represents Newey West type standard deviation which is estimated according to the equation 50 in Pesaran (2006) at p. 981 and T represents time. CCE co-efficient of independent variables are estimated according to the equation 29 in Pesaran (2006) at p. 977.

According to table 8 and the individual results, in the long-term, the inflation rate and the number of tourist arrivals have positive contribution to the tourism growth for each selected country. To reconfirm the significance of estimations please check Pesaran's (2006) study, p. 994, table 1a. Real exchange rate contributes negatively to the economic growth of tourism in Turkey for the selected period and in Brazil and Russia transportation costs effect tourism receipts negatively. Except China and Russia in the other countries the trade contributes to the tourism growth negatively. Therefore, first the inflation rates and later the tourist arrivals are the most incautious ones.

4. Conclusion

This paper examined the nexus between tourism growth and transportation costs with a macroeconomic perspective for BRIC-T countries during the period 1995 and 2017. Empirical results show that there is a co-integration between the number of tourist arrivals and tourism receipts as well as transportation costs. Also, negative tourism shock causes positive tourist arrivals and positive tourism receipts cause negative transportation costs. Hence, there is a causality between the variables only in these conditions. The macroeconomic determinants of tourism growth such as the inflation rate and the number of tourist arrivals (demand side) have the biggest effect on it according to cross-country (individual) and means to group results.

The BRIC-T countries are not a part of monetary or fiscal community such as the European Union and each country have different transportation structure and natural environment. So, the changes in the exchange rates and transportation costs did not affect in general the whole data set, but separately the effects of each variable can be seen negatively or positively from the quantitative research. The inflation rate depends on prices and except China, in all other countries the inflation rates are relatively high especially in Turkey and Brazil. Russia is more likely not a destination, but the shipper of her citizens mostly to the warm places. This is why the coefficient of the number of tourist arrivals remains the lowest among the others. The negative contribution of trade to tourism growth in China and Russia for the selected period can be interpreted due to the trade war between China and the USA, similar to the decreasing export volume and trade sanctions on Russia from the trade partners and the declining market share of Russia.

For further research, the nexus between variables can be seen in a field of sustainable tourism (reducing energy use) with the same group of countries. Except Russia, other BRIC-T members are dependent to the imported energy. As a part of their development plans, it is important to build a sustainable transportation infrastructure not only for tourism sector but also, for many other sectors of the economies.

References

Bimonte, S., Ferrini, S. & Grilli, G. (2015). Transport infrastructures, environment impacts and tourists' welfare: A choice experiment to elicit tourist preferences in Siena–Italy. *Journal of Environmental Planning and Management,* 0(0), 1-20.

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

Chan, F., Lim, C., & McAleer, M. (2005). Modelling multivariate international tourism demand and volatility. Tourism Management, 26(3), 459-471.

Erkan, İ. & Erkan Şimşek, A. (2015). Tourism and air transportation in Turkey, International Journal of Business Tourism and Applied Sciences, 3(1): 34-40.

Gunduz, L & Hatemi-J, A. (2005). Is the tourism-led growth hypothesis is valid for Turkey? Applied Economic Letters, 12(8): 499-504.

Jeganathan, G. S & Srinivasulu, Y. (2017). Impact of tourism on macro-economic indicators: A comparison study of BRICS nations, IJARIIE, 3(4): 2395-4369.

Hatemi-J, A. (2011). Asymmetric panel causality tests with an application to the impact of fiscal policy on economic performance in Scandinavia, *Munich Personal RePEc Archive,* https://mpra.ub.uni-muenchen.de/55527/1/MPRA_paper_55527.pdf , 20.11.2018.

Hatemi-j, A., N. Ajmi, Ghassen, A. El Montanasser, R., Inglesi, Lots & Rangan Gupta (2015). Reserach output and economic growth in G7 countries: new evidence from asymmetric panel causality testing, *Applied Economics*, November, 1-8.

Hatemi-J, A., Chang, T., Wen-Yi, C., Feng-Li, L. & Gupta, Rangan (2015). Asymmetric Granger causality between military expenditures and economic growth in top six defense suppliers, University of Pretoria, *Department of Economics Working Paper Series*, September.

Hatemi-J, A. & El-Khatib, Y. (2016). An extension of the asymmetric causality tests for dealing with deterministic trend components, *Applied Economics*, 48(42), 4033-4041.

Kizilkaya, O, Sofuoglu, E. & Karacor, Z. (2016). Türkiye'de turizm gelirleri ekonomik büyüme ilişkisi: ARDL sınır testi yaklaımı, Celal Bayar İİBF Dergisi, 23(1): 203-215.

Kovacic, M. & Milosevic, T. (2016). Interdependence of transport and tourism*,* *Pomorski Zbornik*, 52, 99-111.

Lumsdon, L. (2010). Transport and tourism: Cycle tourism – A model for sustainable development?, *Journal of Sustainable Tourism*, 1(5), 361-377.

Martinez-Zarzosso, I. & Nowak-Lehman, F. D. (2007). Is distance a good proxy for transport costs: The cas of competing transport models, *The Journal of International Trade Economic Development,* 16(3), 411-434.

Pesaran, M. H. (2004). General diagnostic tests for cross-section dependence in panels. *IZA Discussion Paper*, 1240, 1-39.

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

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

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

Pesaran, H. M., Smith, V. L. & Yamagata, T. (2013). Panel unit root tests in the presence of multifactor error structure. *Journal of Econometrics*, 173, 94-115.

Pop, L. (2014). The role of tourism in the economies of BRICS countries, Knowledge Horizons – Ecnomics, 6(2): 136-141.

Proenca, S., & Soukiazis, E. (2008). Tourism as an economic growth factor: a case study for Southern European countries. Tourism Economics, 14(4), 791-806.

Sorupia, E. (2005). Rethinking the role of Transportation in Tourism. Proceedings of the Eastern Asia Society for Transportation Studies, 5, 1767-1777.

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

Troung, N. V. & Shimizu, T. (2017). The effect of transportation on tourism promotion: Literature review on application of the Computable General Equilibrium (CGE) model. Transportation Research Procedia, 25, 3096-3115.