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The relationship between tourism, financial development and economic growth in India

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Abstract

This study investigates relationship between tourism and economic growth in India by considering the relative importance of financial development over the period of 1960–2014. The results of newly-developed Bayer and Hanck combined test indicate that tourism, economic growth and financial development are cointegrated. It is shown that the inbound tourism spurs economic growth in India both in long-run and short-run. In addition, the analysis indicates the presence of a long-run one-way Granger-causation running from tourism to economic growth. It is suggested that policies for attracting more international tourists should be promoted.

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Keywords: Economic growth; India; Bayer and Hanck model; ARDL model; VECM; Variance decomposition

1. Introduction

The tourism has become the world's fourth largest export industry after fuels, chemicals and food (Tugcu, 2014; Balli, Curry & Balli, 2015). Specifically, tourism accounts for 6 per cent of the world's total merchandise and service exports that represent 30 per cent of international trade in services in the year 2014. Besides, 9.8 per cent of the world's total gross domestic product (GDP) originates in the tourism sector during the same period. The influence of inbound tourism on national economies is becoming increasingly important because of the growing size of the tourist market. In this context, the tourism-led growth hypothesis (TLGH), proposed by Balaguer and Cantavella-Jordá (2002), postulates that expansion of international tourism activities generates economic growth. The TLGH is directly derived from widely known export-led growth hypothesis (ELGH) which suggests that economic growth can be promoted not just by expanding human resources and technology inside of the economy, additionally by expanding foreign exchange earnings.

Analogously to the export, inbound tourism can stimulate economic growth in numerous ways. For instance, first, tourism significantly contributes to foreign exchange reserves which help in bringing new technologies for production process (McKinnon, 1964). Secondly, tourism stimulates investments in new infrastructure, human capital and increases competition (Blake, Sinclair, & Campos, 2006; Lemmetyinen and Go, 2009). Thirdly, inbound

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tourism promotes industrial development through spillover effects (Cernat & Gourdon, 2012). Fourthly, tourism creates jobs and hence stimulates earnings (Lee & Chang, 2008). Finally, tourism generates positive economic externalities (Punia, 1994; Andriotis, 2002; Weng & Wang, 2004; Croes, 2006).

Regarding other factors affecting economic growth, it may be noted that financial development is also emerging as an important driver of economic growth (Shahbaz, Kuma, Ivanov & Loganathan, 2016). Besides, Ridderstaat and Croes (2015) established a link between money supply and tourism demand cycles.¹ Indeed, the global tourism has been severely affected by the recent financial crisis (Papatheodorou et al., 2010). From our foregoing discussion, it appears that there is a reasonable relationship between economic growth, tourism and financial development. Against this background, the objective of the current study is to investigate the plausible linkages between economic growth and tourism while considering the relative importance of financial development in the context of India.

1.1. Importance of tourism in India

The enduring ability of the tourism sector to advance economic growth and make employment at a quicker rate than the other sectors of the economy has driven the Government of India (GOI) to reform its tourist visa policy, develop infrastructure, and rationalize the rates of luxury tax in conformity with best international practice. Besides, the GOI has also recently formulated National Tourism Policy 2015 which is aimed at promoting the country as a honeymooners' paradise. Moreover, India's new government has set tourism as a key sector to meet the overall objective of the faster economic growth. Presently, the significance of tourism in Indian economy is relatively low (Aramberri, 2004, Narayan, Rajendran, Sai & Gopalan, 2009). For instance, just 6.7 per cent of GDP originates in this sector in 2014. This implies that there is a large untapped potential in Indian tourism industry. In fact, UNWTO (2015) noted that India recorded the strongest growth in international tourists arrival during the last decade. In view of these reservations, it becomes imperative to know whether the new government efforts to transform India into a travel haven will stimulate the country's economic growth. Therefore, the main objective of this study is to examine whether and if so, to what degree India's economic growth is responsive to the development in inbound tourism.

Our choice of India as an empirical attempt is motivated by the fact that the country is one of the fastest growing Asian economies, which implies that its tourism industry can be expected to grow faster in the years to come (Ohlan, 2016a). The choice of India is further motivated by the fact that it has been the world's third largest economy in terms of purchasing power parity next to the USA and China (Ohlan, 2012). Another distinctive feature of India is that it has recorded double-digit growth in international tourism receipts, a compound annual growth rate of 11.23 per cent during 2005–2014. India is eager to promote tourism internationally, and it offers enormous natural and cultural advantages for those who are looking for a vibrant destination (Jauhari, 2009). It is clear here that exploring the link between tourism and economic growth in India enables the policy makers to design effective tourism policy.

The remainder of the study is organized as follows. Section 2 provides an analytical review of the literature establishing a link between tourism, economic growth and financial development. The data, empirical model and econometric techniques used in the study are deliberated in Section 3. The empirical findings and their discussion are given in Section 4. Finally, the concluding remarks with the policy implications of our findings for promoting sustainability of the tourism industry are outlined in Section 5.

2. Literature review

A brief review of the relevant literature on tourism-growth nexus for the world at large, link between tourism and financial development, and applicability of tourism-led growth hypothesis in India is in order.

2.1. Tourism-growth nexus in the world

To the best of our knowledge, Castro-Nuno, Molina-Toucedo, and Pablo-Romero (2013), Pablo-Romero and Molina (2013), Brida, Cortes-Jimenez, and Pulina (2016), Kumar, Loganathan, Patel, and Kumar (2015) and Tang and Abosedra (2016) have compiled comprehensive survey of literature for the TLGH. To avoid repetition, different strands of the literature on tourism-growth nexus are provided here. First, on the dynamics of tourism and economic

¹Our attention was drawn to this by an anonymous referee of this journal.

growth nexus, Brida, Carrera, and Risso (2008), Katircioglu (2011), Belloumi (2010), Al-mulali, Fereidouni, Lee, and Mohammed (2014), Jalil, Mahmood, and Idrees (2013), Brida, Lanzilotta, Pereyra, and Pizzolo'n (2015), Bassil, Hamadeh, and Samara (2015), Ertugrul and Mangir (2015), and Tang and Tan (2015) found support for the legitimacy of the tourism-led growth hypothesis. However, among others, Oh (2005), Parrilla, Font, and Nadal (2007), Payne and Mervar (2010), Matarrita-Cascante (2010), Lee (2012), Ivanov and Webster (2012) and Bouzahzah and Menyari (2013) maintained its antithesis: economic growth promotes tourism, and not vice-versa. This strand of literature holds the existence of the growth-led tourism hypothesis. Whilst, there are additionally a few studies which propose either a feedback type link between tourism and growth (e.g., Katircioglu, 2009a; Seetanah, 2011; Yazdi Salehi, & Soheilzad, 2017) or no relationship at all (e.g., Tang & Jang, 2009; Katircioglu, 2009b).

In regard to the influence of the size of a country on the link between tourism and growth, Lanza and Pigliaru (2000) and Singh (2008) empirically observed that only small countries were highly specialized in tourism. On the other hand, Sequeira and Nunes (2008) conclude that country size does not influence the link between tourism and economic growth.

On the issue of the effect of the level of economic development of a country on the dynamics of tourism and growth, Figini and Vici (2010) and Ekanayake and Long (2012) find that tourism does not boost growth in developing countries, while the link between tourism and economic growth occurs in more developed countries (Cárdenas-García et al., 2015). In sharp contrast, Seetanah (2011) and Salmani, Panahi, and Razzaghi (2014) observed that tourism positively affected the growth in both developed and developing countries with comparatively higher growth effects in developing countries.

2.2. *Tourism and financial development*

Some select studies investigating the relationship between tourism and financial development are briefly reviewed below.

Song and Lin (2010) estimated the impact of financial crisis of 2007 on tourism in Asia using autoregressive distributed lag model. It was found that the financial crisis had a negative impact on both inbound and outbound tourism in Asia.

Ridderstaat and Croes (2015) investigated whether money supply cycles in Canada, United Kingdom, and United States affected tourism demand cycles for Aruba and Barbados applying unit root, cointegration and causality testing. They found that money supply cycles could impact the cyclical movements of tourism demand and that the impacts were asymmetric, depending on the stage of development of the cycles.

Başarir and Çakir (2015) investigated the casual relationship between tourism, financial development, energy consumptions and carbon emissions in Turkey and four European Union countries, France, Spain, Italy and Greece, over the period 1995–2010. They found the existence of a feedback type causal relationship between the tourist arrivals and financial development.

Shahbaz et al. (2016) examined the tourism-growth nexus for Malaysia by incorporating financial development and trade openness over the period 1975–2013. Their results show the presence of bidirectional causation between tourism and output per capita, financial development and tourism and trade openness and tourism demand, duly indicating the feedback or mutually reinforcing impact between the variables and providing evidence that tourism was central to enhancing the key sectors and the overall income level.

Ngoasong and Kimbu (2016) used a micro-ethnographic approach to analyze the role of informal microfinance institutions in development-led tourism entrepreneurship in Cameroon. They found that collective action in informal microfinance institutions enabled entrepreneurial members to create small tourism firms.

Kumar and Kumar (2013) investigated the contribution of tourism with other contemporary drivers such as financial development and urbanization in economic growth in Fiji over the periods 1981–2009 using the ARDL bounds approach. They found that tourism accounted for 0.13 per cent to per worker output, whereas financial development had the largest contributory power of 0.71 per cent per every 1 per cent increase in the long-run.

Kumar (2014) explored the dynamics of the relationship between information communication technology (ICT), tourism and financial development on economic growth in Vietnam over the period 1980–2010 using the ARDL bounds testing model. It was found that a bi-directional causation existed between tourism and output per worker indicating that both tourism and output per worker were mutually reinforcing each other. In addition, tourism has a

short-run effect only, whereas ICT and financial development has a long-run effect on output per worker. From these studies it appear that financial development affects tourism and economic growth.

2.3. *Tourism-growth nexus in India*

The empirical literature concerning applicability of TLGH in India is scant to the extent that the findings of earlier studies are contradictory in nature which required more evidence. For instance, [Ghosh \(2011\)](#) examined the cointegration between numbers of international tourist arrivals and economic growth over the period 1980 to 2006 using autoregressive distributed lag (ARDL) model. It was concluded that there is no long-run relationship between international tourist arrivals and economic growth, thus TLGH is not valid for India. On the contrary, [Tang, Tiwari, and Shahbaz \(2016\)](#) related international tourist arrivals with energy consumption and economic growth nexus for India covering the period from 1971 to 2012. Their results showed a feedback type relationship between international tourist arrivals and economic growth in India.

[Mishra, Rout, and Mohapatra \(2010\)](#), applying VECM (Johansen)-Granger's causality test on annual data on GDP, international tourism receipts and exchange rate over the period 1978–2009, concluded that tourism promoted India's long-run economic growth. [Georgantopoulos \(2013\)](#), in sharp disagreement, using annual data on tourism expenditure, GDP and real effective exchange rate over the period 1988–2011, failed to find the long-run casual link between tourism and economic growth in India.

However, the extant empirical literature has limitations that the study aims to address. For instance, we observed that none of the above mentioned studies provided the estimates of the magnitude of the impact of tourism on India's economic growth both in the short-run and long-run. In other words, the empirical literature on confirmation of TLGH looked generally at the presence of cointegration relationship and causality nexus while ignoring the economic growth elasticity with respect to tourism which is vital for policy discussion. Second, [Ghosh \(2011\)](#) and [Tang et al. \(2016\)](#) used data on number of international tourist arrivals and [Georgantopoulos \(2013\)](#) on tourism expenditure while the widely used proxy of inbound tourism is international tourism receipts ([Brida et al., 2016](#)). Third, studies concerning applicability of TLGH in India used a relatively small time series (24 to 40 observations).

Forth, in context of international literature as well, regarding the methodological structure used to examine the relationship between tourism and economic growth, the majority of the empirical studies relied upon [Engle and Granger \(1987\)](#) two-step approach and the Johansen test ([Johansen, 1988](#)) which did not allow for estimation of the short-run elasticity. The majority of studies confirming validity of TLGH is confined to small economies. In addition, very little attention is paid to innovative accounting and variance decomposition analyses. Apart from these, there are very few studies considering the possible effect of structural breaks in investigation of the stationarity of the tourism series. In sum, the empirical literature on TLGH is less rigorous. Hence, it is clear that the validation of the applicability of TLGH in India requires exact empirical estimation of the direct influence of inbound tourism on economic growth.

The present study fills these important gaps in the literature by assessing the less explored link between tourism and economic growth in India applying advance econometric techniques. Our methods of analysis comprise of: break point unit root test to confirm the stationarity status of the series, [Bayer and Hanck \(2013\)](#) combined tests and [Pesaran, Shin, and Smith \(2001\)](#) ARDL bounds testing approaches to cointegration, vector error correction model to ascertain the direction of causality, and impulse response and variance decomposition analyses to obtain the information behind the sample period. The current study covers a large enough period from 1960 to 2014. We used an appropriate proxy of inbound tourism: international tourism receipts ([Kumar, 2014](#)). In addition, the study contributes to the international literature by validating TLGH in case of a large country.

3. Methodology

3.1. *Data description*

The data used in the study are annual figures for the period stretching from 1960 to 2014, consisting of one endogenous variable (GDP per capita, a proxy for economic growth) and two exogenous variables (international tourism receipts per capita and financial development). The variables selected in the study are based on the new economic growth theory, provided by [Balassa \(1978\)](#), which posits that export expansion can stimulate economic

growth because it promotes specialization and raises factors productivity by increasing competition, creating positive externalities by advancing the dispersal of specialized information and abilities. The inclusion of financial development in the examination of the tourism-led growth hypothesis is indeed one of the unique features of the study in case of India that reduces the omitted variable bias as it is a theoretically and empirically recognized source of comparative advantage (Hur, Raj, & Riyanto, 2006).

The GDP and international tourism receipts are measured in terms of an international currency, US\$, which mitigates, to some extent, the effect of exchange rate fluctuations on the data series. In line with a recent study on the link between financial development and economic growth (Hassan, Sanchez, & Yu, 2011), the proxy of financial development is obtained as a ratio of the aggregate money supply (M_3) to GDP.

The data on all three variables have been obtained from the *Economic Survey*, Government of India, India. The correlation matrix and descriptive statistics of the data series used in the study are presented in Table 1 for ready reference.

As noted from the correlation matrix, the natural logarithm of growth, tourism and financial development are positively correlated. In addition, there is not any unusual feature in our data.

3.2. The model

In order to avoid the problem of omitted-variable bias, this study parallels Kumar and Kumar (2013), Kumar (2014), Başarir and Çakir (2015) and Shahbaz, Kuma, Ivanov, and Loganathan (2016) in the use of the financial development as an additional variable in tourism and economic growth function for India. The general functional form of the model for estimating the influence of tourism on economic growth is developed as Eq. (1).

$$G_t = f(T_t \times F_t) \quad (1)$$

In conformity with the existing literature, all the data series have been transformed into the natural logarithmic (ln) form, so estimated coefficients represent elasticities and be efficient. The log-linear model can now be presented as follows:

$$\ln G_t = \ln T_t + \ln F_t + \mu_t \quad (2)$$

where G = GDP per capita, T = international tourism earnings per capita, F = financial development, t = time, μ = error term.

Table 1
Correlation matrix and descriptive statistics.

Statistic	Growth (lnG)	Tourism (lnT)	Financial Development (lnF)
Mean	5.7331	4.6851	4.3161
Median	5.7368	5.1258	4.1128
Maximum	7.3281	7.3466	7.9811
Minimum	4.4285	1.7407	1.8405
Standard deviation	0.8469	1.8012	1.9980
Skewness	0.2840	-0.3773	0.5200
Kurtosis	2.2260	1.8965	2.0246
Jarque bera	2.1120	4.0953	4.6591
(Probability)	(0.3478)	(0.1290)	(0.0973)
Observations	55	55	55
Correlation			
lnG	1.0000	–	–
lnT	0.9656	1.0000	–
lnF	0.9757	0.9270	1.0000

3.3. Cointegration analysis

The cointegration relationship between tourism and economic growth is investigated by applying the joint cointegration test proposed by [Bayer and Hanck \(2013\)](#). This test provides uniform and reliable cointegration results by integrating the findings of four cointegration approaches, namely [Engle and Granger \(1987\)](#), [Johansen \(1995\)](#), [Boswijk \(1994\)](#) and [Banerjee, Dolado, and Mestre \(1998\)](#) which are expressed by EG, JOH, BO and BDM respectively. This formula is as follows:

$$EG-JOH-BO-BDM = -2[\ln(PEG) + \ln(PJOH) + \ln(PBO) + \ln(PBDM)] \quad (3)$$

where PEG, PJOH, PBO and PBDM represent the probability values of EG, JOH, BO and BDM tests respectively. To conclude whether long-run association is present or not among the series, the Fisher statistic is applied. One can reject the null of no cointegration hypothesis if the critical value provided by Bayer and Hanck is below the calculated Fisher statistics and vice-versa ([Ohlan, 2016b](#)).

Further, the results of this test are confirmed by applying [Pesaran, Shin, and Smith \(2001\)](#) autoregressive distributed lag (ARDL) model. In comparison of other cointegration methods such as the two-step approach suggested by [Engle and Granger \(1987\)](#) and the Johansen test ([Johansen, 1988](#)), the ARDL model of cointegration enjoys certain econometric advantages. For instance, this model does not require the presence of singular integration (I(1)) unlike other approaches such as [Johansen and Juselius \(1990\)](#). The estimates for long-run and short-run relationship can be obtained at the same time. However, a limitation of the ARDL model is that it fails to give any empirical estimates if the series are integrated of order two or I(2).

From Eq. (2), the empirical version of the ARDL model to determine the relationship between India's economic growth, tourism and financial development can be expressed as Eq. (4):

$$\Delta \ln G_t = \alpha_0 + \sum_{i=1}^m b_i \Delta \ln G_{t-i} + \sum_{i=0}^n c_i \Delta \ln T_{t-i} + \sum_{i=0}^o d_i \Delta \ln F_{t-i} + \phi_1 \ln G_{t-1} + \phi_2 \ln T_{t-1} + \phi_3 \ln F_{t-1} + \mu_t \quad (4)$$

where Δ is the first-difference operator, α_0 stands for constant, t shows time, b_i , c_i , d_i are the coefficients of short-run dynamics and ϕ_1 , ϕ_2 , ϕ_3 represent the long-run dynamic relationship, while μ is a stochastic error term. In the ARDL model, the bounds test is applied to determine whether the variables are cointegrated.

This test is based on the joint significance of F -statistic and the χ^2 statistic of the Wald test. When the GDP per capita ($\ln G$) used as a dependent variable and international tourism receipts per capita ($\ln T$) and financial development ($\ln F$) were assumed as the explanatory variables. The null of no cointegration hypothesis is examined by testing the joint significance of the F statistic of ϕ_1 , ϕ_2 , ϕ_3 . And if the calculated F statistic falls above the upper critical value presented by [Pesaran et al. \(2001\)](#), the no cointegration hypothesis is rejected. In other words, the variables are cointegrated.

If the series are cointegrated, an error correction mechanism (ECM) can be developed as Eq. (5), which shows the short-run influence of tourism and financial development on India's economic growth.

$$\Delta \ln G_t = \gamma_0 + \sum_{i=1}^m c_i \Delta \ln G_{t-i} + \sum_{i=0}^n d_i \Delta \ln T_{t-i} + \sum_{i=0}^o e_i \Delta \ln F_{t-i} + \psi Ecm_{t-i} + \nu_t \quad (5)$$

where Ecm is the error correction term, and ψ is the coefficient of the error correction term which shows the pace of adjustment of the variables to equilibrium in long-run every year. The Augmented Dickey-Fuller (ADF) ([Dickey & Fuller, 1979](#)), [Phillips and Perron \(1988\)](#) and [Vogelsang and Perron \(1998\)](#) unit-root tests are applied to ensure that the variables are not integrated of order two (I(2)). Likewise, the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) tests suggested by [Pesaran and Shin \(1999\)](#) are applied to test the long-run stability of the parameters to be estimated.

3.4. Causality analysis

As we show in [Section 4.1](#), the series of economic growth, international tourism receipts and financial development are cointegrated. For this reason, to examine the direction of the causality, the Vector Error-

Correction Model (VECM) Granger-causality test is used. The VECM can be presented as given below:

$$\begin{pmatrix} 1-L \end{pmatrix} \begin{bmatrix} \ln G_t \\ \ln T_t \\ \ln F_t \end{bmatrix} = \begin{bmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \end{bmatrix} + \sum_{i=1}^p \begin{pmatrix} 1-L \end{pmatrix} \begin{bmatrix} \partial_{11,i} \partial_{12,i} \partial_{13,i} \\ \partial_{21,i} \partial_{22,i} \partial_{23,i} \\ \partial_{31,i} \partial_{32,i} \partial_{33,i} \end{bmatrix} \times \begin{bmatrix} \ln G_{t-1} \\ \ln T_{t-1} \\ \ln F_{t-1} \end{bmatrix} + \begin{bmatrix} \delta_1 \\ \delta_2 \\ \delta_3 \end{bmatrix} \begin{pmatrix} ECT_{t-1} \end{pmatrix} + \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \end{bmatrix} \quad (6)$$

where $(1-L)$ is showing the difference operator, ECT_{t-1} is the one period lagged error correction term, derived from cointegrating vector while μ_{1t} , μ_{2t} , and μ_{3t} are residual terms. The statistical significance of ECT_{t-1} confirms the existence of long-run Granger-causality while Wald's test χ^2 statistic for the combined significance of lagged values of variable exhibits short-run dynamics (Ohlan, 2015). In order to examine the robustness of the causality analysis, the variance decompositions (VDs) and impulse response functions (IRFs) are applied.

4. Results and discussion

4.1. Analysis of the long-run and short-run impact

Primarily, in order to ensure that the variables are not $I(2)$, we have examined the integrating properties of the series by applying Augmented Dicky–Fuller (ADF) and Philip Perron (PP) unit root tests. The results of ADF and PP tests are detailed in Table 2.

It is found that the indices of economic growth, tourism and financial development are non-stationary at the level. However, in first difference form, all the variables become stationary. This empirical result indicates that GDP per capita ($\ln G_t$), international tourism receipts per capita ($\ln T_t$) and financial development ($\ln F_t$) series are integrated of order one: $I(1)$. This empirical finding supports a growing recognition that the majority of the macroeconomic series is $I(1)$ (Nelson & Plosser, 1982).

The results of Vogelsang and Perron (1998) structural break unit root test are presented in Table 3. These results confirm our earlier finding that in spite of the presence of structural breaks, our variables are integrated of order one.

Since unit root tests consistently suggest that all series have singular integration, the Bayer and Hanck (2013) test is appropriate to investigate whether the variables are cointegrated. The results of Bayer and Hanck (2013) cointegration test are given in Table 4. A glance at Table 4 makes it clear that the estimated value of Fisher-statistics for EG-JOH-BO-BDM test is greater than the table value at 5 per cent level of significance. Hence, we reject the null of no cointegration hypothesis and conclude that tourism, financial development and economic growth are cointegrated.

The results of Bayer and Hanck (2013) model are verified further applying ARDL model selected based on Schwarz Bayesian Criterion (SBC). Table 5 illustrates that the estimated value of F -statistic is above the upper limit of the bound when $\ln G_t$ is used as a dependent variable. Hence, we reject the null hypothesis $H_0: \phi_1 = \phi_2 = \phi_3 = 0$ of Eq. (4). Therefore, we are able to conclude that $\ln G_t$, $\ln T_t$ and $\ln F_t$ are significantly cointegrated over the period from 1960 to 2014.

Having found the presence of cointegration relationship among the variables, we have gone in for examining the long-run and short-run impact of these variables on economic growth. According to Eq. (4) and the principle of minimum SBC value, we single out the ARDL (1,0,1) model, and the estimates for the long-term impact are shown in Table 6. Obviously, our model fits the data well and all the independent variables are statistically significant.

Several observations are made from Table 6. Briefly, tourism and financial development are positively and statistically significantly related to economic growth. In other words, the increase in tourism and financial development will result in an increase in economic growth in the long run. The details are stated as below. First, rising international tourism receipts have a long-run significant influence on India's economic growth, specifically, a 10 per cent increase in tourism earnings per capita leads to 1.9 per cent growth in GDP per capita. In a policy context, our finding suggests that tourism would be a significant catalyst for boosting the growth of Indian economy. This is an important fact since tourism in India has never indicated.

Table 2
ADF and PP unit root tests results.

Variable	ADF		PP		Inference
	Constant	Constant and trend	Constant	Constant and trend	
$\ln G_t$	0.4463(0)	-1.5885(0)	0.4463(0)	-1.7485(2)	Nonstationary
$\ln T_t$	-0.7997(1)	-2.0684 (1)	-0.5362(3)	-1.8114(3)	Nonstationary
$\ln F_t$	0.6072(1)	-2.4694(1)	1.4035(1)	-2.3436(1)	Nonstationary
$\Delta \ln G_t$	-6.6532* (0)	-6.6581* (0)	-6.6532* (0)	-6.6580* (1)	Stationary
$\Delta \ln T_t$	-4.7493* (0)	-4.7049* (0)	-4.7738* (1)	-4.7286* (1)	Stationary
$\Delta \ln F_t$	-4.4457* (0)	-4.6251* (0)	-4.3912* (3)	-4.4223* (4)	Stationary

Note: () shows lags and bandwidths for ADF and PP tests respectively.

*indicates the rejection of the null of non-stationarity hypothesis at 1 per cent level of significance.

Table 3

Break point unit root test results.

Variable	Constant	Break Year	Constant and trend	Break Year	Inference
$\ln G_t$	-1.6281(0)	2002	-2.8498(0)	2004	Nonstationary
$\ln T_t$	-2.2346(1)	1973	-4.1916(1)	1974	Nonstationary
$\ln F_t$	-1.6728(1)	1996	-4.5213(1)	1999	Nonstationary
$\Delta \ln G_t$	-7.1615 [*] (0)	1991	-7.0604 [*] (0)	1991	Stationary
$\Delta \ln T_t$	-5.3385 [*] (0)	1980	-5.8667 [*] (0)	1980	Stationary
$\Delta \ln F_t$	-4.9534 [*] (1)	1995	-5.5390 [*] (0)	2008	Stationary

Note: () shows lags for [Vogelsang and Perron \(1998\)](#) unit root test.

^{*}indicates the rejection of the null of non-stationarity hypothesis at 1 per cent level of significance.

Table 4

Bayer and Hanck cointegration test results.

Model	EG-JOH-BO-BDM	Critical value at 5 per cent level	Inference
$F(\ln G_t \ln T_t, \ln F_t)$	25.380 [*]	21.106	Cointegration

^{*}shows rejection of the null of no cointegration hypothesis at 5 per cent level of significance.

Table 5

The results of ARDL cointegration analysis.

Estimated ARDL model	Optimal lag length	F-statistics	Lower Bound critical value at 5 per cent level	Upper Bound critical value at 5 per cent level	Inference
$F(\ln G_t \ln T_t, \ln F_t)$	(1,0,1)	5.6570 [*]	4.0461	5.1315	Cointegration

Note

^{*}shows rejection of the null of no cointegration hypothesis at 5 per cent level of significance.

Table 6

Long run estimates from ARDL model.

Variable	Coefficient	Standard Error	T-Ratio [Prob]
$\ln T_t$	0.1986 [*]	0.0418	4.7455[0.000]
$\ln F_t$	0.2700 [*]	0.0378	7.1382 [0.000]
Constant	3.7977 [*]	0.0838	45.3337 [0.000]

Note.

^{*}indicates significant at the 1 per cent level. Prob = Probability.

Second, financial development as expected is found to be positively and strongly associated with economic growth. To be precise, a 10 per cent advancement in financial development could be linked with a 2.7 per cent rise in economic growth in the long run, all else remaining the same. This empirical evidence is consistent with the finding of [Hassan et al. \(2011\)](#) for a panel of South Asian countries.

Next, in order to obtain the estimates of the short-run influence of tourism on economic growth in India, the error correction approach is employed. The findings of short-run analysis are given in [Table 7](#).

It is found that the estimated ECM_{t-1} is statistically significant at the 1 per cent level and holds a negative sign. This finding substantiates the earlier cointegration between tourism and economic growth, and indicates the pace of adjustment from the short-run toward long-run equilibrium path. Error correction coefficient reveals that the short-run divergences in economic growth from long-run equilibrium are adjusted by 35 per cent every year.

The results show that tourism has statistically significant positive impact on economic growth. This signifies that tourism acts as an engine of economic growth in the short-run as well, a 5 per cent growth in international tourism receipts per capita gives rise to a 0.35 per cent increase in GDP per capita, ceteris paribus. The coefficient of financial development is found to be insignificant in the short-run.

Table 7
Results of error correction representation for the ARDL model.

Variable	Coefficient	Standard Error	T-Ratio [Prob]
$\Delta \ln T_t$	0.0707*	0.0212	3.3382 [0.002]
$\Delta \ln F_t$	-0.0973	0.0666	-1.4606 [0.150]
ECM_{t-1}	-0.3559*	0.0767	-4.6396 [0.000]
Diagnostic tests	$R^2 = 0.3434$; F-Stat. $F(3,50) = 8.5438^*$ [0.000]; DW-statistic = 1.6703		

Note.

*shows significance at 1 per cent level. Prob = Probability.

In what follows, a comparison of short-run and long-run elasticity coefficients makes apparent that long-run responsiveness of economic growth with respect to tourism is higher than that of short-run. It indicates that over time higher international tourism receipts in India give more rise to economic growth. The calculated value of the F -statistic given in the last row of Table 7 is statistically significant at the 1 per cent significance level. It means that the overall fit of the model used is good. The value of Durbin–Watson's statistic for our model is less than two that means there is no autocorrelation problem. Besides, the R^2 value is 0.34, which shows these independents can explain 34 per cent of the total information on economic growth changes in the short term and other factors may explain 66 per cent.

Moreover, because of the occurrence of the structural changes in the country, India's macroeconomic series may have witnessed structural breaks. Therefore, the stability of parameters of the ARDL model is examined by conducting the CUSUM and the CUSUMSQ tests. The results of these tests are displayed in Figs. 1 and 2 respectively.

As noted from Fig. 1, there is a slight instability in the year 1991, which could have been due to adoption of economic liberalization by the country. Nevertheless, the CUSUMQ plot shows relatively evidence of parameter stability in the model at the 5 per cent level of significance. That is the estimated parameters are stable and consistent. This result corroborates the similar finding of Kumar, Loganathan, Patel, and Kumar (2015) in the case of Malaysia.

4.2. Analysis of causality

At this stage, we investigate the causal relationship between international tourism receipts per capita, financial development and GDP per capita. The empirical results derived applying VECM (Eq. (6)) are given in Table 8.

Turning first to the long-run result, we find that ECM_{t-1} in G_t equation has a negative sign and is statistically significant at the 1 per cent level of significance. Hence, based on the significance of the ECM_{t-1} term, we can state that inbound tourism Granger-causes to GDP in India in the long run and no other way round. This result reinforces the finding of Mishra et al. (2011) in Indian context.

In addition, the analysis indicates the existence of a long-run one-way Granger-causation running from financial development to economic growth in India. Based on these empirical findings, the TLGH is validated by Indian experience. This finding provides further imputes to the tourism management strategies obtained in Incredible India International Campaigns.

In case of short-run, the value of joint χ^2 Wald statistics of the lagged explanatory variables of VECM is statistically insignificant. These findings convey that, in the short-run, there is an absence of Granger-causality between tourism and economic growth. This finding is different from Georgantopoulos (2013) for India, but consistent with that of Belloumi (2010) in the case of Tunisia. Next, we test the robustness of the above causality analysis.

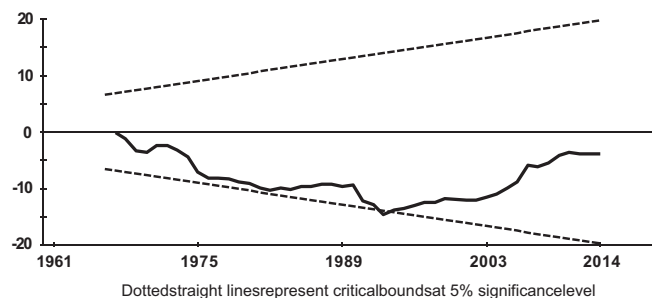


Fig. 1. The results of CUSUM test.

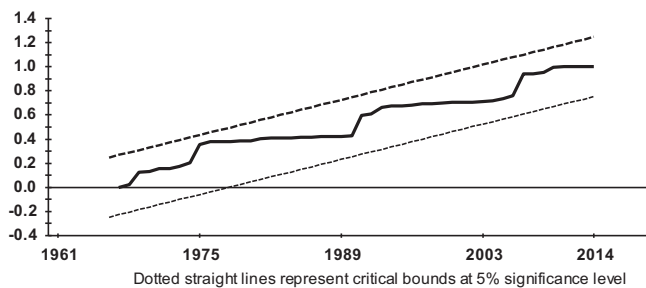


Fig. 2. The results of CUSUMSQ test.

Table 8
Results of VECM granger causality model.

Dependent variable	Direction of causality			
	Short-run (Wald Test χ^2 statistic)			Long-run
	$\sum \Delta \ln G_{t-1}$	$\sum \Delta \ln T_{t-1}$	$\sum \Delta \ln F_{t-1}$	ECM_{t-1} [Prob]
$\Delta \ln G_t$...	1.039[0.595]	0.439[0.803]	-0.381* [0.001]
$\Delta \ln T_t$	0.101[0.951]	...	1.450[0.484]	0.025 [0.924]
$\Delta \ln F_t$	0.809[0.667]	1.345[0.510]	...	0.135 [0.519]

Note.

*shows significance at the 1 per cent level. [] = Prob = Probability.

4.3. Impulse response and variance decomposition analyses

In order to investigate the influence of innovations in all variables in the system on economic growth, the impulse response analysis is applied. The impulse responses of economic growth to one standard deviation innovations to tourism and financial development are depicted in Fig. 3.

The impulse response findings reveal that, first, the response of economic growth to a shock on tourism earnings per capita is positive throughout the period under analysis. Specifically, it increases consistently in the first fifteen periods, reached at a level of 0.47, and then turns to be almost stable.

This finding is contrary to a conclusion reached in Georgantopoulos (2013) that an expected shock to tourism expenditure does not influence the growth in GDP, but consistent with that of Bassil et al. (2015) in Lebanese case: positive shocks to the tourism sector enhance economic growth. This difference in findings may be traced in methodological weakness of earlier studies in the context of India. Second, the response of economic growth to a shock on financial development exhibits a steady rising trend up to first sixteen periods and thereafter reaches the stable level about

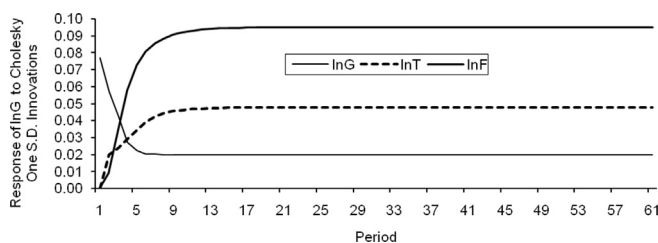


Fig. 3. Impulse response of economic growth.

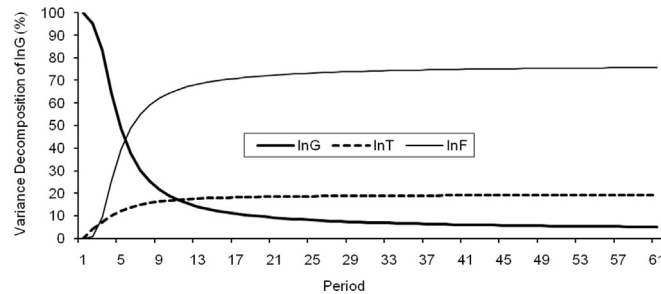


Fig. 4. Variance decomposition of economic growth.

0.095. This finding confirms our earlier finding regarding the sign of a coefficient of long-run (positive) impact of tourism and financial development on economic growth obtained applying ARDL bounds testing approach.

Finally, in order to compare the contribution extent of the percentage of tourism and financial development to the change in economic growth, the variance decomposition approach is adopted in the paper. The results are presented in Fig. 4. Fig. 4 displays that as time goes by, the contribution extent of GDP itself to the change in GDP has a sharp downward trend, while those of tourism and financial development rise steadily. Subsequently, the findings assert that TLGH for India is valid and stable.

This empirical evidence is again in contrast to the finding of Georgantopoulos (2013) though it is notable that the earlier study uses small sample and is methodologically weak. Evidently, these results are useful for policy makers. The main policy implication is that India will benefit from the encouragement of tourism growth. The eager tourism advancement may be as persuasive as India's new government currently believe.

5. Concluding remarks and policy recommendations

This paper empirically investigated both the short-run and long-run effects of inbound tourism on economic growth in India over the period of 1960–2014. To accomplish this, the degree of stationarity of the variables was examined by applying the Vogelsang and Perron (1998) break point unit root test. Our finding shows that all the variables used in the study are $I(1)$. Evidence for the existence of a tourism-led growth hypothesis has been established for India. To do so, the study applied the Bayer and Hanck (2013) and ARDL modeling approaches to cointegration, VECM, innovative accounting and variance decomposition methods.

The empirical results of both Bayer and Hanck (2013) and ARDL approaches to cointegration consistently revealed that India's economic growth, tourism and financial development are cointegrated. This methodology has allowed obtaining elasticities of economic growth with respect to tourism both in the long-run and short-run. Remarkably, we find that the earnings from the international tourism positively affect India's economic growth both in the long-run and short-run. With a 1 per cent raise in international tourism receipts, on average, India's GDP increases by 0.2 per cent in the long run. The estimates of parameters are found to be stable over the sample period. Notably, we find a unidirectional long-run causation running from tourism to economic growth in India. This means that inbound tourism earnings precede growth in GDP. This finding is in line with that of Gunduz and Hatemi-J (2005) for Turkey, Belloumi (2010) for Tunisia, and Tang and Abosedra (2016) for Lebanon. In sum, these empirical findings lend further support to wide applicability of the tourism-led growth hypothesis.

In the policy context, our findings offer justification for Government of India's goal of investing in the tourism industry as a means of invigorating economic growth over the long run. Tourism can be depended upon to stimulate India's economic prosperity and, for this reason, policy makers ought to give careful consideration toward encouraging inbound tourism.

These findings accentuate the need for more reliable tourism development strategies and programs to be executed by the Government of India to take full advantage of the potential of tourism for promoting economic growth. Presently, the tourism sector is witnessing a shortage of talent in India. Therefore, to achieve the desired growth in this sector the country needs to execute policies that advance enthusiastic and prudent talent management, particularly in human capital development. In addition, the country may step up its incredible India campaign—showcase of different aspects of Indian culture and history—globally to help counterbalance some of the adverse conceptions about tourism, especially the safety of women tourists.

Such novel findings on India have general relevance to different nations too, particularly those looking for new drivers of economic prosperity. For example, Pakistan, they might rely on tourism for economic growth on the off

chance that they found themselves able to draw in honest-to-goodness traveler landings instead of would-be vagrant labors, from Afghanistan, Bangladesh, Burma and Sri Lanka, who facade as tourists. They can direct their policy focus towards extending very warm hospitality to inbound tourists, enhancing tourism infrastructure and generating more visitor trust in the worldwide tourism market. Apart from these, they can provide internationally benchmarked tourism products and vibrant destinations to attract the tourists across the globe.

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