

The Relationship Between Tourism, Trade Openness and Economic Growth: The Case of BRICS-T Countries

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Abstract

With the acceleration of globalization, the relationships between trade openness, tourism and economic growth have become an important area of interest in academic literature. Trade openness has the potential to support economic growth by increasing the integration of countries into international markets and stimulating the tourism sector. Especially in emerging economies such as BRICS-T countries, the contribution of trade and tourism to growth is of strategic importance in terms of sustainable development goals. This study examines the causal relationships between economic growth, tourism and trade openness variables in BRICS-T countries. The Dumitrescu-Hurlin panel causality test was applied in the analysis conducted using annual data for the period 1995-2020. The findings of the study reveal that there is no statistically significant causal relationship between economic growth and tourism in BRICS-T countries. However, a unidirectional causality from trade openness to economic growth was determined. Similarly, a unidirectional causality relationship from trade openness to tourism was determined. The study emphasizes the importance of trade openness policies that support economic growth and contribute to the development of the tourism sector in BRICS-T countries. In this context, it is thought that the findings may guide policy makers in BRICS-T countries in developing strategic steps to promote economic growth and the tourism sector.

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INTRODUCTION

Tourism is an important source of income and employment for many countries' economies. Therefore, it is considered as the driver of economic growth for local and global economies (Danish & Wang, 2018). Tourism development has been established as a popular strategy for economic growth worldwide (Matarrita-Cascante, 2010). Therefore, increasing the number of tourist arrivals is at the focal point of economic planning for local and central governments. Especially in developing countries, tourism has a great potential in terms of foreign exchange inflows and local development. The increase in the number of tourist arrivals can positively affect the economic growth of the country with its direct and indirect effects. The expenditures of tourists on accommodation, food and beverage, transportation and other services trigger the multiplier effect of economic growth spreading to different sectors. In this context, examining the relationship between tourism and economic growth is of great importance in understanding the contribution of tourism to the economy. In addition, investment in the tourism sector to promote economic growth will not only increase the income of the existing workforce, but also create new job opportunities for those who want to work in tourism and related industries (Singh & Alam, 2024). Therefore, examining the impact of the tourism sector on economic growth in BRICS-T countries (Brazil, Russia, India, China, South Africa and Türkiye) reveals the potential role that tourism can play in achieving the sustainable development goals of these countries. BRICS-T countries have attracted attention with their high growth rates and rapidly developing economic structures in recent years. This group of countries attracts attention with their rapid economic growth and becoming an attractive center for international investments (Ertürkmen, 2023).

Figure 1 shows the annual changes in the number of tourists in BRICS-T countries between 2005 and 2020. It is noteworthy that China was the country with the highest number of tourists in the entire country group during the period examined. In recent years, Türkiye has stood out as the second country following China. This situation can be evaluated as a reflection of the efforts of both countries to develop their tourism infrastructure and gain competitive advantage in the sector. In particular, improvements in Türkiye's tourism policies and promotional activities have brought the country to a position close to China. The country with the lowest number of tourists is Brazil. Brazil's lower level of tourist numbers compared to other countries indicates that the country may have been affected by factors such as geographical distance, inadequate infrastructure or lack of promotion. A steady increase trend was observed in all countries until 2019, and this

increase was interrupted after 2019 due to travel restrictions brought about by the COVID-19 pandemic. It is seen that there was a significant decrease in the number of tourists in all countries as a direct effect of the restrictions implemented during the pandemic period. This situation shows that global crises such as pandemics can lead to fluctuations in the tourism sector and therefore pose a risk to the sustainability of tourism-based economic growth.

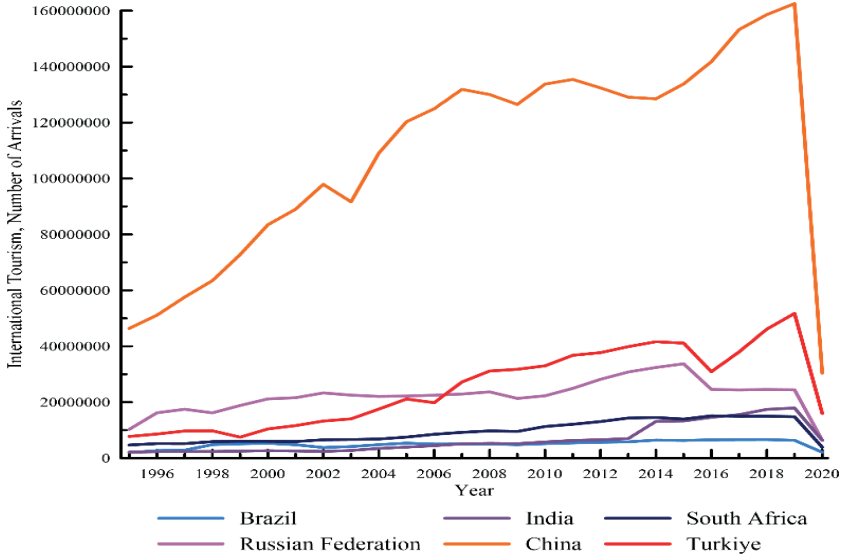


Figure 1: Number of Tourist Arrivals (BRICS-T Countries)

Trade openness, one of the important factors affecting economic growth, is a critical indicator of a country's degree of integration into the global economy. In addition, measuring countries' trade openness levels is an important concept for determining the level of trade liberalization (Ertürkmen & Çelik, 2023). Trade openness is the sum of exports and imports of goods and services measured as a share of gross domestic product. This rate is considered a reflection of the level of economic liberalization in the country. The trade openness rate, which increases with the increase in exports and imports, expresses the openness of country economies to international markets, while also emphasizing the contributions that foreign trade can provide for economic growth. Trade openness is of vital importance for economic growth not only in developing but also in developed economies (Udeagha & Ngepah, 2020). In international economic theory, it is widely accepted that trade openness can help improve the quality of economic growth (Kong, Peng, Ni, Jiang & Wang, 2021).

Figure 2 presents annual changes in trade openness rates in BRICS-T countries between 2005 and 2020. It is noteworthy that trade openness rates have followed a rather volatile course in all countries during the period under review. Türkiye was the country with the highest trade openness rate as of the end of the reference period, while the lowest rate was observed in Brazil; Brazil has continued to have a relatively closed trade structure since the beginning.

There has been a general increase in the trade openness rates of BRICS-T countries, especially since 1998; this situation reflects the countries' economic liberalization policies and their efforts to increase their integration with global trade. However, in 2009, during the global economic crisis, there was a significant decrease in trade openness rates in all countries. This decrease shows the negative effects of the crisis on global trade volume and the sensitivity of trade openness to global economic fluctuations. While such fluctuations emphasize the sensitivity of trade openness to global and regional economic conditions, it is observed that economies such as Türkiye tend to adopt more open policies to trade, while Brazil maintains a more inward-looking economic structure.

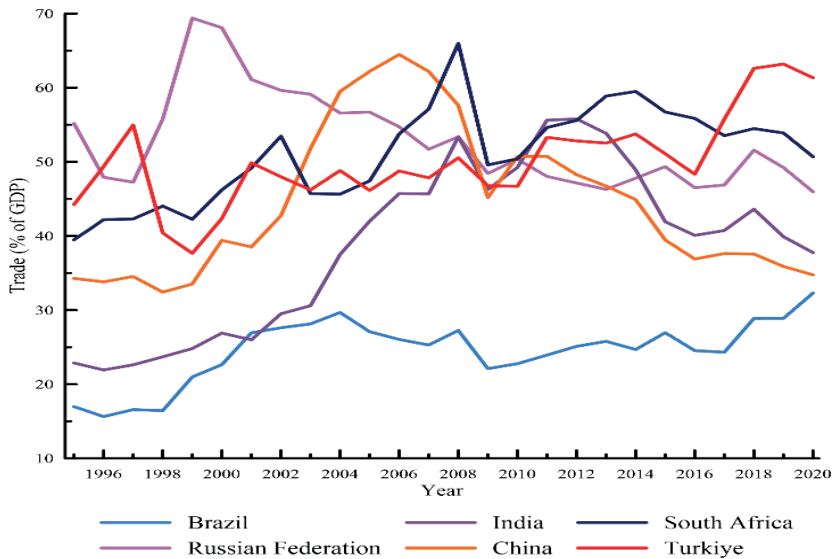


Figure 2: Trade Openness Rate (%) (BRICS-T Countries)

The tourism sector and trade openness indicators are not only related to economic growth, but also support each other in a mutual interaction. The increase in tourism is seen as a factor that encourages international

trade, and this situation is gaining importance in sustainable growth strategies, especially in developing economies such as BRICS-T countries. Understanding this strong connection between tourism and trade openness makes it possible to consider the effects of tourism, which is a part of international economic activities, on economic growth in a broader context. The interaction between trade openness and the growth dynamics of the economy, as well as the contribution of tourism to economic growth, has an important place in the growth strategies of countries.

BRICS-T countries are a group of rapidly growing developing countries (Uçar, Ülger & Atamer, 2024). These countries offer remarkable examples in terms of economic growth with their different economic structures, natural resource wealth, large population structures and rapidly developing industrialization processes. The impact of indicators such as tourism and trade openness on the growth dynamics in these economies plays an important role in achieving sustainable development goals. The study aims to better understand the effects of these sectors on growth by evaluating the growth recorded in the tourism and trade sectors of BRICS-T countries in line with their economic development goals.

The aim of the study with this motivation is to reveal the causal relationship between economic growth, tourism and trade openness in BRICS-T countries. Using annual data between 1995-2020, this study aims to understand the role played by tourism and trade openness in the economic structures and development processes of these countries.

In the literature, the effects of tourism and trade openness on economic growth have usually been examined separately. This study comparatively analyzes the causal relationships of tourism and trade openness on economic growth in BRICS-T countries by considering both sectors together, thus aiming to fill the gap in the literature. Studies on developing economies such as BRICS-T countries address the effects of tourism and trade openness on growth from a different perspective than developed countries. The study aims to offer a new perspective to the literature on this subject by examining the effects of tourism and trade openness on economic growth in developing countries. This analysis, conducted with up-to-date data for the period 1995-2020, will provide meaningful implications for policy makers by examining the effects of tourism and trade openness on growth in BRICS-T countries. The study will contribute to the empirical studies on this subject in the literature by examining the causal relationship between economic growth, tourism and trade openness.

LITERATURE

The literature is examined under two main headings: the causal relationship between tourism and economic growth and the causal relationship between trade openness and economic growth. Under these headings, the causal relationships between the relevant variables are discussed in more detail by considering them at different levels. In order to examine the literature in a more systematic manner, the causal relationships between the variables under both headings are divided into three main categories: (i) studies that found a one-way causal relationship, (ii) studies that found a two-way causal relationship, and (iii) studies that did not find a causal relationship. This structure allows for a clearer comparison and interpretation of different research findings in the literature. Thus, the complexity of the relationships between tourism, trade openness and economic growth and the place of these relationships in different contexts can be evaluated more comprehensively.

2.1. Causal Relationship Between Tourism and Economic Growth

Studies examining the one-way causal relationship between tourism and economic growth in the literature show that there is a relationship between these two variables in different directions in different countries and periods. For example, Kibara, Odhiambo, and Njuguna (2012) found a unidirectional causality from tourism to economic growth in Kenya during the period 1999-2010. In the case of Tanzania, Kyara, Rahman, and Khanam (2021) confirmed that tourism development affected economic growth unidirectionally for the period 1989-2018. In another study conducted in Romania, Surugiu and Surugiu (2013) found that tourism had a unidirectional effect on economic growth during the period 1988-2009. Similarly, Bento (2016) found a causality relationship from tourism to economic growth in Portugal during the period 1995:Q1-2015:Q1. In a study conducted in small island developing states, Akadiri and Akadiri (2021) found a unidirectional causality relationship from tourism to economic growth during the period 1995-2016.

Similar to these findings, L. Zhang and Gao (2016) found that tourism development in China affected economic growth in a unidirectional manner for the period 1995-2011. In addition, Tang and Tan (2015) showed that tourism development was linked to economic growth with a unidirectional causality for Malaysia in the period 1975-2011. Aratuo and Etienne (2019) found that there was a unidirectional causality from economic growth to each subsector in the United States between 1998-2017. In another study conducted in 29 regions of China, Lin, Yang and Li (2019) found that

there was a unidirectional causality from tourism to economic growth in ten regions and from economic growth to tourism in nine regions. In the case of Indonesia, Suryandaru (2020) showed that there was a unidirectional causality from economic growth to tourism between 1974-2017. Naseem (2021) found a one-way causality between economic growth and tourism in Saudi Arabia during the period 2003-2019.

Studies examining the bidirectional causality relationship between tourism and economic growth in the literature show that these two variables can mutually support each other. Especially in developing and tourism-based economies, the tourism sector contributes to economic growth, while economic growth encourages the development of tourism infrastructure and the sector. For example, Roudi, Arasli and Akadiri (2019) found a two-way causality between tourism and economic growth in small island developing states (SIDS) for the period 1995-2014. Similarly, Bilen, Yilanci and Eryüzlü (2017) revealed a long-term bidirectional causality between tourism and economic growth in 12 Mediterranean countries during the period 1995-2012. In another study conducted on Caribbean countries, Apergis and Payne (2012) found that the short-term causality relationship between economic growth and tourism was bidirectional in the period 1995-2007. In the case of Nigeria, Lawal, Asaleye, Iseolorunkanmi, and Popoola (2018) stated that there was a bidirectional causality relationship between economic growth and tourism between 2000-2016.

Examining a larger sample group, Wijesekara et al. (2022) showed that the relationship between economic growth and tourism in 105 countries during the period 2003-2020 was reciprocal. In another study conducted in micro-states, Fahimi, Saint Akadiri, Seraj and Akadiri (2018) found a bidirectional causality between tourism and GDP for the period 1995-2015. Seghir, Mostéfa, Abbes, and Zakarya (2015) revealed a reciprocal causality relationship between tourism and economic growth in 49 countries during the period 1988-2012. Finally, J. Zhang and Zhang (2021) confirmed the bidirectional causality between GDP and tourism in 30 provinces of China during the period 2000-2017, both in the short and long term.

These studies show that in addition to the contribution of the tourism sector to economic growth, economic growth can also play a supporting role in the tourism sector. In particular, infrastructure investments and increased welfare provided by economic growth accelerate the development of tourism and support a mutual growth cycle.

There are also studies in the literature that do not find a causal relationship between tourism and economic growth. For example, Ekanayake and Long

(2012), in their study on developing countries in the period 1995-2009, revealed that there is no causal relationship between tourism and economic growth. Similarly, Eyuboglu and Eyuboglu (2020), in their study examining 9 developing countries for the period 1995-2016, found that there is no causal relationship between tourism and economic growth. These findings show that the tourism sector may not always be effective as a factor supporting economic growth in developing countries and indicate that the contribution of tourism to economic growth may vary depending on the sectoral development level of the countries.

2.2. Causality Relationship Between Trade Openness and Economic Growth

Studies in the literature that find a unidirectional causality relationship between trade openness and economic growth show that the direction of the relationship between these two variables may differ by country and region. Raghutla (2020) found a unidirectional causality from economic growth to trade openness in five emerging market economies during the period 1993-2016. In a similar study conducted in India, Kaushal and Pathak (2015) showed a unidirectional causality from economic growth to trade openness during the period 1991-2013. Dutta, Haider, and Das (2017) found a unidirectional causality from economic growth to trade openness in Bangladesh during the period 1976-2014.

However, some studies found a causal relationship from trade openness to economic growth. For example, Keho (2017) found a causal relationship from trade openness to economic growth in Ivory Coast during the period 1965-2014. Dritsakis and Stamatiou (2016) found a unidirectional causal relationship from trade openness to economic growth in the thirteen new European Union members during the period 1995-2013, both in the short and long term. In another study conducted in Pakistan, Chandio, Rehman, Jiang and Joyo (2017) found a unidirectional causality between trade openness and economic growth during the period 1970-2014. These findings indicate that the contribution of trade openness to economic growth may vary according to the country's economic structure and level of liberalization.

Studies examining the bidirectional causal relationship between trade openness and economic growth reveal that these two variables mutually affect each other. For example, Idris, Yusop, and Habibullah (2016) found a reciprocal causality between trade openness and economic growth in a sample of OECD and developing countries between 1977 and 2011.

Another study covering G7 countries, Zeren and Ari (2013), confirms a similar bidirectional relationship with data from 1970 to 2011.

Regional studies also support this interaction. Alam and Sumon (2020) found a reciprocal interaction between trade openness and economic growth in 15 Asian countries between 1990 and 2017. Similarly, Jamel and Maktouf (2017) found a bidirectional causality between 40 European economies between 1985 and 2014.

Among the studies conducted in OECD countries, Belazreg and Mtar (2020) found that trade openness and economic growth interact with each other with data from the period 2001-2016; Fan and Hossain (2018) observed the effect of trade openness on growth and growth on trade openness in the period 1974-2016 in the case of China and India. In addition, Wijesekara et al. (2022) suggested that trade openness and economic growth can mutually affect each other with their study on 105 countries in the period 2003-2020. All these findings show that the interaction between trade openness and economic growth has an important role in the economic development processes of countries.

Studies that could not find a causal relationship between trade openness and economic growth suggest that there is no direct connection between these two variables. For example, Ayad and Belmokaddem (2017) examined 16 MENA (Middle East and North Africa) countries for the period 1980-2014 and found that trade openness did not have a significant effect on economic growth. Similarly, Kumari et al. (2023) determined that there was no bidirectional causality between trade openness and economic growth in the case of India between 1985-2018. Such studies show that the effect of trade openness on economic growth cannot always be confirmed and that this relationship may be complex or weak in some regions.

3. MODEL, DATA, METHODS AND FINDINGS

3.1. Model and Data Definition

This study investigates the direction of the causal relationship between per capita income, tourism and trade variables in BRICS-T countries. Annual data for the period 1995-2020 are taken as basis. Information on the variables is given in Table 1.

Table 1: Variables and Details

Variables and Their Symbols	Definition and Measurement	Database
Economic Growth (lnGDPpc)	GDP per capita (Constant 2015 US\$)	WDI/1995-2020
Tourism (lnTourism)	International tourism, number of arrivals	WDI/1995-2020
Trade Openness (lnTrade)	Trade (% of GDP)	WDI/1995-2020

Note: WDI: World Development Indicators

The models estimated in the study are as follows;

$$\ln GDPpc_{i,t} = \beta_0 + \beta_1 \ln Tourism_{i,t} + u_{i,t} \quad (1)$$

$$\ln Tourism_{i,t} = \beta_0 + \beta_1 \ln GDPpc_{i,t} + u_{i,t} \quad (2)$$

$$\ln GDPpc_{i,t} = \beta_0 + \beta_1 \ln Trade_{i,t} + u_{i,t} \quad (3)$$

$$\ln Trade_{i,t} = \beta_0 + \beta_1 \ln GDPpc_{i,t} + u_{i,t} \quad (4)$$

$$\ln Tourism_{i,t} = \beta_0 + \beta_1 \ln Trade_{i,t} + u_{i,t} \quad (5)$$

$$\ln Trade_{i,t} = \beta_0 + \beta_1 \ln Tourism_{i,t} + u_{i,t} \quad (6)$$

3.2. Method

CD and Homogeneity Test

Firstly, it was investigated whether the model included cross-sectional dependence. Cross-sectional dependence in the estimated model prevents effective and consistent results. Therefore, in order to reach unbiased and consistent results, robust estimators should be used in the presence of cross-sectional dependence. In this context, determining cross-sectional dependence is very important. Since $N < T$ in this study, Breusch and Pagan (1980) "CD_{LM}" test was used. The test statistic is as follows;

$$CD_{LM} = \sqrt{\frac{1}{N(N-1)}} \sum_{i=1}^{N-1} \sum_{j=i+1}^N (T\hat{p}_{ij}^2 - 1) \quad (7)$$

The null hypothesis of this test is " H_0 : There is no cross-sectional dependence". When the null hypothesis cannot be rejected according to the test statistics, it is concluded that there is no cross-sectional dependence

between the cross-sections in the panel. Otherwise, it is concluded that there is cross-sectional dependence between the countries. Therefore, in such a case, it is decided to use second-generation estimators (Baltagi & Baltagi, 2008).

In order to determine whether the slope coefficients of the variables are heterogeneous or not, the test developed by Swamy, later expanded by Pesaran, Ullah, and Yamagata (2008) in 2008 and named as Delta (Δ) test was used (Pesaran et al., 2008). In this test; A cointegration equation of the form $Y_{it} = \alpha + \beta_{it}X_{it} + \varepsilon_{it}$ is taken into account. β_{it} is used to represent the slope coefficient. The hypotheses of the Delta test are as follows;

$H_0 : \beta_i = \beta_j$, the slope coefficients are homogeneous.

$H_1 : \beta_i \neq \beta_j$, the slope coefficients are not homogeneous.

Pesaran et al. (2008) developed the following equations to test the null and alternative hypotheses.

$$\text{To be able to use it in more observations; } \hat{\Delta} = \sqrt{N} \left(\frac{N^{-1}\hat{S} - k}{\sqrt{2k}} \right) \quad (8)$$

$$\text{To be used in smaller samples; } \tilde{\Delta} \text{ adj} = \sqrt{N} \left(\frac{N^{-1}\hat{S} - k}{\sqrt{2k}} \right) \quad (9)$$

Second Generation Unit Root Test (CIPS)

The unit root test investigates whether the variables in the estimated model have become stationary and their degree of stationarity. Since the estimated model in this study includes cross-sectional dependence, the CADF (Crosssectional Augmented Dickey Fuller) test, which is a second generation unit root test and is considered useful for heterogeneous-homogeneous series, was used. This test was developed by Pesaran (2007). The test first calculates the CADF test statistic for all series forming the panel. Then, the arithmetic mean of these calculated statistics is taken. Thus, the CIPS statistic is calculated for the entire panel. The model used in the calculation of the CADF test is as follows (Pesaran, 2007);

$$t_i (N,T) = \frac{\Delta y_i' \bar{M}_w y_{i-t}}{\sigma_i (y_{i-1}' \bar{M}_w y_i)^{1/2}} \quad (10)$$

The model used to calculate the CIPS statistics for the entire panel (Pesaran, 2007) is as follows:

$$\text{CIPS}(N,T) = N^{-1} \sum_{i=1}^N t_i(N,T) \quad (11)$$

Dumitrescu-Hurlin Causality Test

In this study, Dumitrescu and Hurlin (2012) panel causality test was used to investigate the causality relationship between the variables. This causality test has certain advantages. These advantages are as follows; it produces effective results in the presence of cross-sectional dependence between the countries forming the panel, it can be used both when the time dimension (T) is larger than the cross-sectional dimension (N) and when it is smaller, and it can be used in the presence of both heterogeneous and homogeneous slope coefficients (Dumitrescu & Hurlin, 2012). The model investigating the causality relationship between the Y and X variables in the test is as follows;

$$y_{i,t} = \alpha_i + \sum_{k=1}^K \gamma_i^k Y_{i,t-k} + \sum_{k=1}^K \beta_i^k X_{i,t-k} + \varepsilon_{i,t} \quad (12)$$

K in the equation represents the optimum lag length. The null hypothesis of the test is as follows;

For $H_0 : \beta_i^{(k)} = 0 \forall_i$, there is no causality relationship from X to Y in all cross-sections. Dumitrescu and Hurlin (2012) calculate individual Wald statistics ($W_{i,T}$) for each cross-section to test the null and alternative hypotheses in question. Then, they take the arithmetic mean of the calculated Wald statistics and obtain the Wald statistic of the panel ($W_{N,T}^{HNC}$). Dumitrescu and Hurlin (2012) recommend using the test statistic with an asymptotic distribution in the case of $T > N$. On the other hand, they recommend using the test statistic with a semi-asymptotic distribution $Z_{N,T}^{HNC}$ in the case of $T < N$.

$$Z_{N,T}^{HNC} = \sqrt{\frac{N}{2K}} (W_{N,T}^{HNC} - K) \quad (13)$$

$$Z_N^{HNC} = \frac{\sqrt{N} [W_{N,T}^{HNC} - N^{-1} \sum_{i=1}^N E(W_{i,T})]}{\sqrt{N^{-1} \sum_{i=1}^N \text{Var}(W_{i,T})}} \quad (14)$$

Dumitrescu and Hurlin (2012) calculate test statistics and probability values of these statistics using the panel causality test Monte-Carlo simulation.

In addition, in order to apply this test, all variables must be stationary at the level. In the study, the variables that were not stationary at the level were made stationary at the level by taking the difference and then the causality test was applied.

3.3. Findings

Table 2 shows the summary statistics of the variables as well as the correlation matrix.

Table 2: Summary Statistics and Correlation Matrix

Variables	Obs	Mean	St.Dev.	Min	Max
lnGDPpc	156	3.679	0.338	2.791	4.086
lnTourism	156	7.163	0.506	6.290	8.210
lnTrade	156	1.618	0.144	1.194	1.841

Correlation Matrix			
Variables	lnGDP	lnTourism	lnTrade
lnGDPpc	1		
lnTourism	0.310	1	
lnTrade	0.165	0.505	1

According to the table, the number of observations is 156. This number is sufficient for panel data. The minimum value is 1.194 in the lnTrade variable, while the maximum value is 8.210 in the lnGDPpc variable. According to the correlation matrix, it was observed that there was no problem of multiple linear connection between the variables. If multiple linear connection was detected, it would have been concluded that the variables in question were not suitable for econometric analysis. Table 3 shows the results obtained from the cross-sectional dependency and homogeneity test.

Table 3: Cross-Section Dependency and Homogeneity Test Results

Panel Cross Section Results		
Tes	Statistics	p-value
LM	91.52	0.000***
LMadj	37.13	0.000***
LM _{CD}	8.816	0.005**

Homogeneity Test		
	Delta	p-value
	6.295	0.000***
adj.	6.844	0.000***

The statistics in the table show that the panel results of the model estimated in the first part of the table contain cross-sectional dependence. In addition, the statistics in the second part of the table lead to the conclusion that the slope coefficients of the variables in the estimated model are heterogeneous. Table 4 shows the unit root test results investigating the stationarity levels of the variables.

Table 4: Unit Root Test Results

Variables	CIPS Value		CIPS Value	
	<i>At the level</i>		<i>First Difference</i>	
	Constant	Constant+Trend	Constant	Constant+Trend
lnGDPpc	-1.608	-1.332	-2.604*	-2.801**
lnTourism	-2.285***	-2.318	-	-
lnTrade	-1.557	-1.836	-3.660***	-3.755***

*Note: 10%: -2.21; 5%: -2.33 and 1%: -2.57. *, **, and *** represent significance at 10%, 5%, and 1% significance levels, respectively.*

According to the results obtained from the unit root test, it was observed that the variables lnGDPpc and lnTrade became stationary at the first difference, while the variable lnTourism was stationary at the level. As a result of the method followed for the estimation of the model, it was decided to apply the D-H panel causality test. Table 5 shows the causality test results.

Table 5: Dumitrescu-Hurlin Causality Test Results

	W-bar	Z-bar	P-value	Lag Length
lnGDPpc → lnTourism	1.509	0.882	0.377	1
lnTourism → lnGDPpc	1.384	0.665	0.506	1
lnGDPpc → lnTrade	2.419	2.457	0.014**	1
lnTrade → lnGDPpc	10.779	4.477	0.0000***	5
lnTourism → lnTrade	7.776	1.255	0.209	6
lnTrade → lnTourism	2.012	1.323	0.076*	1

*Note: *, **, and *** indicate 10%, 5%, and 1% significance levels, respectively.*

According to the results in Table 5, both hypotheses established between lnGDPpc and lnTourism were accepted. Accordingly, no causality relationship was found between these variables. While one of the hypotheses established between lnGDPpc and lnTrade variables was rejected, the other was accepted. In this context, a one-way causality from lnTrade to lnGDPpc variable was

observed. In addition, while the first of the hypotheses established between $\ln\text{Tourism}$ and $\ln\text{Trade}$ variables was accepted, the second was rejected. Therefore, a one-way causality relationship from $\ln\text{Trade}$ to $\ln\text{Tourism}$ was determined.

CONCLUSION AND EVALUATION

This study investigated the causal relationship between economic growth, tourism and trade openness variables in BRICS-T countries. The analysis period is 1995-2020 and annual data is used. Dumitrescu-Hurlin panel causality test was used. According to the findings obtained from the causality test, no causal relationship was detected between economic growth and tourism. One-way causality from trade openness to economic growth was observed. Finally, one-way causality from trade openness to tourism was found.

The absence of a causal relationship between tourism and economic growth is an unexpected result from the findings obtained. This result may be due to the fact that the infrastructure, service quality or sustainable tourism policies that will affect the tourism sector in terms of growth in BRICS-T countries have limited this relationship. In addition, while most of the sample group countries show growth in the industry, agriculture or service sectors, the fact that tourism is not strong enough to directly contribute to economic growth in these countries may also explain this causality. Tourism is a sector affected by global economic fluctuations and political instabilities. The fact that tourism does not have a direct effect on economic growth in developing countries such as the countries in question may be due to such external factors. There may be steps to be taken and policies to be implemented in order to increase the impact of tourism on economic growth and to ensure income from tourism. In this context, BRICS-T countries should develop tourism infrastructure such as transportation, accommodation, security and environmental protection in order to increase the contribution of tourism to economic growth. Improvements can be made especially in airports, hotel capacities and access to tourist areas. Sustainable tourism policies should be adopted in order to protect natural and cultural assets. These policies can increase the long-term economic contribution of tourism and sustain the interest of tourists in the country. In addition, by providing diversity in tourism, investments should be made not only in coastal tourism but also in areas such as ecotourism, cultural tourism and business tourism. BRICS-T countries should strengthen their marketing strategies and expand the promotion of the country in the international arena and highlight

opportunities in tourism. In this way, both tourism will develop, tourism revenues will increase and growth will be contributed.

The determination of one-way causality from trade openness to growth; the increase in trade volume may have enabled BRICS-T countries to earn more income through foreign trade and increase their production capacity. This may explain a one-way causality from trade volume to economic growth. The sample countries, especially countries such as China, India and Brazil, follow export-oriented growth strategies. The fact that trade has a direct effect on economic growth for these countries shows the importance of exports and foreign markets on growth. Most of these countries have a significant share in the export of industrial and agricultural products. Such trade may have a positive effect on economic growth, but it has been observed that growth does not affect trade in the same way. In order to increase the supportive effect of trade on economic growth, BRICS-T countries can offer incentives to increase the export of especially high value-added products. This both accelerates economic growth and increases the competitiveness of countries in global trade. At the same time, in order to increase the contribution of trade to economic growth, regulations can be made by reducing bureaucracy, accelerating customs procedures and facilitating trade. For example, regional cooperation can be developed by making trade agreements between BRICS-T countries. In order to increase the effect of trade on economic growth, a trade strategy compatible with industrial policies should be followed. Investments in manufacturing and technology-based sectors can be supported to increase revenues obtained from trade. The finding of one-way causality from trade openness to tourism indicates that the increase in trade volume may have indirectly supported tourism by increasing the number of international business people, entrepreneurs or foreign investors coming to BRICS-T countries. Business and trade travel may support the tourism sector. The increase in trade volume may have stimulated tourism demand by increasing the international awareness of the countries. For example, countries such as China or India may have the potential to attract more tourists as they grow in trade. Tourism may have a smaller economic impact compared to the size of the trade volume in some BRICS-T countries. Therefore, tourism may not provide sufficient contribution to increase trade. In order to strengthen the causality effect from trade openness to tourism, BRICS-T countries can develop policies that encourage business tourism. They can increase trade by organizing international fairs, congresses and trade events while also increasing tourism revenues. Incentives can be provided to increase the interest of foreign investors in the tourism sector in the country. Growth in tourism can be supported by directing the revenues from trade to more

touristic infrastructure and activities. In order to increase the impact of trade relations on tourism, BRICS-T countries can invest more in international promotional activities. The country's tourism potential can be promoted through touristic and cultural activities, especially in countries that are trade partners.

The Dumitrescu-Hurlin panel causality test was used in our study; however, the results obtained with alternative causality and interaction tests may reveal different findings. Therefore, future studies may allow the comparison of the results by applying different methods. In addition, this study focused only on BRICS-T countries. Similar analyses to be conducted among groups of countries with different economic structures would be useful in assessing the general validity.

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