

Analysis of cointegration and causality between tourism, economic growth and exchange rate in India

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Abstract

The Indian tourism industry has flourished rapidly in the past years and is expected to expand further, thereby providing immense employment opportunities and contributing massively to the country's overall development. This has made it necessary to assess the impact that tourism might have on a country's economy. This study examines the association among tourism, growth of the economy and currency rate in India and investigates the existence of co-integrating relationship and causality among these variables. The findings of co-integration analysis signal that tourism, economic growth and currency rate are co-integrated. Further, the study evinces the prevalence of unidirectional causalities between foreign exchange earnings and exchange rate and also among foreign exchange earnings and real GDP. The study also revealed that a one way causal link is pervasive between real GDP and the foreign tourist arrival figures.

Keywords: Co-integration, Granger Causality, Economic Growth, Tourism

JEL Classification: F40, F31, L83

Introduction

The tourism industry has always developed at a rapid pace, creating massive employment opportunities and contributing substantially to the global wealth. Further, globalisation has made the world 'a global village' which has led to a great spur in the tourist activity across the globe. The activities of the travel and tourism sector are said to have contributed up to 10.4 per cent of the international GDP and up to 9.9 per cent of total job opportunities in the world, in the year 2017. In case of India, the contribution by travel and tourism sector has accounted for 9.4 per cent of India's GDP in 2017 and it is expected to reach 9.9 per cent by 2028. Further, 8 per cent of total job opportunities in the country is said to be created by this sector and this is estimated to become 8.4 per cent by 2028 (WTTC, 2018).

India is a country having abundant natural resources. The lofty Himalayas, the ocean, desert, and the enticing lagoons are all great appeal to nature lovers. The demand for adventure tourism like river rafting, paragliding, bungee jumping and trekking are also on the rise. There are also an innumerable number of fortresses, palaces and a number of old and new temples which makes the country a centre for spiritual tourism, thereby attracting both local and foreign tourists. The treatments of Ayurveda, is an Indian variant of conventional medicine and have existed for more than 4,000 years. This sector attracts tourists from all across the world thereby making India a hub for medical tourism. Most researches have given a positive report on the influence of tourism on the overall growth, and this has made it necessary to assess the environmental impact of tourism. As a result of this, a study was conducted in South Korea and the findings indicated a co-integrating relationship between tourism and the environmental quality variables like, air quality index and water quality index, and the granger casualty test indicated that tourism has an effect on environment; however the environment has no significant impact on tourism (Lee, Verances, & Song, 2009). Tourism development is also considered to reduce poverty, which has evidence from research which evinces a long-term link between tourism, expansion of economy and poverty alleviation (Croes & Sr, 2008).

The tourism sector is an intricate sector in the service industry, which encompasses the activities of various other sectors, therefore if tourism sector has to achieve effective growth in India and become an active world player, it requires the support of Central and State governments along with various other private parties and voluntary organisations (Venkatesh & Raj, 2016). Over the years the Central government and various state governments have announced a number of policies for improvement in the tourism sector. The major initiatives undertaken by the government in the recent years include the introduction of Swadesh Darshan scheme which was launched for the advancement of theme-based tourism. The ministry of tourism has also introduced a mobile application through which the natives can notify the authorities about any hygiene issues at various tourist destinations across the country. They have also established a tourist helpline which provides service in multiple languages including ten international languages. However, studies have revealed that there is a need for more facilities and further development and change in this sector and that the human resource ministry must arrange training programmes to develop the manpower in the tourism industry (Ghatage & Kumbhar, 2015).

The study primarily focuses on determining the overall relationship existing among tourism, the extent of growth of the economy and the currency rate in India. The study examines the co-integration and causality pattern prevalent among tourism, economic growth and currency rate. The findings of the analysis will be beneficial for businesses engaged in the tourism sector, travel agencies, private parties, and even government to decide on certain policies and decisions relating to tourism. It will also be of use to various academicians, researchers and other interested parties.

Review of literature

There exist plenty of studies pertaining to the tourism sector, however, studies analysing the real impact of tourism on the country's exchange rate and the overall GDP is rather limited.

In the Indian context, an analysis on the causality between GDP and the development of the economy has indicated a long term link among the tourism activities and the country's GDP growth. The study concluded that if the overall tourism level surges it will result in a rise the GDP, therefore study suggests that the government

must take necessary steps to encourage tourism in the country (Mishra, Rout, & Mohapatra, 2011). Another study, (Georgantopoulos, 2012) analysing the interconnection between tourism and development of the economy revealed that there is no significant link between the country's real output and the total tourism expenditure. A study on the association between international tourist arrivals in India (Ghosh, 2011) and the economic activity revealed that neither long term nor short term interconnection subsist among the growth of the economy and the FTA figures. An analysis of the relation among tourism, the growth of the economy and the financial advancement indicated that there exists co-integration between all the three and revealed that a hike in tourism can raise the GDP and therefore economic growth (Ohlan, 2017).

There have been numerous researches worldwide examining the interconnection among tourism and economic development and vice versa. A study done in Turkey using Johansen's co-integration approach had arrived at the conclusion that international tourism and the level of growth of the economy are not co-integrated. (T.Katircioglu, 2009). A different study on tourism-led growth in Turkey indicated that no long term association prevails among GDP and foreign tourism (Ozturk & Acaravci, 2009). However, another study on the link between tourism and trade revealed that there is co-integration between tourism and trade. Further analysis also revealed a short term two-way link among trade and tourism earnings and also between tourism earnings and export (B, 2017). In the case of Nepal, analysis has (Gautam) confirmed the prevalence of both short and long-term co-integrating association between tourist income and GDP. In addition, the analysis also indicated a two-way causal link among tourist activities and the growth of the economy. In the case of Tunisia, analysis has revealed that there exists a co-integrating connection among tourism and the growth of the economy and in long term a two-way causality among tourism and economic growth (Belloumi, 2010). A study carried out in Spain by Balgauer and Cantavella- Jorda (2002) has also arrived at the same conclusion that there exist short-term association and a long-run co-integration link among tourism income and GDP. In case of Mexico, a study using granger causality have exhibited a unidirectional link among tourism expenditure and real GDP and concluded that in the long term, the total tourism expenditure is a salient factor that may have an influence of the overall growth of the economy. A study in UAE, that analysed the association between the level of growth of the economy and the activities of travel and tourism industry of the country, indicated a unilateral link among growth of the economy and proceeds from international tourism (Shadab, 2018). A Jordanian study conducted using a linear approach showed that tourism has a one- way causal link with the growth of the economy. However, the non-linear method suggested a two-way causal link among tourism and growth of the economy (Muhtaseb & Daoud, 2017). A panel data analysis estimating the causal link between GDP and tourism revenue in different countries (Çağlayan, Şak, & Karymshakov) revealed a two-way causal relationship in Europe, whereas, in America a one-way causality among GDP and tourism was found. In the case of Asia and Oceania, the results showed an analogous unidirectional causal link from tourism revenue to the level of economic growth, i.e. in the reverse direction as compared to the results from America. Estimations from Asia and Africa revealed no association among tourism and economic development. Another study compiling the literature of different studies from around the world (Gwenhure & Odhiambo, 2017) has concluded that there are different perspectives about the link among tourism and growth of the economy. One interpretation was the subsistence of a one-way link among tourism and economic development, then in a different study; a unidirectional link from the growth of the economy to tourism was discovered. A two-way link among tourism and growth of the economy was also found. There exist various other studies that have arrived at similar conclusions.

A study in Australia, examining the effect of exchange rate on inward tourism revealed a weak association among currency rate shocks and inflow of tourism, which indicates that an increase in the value of its currency will not impact the tourist's decision to travel to Australia (Yap, 2012). A study on the relationship between the extent of Japanese tourists and exchange rates in Guam has revealed that a stronger USD and a weaker JPY, discourages Japanese tourists to visit Guam (Ruane, 2014). In case of Nigeria, an analysis on the effect of currency fluctuation on the tourism sector, have revealed that currency fluctuation has a significant negative impact on the tourism sector and that a surge in the variation results in a reduction in the total proceeds contributed by the tourism sector to the country's GDP. The results of Granger causality test indicated a one-way causal link and long-term association among total proceeds of the tourism sector and real effective exchange rate (Peace, Izuchukwu, & Shehu, 2016). A study conducted in Greece using Error Correlation Model (ECM) has indicated the existence of a causal link among currency rate and the level of growth of the economy

and a causal link among real exchange rate and proceeds from foreign tourism and also among the level of economic growth and proceeds from international tourism (Dritsakis, 2004). Findings of a study that assessed the relationship between the tourist flows and volatility of the exchange rates using ARDL co-integration method have revealed a long-term co-integrating link among the variables and have concluded that exchange rate volatilities should be lessened in order to increase the tourist flows (Ergen & Yavuz, 2017). This finding is consistent with a study conducted in Iceland which suggested that volatility in currency rate has a negative link with the number of foreign tourist arrivals (Agiomirgianakisa, Serenis, & Tsounis, 2015). A panel co-integration analysis that analysed the effect of currency rate on the total demand of foreign tourism in the USA from certain countries in Europe showed that the numerical figures of tourists visiting the USA, is affected by the fluctuations in the currency rate, however, it is not affected by variations in GDP. The results further revealed that tourists from the UK responded highly to the changes in real exchange rate, whereas French tourists were shown to respond greatly to the changes in GDP (Ongan, Isik, & Özdemir, 2017).

One major problem in analysing the total contribution made by the tourism sector to the nation's economy is that tourism does not exist as a distinct sector but its characteristics are spread across different sectors like transport, hotels and accommodation, thus making it difficult to track the tourist spending. Studies have revealed that this can be resolved by creating internationally recognized tourism satellite accounts and thereby providing a standardized technique for assessing the effect of tourism spending on various sectors (Ennew, 2003).

Methodology

Data relating to, foreign exchange earnings (FEE) and foreign tourist arrivals (FTA) were taken from the website of the Ministry of tourism. Data regarding the real Exchange rate (real Indian Rupee -US Dollar Exchange rate) and gross domestic product (GDP) was retrieved from the RBI website. Quarterly data for a time span of nine years ranging from 2005 to 2018 was used.

Data was analysed using the E-views software. Stationarity properties were analysed using the popular unit root test model namely, Augmented Dickey-Fuller (ADF) test. Later using the Johansen Co-integration Test, the co-integration among the variables were determined and the Granger causality test helped to ascertain the direction of relationship among the variables.

Analysis and interpretation

The empirical analysis begins with checking the stationarity of data to identify the order of integration of each variable. ADF unit root test has been applied for analysing the data.

Table 1: Augmented Dickey-Fuller Unit Root Test Results

Variables	Levels	1 st Difference	2 nd Difference
GDP	-3.314207(0.0755)	-7.537021(0.0000)	-19.13446(0.0000)
Exchange rate	-2.059947(0.5551)	-5.967418(0.0000)	-11.26626(0.0000)
FEE	0.398379(0.9986)	-24.25514(0.0000)	-9.173511(0.0000)
FTA	-2.829612(0.1943)	-3.348843(0.0710)	-5.427368(0.0003)

The findings in Table 1 reveals that the variables are non-stationary in their levels, however, the null hypothesis of no unit roots is rejected at their second difference, for all the four variables at critical values of one per cent, five per cent and ten per cent significances.

Table 2: Johansen's Co-integration Test Results

Hypothesis	Trace Statistics	Maximum - Eigen Statistics
None*	104.8177(0.0000)	67.54390(0.0000)
At most 1*	37.27378(0.0057)	22.45074(0.0324)

At most 2	14.82304(0.0629)	12.01102(0.1102)
At most 3	2.812019(0.0936)	2.812019(0.0936)

To determine the long term link among tourism, the growth of the economy and currency rate co-integration test is performed. Johansen's co-integration test has been used to discern the co-integration among the stationary variables. The findings in Table 2 indicates that the variables are co-integrating at one per cent, five per cent and ten per cent significances and confirms the existence of a long-term association among GDP, Exchange Rate, FEE and FTA.

Table 3: Granger Causality Test Results

Null Hypothesis	F-statistics	P.value	Decision	Direction of Causality
GDP doesn't Granger Cause Exchange Rate	0.98386	0.4279	Accept	No Relation
Exchange rate doesn't Granger Cause GDP	0.86443	0.4941	Accept	
FTA doesn't Granger Cause Exchange rate	0.44326	0.7765	Accept	No Relation
Exchange rate doesn't Granger Cause FTA	0.37173	0.8272	Accept	
FEE doesn't Granger Cause Exchange rate	2.94376	0.0326	Reject	FEE → Exchange rate.
Exchange rate doesn't Granger Cause FEE	0.10405	0.9804	Accept	
FTA doesn't Granger Cause GDP	1.12818	0.3582	Accept	GDP → FTA
GDP doesn't Granger Cause FTA	320.818	0.0000	Reject	
FEE doesn't Granger Cause GDP	3.43718	0.0171	Reject	FEE → GDP.
GDP doesn't Granger Cause FEE	0.45366	0.7691	Accept	
FEE doesn't Granger Cause FTA	0.34921	0.8429	Accept	No Relation
FTA doesn't Granger Cause FEE	0.09070	0.9848	Accept	

Finally, the Granger Causality Test (Granger, 1969) is deployed to know the pattern of causality among the four variables. The test analysed the direction of relationship among the variables and the findings revealed that no causal link subsist among GDP and currency rate and between FTA and Exchange rate. However, there is a unidirectional link between FEE and Exchange Rate. The one-way link running from GDP towards FTA is accordant with the research of Kaur and Sarin (2016). The findings also reveal a unidirectional relationship between FEE and GDP. There was no relation found between FEE and FTA and is accordant with the findings of Mishra, Rout, & Mohapatra in their study on the causality between FEE and FTA (2011).

Conclusion

The tourism sector has always held a significant position in the global economy. The previous decade has shown a rise in the numerical figures of total tourists arriving in India thereby making the tourism industry one among the key drivers of the nation's socio-economic progress. This has made it necessary to evaluate the interconnection of tourism with certain economic indicators and thereby understand the relevance of tourism for the nation's development. The paper has investigated the association among real GDP, currency rate, FTA and FEE for the time period ranging from 2005 to 2018. The data properties are analysed using the ADF unit root test to ascertain the stationarity of time series. Further analysis has been carried out using Johansen's co-integration test to discern the co-integration among the variables and Granger causality test has been utilized to know the causal link among them.

The findings of co-integration analysis using Johansen's co-integration test revealed the prevalence of a co-integrating association between all the four variables, i.e., GDP, Exchange rate, FEE and FTA in long term. The findings of the Granger Causality test evinced that no causal link subsists among GDP and currency rate and between FTA and Exchange rate. However, it was found that there is a unidirectional association between foreign exchange earnings and the real exchange rate and also between FEE and GDP, thereby indicating that FEE can influence the currency rate and economic growth of the country. The findings further indicate the presence of a one-way link among GDP and FTA, confirming that the country's economic growth will affect the total foreign tourist arrival figures. From the analysis it can be inferred that the tourism sector holds an imperative place in contributing to the nation's overall economic development and therefore many more initiatives must be taken by the government and also by various private parties to promote the overall tourists activities in the country and thereby take the Indian tourism industry to a higher place in the hierarchy of the globally recognized tourist destinations. A limitation of this study is the exclusion of various indicators like FDI and government rules and regulations which can have an impact on tourism. There is also scope for further research to examine the effect of other non-economic indicators like accessibility, environmental condition and cultural heritage on tourism.

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