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Tourism as a mechanism in reducing income inequality in developing economies

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Abstract

Although numerous studies have investigated the contribution of tourism to economic growth and development, much less attention has been paid to assessing whether tourism-induced growth and development contribute to the poverty alleviation and income inequality (Kinyondo & Pelizzo, 2015). This study examines the statistical relationship between tourism activities and a suite of income inequality measures. Using a dynamic fixed country-level effects panel model and bootstrapped standard errors, we find strong evidence showing both tourism dollars and inbound tourism numbers have an adverse effect on income equality. These findings are supported by the results of the fixed-effects panel and dynamic pooled OLS regressions. The results of this study suggest that more effort should be exerted to develop pro-poor tourism initiatives in order to mitigate the inequitable distribution of the benefits of tourism as well as to reduce possible environmental degradation caused by rural poverty.

Keywords: Tourism, Developing economies, Income inequality, Income distribution, GINI coefficients, Dynamic Panel Model Approach

JEL classification: C51, R49, Z32

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1. Introduction

The level of attention paid by policy makers, development experts and industry leaders to the economic contribution made by tourism in developing countries has been significant. The declaration of the United Nations (UN) in 1963, in which tourism was considered as a major contributor to economic growth, influenced many developing countries to adopt tourism-led economic development strategies. The financing programmes of international organisations, such as the World Bank and IMF (International Monetary Fund), encouraged developing countries to adopt outward-oriented development strategies, which also pointed towards development in tourism. Furthermore, sustainable tourism development, the process that considers not only economic but also socio-environmental impacts, has become an increasingly popular field of research since the late 1980s.

More recently, the role of tourism in poverty alleviation gained significant attention (UN World Tourism Organisation (UNWTO), 2011). The UNWTO adopted the pro-poor tourism concept, which is the concept emerged in the late 1990s and implies increasing benefits from tourism for the poor. The UNWTO also launched the Sustainable Tourism-Eliminating Poverty (ST-EP) Initiative in 2003. There are currently a growing number of strategic national plans for pro-poor tourism. For example, in August 2015, the China National Tourism Administration and the State Council Leading Group Office of Poverty Alleviation and Development proposed to lift 17% of China’s total impoverished population or approximately 12 million out of poverty through rural tourism. This is in order to fully realise the strategic role of rural tourism in poverty alleviation and development.

Tourism offers labour-intensive and small-scale employment opportunities, especially for women and youth (Deloitte & Touche, 1999). In the past, the tourism development focus was based on market niche (e.g., community tourism, eco-tourism), but strategies for promoting pro-poor tourism are emerging by considering the full range of impacts on the livelihoods of the poor (Ashley et al., 2000). More specifically, many studies have emphasised the importance of tourism for pro-poor growth in Africa (Ashley & Mitchell, 2005). For example, Akyeampong (2011) has examined tourism policy in Ghana with special focus on its pro-poor impacts, and claimed the importance of enhancing local residents’ livelihood options. The needs of quantifying the pro-poor impacts from tourism activities was also widely discussed (e.g., Truong, 2015). Yet, Buckley (2012) argues that majority of the studies on the effects of the tourism activities still mainly focuses on economic aspects with less attention paid to socio-environmental impacts.

Schilcher (2007) emphasises the necessity to shift the focus of current growth-oriented policies to ones that include more equity considerations. Liu (2003), also, argues that inadequate attention has been paid to the fairness of benefits and costs distribution among the stakeholder groups of tourism development. He further claims that even those studies that have investigated distributional aspects failed to recognise that the host population is often not empowered to take control of the development process. Although many studies have investigated the contribution of tourism to economic growth and development since the 1970s, much less attention has been paid to assessing whether tourism-induced growth and development contribute to the poverty alleviation and income inequality (Kinyondo & Pelizzo, 2015). Kinyondo and Pelizzo (2015) have analysed the relationship between the development of the tourism industry, economic development, employment and income inequality in Tanzania. They have found that tourism development in Tanzania has led to growth in employment and aggregate wealth, but not more equitable distribution of wealth. They have identified that this is mainly due to foreign ownership, vertical integration, and inadequate remuneration packages for workers employed in the tourism sector. Some argues that tourism-induced growth may alleviate poverty when tourism operations are run on a small scale (e.g., Donaldson, 2007). Although there is a strong potential for tourism industry to contribute to poverty alleviation, many also perceive that making current tourism practices more pro-poor is a major challenge (Scheyvens, 2007).

In order estimate the impacts of tourism on economic growth, various quantitative methodologies have been applied . Traditionally, input-output (IO) analysis has been employed to examine the impacts of tourism on the economy of a region (Fletcher, 1989; Briassoulis, 1991; Zhou et al., 1997). Later, an alternative technique, computable general equilibrium (CGE), has also been used. For example, Zhou et al. (1997) use CGE models to estimate the impacts of tourism on Hawaii's economy from a decrease in visitor expenditure. They have found that reductions in visitor expenditure affected most significantly the industries closely related to tourism (hotel, transportation, and eating and drinking industries). They have compared the results of the IO and CGE models and pointed out the advantage of CGE models, i.e., their ability to account for inter-sectoral resource flows.

Another quantitative approach includes social accounting. For example, Klychnikova and Dorosh (2014) have assessed the impact of tourism spending on economic growth and poverty in Panama using a social accounting matrix model. They have found that the tourism sector in Panama has large multiplier effects on the economy with a huge potential for significant benefits to the poor.

Econometric techniques are also often used to analyse the relationship between tourism and economic growth (Brida 2016). However, these studies mainly focus on economic development without considering distributional impacts. For example, The first study to empirically examine the relationship between tourism and economic growth was conducted by Balaguer and Cantavella-Jorda (2002). Using cointegration and causality tests, they have shown evidence of tourism facilitating economic growth in Spain. Fayissa (2009) has found a positive and significant impact of tourism on economic growth using panel data of 17 Latin American countries between 1995 and 2004 with fixed effects estimations. Di Liberto (2010) has found a significant and positive impact of tourism on income using cross section data of 72 countries between 1980 and 2000. Castro-Nuno et al (2013) conducts a meta-analysis of a selected sample of 87 panel data studies and found a positive relationship between tourism and GDP. Chiu & Yeh (2017) have found strong evidence of a nonlinear relation between tourism and economic growth using a cross section data of 84 countries from 1995 to 2008.Eugenio-Martin, Morales, and Scarpa (2004) have demonstrated that an increase in the number of tourist arrivals can stimulate economic growth in developing countries, but not in developed countries, using the generalized method of moments (GMM) approach. Similar result was found in Cardenas-Garcia, Sanchez-Rivero, and Pulido-Fernandez (2015).

There are also some studies that did not support such tourism development–economic growth nexus. For example, Figini and Visi (2009) have used cross section data of 150 countries from 1980 to 2005 and found no significant relationship between tourism specialisation (share of international tourism recipient expressed as a percentage of GDP) and economic growth. Chou (2013) also concludes no evidence of such a relationship in 5 of 10 transition countries.

There is a clear shortage of convincing empirical evidence to justify the claim that tourism development will result in significant benefits for the poor (Chok et al., 2007). Partly, this is explained by the fact that much of the discussion on pro-poor tourism is simply based on theory as a result of the lack of field data (Roe & Urquhart, 2004). Furthermore, there are currently a limited number of studies that investigate the impact of tourism on income inequality. Those existing studies are usually single-country studies, but not cross-country analyses. For example, Lee and Kang (1998) have estimated the impact of earnings inequality in the South Korean tourism industry between 1985 and 1995 using Gini coefficients and Lorenz curve for income distribution across different industries. They have concluded that the tourism industry generates more equal distribution of earnings and performs better than other industries. Marcoullier et al. (2004) have studied the distributional mechanisms of aggregate natural amenity-led economic growth in the US Lake States by using Gini coefficients in order to develop more informed rural tourism planning. Blake et al. (2009) have analysed the effect of Brazilian tourism in reducing income inequality using the CGE model.

There are also a small number of cross-country studies being conducted. For example, Vanegas (2014) has quantitatively assessed the relationship between tourism, economic growth, inequality, and poverty reduction in five countries of Central America. They have applied an unbalanced panel data analysis for the period between 1980 and 2012. They have found that both economic growth and inequality have a strong statistically significant impact on poverty in those Central American countries. The study of Venegas (2014) has focused on a specific region and we expand his study by investigating the impact of tourism on income inequality using larger panel data that include much wider geographical coverage.

In this paper, we apply a dynamic fixed-effects panel regression to a cross-country dataset of developing economies. The persistence in income inequality is accounted by an autoregressive term in the model specification. We overcome the inherent bias of an autoregressive term in a fixed-effects panel model by bootstrapping 10,000 samples and calculating robust bootstrapped standard errors. A suite of income inequality measures are employed, including the Gini coefficient, the number of individuals earning less than $2 USD a day, and the proportion of national income earned by the poorest 20% of the working population. This study links these measures with the number of inbound tourists and tourism dollars whilst controlling for various country-level factors. We employ economic growth as a control variable to mitigate any potential endogeneity problem in the model specification. The findings suggest that the number of inbound tourists and the level of tourism income serve to increase income inequality in developing economies, albeit at a decreasing rate. The results support the notion that more pro-poor tourism initiatives are required as the distribution of wealth from unchecked tourism activities create greater economic divisions in society.

This paper is organised as follows: Section 2 discusses the econometric methodology employed to analyse the tourism-inequality relationship, Section 3 outlines the data sources and the variables employed in this study, Section 4 discusses the results, and Section 5 concludes the paper.

2. Methodology

2.1. Pooled Dynamic OLS and Fixed-Effects Regressions

In order to explore the causal relationship between tourism and income equality, we first apply the pooled OLS and fixed-effects regressions on the following model specification:

$$Y_{i,t} = \beta_0 + \beta_1 T_{i,t} + \beta_2 T_{i,t}^2 + \beta_3 X_{1,i,t} + \ldots + \beta_{k+1} T_{k,i,t} \qquad \text{(a)}$$

Where $Y_{i,t}$ is a measure of income equality at time period *t* for country *i*;

$T_{i,t}$ is a measure of tourism activity at time period *t* for country *i*;

β_1 is the regression coefficient for $T_{i,t}$;

$X_{j,i,t}$ is the j^{th} control variable at time period *t* for country *i*;

β_{j+1} is the regression coefficient for $X_{j,i,t}$, and;

β_0 is the constant term across all countries.

Alternate measures of income inequality and tourism activity are employed in this study to ensure the stability and robustness of the coefficient estimates of (a). The fixed-effects panel model is applied to (a). It allows for the unobservable heterogeneity in the tourism-income equality relationship across countries, whilst the pooled dynamic OLS accounts for the persistence in $Y_{i,t+1}$ by including $Y_{i,t}$ as a regressor. Due to the strict exogeneity assumption, the lag of the dependent variable is omitted in the fixed-effects panel regression specification. The quadratic term ($T_{i,t}^2$) is included to account for possible non-linearity in the tourism-inequality relationship.

2.2. Dynamic Fixed-Effects Regression and Bootstrapped Standard Errors

We overcome the strict exogeneity restriction in the fixed-effects regression model that prevents a dynamic (autoregressive) term from being included as a regressor by employing a bootstrapping procedure.

$$Y_{i,t} = \beta_0 + \beta_1 Y_{i,t-1} + \beta_2 T_{i,t} + \beta_3 T_{i,t}^2 + \beta_4 X_{1,i,t} + \ldots + \beta_{k+2} T_{k,i,t} \qquad \text{(b)}$$

Where $Y_{i,t}$ is a measure of income equality at time period *t* for country *i*;

$T_{i,t}$ is a measure of tourism activity at time period *t* for country *i*;

β_1 is the regression coefficient for $T_{i,t}$;

$X_{j,i,t}$ is the j^{th} control variable at time period *t* for country *i*;

β_{j+1} is the regression coefficient for $X_{j,i,t}$, and;

β_0 is the constant term across all countries.

At each cross-section (country), each individual variable's observation is randomly sampled with replacement. This creates a bootstrapped sample that assumes the null hypothesis is true[1]. A dynamic fixed-effects panel regression is then estimated on the bootstrapped sample. This procedure is repeated 10,000 times to produce 10,000 coefficient estimates that assume the null hypothesis is true. We use this to form a distribution of the coefficients under the null hypothesis. A dynamic fixed-effects panel model is then estimated, and the coefficient estimates' p-values observed directly from the bootstrapped distribution. The bootstrapped standard errors can be calculated directly from the bootstrapped samples.

This procedure overcomes the strict exogeneity restriction that prevents the inclusion of an autoregressive term as the coefficient estimate bias due to this violation is also inherent in the bootstrapped coefficient distribution. That is, the bootstrapped samples contain this bias as they too are dynamic fixed-effects models, albeit estimated under the null hypothesis. As such, when estimating the model of interest using the original dataset and calculating the p-value, the bias in the dynamic fixed-effects coefficient estimates are nullified by the exact same bias in the bootstrapped coefficient distribution. Inferences of coefficient significance under this procedure are unbiased.

2.3. Potential Endogeneity

It is common in macroeconomic relationships such as (1) to be susceptible to the endogeneity problem. For example, tourism has been shown to have an impact on economic growth (Klychnikova & Dorosh, 2014; Di Liberto, 2010) whilst there is a clear linkage between economic growth and development with income inequality (Aghion et al., 1999; Halter et al., 2014). As such, it is often difficult to untangle causality between two economic variables such as tourism activity and income equality. However, as economic growth is included as a control

[1] The null hypothesis is that there is no relationship between the dependent variable and its regressors.

variable in (1), any form of endogeneity between tourism activity and income equality that exists via economic growth and development will be accounted for. In fact, we argue that any form of endogeneity between tourism activity and income equality must be transmitted via economic activity, which is included as a regressor, and hence, endogeneity is unlikely to be a problem in this study. As such, no instrumentation of $T_{i,t}$ is required.

The control variables, such as economic growth and political stability, may be endogenously determined. As such, we treat the control variables as endogenously determined covariates in order to account for any correlations with tourism. Thus, causality will not be inferred for the control variables and will be interpreted as marginal correlations.

3. Data

The data for this study is sourced from the World Bank and United Nations University – Wider World Income Inequality databases. We use annual observations of 138 developing countries over the period of 1995 to 2012, totalling of sample size of 1104. Following the definition of developing economics from the World Bank, a developing country is one whose annual GDP per capita is below the middle-income threshold. This provides us with an unbalanced dataset with 1046 country-year observations. However, only observations with no variables-observations missing are retained for estimation.

The dependent variables are *GINI*, *TWO.DOLLARS*, and *INC.TWENTY* as reported by the United Nations University database. *GINI* is a measure of statistical dispersion in a country's household income that ranges between 0 and 100. A Gini coefficient of 100 suggests that all income belongs to one household only, and a value of 0 indicates perfect equality in household incomes. Alternate measures of income inequality will also be used including the number of people earning under $2 a day (*TWO.DOLLARS)* and the income share held by the lowest 20% of the national population (*INC.TWENTY)*.

Table 1 contains the variable labels and definitions. The *GINI* is sourced from the United Nations University Wider World Income Inequality database. It was first introduced by Corrado Gini (1912) to measure the degree of income inequality in income and wealth, and has now become a standard measure of inequality in a frequency distribution. Many studies have applied the Gini coefficient to measure the degree of income inequality in developing countries (Adams & Page, 2005; Mahood & Noor, 2014).

The regressors of interest are *T.DOLLARS* and *T.NUMBERS*. These variables measure the level of inbound international tourist activity in the country and are sourced from the World Bank database. In this study, we employ two proxies for tourism activity in order to distil nuances in the relationship. *T.DOLLARS* will demonstrate whether it is the level of direct financial contribution to the economy that influences income distribution. *T.NUMBERS* represents the volume of visitors to the country and captures the popularity of the country as a tourist destination. Though *T.NUMBERS* and *T.DOLLARS* are expected to be highly correlated, there may be many reasons why the variation or impact of the number of arrivals is different from that of actual dollar expenditure. For example, a marketing push by the national tourism body towards high income tourists can disproportionately change the variations in *T.NUMBERS* and *T.DOLLARS*.

Figure 1 below displays the time series plots of *T.NUMBERS* and *T.DOLLARS* during the period of 1995 to 2012 for Zimbabwe and Thailand. The relationship between these two variables across time varies markedly from country to country. In Zimbabwe, there is a clear disconnect between *T.NUMBERS* and *T.DOLLARS* during the early 2000s and from 2008 onwards. Interestingly, from 2008 onwards, tourism dollars increases at an exponential rate whilst tourism numbers steadied. This suggests that the demographics or spending patterns of tourists altered from 2008 onwards. Whereas in Thailand tourism spending and tourism numbers track closely together. This is indicative that the spending patterns (demographics) of tourism have remained relatively constant during the sample period.

Figure 1: Tourism Numbers and Dollars 1995 - 2012

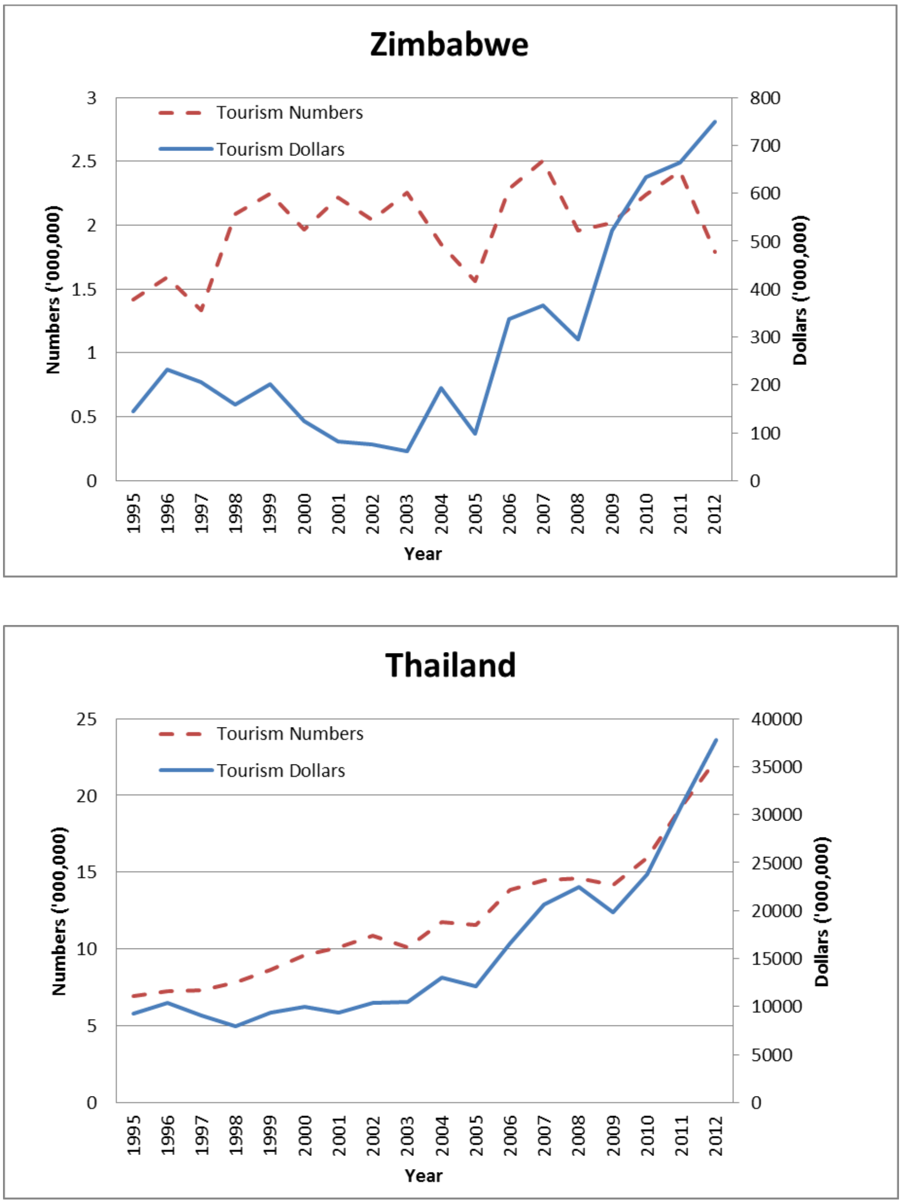

Table 1 below presents the variables employed in this study and their definitions. The economic value added by the manufacturing industry (*MANU.VAL.ADD*) is included as a control variable as higher dependency on manufacturing has been known to be associated with lower levels of poverty (Deller, 2010). In fact, many studies find that the relative size of the manufacturing sector serves to reduce income inequality when compared to the service sector (Chevan & Stokes, 2000; Lobao et al., 1999). *M2.GDP* is employed as a regressor as it accounts for the level of financial development in the economy (Asongu, 2013; Calderon & Liu, 2003). Financial development is expected to increase economic growth and reduce inequality as less credit constraints allows for the more efficient allocation of capital (Galor & Moav, 2004; Perez-Moreno, 2011). GDP per capita (*GDP.PER.CAP)* and GDP growth (*GDP.GROWTH*) are included as control variables as there is evidence that income and wealth inequality are intrinsically related to economic development (Daly, 1977; Campano & Salvatore, 1988; Victor, 2008).

Female labour force participation rates (*FEMALE.LFORCE*) is linked to both economic development and the distribution of wealth (Cagatay & Ozler, 1995; Pampel & Tanaka, 1986). As women are often significantly earning little to no income in developing countries (Anderson, 2005), *FEMALE.LFORCE* is expected to be related to income and wealth inequality. The economic value added by the agricultural industry (*AGRI.VAL.ADD*) has been shown to be a determinant of an economy's rate of industrialisation (Gollin et al., 2002; Timmer, 1988), which plays a key role in economic development. Political stability is included as an endogenous covariate, as political stability is expected to affect economic growth and simultaneously be the consequence of extreme inequality across the population (Alesina & Perotti, 1996). *RURAL.VAL.ADD* is included as it has been well-documented that economies that remain heavily reliant on rural sectors are more likely to exhibit greater wealth and income disparity (Nguyen et al., 2007).

Table 1. Variables and Definitions

GINI	Gini index measures the extent to which the distribution of income among individuals or households within an economy deviates from a perfectly equal distribution. a Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality.
TWO.DOLLARS	Number of people in the national population earning less than two dollars USD a day.
INC.TWENTY	Proportion of the national income earned by the lowest twenty percentile in the working population.
T.DOLLARS	International tourism receipts are expenditures by international inbound visitors, including payments to national carriers for international transport.
T.INBOUND	International inbound tourists (overnight visitors) are the number of tourists who travel to a country other than that in which they have their usual residence, but outside their usual environment, for a period not exceeding 12 months and whose main purpose in visiting is other than an activity remunerated from within the country visited.
MANU.VAL.ADD	Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs for the manufacturing industry, as a percentage of GDP. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources.
M2.GDP	Money and quasi money comprise the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government.
GDP.PER.CAP	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products.
GDP.GROWTH	Annual percentage growth rate of GDP at market prices based on constant local currency.
FEMALE.LFORCE	Female labor force as a percentage of the total show the extent to which women are active in the labor force.
AGRI.VAL.ADD	Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs for the agriculture industry, as a percentage of GDP. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources.
POL.STABILITY	An index that captures the perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism.
RURAL.VAL.ADD	Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs for the rural industry, as a percentage of GDP. It is calculated without making deductions for depreciation of fabricated assets or depletion and and degradation of natural resources.

The correlation matrices of the variables[2] suggest that the one-year forward measure of the dependent variables should be employed rather than their contemporaneous values. This is plausible as the economic transmission of the effects of the regressors to *GINI*, *TWO.DOLLARS*, and *INC.TWENTY* are unlikely to be instantaneous. All variables (except for *GDP.GROWTH)* are transformed into their natural logarithm to ensure stationarity[3]. *GDP.GROWTH* is a stationary variable and thus remains in its original unit of measure.

4. Results

[2] These tables remain unreported for the sake of brevity. Contact the corresponding author for details.
[3] The results of the tests for stationarity are unreported for the sake of brevity. Contact the corresponding author for details.

Table 2 contains the results for the pooled OLS panel regression specifications with *GINI*, *TWO.DOLLARS*, and *INC.TWENTY* as the dependent variables. Employing a suite of measure of economic inequality allows us to study the complex relationship tourism may have with inequality. The quadratic term allows for a non-linear relationship between tourism and income inequality. Model (1) uses the forward of *GINI* (*F.GINI)* as a dependent variable and *T.DOLLARS* and its quadratic term as the regressors of interest. First, note that the lag of *GINI* is statistically significant at the one percent level, suggesting that *F.GINI* exhibits dynamic persistence over time. Tourism dollars do not statistically influence *F.GINI*. *GDP.PER.CAP* and *FEMALE.LFORCE* are both significantly marginally negatively correlated with *F.GINI*. This indicates that a reduction in inequality is often associated with more female participation in the labour force and growing income levels across the population. *AGRI.VAL.ADD* has a negative marginal correlation with *F.GINI*, suggesting that a larger agriculture sector is associated with lower income inequality. Interestingly, there is evidence, at the 10% significance level, that more money supply (M2) in a developing country correlates to a higher level of income inequality.

Model (2) estimates the pooled dynamic OLS using *T.INBOUND* and its quadratic term as the regressors of interest. Both terms are statistically significant at the one percent level. The maximum number of inbound tourists for the quadratic equation, ceteris paribus, is in excess of two billion per year. This number is unlikely to be reached by any country in the dataset. As such, it is likely that inbound tourists will result in a rise in *F.GINI* and result in greater income inequality. Similarly, Models (3) and (4) report the pooled dynamic regression models using *F.TWO.DOLLARS* as the dependent variable. The results are consistent with Models (1) and (2): that is, an increase in inbound tourism flows results in a higher number of individuals living on $2 USD or less per day. Again, though the relationship is quadratic, the number of tourists required per year in order to eventually reduce poverty, ceteris paribus, remains unrealistic.

The final two specifications in Table 2 are Models (5) and (6). *T.DOLLARS* has no statistical impact on the proportion of national income earned by the lowest twenty percentile of the working population. On the other hand, the number of tourists does influence *F.INC.TWENTY*. Similar to the previous models, it seems that an increase in the number of inbound tourists will result in a fall in the proportion of income earned by the poorest 20% of the working population. Again, the statistically significant quadratic term suggests that this is a decreasing function of the number of tourists.

Table 2. Pooled Regression Models

Dependent Variable: *F.Y*

Regressor	**(1) GINI**	**(2) GINI**	**(3) TWO.DOLLARS**	**(4) TWO.DOLLARS**	**(5) INC.TWENTY**	**(6) INC.TWENTY**
Constant	1.2693*	0.3925	-4.2831	-2.3139	-0.4655	-0.496
	(0.6557)	(0.3207)	(3.2121)	(1.6401)	(2.5108)	(1.025)
Y	0.8728***	0.8631***	1.0331***	1.0241***	0.8436***	0.8319***
	(0.0280)	(0.0283)	(0.0176)	(0.0167)	(0.0412)	(0.0443)
T.DOLLARS	-0.0202	-	0.4253	-	-0.1255	-
	(0.0573)		(0.2833)		(0.2411)	
T.DOLLARS2	0.0004	-	-0.0116*	-	0.0033	-
	(0.0014)		(0.0074)		(0.0059)	
T.INBOUND	-	0.0749***	-	0.3414**	-	-0.1735*
		(0.0276)		(0.1651)		(0.1007)
T.INBOUND2	-	-0.0027***	-	-0.0138**	-	0.0064*
		(0.0012)		(0.0063)		(0.0038)
RURAL.VAL.ADD	-0.0089	-0.0068	0.1157*	0.1161**	0.0655	0.0674
	(0.0139)	(0.0137)	(0.0604)	(0.0584)	(0.0464)	(0.046)
MANU.VAL.ADD	-0.0218	-0.0167	0.0474	0.0193	0.0481	0.0528
	(0.0145)	(0.0136)	(0.0832)	(0.0746)	(0.0464)	(0.04)
AGRI.VAL.ADD	-0.0422**	-0.0336*	0.1061	0.0868	0.0143	0.0171
	(0.0181)	(0.0179)	(0.0819)	(0.0764)	(0.063)	(0.0639)
M2.GDP	0.0221*	0.0265**	-0.0443	-0.0595	-0.0388	-0.0382
	(0.0115)	(0.0123)	(0.0547)	(0.0568)	(0.0536)	(0.0537)
GDP.PER.CAP	-0.0245*	-0.0211	0.1381*	0.0916	0.0291	0.0439
	(0.0135)	(0.0133)	(0.078)	(0.0656)	(0.0413)	(0.0464)
GDP.GROWTH	-0.0021	-0.0018	-0.0122**	-0.0112**	0.002	0.0022
	(0.0013)	(0.0013)	(0.0057)	(0.0054)	(0.0036)	(0.0036)
FEMALE.LFORCE	-0.0684**	-0.0441*	-0.3532**	-0.2577*	0.329**	0.2913*
	(0.0265)	(0.0252)	(0.1473)	(0.1420)	(0.1621)	(0.1528)
POL.STABILITY	0.0007	-0.0053	-0.0013	-0.0051	-0.0105	-0.0097
	(0.0077)	(0.0076)	(0.0327)	(0.0335)	(0.0314)	(0.0279)
R-Squared Statistic	0.8435	0.8414	0.9806	0.9811	0.9082	0.9081
Obs	288	288	206	207	201	202
F-Statistic	188.81***	194.17***	1287.28***	1227.17***	171.64***	210.38***

Notes: Variables are defined in Table 1. All variables, except for *GDP.GROWTH*, have been transformed by the natural logarithm. *Y* is the contemporaneous value of the dependent variable. The dependent variables are the one-period forward values. Robust clustered standard errors (by country) are reported in the parentheses. ***, **, * denote statistical significance at the 1, 5, and 10 percent level, respectively.

The panel model results are presented in Table 3 below. Note that the fixed-effects panel specification essentially de-means all variables at the country level so fixed-country effects are eliminated. After controlling for country effects, *T.INBOUND* no longer has a statistical impact on *F.GINI*. However, the number of people earning less than $2 USD a day is statistically influenced by both tourism dollars spent and the number of inbound tourists in the previous year. Specifically, tourism dollars and flows both increase the number of people living in extreme poverty at a decreasing rate. Neither *T.INBOUND* nor *T.DOLLARS* has a statistically significant impact on *F.INC.TWENTY* in the fixed-effects panel models.

Table 3. Fixed-Effects Panel Regression Models

Dependent Variable: *F.Y*

Regressor	(1) GINI	(2) GINI	(3) TWO.DOLLARS	(4) TWO.DOLLARS	(5) INC.TWENTY	(6) INC.TWENTY
Constant	4.7454***	4.3351***	-14.7331**	4.5185	4.7556	1.2845
	(1.2827)	(0.9811)	(7.4318)	(5.5215)	(3.9605)	(2.8727)
T.DOLLARS	-0.0029	-	3.2173***	-	-0.3682	-
	(0.1141)		(0.6372)		(0.3373)	
T.DOLLARS2	0.0000	-	-0.0812***	-	0.0092	-
	(0.0033)		(0.0166)		(0.0088)	
T.INBOUND	-	0.0726	-	1.3761***	-	-0.1289
		(0.0923)		(0.4741)		(0.2447)
T.INBOUND2	-	-0.0031	-	-0.0436**	-	0.0068
		(0.0037)		(0.0195)		(0.0101)
RURAL.VAL.ADD	-0.0781	-0.1002	-1.7463**	-0.6423	-0.6594*	-0.5649*
	(0.1238)	(0.1166)	(0.6688)	(0.6498)	(0.3482)	(0.3350)
MANU.VAL.ADD	0.0891**	0.0751*	0.3512	0.1628	-0.3725***	-0.3537***
	(0.0389)	(0.0402)	(0.2362)	(0.2401)	(0.1226)	(0.1228)
AGRI.VAL.ADD	-0.0331	-0.0406	-0.0113	-0.1951	0.1302	0.1453
	(0.0327)	(0.0325)	(0.1925)	(0.1954)	(0.1006)	(0.1007)
M2.GDP	-0.0107	-0.0131	-0.4663***	-0.4582***	0.0639	0.0576
	(0.026)	(0.0256)	(0.1603)	(0.1591)	(0.0828)	(0.0814)
GDP.PER.CAP	-0.0475**	-0.0454**	-0.8065***	-0.9930***	0.0239	0.0093
	(0.0226)	(0.0207)	(0.1295)	(0.1153)	(0.0673)	(0.0593)
GDP.GROWTH	0.0009	0.0015	-0.0049	-0.0045	0.0003	-0.0002
	(0.0012)	(0.0012)	(0.0063)	(0.0064)	(0.0032)	(0.0032)
FEMALE.LFORCE	-0.1096	-0.0925	-0.7553	-0.7346	0.5999	0.5863
	(0.1426)	(0.1423)	(0.8447)	(0.8571)	(0.4408)	(0.4418)
POL.STABILITY	0.0078	0.0068	0.0575	0.0731	-0.0418	-0.0494
	(0.0189)	(0.0188)	(0.1016)	(0.1028)	(0.0524)	(0.0522)
R-Squared Statistic	0.0864	0.0781	0.5115	0.4911	0.1324	0.1365
Obs	428	422	366	361	364	359
Groups	88	86	91	89	92	90
F-Statistic	3.12****	2.76***	27.75****	25.18***	4.00****	4.09****

Notes: Variables are defined in Table 1. All variables, except for *GDP.GROWTH*, have been transformed by the natural logarithm. *Y* is the contemporaneous value of the dependent variable. The dependent variables are the one-period forward values. Robust clustered standard errors (by country) are reported in the parentheses. The reported R-Squared statistic measures within-group variation. ***, **, * denote statistical significance at the 1, 5, and 10 percent level, respectively.

Table 4 contains the results of the dynamic fixed-effects panel regression produced by the bootstrapping procedure. First, notice that in all models, the autoregressive term is statistically significant at the 1 percent level. This suggests that there is indeed persistence in the dependent variable even after accounting for fixed country-level effects. In specifications (1) and (2), *T.DOLLARS* and *T.NUMBERS* have a statistically significant positive impact on the Gini coefficient. The significant quadratic terms indicate that this positive relationship is diminishing as the impact of tourism expands. In Model (3), it is shown that *T.DOLLARS* increases the number of persons earning less than $2 USD a day. No statistically significant relationship between tourism and *TWO.DOLLAR* is evident in Model (4). Models (5) and (6) report that both *T.DOLLARS* and *T.NUMBERS* have a diminishing negative impact on the proportion of income earned by the lowest twenty percentile of the working population.

In summary, the results across all models suggest that tourism dollars and inbound tourism flows are likely to have an adverse effect on income equality, albeit at a decreasing rate. Pooling all country-level data, we find that inbound tourism numbers have a diminishing negative impact on Gini coefficients, the number of individuals living on less than $2 USD a day, and the proportion of income earned by the poorest twenty percentile. After controlling for fixed country level effects, we find that both inbound tourist numbers and tourism dollars have a diminishing positive effect on the number of people living on less than $2 USD a day. The Gini coefficient and the proportion of wealth earned by the poorest 20% are not influenced by tourism when accounting for fixed country effects. The dynamic fixed-effects model reports that tourism dollars and numbers increase (at a diminishing rate) the Gini coefficient and decrease (at a diminishing rate) the proportion of income earned by the lowest twenty percentile of the working population. The dynamic fixed-effects model also shows that tourism dollars increases (at a diminishing rate) the number of people earning less than $2 USD a day.

Table 4. Dynamic Fixed-Effects Panel Regression Models Using Bootstrapped Standard Errors

Dependent Variable: *F.Y*

Regressor	(1) GINI	(2) GINI	(3) TWO.DOLLARS	(4) TWO.DOLLARS	(5) INC.TWENTY	(6) INC.TWENTY
Constant	3.2012*	2.6447**	-10.7731**	-2.2072	10.2152***	2.6012
	(0.6389)	(0.637)	(4.6965)	(4.4424)	(2.1557)	(2.1535)
Y	0.4212***	0.3997***	0.7968***	0.7868***	0.3832***	0.3453***
	(0.0861)	(0.0865)	(0.1317)	(0.1297)	(0.1068)	(0.106)
T.DOLLARS	0.1123***		0.8341***	-	-0.8331***	-
	(0.0106)		(0.0952)		(0.0299)	
T.DOLLARS2	-0.0036***		-0.0189***	-	0.0204***	-
	(0.0003)		(0.0024)		(0.0007)	
T.INBOUND	-	0.1907***	-	-0.1102	-	-0.3684***
		(0.0126)		(0.0944)		(0.0389)
T.INBOUND2	-	-0.0071***	-	0.0072**	-	0.0169***
		(0.0005)		(0.0036)		(0.0015)
RURAL.VAL.ADD	-0.1941***	-0.1323*	0.4569	0.654	-0.4986	-0.3664
	(0.0708)	(0.0699)	(0.5189)	(0.52)	(0.3586)	(0.3548)
MANU.VAL.ADD	0.0271	0.023	0.1388	0.0871	-0.2534*	-0.2166
	(0.0485)	(0.0523)	(0.4035)	(0.4354)	(0.1394)	(0.1488)
AGRI.VAL.ADD	-0.0238	-0.0153	0.064	0.0792	0.0546	0.0608
	(0.0263)	(0.0252)	(0.277)	(0.2614)	(0.079)	(0.0766)
M2.GDP	0.0242	0.0056	-0.2603	-0.2499	0.0363	-0.0175
	(0.0239)	(0.0236)	(0.2374)	(0.2324)	(0.0493)	(0.0487)
GDP.PER.CAP	-0.0245*	-0.0423***	-0.1609	-0.1659	0.0249	-0.001
	(0.0146)	(0.0149)	(0.1402)	(0.1429)	(0.0335)	(0.0338)
GDP.GROWTH	0.0003	0.0003	-0.0079	-0.0069	0.0025	0.0019
	(0.0015)	(0.0015)	(0.0122)	(0.0124)	(0.0032)	(0.0032)
FEMALE.LFORCE	-0.2737***	-0.2427**	0.4713	0.4974	0.1376	0.3491
	(0.1019)	(0.101)	(0.8532)	(0.8481)	(0.3872)	(0.393)
POL.STABILITY	0.0219	-0.2427**	0.0981	0.0827	-0.0107	-0.0084
	(0.0192)	(0.101)	(0.152)	(0.1513)	(0.0514)	(0.0503)
R-Squared Statistic	0.2469	0.2391	0.7796	0.7761	0.3418	0.3357
Obs	288	288	206	207	201	202
Groups	48	47	35	34	35	34
F-Statistic	6.83***	6.57***	51.46***	51.06***	7.32***	7.21***

Notes: Variables are defined in Table 1. All variables, except for *GDP.GROWTH* , have been transformed by the natural logarithm. *Y* is the contemporaneous value of the dependent variable. The dependent variables are the one-period forward values. Bootstrapped standard errors calculated from 10,000 iterations are reported in the parentheses. The reported R-Squared statistic measures within-group variation. ***, **, * denote statistical significance at the 1, 5, and 10 percent level, respectively.

5. Conclusion

This study analyses the relationship between inbound tourism numbers and spending and the economic inequality of the local population for a sample of developing countries. Using pooled dynamic and fixed-effects panel regression models, we uncover consistent evidence that both tourism numbers and dollars spent have increased income inequality in developing countries over the period of 1995 to 2012. The results indicate that the Gini coefficient, the number of individuals earning less than $2 USD a day, and the proportion of aggregate personal income earned by the lowest twenty percentile in the workforce are statistically and positively related to inbound tourism numbers and spending, after controlling for various economic characteristics.

This paper is the first study to apply econometric models to multiple measures of income inequality in a cross section of developing countries. The results provide evidence that, whilst tourism may lead to economic development in developing countries (Durbarry, 2004; Fayissa et al., 2008), unchecked tourism activities are likely to disadvantage those who are economically vulnerable and widen income inequality among the local population. Previous researchers have argued that this is due to the financing of low-paying seasonal employment industries (Krakover, 2000; Chant, 1997) and that the depletion and destruction of natural resources that the extremely poor rely on (Mastney, 2002). Furthermore, especially for tourism in developing countries, large multinational companies often control most of tourism-related industries, such as accommodation, packaged tourism products, and transport (see also Britton, 1982). While local elites usually receive some benefits of tourism development, the local poor often receives the smallest share, which then leads to income inequality.

Nonetheless, it should be noted that tourism regardless should be a primary policy objective due to its many benefits to the local economy, especially for developing countries (Lee & Chang, 2008). Moreover, investments in tourism alone seem to be insufficient for long term economic growth; tourism development should be treated as an integral part of a broader development strategy (Du et al 2014). However, the results of recent studies, including the current study, suggest that more resources should be put in place to develop pro-poor tourism programs to mitigate the inequitable distribution of economic benefits of tourism as well as to reduce possible environmental degradation by rural poverty. Governments need to adopt more pro-poor focused approaches and use tourism as a poverty alleviation strategy. Their intervention, through tourism policies and initiatives, should be geared towards the poor. For that happen, local communities need to take part in decision-making processes (Ashley 2000b; Clancy, 1999; Long, 1991; Timothy, 1999). This is crucial as the perception of local communities in terms of economics as well as socio environmental impacts is often different from others such as tourists themselves (Poudel et al 2016). Koutra & Edwards (2012) suggest that, for successful poverty alleviation, capacity building of local communities should be prioritised and its definition should be clearer as well as measureable.

Some other policy recommendations include an explicit and adequate financial commitment to community involvement in tourism development (Tosun, 2000). In addition, a cautious approach must be taken during local empowerment in order to avoid dominance of local elites over more vulnerable local populations (Tosun, 2000). Furthermore, relevant education and training programs should be provided to local populations so that they can become engaged in the tourism development process as entrepreneurs and employees (Tosun, 2000). Moreover, adequate policies need to be formulated to support local employment opportunities.

When developing appropriate policies and institutional framework, specific local conditions must be taken into account (Tosun, 2000). Careful planning and design, based on the good understanding of local environment, as well as participatory approach can greatly facilitate the positive effects of tourism (Ashely 2000). Thus, in order to implement an approach that encourages more participation of the local community, changes in the socio-political, legal, and economic structure of developing countries may be necessary (Tosun 2000).

This study is a first step to examine the statistical relationship between tourism activities and a set of income inequality measures. The next step should be to look into the factors that cause such income inequality in details. The importance of explicitly addressing negative impacts of tourism development on local livelihoods, especially on assets and existing activities of those rural communities, is widely discussed (e.g., Ashley 2000). Therefore, future research could further study, in depth, those potential negative issues, such as loss of local culture, loss of local biodiversity, and increased land or local commodity prices.

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