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The impact of tourism growth on income inequality: Evidence from developing and developed economies

Abstract

In this paper, we investigate the effects of tourism indicators on income inequality in a sample of 102 countries. We divide the sample countries into 71 developing and 31 advanced economies. Using annual data from 1995 to 2014, we employ panel unit root tests, cointegration, fixed-effects, fully modified ordinary least squares, and causality techniques. Our findings show that tourism indicators have a significant negative impact on income inequality in developing economies, while they have an insignificant impact in developed economies. Conversely, economic globalization increases income inequality in developing economies, whereas its effect is positive but statistically insignificant in developed countries. From these findings, the study outlines detailed policy and practical implications.

JEL Codes: Z32; D63; C33

Keywords: Tourism development; inbound tourism; income inequality; economic globalization; panel data estimations

1. Introduction

Thanks to the benefits of economic and social globalization, e.g., the decline of communication and transportation costs as well as an increase in internet users and international airports, the tourism sector has gradually flourished both in developing and developed countries in the last few decades. Globally, international tourist arrivals increased from 435 million in 1990 to 809 million in 2005 and 1.326 billion in 2017 (the United Nations World Tourism Organization (UNWTO), 2019). Furthermore, international tourism receipts increased from 104 billion USD in 1980 to 495 billion USD in 2000 and 1.34 trillion USD in 2017 (UNWTO, 2019). Tourism has been tagged as the third-largest export category (after chemicals and fuels) in the world. Tourism is also the top export category in various developing economies (UNWTO, 2019).

Income inequality is considered a significant problem for various aspects of the economy and society. For example, income inequality negatively affects economic growth, and it can also lead to internal conflict and tensions. For example, the model by Galor and Zeira (1993) predicts that the effect of rising inequality on GDP per capita is negative in relatively wealthy countries but positive in developing countries. The empirical analysis of Bruckner and Lederman (2015) indicates that the increase in income inequality raises GDP per capita in developing countries, while the opposite is seen in middle- and high-income countries.

Further, income inequality decreases social trust among economic actors and can even cause higher crime rates (Dabla-Norris et al., 2015). Therefore, it is essential to understand the determinants of income inequality across developed and developing countries. The recent empirical literature (e.g., Alam and Paramati, 2016; Blake et al., 2008; Mahadevan and Suardi, 2019; Raza and Shah, 2017) documents that tourism is a significant determinant of income

inequality. In the spirit of these studies, our paper analyses the effects of various dimensions of tourism, such as the direct contributions of tourism, domestic tourism spending, leisure travel and tourism spending, the total contribution of tourism, and total travel and tourism investments on income inequality in a panel dataset of 102 countries.

Inspired by the effects of tourism activities on income inequality at the regional level, as outlined in the Theoretical Background section, we continue to explore how tourism development affects income inequality at the cross-country level. Given that tourism is the leading export category in various developing economies, tourism can significantly affect income inequality via the reallocation of resources among the owners of different production factors (i.e., "earning effect"). Specifically, the countries that are the leading tourism destinations can benefit from international tourism activities since their firms can increase profits and their people (workers) can benefit from employment opportunities and other positive externalities. Note that these job opportunities can decrease the poverty rate, but a lower rate of poverty does not guarantee that there will be a reduction in income inequality. Of course, tourism benefits poor people if they are involved in the production of tourism-related goods and services. However, income inequality can increase alongside poverty alleviation if there is a high return for capital investment in the economy. Typically, tourism activities create "winner countries" and "loser countries" in terms of the development of the tourism sector, and this issue can change the level of income inequality across countries over a more extended period.

At this stage, tourism development is a significant aspect of social globalization, and it can significantly affect income inequality (Dreher and Gaston, 2008: Gozgor and Ranjan, 2017). Tourism is also one of the leading sources of foreign exchange, and this can also create "winners" and "losers" in terms of exchange rate stability and the Dutch Disease (i.e., "the

international price effect"). Tourism can affect income inequality via the international price effect. Finally, the tourism sector needs significant infrastructure investments that can be financed by local and central governments, as advocated by Alam and Paramati (2017) and Paramati, Alam, and Lau (2018). Therefore, firms that invest in infrastructure can benefit from tourism development. Similarly, the difference between tax rates and tax policies related to tourism and other sectors can change the income distribution among the economic actors, and these issues can also affect income inequality.

Overall, there is not yet a systematic empirical study that has investigated the effect of tourism, using six measurement dimensions, on income inequality in a comprehensive panel dataset. This paper is designed to contribute to filling this gap in the literature on the tourism-inequality nexus in two ways.

First, this is the first paper in the literature that considers more than 100 countries in the investigation. Unlike previous studies (e.g., Barro, 2000; Behar, 2013), which have not focused on top tourist arrival (tourism-intensive) economies, our dataset includes 102 countries, of which 31 are developed and 71 are developing. Some of these countries have undertaken various tourism development programs in the last two decades. Some of them have implemented growth strategies. Analyzing these 102 heterogonous countries in different panel dataset frameworks will enhance our knowledge on the tourism-inequality nexus. This paper makes an essential contribution to the literature by including such a large number of countries in the investigation to understand the nature of the association between income inequality and tourism indicators.

Second, this paper contributes to the literature by not only classifying the sample countries into developed and developing countries, but also by focusing on major tourism

countries—those with an average of 1 million tourist arrivals per year during the sample period. For robustness, we also estimate long-run parameters by excluding the global financial crisis (GFC) period, i.e., 2007-09. We undertake these exercises considering various dimensions of tourism development and economic globalization. Given that, our study aims to fill these important research gaps in the empirical literature and to offer constructive policy recommendations for the selected economies.

The rest of this paper is organized as follows. Section 2 reviews the previous papers on the effects of domestic- and international tourism indicators on income inequality. Section 3 provides details on data measurement, empirical models, and econometric methodology. Section 4 reports empirical results and discusses potential policy implications. Finally, the conclusion of the paper is provided in Section 5.

2. Literature Review

2.1 Theoretical Background

All standard assumptions of mainstream economics lead to a convergence of equality among individuals and countries under the conditions of tourism development. However, various theoretical foundations, such as price effect, earnings effect, and tax revenue effect, connect tourism development and income inequality. Explicitly, Blake et al. (2008) and Incera and Fernandez (2015) define three main aspects of how tourism development affects income distribution and poverty. First is the "price effect," that is, tourism consumption increases the prices of accommodation, cultural and recreational services, which are generally consumed by wealthier households. However, the increase in price spillover is limited in the prices of food, beverages, and primary products, which are generally consumed by poorer households. Thus,

tourism consumption can decrease income inequality within a country via price effect (Incera and Fernandez, 2015).

The second effect is the "earnings effect," that is, tourism can significantly affect income inequality, because most low-skilled workers (wage earners) belong to more impoverished households. However, tourism development can promote self-employment in accommodation, restaurants, and transportation services. These opportunities may provide higher incomes for the self-employed and for firms that are involved in tourism services than for low-skilled workers. As a result, tourism can increase income disparity.

The third effect is the "tax revenue effect." Depending on the tax rates of tourism-related products and services, tourism activities can increase the tax revenues for governments. Thus, governments can rationally generate expenditures (e.g., infrastructure investments) in tourism-related activities to increase their tax revenues (Blake et al., 2008; Incera and Fernandez, 2015).

Concisely, tourism can theoretically decrease income inequality in a country via "price effect," but it can increase income inequality via "earnings" and "tax revenue" effects. Overall, the net impact of tourism on income inequality depends on the magnitude of "price," "earnings," and "tax revenue" effects. The country's income level is important to understand to determine which of these effects will be dominant.

Finally, it is important to note that the effects of tourism development on economic growth can create some "winners" and "losers," both within a country and between countries. Tourism development can significantly affect income inequality both at the regional and cross-country levels. Income inequality increases at the initial stage of tourism development, but once it reaches a threshold level it will begin to have a decreasing effect (Alam and Paramati, 2016).

2.2 Cross-country Studies on Tourism and Inequality

There are a few studies in the literature (Alam and Paramati, 2016; Mahadevan and Suardi, 2019; Raza and Shah, 2017) that investigate the direct effects of tourism indicators on income inequality. Also, some papers focus on the tourism-inequality nexus in the case of regions of developing or developed economies (e.g., Li et al., 2016; Marcouiller et al., 2004). However, interest in the subject has increased, especially over the last couple of years. Looking at available cross-country studies, Alam and Paramati (2016) provide the first empirical evidence on the effect of tourism on income inequality. Their empirical findings confirm that tourism revenues increase income inequality in a panel dataset of 49 developing economies from 1991 to 2012. However, a nonlinear relationship also exists, and this evidence means that if the current level of tourism revenues double, then tourism can play a vital role in decreasing income inequality among the selected countries. Raza and Shah (2017) also investigate the impact of tourist arrivals on income inequality in a panel of top 43 tourist arrival countries from 1995 to 2015. Using various panel data estimation techniques, the authors observe that tourism increased income inequality in the selected countries. However, Mahadevan and Suardi (2019) conclude that there is no significant impact of tourism development (measured by the contribution of tourism receipts to GDP) on income inequality in a panel dataset of 13 leading tourism countries from 1995 to 2012.

2.3 Cross-country Studies on Social Globalization and Income Inequality

Several papers have analyzed the impact of social globalization on income inequality. For example, the Konjunkturforschungsstelle (KOF) social globalization index, constructed by Dreher (2006), considers international tourist arrivals to calculate the level of social globalization in 180 countries. The papers, which use the KOF social globalization index, has also indirectly considered the role of international tourist arrivals. At this stage, there are also various papers that investigate the impact of the KOF social globalization index on income inequality. Potrafke (2015) provides a literature review of the effects of social globalization on income inequality and other related variables. In addition, Dreher and Gaston (2008) find that there is a positive impact of the KOF social globalization index on income inequality in a panel dataset of 100 countries and in the subsample of the Organization for Economic Cooperation and Development (OECD) countries for the period of 1970 to 2000. Bergh and Nilsson (2010) also observe a positive impact of the KOF social globalization index on income inequality in a panel of 79 countries during the period of 1970 to 2005. The authors observe that the impact is higher in low-income and middle-income economies than in high-income economies. Gozgor and Ranjan (2017) find a positive impact of the KOF social globalization index on income inequality in a panel of 140 countries over the period of 1970 to 2012, and their evidence is robust to the inclusion of many different control variables.

To conclude the literature review, we observe that there is a lack of cross-country evidence on the impact of tourism development on income inequality. Notably, we need to enhance our knowledge on this issue across developing and developed economies, since analysis across countries at different income levels represents a gap in the literature. For this purpose, we use various dimensions of tourism development and economic globalization in the analysis. Further, we use alternative panel econometric techniques (methodological robustness) and

subsample analyses to ensure the robustness of our empirical findings. Using yearly data from 1995 to 2014 for 102 countries and various panel econometric techniques, we provide fresh evidence of the effect of tourism development on income inequality. The findings derived from this study will not only add considerable value to the literature, but they will also inform relevant policy recommendations for both developed and developing economies.

3. Data, Model, and Estimation Methodology

3.1 Data

This study makes use of annual data from 1995 to 2014 and considers 102 countries around the world. The selection of the sample period and countries is based on the availability of data. It is also important to highlight that the tourism sector started to expand in most countries only in the late 1990s; this coincides with the availability of data from the World Travel and Tourism Council (WTTC). Further, the end period of our sample (2014) is determined by the availability of income inequality data for most countries. Using these annual data, we construct an unbalanced panel dataset. Further, we divide the sample countries into 71 developing and 31 developed economies following the income classification of the World Bank. The list of selected developing and developed countries is provided in Appendix-I.

The dependent variable in this study is income inequality, which is measured through the Gini index (IIE) based on disposable income. Among the available data sources on income inequality, the GINI index is the best measure, as it is based on the disposable income in the cross-country context. Therefore, we use the GINI index in our study as a proxy for income inequality. A higher Gini index value is an indication of greater income inequality in any given country. The primary variable of interest is tourism development, and it is measured through five

dimensions: i) the direct contribution of tourism to GDP (TDC); ii) domestic tourism spending (TDS); iii) leisure travel and tourism spending (TLS); iv) total contribution of tourism to GDP (TTC); and v) total tourism investments (TI). All of these tourism indicators are measured in millions of US$ (real prices). Tourism investment is the supply-side indicator, while the other four indicators are the demand-side of tourism, so we focus on both sides of tourism market development.

Following previous literature, we use various control variables in the model. Specifically, we consider GDP per capita (PI) in constant 2010 US$ and age dependency ratio (ADR) as a percentage of the working-age population. The ADR is the ratio of dependents—people younger than 15 or older than 64—to the working-age population—those between age 15 and 64. The ADR can be a significant determinant of income inequality, since it relates to social expenditures (OECD, 2007). We also consider the economic globalization (EG) index of the KOF, which considers international trade (exports and imports of goods and services relative to GDP) and financial inflows as well as restrictions on international trade and financial flows (Dreher, 2006). To check the robustness of EG findings, we use a reconstructed index of EG (RCEGI). The reconstructed index of the KOF uses international trade in real prices instead of nominal prices to calculate the index of the original KOF EG index. Using real prices instead of nominal prices can be relevant in measuring the level of international trade due to the Harrod-Balassa-Samuelson (HBS) effect. According to the HBS effect, nominal trade openness decreases the role of the relative price of non-tradable goods. Therefore, non-tradable products are relatively more expensive in developed countries. Using trade openness in real prices can solve this problem (Gozgor, 2018).

The required data on IIE and tourism indicators (TDC, TDS, TLS, TTC, and TI) are sourced from the Standardized World Income Inequality Database (SWIID) and the WTTC, respectively. Finally, the data on PI and ADR are obtained from the World Development Indicators (WDI), whereas the data on EG are sourced from the KOF online database.

3.2 Empirical Model and Estimation Procedures

We build our empirical model by making use of theoretical and empirical literature in the tourism field. More specifically, Alam and Paramati (2016) demonstrate the theoretical aspects of how tourism, economic globalization (through foreign direct investment and trade), and economic growth drive income inequality. The empirical evidence from Alam and Paramati (2016) also strongly supports the view that tourism, economic globalization indicators, and per capita income have a significant impact on income inequality. Further, the age dependency ratio is also included in the model, as it is a critical determinant of income inequality in that it is strongly associated with social expenditure, as documented by the OECD (2007). Given these theoretical and empirical arguments, we develop the following model:

$$IIE_{it} = f\left(ADR_{i,t}^{\beta_1}, PI_{i,t}^{\beta_2}, EG_{i,t}^{\beta_3}, TDI_{i,t}^{\beta_4}\right) + \mu_{i,t} \quad (1)$$

$$IIE_{it} = \beta_0 + \beta_1 ADR_{i,t} + \beta_2 PI_{i,t} + \beta_3 EG_{i,t} + \beta_4 TDI_{i,t} + \mu_{i,t} \quad (2)$$

Where IIE, ADR, PI, EG, and TDI represent income inequality, age dependency ratio, GDP per capita income, economic globalization, and tourism development indicators (such as

TDC, TDS, TLS, TTC, and TI), respectively. Similarly, i and t refer to cross-section (102 countries) and period (1995 to 2014), respectively, while μ denotes the error term.

For the empirical investigation, we start with our preliminary examination to see whether our variables are integrated with the same order or a different order by employing the panel unit root tests of Im et al. (2003) (known as the IPS test) and Levin et al. (2002) (known as the LLC test). Evidence from these unit root tests determines the suitable econometric techniques for our investigation. The estimated results from these panel unit root tests confirm that all of the variables are integrated with I (1). Then we proceed to the empirical investigation using the fixed-effects estimator. The obtained long-run parameters from the fixed-effects estimator are cross-checked using the panel fully-modified ordinary least squares (FMOLS) estimation technique (Pedroni, 2000; Mark and Sul, 2003). We perform cross-checking, because the fixed-effects estimators can be weak since they ignore the endogeneity problem. To address this issue, panel FMOLS uses the non-parametric framework to provide more reliable findings, even in the presence of endogeneity in the model. It is also important to highlight here that the results from the fixed-effect estimator and panel FMOLS methods are reliable only if the selected variables are integrated with the same order, as confirmed from the panel unit root tests. Finally, we apply the heterogeneous non-causality test of Dumitrescu and Hurlin (2012) to investigate the short-run causalities among the variables. Further discussion on the empirical models is avoided to conserve the space in the paper.

4. Empirical Results

4.1 Results of the Descriptive Statistics

The summary of descriptive statistics is displayed in Table 1. These statistics suggest that the mean income inequality (IIE) is significantly higher in the developing economies (42.05) compared to the developed economies (29.73). Similarly, the age dependency ratio (ADR) is considerably higher in the developing economies (64.33) than in the developed economies (48.98). Interestingly, the average per capita GDP (PI) in developed countries (US$ 38,189.86) is about nine times higher than those of developing economies (US$ 4,210.37).

[Insert Table 1 around here]

We also notice that the average economic globalization and tourism indicators are substantially higher in the developed economies than in the developing economies. More specifically, the average tourism investments (TI) are four times higher in the developed economies than in the developing economies. Overall, these summary statistics indicate that both income inequality and the age dependency ratio are considerably higher in developing economies, while all other indicators are substantially higher in the developed economies. Further, these statistics imply that there is considerable divergence across the selected variables of developed and developing economies. Therefore, it is essential to divide the sample countries into developing and developed countries to get more reliable and robust findings, which might also be crucial in identifying policy implications for these economies.

4.2 Empirical Findings and Discussion

This subsection outlines our empirical findings and discusses the results in detail. For this reason, we first present the results of our panel unit root tests in Table 2. More specifically, we employ two-panel unit root tests, such as the LLC and the IPS. The LLC test assumes a “common unit root process,” while the IPS test assumes an “individual unit root process” in the estimation.

Both of these tests have the same null (unit root) and alternative hypotheses (no unit root for LLC and some cross-sections without unit root for IPS). Given that the findings of these tests on the level data indicate that none of the selected variables across the total sample of developing and developed economies reject the null hypothesis of a unit root, at 5% significance levels. However, these variables strongly reject the null hypothesis across the panels when we apply these tests to the first difference data series. These results indicate that the selected variables are non-stationary at their levels and stationary at their first-order differences.

[Insert Table 2 around here]

Since all of our variables are integrated and of the same order, we explore the long-run cointegration relationship among income inequality, age dependency ratio, per capita income, economic globalization, and tourism indicators using Pedroni's test (1999, 2004). The results of the Pedroni cointegration test on the total sample of developing and developed economies are displayed in Tables 3, 4, and 5, respectively. All of these results confirm the significant long-run association among the selected variables of the study.

[Insert Table 3 around here]

[Insert Table 4 around here]

[Insert Table 5 around here]

Since all of our selected variables have the same order of integration across the panels, we explore the long-run elasticities of income inequalities. For this purpose, we first apply the fixed-effects method, and the results are reported in Table 6. The findings from the total sample show that all of the considered tourism indicators, i.e., tourism direct contribution (TDC),

tourism domestic spending (TDS), leisure travel and tourism spending (TLS), tourism total contribution (TTC) and finally, tourism investments (TI) have a negative and statistically significant impacts on income inequality in a global sample of 102 countries.

On the other hand, across the models, the economic globalization (EG), has a positive and statistically significant effect on income inequality. Similarly, the other two control factors, i.e., the age dependency ratio (ADR) and the per capita income (PI), also have a positive and significant impact on income inequality. These long-run estimates of income inequality on the total sample of countries suggest that tourism indicators play an important role in reducing income inequality. In contrast, economic globalization, along with the age dependency ratio and per capita income, increases income inequality in the global sample.

[Insert Table 6 around here]

To better understand the long-run association among the dependent and independent variables, we classify the total sample into developing and developed economies. These countries also have significant variation in levels of tourism development, income inequality, and economic globalization. Therefore, it is crucial to classify the sample countries into developed and developing economies. The empirical findings on developing economies show that all of the tourism indicators have a substantial negative impact on income inequality. The results also confirm that the age dependency ratio, per capita income, and economic globalization have a considerable positive impact on income inequality. Interestingly, our long-run estimations on developed economies show that the growth in leisure travel and tourism spending helps to reduce income inequality. All other tourism indicators and economic globalization are statistically

insignificant; however, the increase in the age dependency ratio and per capita income remain positive in relation to income inequality in developed economies.

For robustness checks, we employ panel FMOLS method to explore the long-run estimates of income inequality across these panels. The significance of this approach is that it uses a non-parametric framework to provide more reliable findings, even in the presence of endogeneity in the model. Therefore, we argue that the panel FMOLS method provides robust and reliable estimates on long-run parameters. Several studies (e.g., Alam and Paramati, 2016) in the tourism literature have also used the panel FMOLS technique to estimate long-run parameters. The results of the panel FMOLS method are displayed in Table 7.

[Insert Table 7 around here]

Our long-run estimations establish that the growth in tourism indicators has a significant negative impact on income inequality across the panels of the total sample and developing countries. We find a similar effect on developed economies, but it is statistically insignificant in all cases. It is important to note that the growth in economic globalization is an obstacle for income distribution in developing economies. At the same time, it has a similar impact on developed economies, but it is statistically insignificant. Furthermore, we find that the growth in the age dependency ratio and per capita income raises income disparity across both the developing and developed economies. Overall, this robustness check confirms that both fixed-effects and panel FMOLS methods provide almost consistent results across the panels.

We further use the reconstructed economic globalization index to see whether its impact on income inequality changes across the considered panels. For this reason, we again apply fixed-effects and panel FMOLS methods. The results of the fixed-effects models are presented in

Table 8. The findings confirm that the impacts of tourism indicators, the reconstructed economic globalization index, age dependency ratio, and per capita income remain the same in relation to income inequality across the panels.

[Insert Table 8 around here]

Similarly, the panel FMOLS results from Table 9 endorse that the variables have an effect on income inequality. Hence, these results remain consistent across the models and panels. Overall, our long-run findings suggest that growth in tourism indicators is a significant factor for developing economies, as they effectively manage to improve income distribution. In the case of developed economies, only leisure travel and tourism spending are essential tourism indicators that effectively help to improve income distribution. In contrast, all other tourism indicators are statistically insignificant. The control factors continue to have a similar impact on income inequality across the panel groups.

[Insert Table 9 around here]

We again estimate long-run parameters by excluding the global financial crisis (GFC) period (2007-09), and the results are presented in Table 10. The findings from the panel FMOLS method show that all of the tourism indicators have a significant negative impact on income inequality across the panels of the total sample and developing economies. However, the findings from developed economies show that only tourism investments have a positive effect on income inequality, while all other tourism indicators have no significant impact. Similarly, the age dependency ratio and per capita income positively contribute to income inequality across the panels. At the same time, economic globalization has a positive and significant effect on the total sample and developing economies. These results are mostly consistent with our previous

findings, except for tourism investments in developed economies. Given these results, we can argue that the global financial crisis mostly did not change the nature of relationships among the considered variables of the study.

[Insert Table 10 around here]

Again for a robustness check, we estimate long-run parameters of income inequality in major tourism countries that have an average of 1 million tourist arrivals per year during the sample period. Here, we considered about 68 countries of the 102 sample countries. The results of the panel FMOLS technique are displayed in Table 11. The findings again confirm that the tourism indicators have a decreasing effect on income inequality in these major tourism countries. The results also advise that changes in the age dependency ratio, per capita income, and economic globalization contribute to greater income inequality in these countries. These results, overall, remain consistent with our previous findings, meaning that the impact of tourism on income inequality in the total sample and major tourism countries stays the same.

[Insert Table 11 around here]

Finally, we present short-run causalities among the variables of the study. The heterogeneous panel non-causality test results are reported in Table 12. The short-run causalities on developing economies indicate bidirectional causality between per capita income and income inequality. Further, our results show one-way causality from tourism domestic spending and tourism investments on income inequality in developing economies. On the other hand, we find a unidirectional causal relationship that runs from income inequality to the per capita income, direct tourism contribution, leisure travel and tourism spending, and total tourism contribution in developed economies. These short-run causalities demonstrate that tourism indicators cause

income inequality in developing economies, while income inequality drives tourism indicators in developed economies.

[Insert Table 12 around here]

4.3 Discussion and Policy Implications

Given the long-run estimates of the fixed-effects and panel FMOLS methods, we offer several policy recommendations and identify practical implications for developing and developed economies. Our results show that the growth in tourism indicators is a significant factor for income distribution in developing economies. This evidence means that the growth in tourism development helps to improve income distribution, and thus reduces income inequality in developing economies. Consequently, the tourism industry might be a driving force for income distribution in these countries.

On the other hand, the nexus between tourism and income inequality in developed economies is different. Precisely, the results show that in most cases, except in leisure spending in some cases, the tourism indicators have no significant impact on income inequality in developed economies. However, it is important to note that most of the tourism indicators harm income inequality but are statistically insignificant.

Furthermore, we find that both economic globalization and reconstructed economic globalization indices have positive effects on income inequality. Based on these findings, we can argue that economic globalization works in favour of income inequality. Economic globalization has widened income disparity between the rich and the poor. This finding is particularly evident in developing economies. We also find a similar impact in the case of developed economies, but in most cases, it is statistically insignificant.

Similarly, our results confirm that economic development (per capita GDP) improves income inequality across these economies. Given this result, we argue that economic growth is an important driving force of income inequality across these countries.

Given the above discussions and arguments concerning the empirical findings, we provide more specific policy and practical suggestions for these economies. For instance, we suggest that policymakers in developing economies initiate further policies to strengthen the tourism sector in their respective economies, as it plays a crucial role in fighting the growth of income inequality. Further, policymakers also need to realize that the tourism industry provides enormous employment opportunities for local communities, more specifically, for low skilled workers, which is again crucial for keeping unemployment and poverty under control. Policymakers of developed economies need to realize that the tourism industry is neither improving nor worsening income inequality, in most cases. Therefore, it is essential to take appropriate measures to redistribute the income that is generated from the tourism industry. In such a way, the tourism industry can play an important role in employment generation and improving income distribution from the rich to the poor. We also suggest that policymakers initiate appropriate policies with regard to the economic globalization and economic development, as these two factors contribute the most to greater income inequality across these countries. Policymakers should implement strategies to redistribute income from the rich to the poor (e.g., a higher top marginal income tax rate, higher levels of social spending and transfers, and higher spending on human capital development such as education and skills development) through various socioeconomic schemes. These additional policies can play a crucial role in improving income distribution in these countries.

5. Conclusion

For the last couple of decades, the tourism industry has grown significantly across developing and developed economies. Consequently, the tourism industry contributed to nearly 10 percent of the global GDP in the recent period. It is also widely acknowledged that the tourism industry has played a considerable role in socioeconomic development. Our research is specially designed to explore the long-run effects of tourism indicators on income inequality across the panels of 71 developing and 31 developed economies. We considered five indicators for the tourism industry: direct tourism contribution, domestic tourism spending, leisure travel and tourism spending, total tourism contribution, and tourism investments. We also accounted for other relevant variables in the model, such as the economic globalization, per capita income, and age dependency ratio. Our paper uses annual data from 1995 to 2014 and constructs unbalanced panel datasets for the total sample of developing and developed economies. In so doing, we employ panel data techniques such as the fixed-effects, panel FMOLS, and heterogeneous non-causality tests.

Our empirical findings established that the tourism indicators have varying impacts on income inequality across developing and developed economies. More specifically, all of the tourism indicators have considerable negative and statistically significant effects on income inequality in developing economies. In contrast, most tourism indicators have an insignificant impact on income inequality in developed economies. These results are consistent with previous findings that tourism reduces income inequality in developing economies (e.g., Li et al., 2016). Our results showed that economic globalization is one of the significant drivers of income inequality across these economies; however, it is not statistically significant in developed economies. Finally, our results confirmed that both economic development (per capita income) and the age dependency ratio improve income inequality across developing and developed economies.

Given this evidence, we argue that policymakers of developing economies should further initiate appropriate policies to strengthen the tourism industry, which is an important industry that helps to improve income distribution. Likewise, developed economies need to revise their targeted plans for tourism development, as they are not effectively reducing income inequality. Further, we suggest that economic growth and economic globalization are not in favour of reducing income inequality across these panels. Therefore, policymakers need to redesign their policies such that these factors assist in improving income distribution. In addition, our paper adds value to the empirical literature. More specifically, this is the first paper to consider five tourism indicators, which take into account various dimensions of tourism development. Importantly, our paper uses several panel econometric techniques. Therefore, we suggest that the findings derived from this study are more reliable and have various policy and practical implications. However, the conclusions of the panel data estimations are limited since they are general. Therefore, future studies on this subject can focus on the effects of tourism indicators on income inequality in specific countries (e.g., the top tourism nations) using time-series techniques once data becomes available for a more extended period.

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Table 1: Summary statistics on the selected variables and sample countries

	IIE	ADR	PI	EG	TDC	TDS	TLS	TTC	TI
Total sample									
Mean	38.20	59.54	14824.65	61.23	16489.23	26484.93	26590.79	48394.12	5217.16
Maximum	60.90	113.86	111968.30	99.00	476484.00	767714.00	689052.00	1418110.00	188580.00
Minimum	22.00	34.52	322.15	9.46	0.00	20.00	-20.00	10.00	0.00
Std. Dev.	8.71	17.03	19679.75	17.98	47826.30	82100.84	71919.50	142831.90	16410.58
Developing economies									
Mean	42.05	64.33	4210.37	52.73	6837.13	9948.64	11252.05	19982.15	2653.16
Maximum	60.90	113.86	24323.57	86.73	235157.00	464715.00	452596.00	847497.00	118996.00
Minimum	22.80	34.52	322.15	9.46	0.00	20.00	-20.00	10.00	0.00
Std. Dev.	7.39	18.38	3754.24	13.68	17195.28	29971.94	31266.56	59268.60	9527.63
Developed economies									
Mean	29.73	48.98	38189.86	79.95	37736.39	62886.25	60355.93	110937.40	10861.28
Maximum	40.20	63.45	111968.30	99.00	476484.00	767714.00	689052.00	1418110.00	188580.00
Minimum	22.00	35.80	6539.05	42.44	454.66	154.61	892.44	1332.73	115.12
Std. Dev.	4.26	4.74	20370.15	10.66	77599.32	133016.10	112970.60	227914.90	24833.28

Note: The summary statistics were calculated using before the log conversion data.

Table 2: Panel unit root tests' results

		Total sample				Developing economies				Developed economies			
Variable		Level		First difference		Level		First difference		Level		First difference	
	Method	LLC	IPS	LLC	IPS	LLC	IPS	LLC	IPS	LLC	IPS	LLC	IPS
IIE	Statistic	0.540	1.671	-9.284***	-5.105***	-0.095	2.179	-6.962***	-3.761***	2.187	-0.339	-5.688***	-3.578***
	Prob.	0.706	0.953	0.000	0.000	0.462	0.985	0.000	0.000	0.986	0.367	0.000	0.000
ADR	Statistic	5.795	8.243	-3.840***	-2.700***	5.088	5.257	-10.704***	-2.690***	12.625	1.808	-7.393***	-2.048**
	Prob.	1.000	1.000	0.000	0.004	1.000	1.000	0.000	0.004	1.000	0.965	0.000	0.020
PI	Statistic	0.406	-0.284	-22.124***	-15.830***	1.736	-1.205	-12.457***	-8.349***	1.851	1.697	-9.719***	-6.201***
	Prob.	0.658	0.388	0.000	0.000	0.959	0.114	0.000	0.000	0.968	0.955	0.000	0.000
EG	Statistic	11.983	-0.061	-12.997***	-11.345***	6.067	-1.105	-11.245***	-9.803***	17.670	1.569	-5.678***	-5.742***
	Prob.	1.000	0.476	0.000	0.000	1.000	0.135	0.000	0.000	1.000	0.942	0.000	0.000
TDC	Statistic	2.007	-0.283	-12.974***	-12.136***	2.443	1.036	-10.386***	-11.084***	15.935	-0.085	-7.182***	-5.241***
	Prob.	0.978	0.389	0.000	0.000	0.993	0.850	0.000	0.000	1.000	0.466	0.000	0.000
TDS	Statistic	24.898	1.165	-12.354***	-11.111***	5.075	-0.334	-9.663***	-10.077***	8.210	-1.096	-7.876***	-4.905***
	Prob.	1.000	0.878	0.000	0.000	1.000	0.369	0.000	0.000	1.000	0.137	0.000	0.000
TLS	Statistic	5.937	0.699	-13.326***	-11.752***	4.132	0.752	-11.261***	-10.773***	5.605	0.129	-6.617***	-5.012***
	Prob.	1.000	0.758	0.000	0.000	1.000	0.774	0.000	0.000	1.000	0.551	0.000	0.000
TTC	Statistic	3.518	0.153	-10.843***	-12.548***	3.500	0.042	-9.081***	-10.749***	1.112	0.214	-5.927***	-6.494***
	Prob.	1.000	0.561	0.000	0.000	1.000	0.517	0.000	0.000	0.867	0.585	0.000	0.000
TI	Statistic	41.642	0.418	-12.357***	-13.821***	33.869	0.069	-8.272***	-9.809***	6.538	-1.007	-9.084***	-10.227***
	Prob.	1.000	0.662	0.000	0.000	1.000	0.528	0.000	0.000	1.000	0.157	0.000	0.000

Notes: The unit root tests were estimated using the constant and trend variables; *** and ** indicate the rejection of the null hypothesis of a unit root at the 1% and 5% significance levels, respectively.

Table 3: Panel Pedroni cointegration test results on total sample

	Statistic	Prob.	Weighted Statistic	Prob.	Statistic	Prob.	Weighted Statistic	Prob.	Statistic	Prob.	Weighted Statistic	Prob.
	IIE = f (ADR, PI, EG, TDC)				IIE = f (ADR, PI, EG, TDS)				IIE = f (ADR, PI, EG, TLS)			
Alternative hypothesis: common AR coef. (within-dimension)												
Panel v-Statistic	7.987***	0.000	2.560***	0.005	9.124***	0.000	3.388***	0.000	8.626***	0.000	2.170**	0.015
Panel rho-Statistic	8.707	1.000	8.940	1.000	8.265	1.000	8.336	1.000	8.815	1.000	8.570	1.000
Panel PP-Statistic	1.536	0.938	1.505	0.934	0.117	0.546	-0.846	0.199	1.921	0.973	0.256	0.601
Panel ADF-Statistic	-4.091***	0.000	-3.722***	0.000	-6.361***	0.000	-5.747***	0.000	-4.128***	0.000	-4.562***	0.000
Alternative hypothesis: individual AR coef. (between-dimension)												
Group rho-Statistic	12.466	1.000			11.799	1.000			12.311	1.000		
Group PP-Statistic	-1.826**	0.034			-5.453***	0.000			-1.235	0.108		
Group ADF-Statistic	-5.299***	0.000			-7.917***	0.000			-5.559***	0.000		
	IIE = f (ADR, PI, EG, TTC)				IIE = f (ADR, PI, EG, TI)							
Alternative hypothesis: common AR coef. (within-dimension)												
Panel v-Statistic	8.365***	0.000	3.137***	0.001	7.953***	0.000	1.534*	0.063				
Panel rho-Statistic	8.575	1.000	8.845	1.000	8.956	1.000	8.675	1.000				
Panel PP-Statistic	1.576	0.943	1.603	0.946	3.312	1.000	0.766	0.778				
Panel ADF-Statistic	-5.008***	0.000	-3.345***	0.000	-1.838**	0.033	-3.621***	0.000				
Alternative hypothesis: individual AR coef. (between-dimension)												
Group rho-Statistic	12.348	1.000			12.407	1.000						
Group PP-Statistic	-1.413*	0.079			1.013	0.845						
Group ADF-Statistic	-4.997***	0.000			-4.719***	0.000						

Note: ***, **, and * indicate the rejection of the null hypothesis of no cointegration at 1%, 5%, and 10% significance levels, respectively.

Table 4: Panel Pedroni cointegration test results on developing economies

	Statistic	Prob.	Weighted Statistic	Prob.	Statistic	Prob.	Weighted Statistic	Prob.	Statistic	Prob.	Weighted Statistic	Prob.
	IIE = f (ADR, PI, EG, TDC)				IIE = f (ADR, PI, EG, TDS)				IIE = f (ADR, PI, EG, TLS)			
Alternative hypothesis: common AR coef. (within-dimension)												
Panel v-Statistic	7.975***	0.000	2.772***	0.003	9.922***	0.000	3.399***	0.000	9.101***	0.000	2.117**	0.017
Panel rho-Statistic	7.961	1.000	7.661	1.000	7.422	1.000	6.892	1.000	8.174	1.000	7.337	1.000
Panel PP-Statistic	2.751	0.997	1.266	0.897	1.271	0.898	-1.489*	0.068	3.244	0.999	-0.070	0.472
Panel ADF-Statistic	-3.778***	0.000	-2.979***	0.001	-5.854***	0.000	-5.800***	0.000	-3.438***	0.000	-4.497***	0.000
Alternative hypothesis: individual AR coef. (between-dimension)												
Group rho-Statistic	10.551	1.000			9.813	1.000			10.554	1.000		
Group PP-Statistic	-1.879**	0.030			-4.621***	0.000			-0.987	0.162		
Group ADF-Statistic	-3.913***	0.000			-6.799***	0.000			-4.317***	0.000		
	IIE = f (ADR, PI, EG, TTC)				IIE = f (ADR, PI, EG, TI)							
Alternative hypothesis: common AR coef. (within-dimension)												
Panel v-Statistic	8.458***	0.000	3.247***	0.001	9.559***	0.000	1.389*	0.082				
Panel rho-Statistic	7.880	1.000	7.372	1.000	7.620	1.000	7.231	1.000				
Panel PP-Statistic	3.044	0.999	1.243	0.893	2.935	0.998	-0.120	0.452				
Panel ADF-Statistic	-3.794***	0.000	-2.649***	0.004	-3.464***	0.000	-4.208***	0.000				
Alternative hypothesis: individual AR coef. (between-dimension)												
Group rho-Statistic	10.353	1.000			10.403	1.000						
Group PP-Statistic	-1.569*	0.058			0.375	0.646						
Group ADF-Statistic	-3.821***	0.000			-4.350***	0.000						

Note: ***, **, and * indicate the rejection of the null hypothesis of no cointegration at 1%, 5%, and 10% significance levels, respectively.

Table 5: Panel Pedroni cointegration test results on developed economies

	Statistic	Prob.	Weighted Statistic	Prob.	Statistic	Prob.	Weighted Statistic	Prob.	Statistic	Prob.	Weighted Statistic	Prob.
	IIE = f (ADR, PI, EG, TDC)				IIE = f (ADR, PI, EG, TDS)				IIE = f (ADR, PI, EG, TLS)			
Alternative hypothesis: common AR coef. (within-dimension)												
Panel v-Statistic	2.969***	0.002	0.551	0.291	2.740***	0.003	1.083	0.139	2.817***	0.002	0.759	0.224
Panel rho-Statistic	4.071	1.000	4.676	1.000	4.056	1.000	4.675	1.000	4.060	1.000	4.480	1.000
Panel PP-Statistic	-0.645	0.259	0.814	0.792	-1.039	0.150	0.518	0.698	-0.477	0.317	0.489	0.688
Panel ADF-Statistic	-1.951**	0.026	-2.231**	0.013	-3.098***	0.001	-2.017**	0.022	-2.287**	0.011	-1.580*	0.057
Alternative hypothesis: individual AR coef. (between-dimension)												
Group rho-Statistic	6.645	1.000			6.551	1.000			6.359	1.000		
Group PP-Statistic	-0.468	0.320			-2.898***	0.002			-0.747	0.228		
Group ADF-Statistic	-3.689***	0.000			-4.071***	0.000			-3.550***	0.000		
	IIE = f (ADR, PI, EG, TTC)				IIE = f (ADR, PI, EG, TI)							
Alternative hypothesis: common AR coef. (within-dimension)												
Panel v-Statistic	3.066***	0.001	0.875	0.191	1.796**	0.036	0.684	0.247				
Panel rho-Statistic	3.999	1.000	4.886	1.000	4.812	1.000	4.791	1.000				
Panel PP-Statistic	-0.833	0.202	1.001	0.842	1.680	0.954	1.419	0.922				
Panel ADF-Statistic	-3.110***	0.001	-2.032**	0.021	0.600	0.726	-0.328	0.371				
Alternative hypothesis: individual AR coef. (between-dimension)												
Group rho-Statistic	6.730	1.000			6.762	1.000						
Group PP-Statistic	-0.189	0.425			1.270	0.898						
Group ADF-Statistic	-3.281***	0.001			-1.977**	0.024						

Note: ***, **, and * indicate the rejection of the null hypothesis of no cointegration at 1%, 5%, and 10% significance levels, respectively.

Table 6: Long-run estimates using fixed-effects models

Variable	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.
Total sample										
Constant	2.463***	0.000	2.476***	0.000	2.434***	0.000	2.447***	0.000	2.348***	0.000
ADR	0.166***	0.000	0.174***	0.000	0.170***	0.000	0.172***	0.000	0.193***	0.000
PI	0.054***	0.000	0.050***	0.000	0.055***	0.000	0.054***	0.000	0.042***	0.000
EG	0.054***	0.000	0.045***	0.000	0.051***	0.000	0.052***	0.000	0.043***	0.000
TDC	-0.027***	0.000								
TDS			-0.023***	0.000						
TLS					-0.023***	0.000				
TTC							-0.023***	0.000		
TI									-0.007***	0.002
Developing economies										
Constant	2.614***	0.000	2.626***	0.000	2.556***	0.000	2.591***	0.000	2.481***	0.000
ADR	0.167***	0.000	0.176***	0.000	0.176***	0.000	0.174***	0.000	0.195***	0.000
PI	0.050***	0.000	0.046***	0.000	0.050***	0.000	0.049***	0.000	0.039***	0.000
EG	0.058***	0.000	0.048***	0.000	0.053***	0.000	0.056***	0.000	0.046***	0.000
TDC	-0.027***	0.000								
TDS			-0.024***	0.000						
TLS					-0.022***	0.000				
TTC							-0.024***	0.000		
TI									-0.009***	0.003
Developed economies										
Constant	2.242***	0.000	2.267***	0.000	2.280***	0.000	2.243***	0.000	2.251***	0.000
ADR	0.110***	0.000	0.104***	0.001	0.107***	0.000	0.110***	0.000	0.111***	0.000
PI	0.063***	0.000	0.067***	0.000	0.072***	0.000	0.064***	0.000	0.058***	0.000
EG	0.017	0.388	0.021	0.303	0.026	0.195	0.018	0.374	0.016	0.404
TDC	-0.001	0.900								
TDS			-0.008	0.351						
TLS					-0.018**	0.047				
TTC							-0.003	0.790		
TI									0.003	0.473

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

Table 7: Long-run estimates using panel FMOLS models

Variable	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.
Total sample										
ADR	0.175***	0.000	0.187***	0.000	0.176***	0.000	0.181***	0.000	0.210***	0.000
PI	0.059***	0.000	0.054***	0.000	0.061***	0.000	0.059***	0.000	0.043***	0.000
EG	0.060***	0.000	0.048***	0.000	0.055***	0.000	0.058***	0.000	0.045***	0.001
TDC	-0.035***	0.000								
TDS			-0.030***	0.000						
TLS					-0.030***	0.000				
TTC							-0.032***	0.000		
TI									-0.009**	0.019
Developing economies										
ADR	0.172***	0.000	0.185***	0.000	0.178***	0.000	0.179***	0.000	0.211***	0.000
PI	0.053***	0.000	0.050***	0.000	0.056***	0.000	0.054***	0.000	0.039***	0.008
EG	0.065***	0.000	0.051***	0.001	0.058***	0.000	0.063***	0.000	0.049***	0.002
TDC	-0.035***	0.000								
TDS			-0.032***	0.000						
TLS					-0.030***	0.000				
TTC							-0.032***	0.000		
TI									-0.011**	0.029
Developed economies										
ADR	0.143***	0.002	0.142***	0.003	0.146***	0.002	0.145***	0.002	0.149***	0.001
PI	0.065***	0.003	0.070***	0.001	0.074***	0.000	0.068***	0.002	0.061***	0.001
EG	0.010	0.764	0.011	0.726	0.018	0.588	0.010	0.767	0.012	0.714
TDC	-0.001	0.949								
TDS			-0.008	0.560						
TLS					-0.015	0.289				
TTC							-0.003	0.838		
TI									0.004	0.571

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

Table 8: Long-run estimates using fixed-effects models – with reconstructed economic globalization

Variable	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.
Total sample										
Constant	2.510***	0.000	2.518***	0.000	2.480***	0.000	2.489***	0.000	2.386***	0.000
ADR	0.154***	0.000	0.163***	0.000	0.158***	0.000	0.160***	0.000	0.182***	0.000
PI	0.054***	0.000	0.049***	0.000	0.054***	0.000	0.054***	0.000	0.041***	0.000
RCEGI	0.058***	0.000	0.047***	0.000	0.055***	0.000	0.056***	0.000	0.045***	0.000
TDC	-0.027***	0.000								
TDS			-0.022***	0.000						
TLS					-0.023***	0.000				
TTC							-0.024***	0.000		
TI									-0.007***	0.003
Developing economies										
Constant	2.629***	0.000	2.642***	0.000	2.572***	0.000	2.605***	0.000	2.495***	0.000
ADR	0.158***	0.000	0.167***	0.000	0.167***	0.000	0.165***	0.000	0.187***	0.000
PI	0.051***	0.000	0.047***	0.000	0.051***	0.000	0.051***	0.000	0.041***	0.000
RCEGI	0.060***	0.000	0.049***	0.000	0.056***	0.000	0.058***	0.000	0.048***	0.000
TDC	-0.027***	0.000								
TDS			-0.024***	0.000						
TLS					-0.021***	0.000				
TTC							-0.024***	0.000		
TI									-0.009***	0.003
Developed economies										
Constant	2.376***	0.000	2.402***	0.000	2.453***	0.000	2.376***	0.000	2.376***	0.000
ADR	0.096***	0.003	0.090***	0.006	0.091***	0.004	0.096***	0.003	0.098***	0.002
PI	0.056***	0.000	0.057***	0.000	0.065***	0.000	0.057***	0.000	0.047***	0.000
RCEGI	0.030	0.155	0.031	0.136	0.043**	0.041	0.030	0.148	0.026	0.198
TDC	-0.008	0.482								
TDS			-0.009	0.279						
TLS					-0.029***	0.002				
TTC							-0.008	0.422		
TI									0.003	0.554

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

Table 9: Long-run estimates using panel FMOLS models – with reconstructed economic globalization

Variable	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.
Total sample										
ADR	0.159***	0.000	0.175***	0.000	0.162***	0.000	0.167***	0.000	0.198***	0.000
PI	0.058***	0.000	0.053***	0.000	0.059***	0.000	0.058***	0.000	0.042***	0.001
RCEGI	0.065***	0.000	0.050***	0.000	0.061***	0.000	0.063***	0.000	0.048***	0.001
TDC	-0.035***	0.000								
TDS			-0.029***	0.000						
TLS					-0.030***	0.000				
TTC							-0.032***	0.000		
TI									-0.009**	0.022
Developing economies										
ADR	0.159***	0.000	0.175***	0.000	0.166***	0.000	0.168***	0.000	0.201***	0.000
PI	0.055***	0.000	0.051***	0.000	0.057***	0.000	0.055***	0.000	0.041***	0.007
RCEGI	0.069***	0.000	0.053***	0.001	0.063***	0.000	0.067***	0.000	0.052***	0.001
TDC	-0.036***	0.000								
TDS			-0.031***	0.000						
TLS					-0.030***	0.000				
TTC							-0.032***	0.000		
TI									-0.010**	0.032
Developed economies										
ADR	0.103**	0.039	0.104**	0.040	0.108**	0.028	0.112**	0.026	0.113**	0.022
PI	0.053**	0.018	0.054**	0.010	0.060***	0.003	0.056**	0.015	0.043**	0.033
RCEGI	0.016	0.640	0.015	0.653	0.031	0.351	0.019	0.576	0.016	0.628
TDC	-0.010	0.533								
TDS			-0.012	0.371						
TLS					-0.029**	0.042				
TTC							-0.011	0.489		
TI									0.003	0.647

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

Table 10: Long-run estimates using panel FMOLS models – excluding the GFC period (2007-09)

Variable	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.
Total sample										
ADR	0.192***	0.000	0.204***	0.000	0.193***	0.000	0.198***	0.000	0.225***	0.000
PI	0.060***	0.000	0.054***	0.000	0.061***	0.000	0.059***	0.000	0.043***	0.001
EG	0.063***	0.000	0.051***	0.001	0.057***	0.000	0.061***	0.000	0.047***	0.001
TDC	-0.033***	0.000								
TDS			-0.028***	0.000						
TLS					-0.028***	0.000				
TTC							-0.030***	0.000		
TI									-0.008***	0.059
Developing economies										
ADR	0.190***	0.000	0.203***	0.000	0.197***	0.000	0.197***	0.000	0.225***	0.000
PI	0.053***	0.000	0.050***	0.001	0.054***	0.001	0.052***	0.001	0.039**	0.014
EG	0.066***	0.000	0.053***	0.002	0.059***	0.001	0.064***	0.000	0.051***	0.003
TDC	-0.034***	0.000								
TDS			-0.030***	0.000						
TLS					-0.026***	0.000				
TTC							-0.030***	0.000		
TI									-0.011**	0.044
Developed economies										
ADR	0.142***	0.003	0.144***	0.003	0.144***	0.002	0.146***	0.002	0.149***	0.002
PI	0.071***	0.002	0.072***	0.001	0.080***	0.000	0.069***	0.004	0.057***	0.004
EG	0.025	0.468	0.024	0.479	0.033	0.341	0.023	0.495	0.030	0.361
TDC	-0.001	0.949								
TDS			-0.003	0.831						
TLS					-0.016	0.310				
TTC							0.002	0.901		
TI									0.012*	0.088

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

Table 11: Long-run estimates using panel FMOLS models – major tourism countries

Variable	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.	Coeffi.	Prob.
ADR	0.218***	0.000	0.250***	0.000	0.213***	0.000	0.216***	0.000	0.244***	0.000
PI	0.080***	0.000	0.063***	0.000	0.091***	0.000	0.082***	0.000	0.069***	0.000
EG	0.055***	0.001	0.045***	0.009	0.067***	0.000	0.055***	0.001	0.047***	0.006
TDC	-0.023***	0.000								
TDS			0.000	0.956						
TLS					-0.034***	0.000				
TTC							-0.025***	0.000		
TI									-0.005	0.330

Note: *** indicates the significance at 1% level.

Table 12: Short-run heterogeneous causality test results

	Total sample		Developing economies		Developed economies	
Null Hypothesis:	Zbar-Stat.	Prob.	Zbar-Stat.	Prob.	Zbar-Stat.	Prob.
ADR does not cause IIE	3.661***	0.000	3.327***	0.001	1.606	0.108
IIE does not cause ADR	1.245	0.213	1.607	0.108	-0.173	0.863
PI does not cause IIE	3.417***	0.001	3.748***	0.000	0.527	0.598
IIE does not cause PI	5.110***	0.000	3.566***	0.000	3.873***	0.000
EG does not cause IIE	0.522	0.602	1.570	0.117	-1.429	0.153
IIE does not cause EG	0.593	0.553	0.723	0.470	-0.019	0.985
TDC does not cause IIE	0.339	0.735	0.223	0.824	0.284	0.777
IIE does not cause TDC	1.508	0.131	-0.030	0.976	2.531**	0.011
TDS does not cause IIE	-1.705*	0.088	-1.688*	0.091	-0.262	0.793
IIE does not cause TDS	0.842	0.400	-0.276	0.783	0.660	0.509
TLS does not cause IIE	-1.100	0.271	-0.937	0.349	-0.578	0.563
IIE does not cause TLS	1.514	0.130	0.394	0.694	2.150**	0.032
TTC does not cause IIE	-0.045	0.964	-0.204	0.838	-0.771	0.441
IIE does not cause TTC	0.637	0.524	0.116	0.908	2.828***	0.005
TI does not cause IIE	-1.522	0.128	-2.272**	0.023	0.156	0.876
IIE does not cause TI	0.015	0.988	-0.144	0.886	0.309	0.757

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

Appendix-I: List of selected sample countries

Developing Countries include Albania, Algeria, Argentina, Armenia, Bangladesh, Belarus, Bolivia, Botswana, Brazil, Bulgaria, Burkina Faso, Cambodia, Chile, China, Colombia, Costa Rica, Dominican Republic, Ecuador, Egypt, El Salvador, Eswatini, Fiji, Georgia, Ghana, Guatemala, Honduras, India, Indonesia, Iran, Jordan, Korea Republic, Latvia, Lebanon, Lithuania, Madagascar, Malawi, Malaysia, Mali, Mauritius, Mexico, Moldova, Mongolia, Morocco, Namibia, Nepal, Nicaragua, Niger, Nigeria, North Macedonia, Pakistan, Panama, Paraguay, Peru, Philippines, Romania, Russia, Senegal, South Africa, Sri Lanka, Tanzania, Thailand, Tunisia, Turkey, Uganda, Ukraine, Uruguay, Venezuela, Vietnam, Yemen, Zambia, and Zimbabwe.

Developed Countries include Australia, Austria, Belgium, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Japan, Luxembourg, Netherlands, New Zealand, Norway, Poland, Portugal, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, the United Kingdom, and the United States.