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Tourism and inequality: A relook on the Kuznets curve☆

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ABSTRACT

The study explores the impact of the tourism industry on income inequality upon a panel set of countries, classified in accordance with their levels of economic development. The countries are classified into three clusters based on their per capita GDP, the volume of international trade, and foreign direct investment inflows. The income inequality was measured using the GINI score. The long-run relationship between tourism receipts and GINI income inequality was explored for a panel set of forty-one countries over the period 1995 to 2016. The study concludes that earnings from tourism have varying impacts on the three clustered sets of countries. The inequality index of the highly developed countries remains unaffected by the earnings from tourism. The developed countries show Kuznets curve behaviour as far as the relationship between tourism and inequality is concerned. The developing countries exhibit an inverted Kuznets curve behaviour between tourism receipts and inequality of income.

1. Introduction

The tourism industry is one of the expanding industries found to exist worldwide, and the importance of tourism in fostering economic expansion and development has been expansively acknowledged in the literature. The notable contributions which document the progressive benefits of tourism activities include the studies of Katircioglu (2009), Balaguer and Cantavella-Jorda (2002), Kadir and Jusoff (2010); and Brida et al. (2008). The present study tries to explore the nature of the impact of tourism on the world market across highly developed, developed, and developing countries. The countries are classified into these three clusters based on their per capita GDP, the volume of international trade, and foreign direct investment inflows. It investigates the effect of tourism on the distribution of income and its inequality in a major set of 41 tourist destination countries across the globe, using a panel data set, which is a balanced one, from 1995 to 2016. The paper investigated the varying behaviour of the Kuznets curve across the three groups of countries of the globe. Finally, in exploring the causal behaviour between tourism, inequality, and the control variables [namely trade-openness and FDI (foreign direct investment)], the study adopts the second-generation panel methodology. Furthermore, the study has utilized Dumitrescu and Hurlin (DH) (2012) Granger non-causality test to scrutinize the causal behaviour between income inequality and the other associated variables.

One major issue that has remained under-explored in the literature: Does tourism development increase inequality? This paper attempts to analyze this relatively less explored but important question of the tourism literature. The study, in particular, tries to delve into the implications of the Kuznets's curve behaviour across the rich and the poor set of countries. It would be pertinent to explore here whether the behaviour of the Kuznets curve is conclusive in the literature on tourism studies or there is still scope for an empirical challenge to the long-run verification of the Kuznets curve. Wattanakuljarus and Coxhead (2008) and Blake, Arbache, & Teles (2008) observe that domestic tourism has more inequality reducing impact compared to international tourism because the gains from international tourism are appropriated by large hotel chains, which are in most cases multinational companies. Nevertheless, to achieve the Sustainable Development Goal (SDG) 10 by 2030, it is important to adopt specific policy measures to ensure that tourism does not exacerbate inequality in the spread of income as discussed in the studies of Hardner & Stewart (2009); Alam and Paramati (2016) and Raza and Shah (2017).

The empirical literature that investigates the connection between poverty and tourism-led-growth has mixed conclusions. The studies of

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Croes and Vanegas (2008) and Vanegas and Croes for the country case study of Nicaragua found the significant poverty-reducing impact of tourism expansion. However, Croes (2014) found that tourism does not impact poverty significantly for Costa Rica. Vanegas (2014) concludes for countries in Central America regarding the varied impact of tourism on poverty; it has the weakest impact on Salvador and Honduras and has the strongest impact on Costa Rica and Guatemala. Mbaiwa (2017) case study for Botswana based on both primary and secondary data sets show how transnational companies repatriate profits to the home country. The paper recommends the need for more inclusive development such that the local citizens enjoy the benefits of tourism revenue flows.

The following section discusses the data sets and the methodology. We report the major findings and the discussion in section III. The concluding observations and policy concerns are discussed in section IV.

2. Data and methodology

Depending on the nature of available annual data sets of the concerned set of variables, a total set of forty-one countries are chosen, and the period of observations run from 1995 to 2016. Income inequality is taken as the dependent variable, measured through the GINI coefficient. The GINI score is built on evaluating the population's additive proportions alongside the additive proportions of income they earn. It lies between 0 (the case of perfect equality) and 100 (perfect inequality). The time-series data on income inequality is obtained from the website of UNDP (http://hdr.undp.org). To evaluate the influence of tourism growth on income inequality, we used the GINI index as the dependent variable and tourism receipt (TR) and its squared value (TR2) as the independent variable. Following Alam and Paramati (2016) and Raza and Shah (2017), we added FDI and trade openness (TRD) as other independent variables. The influence of trade openness on GINI was analyzed in the studies of Spilimbergo et al. (1999), Daumal (2013), Mahesh (2016), Raychaudhuri and De (2016). Trade openness increases market size through the production of new products at a lower price, increases purchasing power and people's living standards, Bond et al. (2005) and Khan and Nawaz (2019). It is found that trade openness decreases income disparity and fosters economic liberalization through foreign investment, Asteriou et al. (2014).

Foreign direct investment (FDI) is another indicator of openness of the economy, as it leads to capital investment, technology inflows, enhancement of the pool of management talents, better production systems. Endo (2006) observed that FDI in tourism was relatively less, especially in developing countries' hotels and restaurants. However, developing countries should not disregard the possible roles of FDI in tourism as it can benefit countries to unite towards global tourism chains that eventually leads to an increased tourist flow and generates tourism income. FDI can improve employment in countries with unskilled labor, resulting in a drop in income inequality Chen (2016), Ucal et al. (2016), Kaulihowa and Adjasi (2018) and Khan and Nawaz (2019). According to Figini and Gorg (2011), FDI has a progressive influence on Economic Growth, but its behaviour on inequality is inconclusive. Trade liberalization and inflow of foreign direct investment generate an increase in tourism inflows because of high degrees of economic globalization and integration, so FDI and TRD are used as major control variables in the study. The time series on TR, TRD, and FDI are taken from World Development Indicators (WDI), the online database made available by the World Bank.

As the relationship between GINI score and tourism receipts are likely to be affected by the economic strata of the countries, we adopted the k-means clustering approach to split the countries into three clusters, using average values of per capita GDP (denoted by GDPPC), FDI inflow as percentage of GDP and volume of foreign trade as percentage of GDP of the countries selected for this study.

The k-means algorithm gives greater weightage to a variable that has large average (numerical) absolute values compared to variables with low absolute (numerical) value, and therefore the measured values of the series cannot be directly applied for the clustering process. To circumvent the scale effect of the values in the series, data of each series are converted so that the mean value of the series becomes zero with standard deviation equal to 1, using the following conversion. The converted value of each element of the series becomes $\breve{x} = \frac{x-\mu}{\sigma}$, where $\breve{x}$ is the converted value of the original value (x), μ is the arithmetic mean, and σ is the standard deviation of the series.

With the application of k-means, we obtained three clusters with the following cluster means (see Box. 1 and 2).

Cluster means:

It is found that cluster 1 consists of countries whose GDPPC is greater than one standard deviation from the mean values, and similarly, the cluster mean value of FDI and TRD are also very high. Thus cluster 1 consists of countries with high economic development in all three parameters. Cluster 2 consists of countries with high GDPPC, but average cluster mean values for FDI and TRD. Cluster 3 countries are low GDPPC countries whose mean value is about one standard deviation below the mean. The FDI and TRD values are also low. We used following ranges for classification: development level of countries with mean value > 1.0 σ was considered as very high, between 0.5 σ to 1.0 σ were considered as high, between −0.5 σ to 0.5 σ were considered as average, and value ‹ -0.5 σ were considered as low. Thus, the economic development of countries of the three different clusters based on three measures are as follows.

In sum, based on the development levels there are three clusters: *cluster 1*, *cluster 2* and *cluster 3*, countries are classified as "*very high*", "*high,*" and "*low*", respectively. The alternate nomenclature could be "*highly developed*", "*developed,*" and "*developing*" countries.

2.1. Model specification

The study attempts to explore how inequality (GINI) is impacted by TR, TRD and FDI, equation (1) provides the general model specification,

$$GINI_{it} = \mathrm{f}\left(\mathrm{TR}_{\mathrm{it}},\ TR_{it}^{2},\ TRD_{it},\ FDI_{it},\ \mu_i\ \varepsilon_{it}\right) \quad (1)$$

In equation (1), countries are denoted by the subscript i ($i = 1,2, \ldots \ldots$ N) and t indicates the time ($t = 1,2 \ldots \ldots$T), ε_{it} is the usual error term. The specific country-level fixed-effect is shown by μ_i. equation (1) includes TR and its square as explaining variables because the study attempts to capture the nonlinearities in the tourism and inequality relationship. By including the square term of TR, the study attempts to explore the inconclusive linear relation between tourism and income inequality.

2.2. Econometric methodology

Cross-sectional dependence measure and the Unit root tests.

This study examines the causality association among income inequality, tourism receipts, FDI, and trade liberalization in a group of forty-one countries and further splitting the countries into sub-panels based on their per capita incomes; the study applies the cross-sectional independence test to avoid misspecification in empirical results. Here we use the Pesaran (2004) test for cross-sectional dependence (CD).

2.3. Panel level unit root test

A prerequisite to obtaining the long-run cointegrating relationship of the observations is the examination of the stationary properties of the set of variables. This research applied Levin, L, and Chu (LLC) (2002) unit root test. The fundamental difficulty associated with these tests is they are formed with the supposition that each time series of the observations are independent at the cross-section level. However, a wide-ranging study discusses that the panel set of observations in many instances is dependent on the cross-sectional level. The paper to overcome the

Box 1

Cluster #	GDPPC	FDI	TRD
1	1.053	2.413	2.123
2	0.658	−0.395	−0.361
3	−0.914	−0.597	−0.549

Box 2

Cluster #	GDPPC	FDI	TRD
1	Very High	Very high	Very high
2	High	Average	Average
3	Low	Low	Low

shortcoming related to cross-sectional dependency chooses to put the second generation of panel unit test, which rejects the hypothesis of cross-sectional independence. The current research utilized the panel unit root test of Pesaran (2007) to examine the stationary behaviour of the data sets.

2.4. Panel cointegration

After testing the stationary properties of the series observations, the next step is to test the panel cointegrating properties of income inequality, tourism receipts, trade openness, foreign direct investment, over the period 1995 to 2016, across the forty-one sets of countries. In this study, we use the Fisher-type Johansen cointegration method, which was formulated by Maddala and Wu (1999).

2.5. Heterogeneous panel causality test

To search for the short-run bivariate panel causality across inequality of income, tourism receipts, FDI, and trade liberalization, the current paper applies the Dumitrescu and Hurlin (2012) panel causality methods that consider heterogeneity across the cross-section units.

3. Results and discussion

Table 1 gives the means statistics of the different nations over the period 1995 to 2016; the results show that income inequality varies widely across the countries. Table 2 presents the annual growth rates of the concerned observations over the period 1995 to 2016, out of the total forty-one countries, average positive growth rates of income inequality (more than one per cent) is found in the countries, of Australia, Bulgaria, China, Denmark, Japan, and South Africa. This is a cause for concern.

The descriptive statistics for the panel as a whole are presented in Table 3. Based on Table 3, we find that the average inequality for the panel set of countries is around 35.34. Table 3 also presents the results of the correlation matrix.

3.1. Results based on the econometric model

Results of Cross-sectional dependence test and Unit root test.

Table 1
Mean Statistics of individual countries.

Country	GINI	TRD	TR	FDI
Australia	33.32509	40.95898	2.17 E+10	4.08 E+10
Austria	27.95409	91.25856	1.67 E+10	7.73 E+09
Belgium	26.08937	143.4038	9.91 E+09	1.73 E+10
Bulgaria	31.26767	100.7755	2.79 E+09	5.22 E+09
Brazil	49.80417	23.78193	4.06 E+09	1.02 E+11
Canada	32.62273	69.17641	1.55 E+10	4.99 E+10
Switzerland	29.5317	103.4941	1.42 E+10	2.81 E+10
China	40.50273	45.82832	3.07 E+10	1.13 E+12
Colombia	50.58813	36.48923	2.62 E+09	2.07 E+13
Czech Republic	25.32383	116.6662	5.82 E+09	1.72 E+11
Germany	29.58182	69.1771	3.97 E+10	5.27 E+10
Denmark	24.38932	88.93484	5.24 E+09	4.3 E+10
Dominican Republic	45.29872	65.94016	3.69 E+09	5.12 E+10
Spain	33.55455	55.52181	4.77 E+10	2.96 E+10
France	29.05	54.21416	5.09 E+10	3.92 E+10
United Kingdom	33.87273	53.91591	4.16 E+10	6.52 E+10
Greece	34.23909	52.81464	1.24 E+10	1.49 E+09
Hong Kong, China	48.75909	328.0192	2.03 E+10	5.28 E+11
Croatia	29.96273	80.25324	6.68 E+09	1.2 E+10
Hungary	28.2519	136.4205	5.27 E+09	3.02 E+12
Ireland	30.87393	169.3472	6.86 E+09	3.25 E+10
Israel	36.40313	68.62654	4.51 E+09	2.55 E+10
Italy	32.75	50.57637	3.7 E+10	1.6 E+10
Japan	34.62455	26.17989	1.27 E+10	9.9 E+11
Korea, Rep.	32.40909	77.56089	1.19 E+10	1.03 E+13
Luxembourg	27.27176	297.2281	3.59 E+09	1.28 E+10
Morocco	39.30335	67.66728	5.55 E+09	1.3 E+10
Mexico	49.85955	57.14161	1.2 E+10	3.78 E+11
Malaysia	42.33455	179.8396	1.25 E+10	2.51 E+10
Netherlands	28.45182	127.4964	1.34 E+10	1.3 E+11
Norway	24.02618	70.2044	4.45 E+09	5.86 E+10
New Zealand	33.11734	58.62437	5.33 E+09	2.54 E+09
Philippines	43.1349	84.45301	3.42 E+09	7.78 E+10
Poland	32.59136	72.48282	9.05 E+09	4.18 E+10
Portugal	35.06106	67.9056	1.06 E+10	5.95 E+09
Russian Federation	40.24909	53.63887	1.03 E+10	1.48 E+12
Singapore	46.16818	364.091	1.01 E+10	4.95 E+10
Sweden	23.96805	81.77421	8.24 E+09	1.46 E+11
United States	38.33182	25.91313	1.49 E+11	2.54 E+11
South Africa	58.85454	56.12851	7.17 E+09	3.65 E+10

Note: Compilation Author.

Table 2
Average annual growth rates (per cent).

Country	GINI	TRD	TR	FDI
Australia	2.17	0.36	6.20	3.21
Austria	−0.09	1.88	1.78	−213.20
Belgium	−0.05	1.69	5.01	−200.47
Bulgaria	1.29	3.88	9.15	12.07
Brazil	−0.03	1.77	8.96	11.88
Canada	−1.60	−0.31	3.29	4.21
Switzerland	−0.19	2.14	2.51	13.07
China	2.27	0.39	8.05	3.52
Colombia	0.08	0.09	9.15	11.23
Czech Republic	0.17	2.85	4.35	3.72
Germany	0.10	3.18	3.75	8.15
Denmark	1.15	1.84	3.13	1.93
Dominican Republic	0.09	−1.50	7.17	6.92
Spain	−0.31	1.64	3.85	6.56
France	0.10	1.61	3.39	2.63
United Kingdom	−0.71	0.72	3.92	11.37
Greece	−0.32	2.38	6.76	3.56
Hong Kong, China	−0.45	1.78	6.73	8.42
Croatia	0.56	1.92	9.91	12.39
Hungary	−0.48	3.75	4.55	10.70
Ireland	−0.62	2.42	7.10	19.09
Israel	0.84	−0.38	3.07	8.76
Italy	−0.29	0.96	1.36	6.44
Japan	1.60	3.08	9.58	41.05
Korea, Rep.	0.07	1.86	5.66	9.27
Luxembourg	1.10	3.91	5.03	1.86
Morocco	0.15	2.14	8.35	15.72
Mexico	−0.64	2.40	5.38	3.94
Malaysia	−0.79	−1.89	6.28	4.62
Netherlands	−2.76	1.55	2.63	12.33
Norway	0.46	0.03	4.05	−207.80
New Zealand	0.58	−0.42	7.08	−4.45
Philippines	−0.27	−0.98	8.47	6.40
Poland	−0.64	4.04	2.69	6.04
Portugal	−0.08	1.32	5.44	11.65
Russian Federation	−1.14	−0.83	5.32	11.12
Singapore	−0.02	−0.60	4.43	8.17
Sweden	1.06	0.92	5.23	−1.10
United States	0.62	0.79	4.70	8.73
South Africa	1.19	1.59	5.89	2.53

Note: Compilation Authors.

Table 4 presents the results of cross-sectional dependence test (CD) based on Pesaran (2004) and the unit rot test of LLC (2002) and CIPS unit root test, Pesaran (2007). The CD results demonstrate that the null hypothesis of cross-sectional independence can be overruled for the variables, GINI, FDI, TRD, and TR. So, the variables have dependence at a cross-section level. The results of the LLC (2002) unit root test indicate that all the variables are integrated of order I (1).

However, due to the presence of dependence at the cross-section level, the results of the LLC (2004) would be ineffective since it is based on the assumption of cross-sectional independence. The CIPS unit root test developed by Pesaran (2007) is applied, which is built with the supposition of cross-sectional dependence of the set of observations. The CIPS unit root test based on Table 4 shows that the variables GINI, FDI, TRD, and TR are integrated of order I (1). Considering the integration order of the variables, the next task is to investigate the properties of panel cointegration.

Results of co-integration technique.

The analysis of the Fisher-type Johansen panel co-integration test is reported in Table 5.

Both the trace statistic and the maximum Eigen statistic indicate the existence of at least one cointegrating vector. So, we may infer that a significant long-run equilibrating relationship coexists among the concerned variables, namely, GINI, FDI, TRD, and TR.

3.2. Results of FMOLS model

The results of the cointegration, based on Table 5 explain the long-run relationship among the variables; however, they do not explain how the explanatory variables impact income inequality, and whether the relationship is negative or positive. The FMOLS model is applied to examine how FDI, TRD, and TR impact GINI in the long-run. Table 6 presents the results based on the FMOLS model. Since the FMOLS test takes into account the shortcoming of endogeneity and serial correlation, the results of this analysis are meaningful and robust. Based on the results of Table 6, we find that tourism income receipts have a crucial impact on income inequality. A rise in tourism leads to rising inequality. When the impact of the squared tourism income receipts is considered in the analysis, the inequality significantly declines. Such a finding establishes the Kuznets curve relationship in the tourism behaviour on inequality for the panel set of forty-one countries. We next examine how tourism receipts impact the long-run inequality when the countries are divided into three sub-panels. The set of countries is classified as "highly developed", "developed," and "developing" countries, as explained in the section on data and methodology. For Panel A, which consists of the set of *highly developed* countries, tourism receipts have an insignificant influence on income inequality as the p-values are >10%; similar is the finding for squared tourism receipts. Thus, the GINI score of these countries does not depend on tourism receipts and is largely impacted by other variables. For example, the p-value of TRD is highly significant (0.001), and it demonstrates therefore that trade is one of the main factors that have a strong influence on the GINI score of these countries.

In Kuznets (1955) investigation of growth and development, countries grow unequal in the early stage of development because few people are enjoying the benefits of technological advantage, as Economic Growth further expands the benefits of growth gradually trickle down and the people with low income enjoy the benefits which ultimately reduces income inequality. Therefore, according to Kuznets, inequality declines in the mature phases of economic development. The results of Panel B of Table 6, consisting of the developed countries, show that with a rise in tourism receipts, the inequality levels rise in the panel set of countries. However, when the squared term of tourism receipts is

Table 3
Descriptive statistics & correlation matrix.

Variables	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Probability
GINI	35.34384	33	71	21.8	8.768714	0.8534	3.13	107.45	0.00
FDI	1.01 E+12	4.12 E+10	4.02 E+13	−4.4 E+12	4.08 E+12	5.8672	41.74	60072.70	0.00
TRD	95.34811	68.92375	442.62	15.6356	78.73459	2.4083	8.85	2104.41	0.00
TR	1.74 E+10	9.11 E+09	2.49 E+11	5.2 E+08	2.66 E+10	4.6895	32.13	34357.24	0.00

Correlation Matrix

Variables	GINI	FDI	TRD	TR
GINI	1.00	0.21	0.03	0.00
FDI	0.21	1.00	−0.10	−0.08
TRD	0.03	−0.10	1.00	−0.16
TR	0.00	−0.08	−0.16	1.00

Note: Compilation Authors.

Table 4
Test for Cross-sectional Dependence and Panel Unit root tests.

Test for Cross-sectional Dependence		
Variable	Pesaran CD test	p-value
GINI	2.548	0.011
FDI	16.900	0.000
TRD	17.853	0.000
TR	48.196	0.000

Panel Unit root tests								
Variables	Levin, Lin & Chu Unit Root test				CIPS unit root test			
	At level		First Difference		At level		First Difference	
	Test statistic	Prob	Test statistic	Prob	Test statistic	Prob	Test statistic	Prob
GINI	1.421	0.922	−26.395	0.000	−2.639	0.004	−23.331	0.000
FDI	−2.159	0.015	−31.317	0.000	−8.649	0.000	−24.686	0.000
TRD	3.702	1.000	−25.527	0.000	0.338	0.632	−18.926	0.000
TR	10.180	1.000	−17.237	0.000	5.844	1.000	−15.012	0.000

Table 5
Fisher-type Johansen co-integration test results.

H_0: No. of Cointegrating Equations(s)	Fisher Stat.*		Fisher Stat.*	
	(from trace test)	Prob.	(from max-eigen test)	Prob.
None	398.00	0.00	305.50	0.00
At most 1	169.80	0.00	129.00	0.00
At most 2	99.90	0.07	70.83	0.76
At most 3	143.60	0.00	143.60	0.00

Notes: Variables are GINI, FDI, TRD sand TR. **(*)** Probabilities are calculated based on Chi-square distribution.

Table 6a
Analysis of long-run regression, FMOLS Model: Full Panel.

GINI = f (FDI, TRD, TR, TR^2)			
Variable	Coefficient	t-stat	p-value
FDI	−0.016	−1.513	0.131
TRD	0.011	1.802	0.072
TR	7.88E-11	3.317	0.001
TR^2	−1.7E-22	−2.015	0.044

Note: Compilation Authors.

Table 6b
Analysis of long-run regression, FMOLS Model: Sub Panels.

GINI = f (FDI, TRD, TR, TR^2)			
Panel A: Cluster 1 (Highly Developed) Countries			
Variable	Coefficient	t-Statistic	Prob.
FDI	−0.007	−1.142	0.256
TRD	0.017	3.570	0.001
TR	−1.16E-10	−1.296	0.198
TR^2	−1.92E-22	−0.105	0.917
GINI = f (FDI, TRD, TR, TR^2)			
Panel B: Cluster 2 (Developed) Countries			
Variable	Coefficient	t-Statistic	Prob.
FDI	0.039	1.152	0.250
TRD	0.047	2.229	0.027
TR	9.77E-11	3.328	0.001
TR^2	−2.28E-22	−2.408	0.017
GINI = f (FDI, TRD, TR, TR^2)			
Panel C: Cluster 3 (Developing) Countries			
Variable	Coefficient	t-Statistic	Prob.
FDI	−0.0201	−0.582	0.561
TRD	0.0441	3.949	0.000
TR	−3.99E-10	−5.188	0.000
TR^2	1.14E-20	6.942	0.000

Note: Compilation Authors.
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considered, the impact on inequality diminishes. Such a finding is coherent with the Kuznets curve behaviour.

In Panel C (Table 6) countries have a low level of economic development and are classified as developing countries. For these set of developing countries, a rise in tourism receipts leads to a fall in the inequality levels however when the squared tourism receipts are considered, it leads to a rise in the levels of income inequality. Such an outcome demonstrates a case of an *inverted* Kuznets curve.

In sum, the findings of Table 6 make us conclude that for the highly developed countries tourism receipt is not a major determinant of income inequality, but for the developed countries there is the prevalence of the traditional Kuznets curve as far as the long-run impact of tourism receipts on income inequality is examined. On the contrary, for developing countries, a kind of *inverted* Kuznets curve prevails. How do we resolve such a puzzling set of behaviour? For reconciliation, of the presence of Kuznets curve for the (developed) countries and regarding the existence of inverted Kuznets curve for the (developing) countries, we need to consider the impact of some additional factors for example financial inclusion; specialization of markets, expansion of human capital and increasing role of the service sector. For the set of developed countries, the initial gains from tourism are captured by the leading rich entrepreneurs due to the advantage of capital gains. So, tourism receipts have a detrimental impact on inequality. However, as tourism receipts increase considerably, the gains of tourism are spread across lower-income groups due to the "*spillover effect*". This has occurred owing to the expansion of education and financial inclusion in the developed countries and the expansion of specialization of services. In the context of the developing countries, the initial gains from tourism are leading to a fall in income inequality; this is due to lack of specialization, and the global entrepreneurs are yet to reap the benefits from the tourism sector. When tourism thrives as a local business, the gains in the initial stages are appropriated equally. However, as the tourism sector expands, investment from large companies flows in, and the gains are thereby appropriated by the small set of large global operators. Lack of financial inclusion and low levels of education do not make the gains of tourism expansion inclusive in developing countries. Such a finding is crucial for policy suggestion because the set of poor countries need to ensure the expansion of human capital and financial inclusion, so that, tourism becomes an effective tool for inequality reduction. The results from this study, particularly for the developing economies, are at variance with the study of Mahadevan et al. (2017), Alam and Pramati (2016), and Raza and Shah (2017). However, the findings are in conformity to the

findings of Haddad et al. (2013) in the context of Brazil. Further, Khemili and Belloumi, M. (2018) conclude in the context of Tunisia that there is a unidirectional causal relationship running from Economic Growth to poverty. The paper further observes that in the long-run Economic Growth does not affect poverty.

3.3. Robustness check

For the robustness check, we have applied the fixed-effect model; the results are found in Table 7 (for the full panel) and Table 7 for Panel A, Panel B, and Panel C, respectively, "highly developed," "developed" and "developing" countries. The fixed-effect model confirms the earlier results of FMOLS.

3.4. Results of heterogeneous panel non-causality test

Table 8 gives the results of the short-run bivariate causality among the inequality of income, tourism receipts, trade liberalization, and FDI. The results of Dumitrescu and Hurlin's (2012) panel non-causality test show there is bidirectional causality between inequality of income and tourism receipts. There is unidirectional causality from tourist income receipts to FDI and bidirectional causality between trade-openness and tourism income. This implies tourism income raises the Economic Growth of the country which generates opportunities for foreign direct investment.

4. Conclusion and policy suggestions

Tourism has become a crucial industry in the recent decade both in the highly developed, developed and developing nations. Tourism has enormous employment opportunities, generates foreign exchange, and thereby leads to an expansionary Economic Growth. According to the World Tourism Organization (2018), global tourism revenue increased during the last three decades, from 3705 to 11,859 billion US dollars. However, the impact of tourism on inequality is not clearly defined. The present study was an attempt to explore the behaviour of tourism growth on income inequality in the major set of forty-one tourist destination countries.

The purpose of the present study is to explore the distributional implications of the tourism sector, particularly its ability to facilitate pro-poor growth and reduce income inequality globally and in the predominant poor regions of the world. To empirically test the relation between income inequality and tourism, the long-run relationship between tourism receipts and GINI income inequality was explored for a panel set of forty-one countries running over the period 1995 to 2016. It is observed that the effect of tourism income on income inequality affects the nations differently; while developed nations exhibit the Kuznets curve, their developing counterpart displays an inverted Kuznets curve. The tourism income has an insignificant impact on income inequality scores of highly developed countries.

Thus, the study's main finding is that developing countries display a U-shaped relationship, whereas developed countries exhibit an inverted U-shaped relationship. This difference in the relationship necessitates taking different policy measures for developed and developing countries. Income inequality for highly developed countries is significantly unaffected by tourism growth, and hence specific policy targeted to reduce inequality along with tourism expansion for these countries is not a priority.

Developing countries show that the growth of tourism expansion has negatively influenced income inequality in the early stages of tourism expansion. Income inequality can be due to an oligopolistic market environment. Service providers may have created an atmosphere in which only large operators can manage tourism services. In this case, local small and medium-sized enterprises (SMEs) may not compete with large enterprises and quit from the market, which will increase income inequality. Therefore, policymakers in these countries can provide various financial and non-financial support to help local companies compete with large companies. Further, tourism companies may only create low-wage jobs and use their resources to exacerbate income inequality. Therefore, governments in these countries should take proper redistributive measures. For example, tourism-related services can attract more taxes and the receipts can be redistributed on the low-

Table 7a
Fixed effect model: Full panel.

GINI = f (FDI, TRD, TR, TR^2)			
Variable	Coefficient	t-Statistic	Prob.
FDI	−0.012	−1.514	0.131
TRD	0.0092	2.042	0.041
TR	6.61E-11	3.546	0.000
TR^2	−1.35E-22	−2.011	0.045
Constant	33.4932	76.321	0.000

Table 7b
Fixed effect model: Sub panels.

GINI = f (FDI, TRD, TR, TR^2)			
Panel A: Cluster 1 (Highly Developed) Countries			
Variable	Coefficient	t-Statistic	Prob.
FDI	−0.008	−0.738	0.462
TRD	0.015	2.034	0.045
TR	−1.38E-10	−0.981	0.329
TR^2	5.38E-22	0.187	0.852
C	34.021	19.782	0.000
GINI = f (FDI, TRD, TR, TR^2)			
Panel B: Cluster 2 (Developed) Countries			
Variable	Coefficient	t-Statistic	Prob.
FDI	0.0178	0.672	0.502
TRD	0.039	2.501	0.013
TR	8.47E-11	3.782	0.000
TR^2	−2.03E-22	−2.781	0.006
C	26.101	27.463	0.000
GINI = f (FDI, TRD, TR, TR^2)			
Panel C: Cluster 3 (Developing) Countries			
Variable	Coefficient	t-Statistic	Prob.
FDI	−0.0218	−0.734	0.464
TRD	0.037	4.062	0.000
TR	−3.62E-10	−5.770	0.000
TR^2	1.09E-20	8.036	0.000
C	38.278	53.253	0.000

Note: Compilation Authors.

Table 8
Dumitrescu, & hurlin: Heterogeneous panel causality tests.

Null Hypothesis:	W-Stat.	Zbar-Stat.	Prob.
FDI does not homogeneously cause GINI	2.664	0.836	0.403
GINI does not homogeneously cause FDI	2.824	1.211	0.226
TRD does not homogeneously cause GINI	3.093	1.843	0.065
GINI does not homogeneously cause TRD	2.392	0.198	0.843
TR does not homogeneously cause GINI	4.533	5.222	0.000
GINI does not homogeneously cause TR	3.385	2.529	0.011
TRD does not homogeneously cause FDI	3.038	1.714	0.087
FDI does not homogeneously cause TRD	3.118	1.901	0.057
TR does not homogeneously cause FDI	4.164	4.357	0.000
FDI does not homogeneously cause TR	2.809	1.177	0.239
TR does not homogeneously cause TRD	4.377	4.857	0.000
TRD does not homogeneously cause TR	3.311	2.354	0.019

Note: Compilation Authors.

income population group through welfare programmes. Training services can also be provided to unskilled workers engaged in tourism services. By improving skills, tourism workers can negotiate better wages. Finally, the government needs to regularly update its minimum wage policy so that lowly paid wage earners can benefit from it.

The low-income countries, shows a U-shaped behaviour, where an increase in tourism income reduces income inequality in the initial phases of tourism expansion. The main benefit of tourism expansion in developing countries is employment for the poor. With increased employment to the weaker section of society, income inequality decreases. However, when the tourism income goes up, large operators enter the business, and significant benefits of tourism income are appropriated by them, leaving less for the economically vulnerable section. The policy-makers' need to take measures to boost the tourism sector in order to increase tourist inflows. The aim should be to make tourism a revenue generation opportunity for the economically vulnerable sections of the society. To increase the tourism allied investment in restaurants, hotels, transportation, governments should lessen the onerous regulations and make things friendly. There should be enough room for small entrepreneurs to participate. The government can also provide financial support to the local businesses that can help them survive and minimize income inequality.

Investment in human capital formation will allow the developing nations to develop better quality labor force who would be able to optimize the gains from tourism. Such observations are made by Fayissa et al. (2009). Fayissa et al. (2009) conclude in a panel set of Latin American countries over 1995 to 2004 that the effect of tourism is higher when there is substantial progress in human capital formation.

The study has two major limitations; first, due to data constraints, it has not considered how tourism impacts population across different income quintiles. It would throw insights at a disaggregated level on how tourism impacts inequality. Second, the study was unable to consider other dimensions of inequality, particularly gender, social and ethnic, and how these multidimensions of inequality are impacted by tourism growth. Such an analysis of inequality impact in a multidimensional framework is particularly useful in the context of the review of the Sustainable Development Goals of reducing inequality and poverty. Raising the opportunities and prospects through the proper functioning of markets and adequate investment in education and development of physical infrastructure would help the poor to reap the benefits from tourism growth. While we attempted to integrate the study findings with the literature, it was not possible to statistically validate the suggestions for lack of data availability and is left as scope for further study.

Author contribution

Author 1: Sudeshna Ghosh: Conceived the idea, Collected Data, Wrote the paper, Discussed the results.

Author 2:Subrata Kumar Mitra: Conceived and designed the analysis, Contributed in data and analysis tools, performed the statistical analysis, Discussed the results and commented on the manuscript.

Impact statement

The study points out that lack of development and low levels of functioning of the institutions could be one of the major reasons as to why tourism expansion could not reduce inequalities in the developing countries. The thrust of emphasis is for tourism expansion to generate upward income mobility the policy makers should put stress on redistributive welfare augmenting policies. The study points out that the principle of equality of opportunity will help the developing nations to augment the gains from tourism. New sets of data and robust estimation techniques renews the interest in Kuznets hypothesis particularly in the area of tourism industry and sets out messages for policy makers to explore the possibilities of redistribution so that tourism generates equal opportunities for all.

Declaration of competing interest

None.

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