Proceeding of the 3rd International Conference on Poverty and Sustainable Development, Vol. 3, 2016, pp. 54-66
Copyright © TIIKM
ISSN: 2362-1028 online
DOI: https://doi.org/10.17501/icpsd.2016.3106

A PANEL QUANTILE REGRESSION ANALYSIS OF TOURISM EFFECTS ON POVERTY ALLEVIATION

Hanlin Xu

Rikkyo University, Japan

Abstract: Tourism increasingly become a tool to achieve sustainable development, especially in the perspective of poverty alleviation. Indeed, increasing international tourism receipt is probably recognized as the most readily way to reduce poverty. Despite the significant amount of strategy research eager to lessen poverty by adopting tourism, there is little understanding of what effects tourism has on poverty alleviation on a macro level, especially at different poverty levels. This study considered the effect of tourism growth on poverty alleviation in 66 developing countries from 1995 to 2012. The analysis focused on the GDP growth rate, international tourism receipts, international tourism arrivals, absolute poverty headcount ratio, and the application of linear and panel quantile regression techniques to the poverty gap. Unlike the mean effect, the results suggest that 1) tourism has the heterogeneous effect on poverty alleviation in terms of different poverty levels: in the case of very low quantiles of poverty, tourism does not seem to reduce poverty effectively; 2) compared with international tourism receipts, international tourism arrivals show a higher effect on poverty reduction; 3) tourism development contributes more than GDP growth on poverty alleviation; 4) higher tourism growth effects are found on headcount ratio rather than the poverty gap.

Keywords: Tourism; Poverty; Economic Growth; Panel

Introduction

As a potential significant source of economic growth in developing countries, tourism has an irreplaceable role in poverty reduction activity (e.g. Croes & Vanegas, 2008; Croes, 2014). All walks of life give strong backing to utilize tourism development to alleviate poverty, especially in countries where abundant nature resources exist to support tourism development in view of a lack of alternative development. According to the recent statistics (UNWTO, 2015), the tourism sector is sustaining the increase and is relatively more important in developing countries, such as Gambia. There, tourism contributes to 33.1% of its total export with its share of global tourism market much larger than its average share of world trade. Many LDCs value tourism as an economic sector (Hawkins and Mann, 2007).

Tourism, as a key driver to eliminate poverty, has been of universality in many LDCs (Croes and Vanegas, 2008). Mitchell and Ashley (2009) indicated that about 80 per cent of African Poverty Reduction Strategy Papers include a reference to encourage using tourism as a tool or strategy to improve national economic conditions and reduce the level of poverty. However, despite the significant amount of strategy research eager to reduce the poverty ratio by adopting tourism, there is little understanding of what effect tourism has on poverty alleviation on the macro level. Some advocates of tourism deem it is a panacea for overcoming poverty and inequality (e.g. Croes &Vanegas, 2008; Khatiwada and Silva, 2015), while some researchers assert tourism has no effect in alleviating extreme poverty (e.g. Plüss and Backes, 2002, cited in Scheyvens, 2007: 232). However, the question of whether tourism is directly applicable to eliminating poverty itself has been neglected (e.g. Zhao & Ritchie, 2007; Vanegas, Gartner and Senauer, 2015).

Corresponding Author's contact details:15wa001a@rikkyo.ac.jp

The mixed conclusions of case studies in estimating the impacts of tourism on poverty imply that tourism failed to provide the same effect on poverty alleviation in different developing regions. Ashley (2009) stressed that the Millennium Development Goals (MDGs) were not successful overall in developing countries, having been partly realized in Asia with buoyant growth by alleviating poverty but also having partly failed in numerous social welfare-orientated development programs. For instance, in the case of Nicaragua and Costa Rica (Croes, 2014), the poverty ratio could be cut by increasing tourism receipts yet the opposite was found in Thailand (Wattanakuljarus and Coxhead, 2008). Wattanakuljarus and Coxhead (2008) argued that the growing income inequality has become a big issue during the development of tourism. Therefore, in order to clarify the effect of tourism on poverty, answering research questions such as why there should be focus on tourism development, and when tourism has the greatest effect on poverty alleviation is critically important in anti-poverty research.

The purpose of this study is to estimate the effect of tourism on poverty alleviation in 66 developing countries from 1995 to 2012 by adopting the panel quantile regression model. Specifically, the study attempts to verify two research questions. The first asks whether tourism has a higher effect on eliminating absolute poverty than GDP growth, and the second asks whether tourism has a consistent effect on poverty alleviation in terms of different poverty levels.

Tourism-poverty link: conceptual framework and current poverty

In the past decade, poverty alleviation has been established as a major priority in tourism development for the United Nations World Tourism Organization (UNWTO). The in-depth development of anti-poverty tourism is a consequence of an international tourism trend converged on LDCs and a shift of global development policy from economic diversification to poverty alleviation (Holden, 2013). According to historical timelines, Scheyvens (2011, 2007) proposed four conceptual approaches for clarifying the debate between tourism development and poverty in the view of history: the liberal, the critical, the alternative, and the post development approach. At the very beginning, the liberal approach links tourism to economic benefit and eliminates poverty naturally. Many empirical studies in LDCs suggested that tourism-led growth (TLG) is indeed an effective strategy; a strong positive correlation between tourism and poverty reduction having been found in Greece (Dritsakis, 2004), Mauritius (Durbarry, 2004), Indonesia (Sugiyarto, Blake and Sinclair, 2003), South Africa (Akinboade and Braimoh, 2010), and other developing counties (Eugenio-Martin, Martin-Morales and Sinclair, 2008). After the "honeymoon period", a number of critics highlighted the costs of tourism development in LDCs in terms of cultural change and damage to traditions (e.g. Aramberri, 2001; Mansperger, 1995), natural environment damage (e.g. Gohar and Kondolf, 2016; Sroypetch, Carr and Duncan, 2016); and price increase in the local market (e.g. Alegre and Sard, 2015; Vanhove, 1997). Furthermore, the TLG hypothesis can be questioned in some countries such as South Korea (e.g. Kim and Lee, 2012; Oh, 2005) and Turkey (Katircioglu, 2009). In order to prevent negative effects, alternative approaches attempt to create more direct benefit to the poor such as the development of "community-based tourism", which is eager to set a direct link between tourists and the poor people. However, community-based tourism also faces the criticism that it mainly fits the interests of NGO rather than local communities (Ruiz-Ballesteros and Hernández-Ramírez, 2010). Under the strong criticism of mass tourism and traditional tourism development, pro-poor tourism (PPT) has been established for advocating all forms of tourism that provide more benefits to the poorest, not only including monetary gains but also education and sanitation. Poverty reduction has become an important issue on the tourism agenda and the nexus of tourism and poverty has bought great interesting to governments, non-governmental organizations, and international organizations (Vanegas, Gartner and Senauer, 2015). Their aim is to enhance positive impacts of tourism growth on poverty alleviation, and emphasize the voice and needs of the poor in tourism development (Ashley and Maxwell, 2001). In the comprehensive historical review of the link between tourism and poverty, Ashley and Mitchell (2009) pointed out three key pathways for the poor to benefit from tourism activity: 1) direct effects, which refer to labor income and other forms of earnings from both

tourism sectors and non-tourism sectors directly; 2) secondary effects, which refer to indirect earnings from non-tourism sectors such as tourism workers who spend their earnings within the local economy. Specifically, according to the multiplier effect of tourism, tourism development not only creates jobs in the tertiary sector, but also encourages growth in the primary and secondary sectors of industry (Leontief and Wassily, 1987); 3) dynamic effects, which cover the long-term changes in macro economy and the local economy at the destination. As William (1998) explained when the growth of any tourism sector reaches a sufficient size, it can make markets thicker and then create additional advantages for the destination markets. However, the issue of leakages and corruption may offset potential tourism benefits (Sinclair, 1998).

Arvin and Barillas (2002) stated that about 1.5 billion people do not have access to clean water and about 2 billion do not have access to electricity. Mover, about 25,000 people die every day of hunger. In more areas, poverty not only means inadequate essential necessities and income, but also refers to human development, vulnerability, and lack of freedom, voice, and capability. Due to the multidimensional features of poverty, alleviating poverty is wide ranging challenge for the global society. In recent years, not only non-government organizations have established several programs (e.g. STEP and PPT) to face this global challenge, but also the governments of Nepal, China, and Vietnam have launched large-scale tourism-based development projects. However, unlike the effects of those governments and NGOs, the implication of tourism for poverty reduction has been neglected by the academic community (Zhao and Ritchie, 2007). The tourism-poverty nexus has attracted few researchers until recently. The mismatch between academia and practice implies an urgent need for researching in this field. Thus, the challenge is how to ensure the poor obtain the maximum benefits during the tourism development.

Literature review on recent tourism-poverty studies

The significance of investigating the tourism-poverty nexus has been highlighted by Zhao and Ritchie (2007). In recent macro-level literature, the relationship between tourism and poverty has been conducted by two types: qualitative research and case studies. From the macroeconomic perspective, country-specific studies dominate empirical research. The most frequently used methods are the simple simulation models, input-output models, and computable general equilibrium models (Winters, Corral and Mora, 2013), while the main criticism faced by the literature on tourism-poverty link studies is lack of global understanding. As Winters, Corral and Mora (2013) argued, despite recent few empirical studies, it is difficult to confirm the effect of tourism development on poverty alleviation since there are only several case studies on the macro-level. Moreover, whereas most empirical studies focused on the TLG (tourism lead growth) hypothesis assume that growth will trickle down to the poor automatically, only a few studies have made efforts on the tourism-poverty link directly (Croes, 2014). According to the recent macro-level empirical researches, the results suggest that 1) that tourism has a positive impact on poverty alleviation; 2) tourism does not have systematic effect on all income groups. Vanegas, Gartner, and Senauer (2015) considered the impact of agricultural, manufacturing and tourism development on extreme poverty reduction in Costa Rica and Nicaragua. And the result showed that for both countries, tourism development is negatively related to indigence, and a higher poverty reduction effect is found on tourism rather than agriculture. The positive correlation between tourism development and poverty alleviation also has been found in Central America countries such as Nicaragua and Costa Rica (e.g. Croes and Vanegas, 2008; Croes, 2014; Vanegas, Gartner, and Senauer, 2015). On the other side, according to TLG studies, the effect of tourism is not constant with different income groups. By adopting a panel data approach and the Arellano-Bond estimator for dynamic panels, Eugenio-Martin, Martín Morales, and Scarpa (2004) found that tourism only lead to economic growth in medium or low-income countries of Latin American. Blake, Arbache, Sinclair, and Teles, (2008) considered the impacts of tourism on different households in Brazil by using a computable general equilibrium model (CGE). The result showed that tourism has a positive effect on all income groups while the lowest income group benefit less than some higher income groups. Incera and Fernández (2015) confirmed the distributive effects of tourism through a social accounting matrix (SAM) model of Galicia. The

analysis has been focused on the changes in household earnings and government revenues, and they concluded that tourism contributing to a slight increase in income inequality and relative wealthy households benefit more than low income group. Thus, tourism is not equally growth-conducive in all areas. However, this problem has been neglected in anti-poverty tourism research.

The literature review indicates that tourism does have the potential to reduce poverty levels, but a number of limitations are also identified. First, no research considers the heterogeneous effect of tourism on poverty alleviation in terms of different quantiles of poverty. Although few researchers have researched the distinct effects of tourism on poverty alleviation among different income groups, national level high income countries do not guarantee low poverty rates in the context of extreme inequality. Thus, using poverty index itself to estimate the heterogeneous effect of tourism on poverty alleviation is better than using national income level. Second, even though many studies stress that tourism could reduce regional poverty level, most of them focus only on case studies, while the global understanding have been neglected, which makes it difficult to understand the overall tourism–poverty link. Third, no empirical study compares international tourism and GDP growth in terms of their effects on poverty alleviation. Therefore, by adopting the quantile regression approach, this paper not only addresses the mean effect of tourism on poverty reduction, but also illustrates how international tourism impact on different quantile levels of poverty. The estimate results contribute to the anti-poverty tourism literature by showing a new and interesting finding regarding the correlation between poverty alleviation and tourism development.

Estimation Method

Quantile regression is a regression method first proposed by Koenker and Bassett (Koenker and Bassett, 1978) that used the distribution conditions of dependent variable to fit independent variables. Koenker and Hallock (2001) explained that the classical linear regression results are obtained by fitting the conditional mean of dependent variable with independent variables. While quantile regression aims at estimating either the conditional median or other quantiles of the response variable, which is a more refined estimation. In tourism research, the traditional Ordinary Least Square (OLS) regression methods have been widely used in tourist expenditure literature. However, OLS presents the risk of undesirable estimated results as tourist receipt features by a long tail (Huan, Beaman, Chang, and Hsu, 2008). Comparing with OLS, the quantile regression method reduces the weight placed on extreme observations, thus it is a more suitable method for estimating asymmetric variables and long-tail distributions (Koenker and Bassett, 1978). Nevertheless, the application of quantile regression is limited to only a few studies, and has been neglected in the tourism context until recent years (Brida and Scuderi, 2013). Therefore, this paper selects the quantile regression method to analyze the heterogeneous effect of tourism development on different poverty levels, and explores the information that is omitted in OLS regression.

Tourism and poverty data

At present the borderline of tourism activities has already become ambiguous. Its unclear industry concept makes it difficult to divide tourism as an industry from the supply. Thus, this paper selects the international tourism receipts and international tourism arrivals as tourism variables as variables based on the demand. The data is obtained from the World Bank, which spans the time period from 1995 to 2012. Poverty, in this study is defined in both headcount ration (H) and poverty gap (PG), which are usually conducted in most poverty researches. H refers to the percentage of the population living on less than $1.90 a day at 2011 international prices. PG is the mean shortfall in income or consumption from the poverty line of $1.90 a day (counting the non-poor as having zero shortfall) expressed as a percentage. The poverty data is available from World Development Indicators (WDI) of World Bank and UNWTO. Since GDP growth (GDPG) usually be regarded as one of the most important factors of poverty alleviation, thus this research also adds GDPG in the eatimation model. In addition, the overall understanding of tourism-poverty links is difficult to appreciate in the case studies. Thus, this study investigates global panel data in the 66 least developed countries, but does not includes sub-Saharan Africa countries. As Bloom and Saches

(1998) illustrated, the reasons of poverty in sub-Saharan Africa are complex, including legacy of colonial rules, slave trading, heaving dependence on a small number of primary exports, and corruption.

Unit root tests

In order to avoid spurious regression, the work begins from the group unit root test, which includes LLC (Levin, Lin and Chu t*) test, IPS (Im, Pesaran and Shin W-stat) test, ADF test and PP test. According to Table 1, H, PG, and GDP growth (GDPG) is stationary series at 1% level, while Tourism receipts (TR) and Tourism Arrivals (TA) are not. After changing the two stationary series into log form then all series are stationary at 1% level. Therefore, this paper uses H, PG, (log) TR, (log)TA, GDPG to assess the empirical model.

Table 1 Group unit root tests: Summary (Exogenous variables: Individual effects)

	Testing methodology: individual intercept and trend Statistical value (P value)			
	Levin, Lin & Chu t*	Im, Pesaran and Shin W-stat	ADF - Fisher Chi-square	PP - Fisher Chi-square
Headcount ration	-20.4 (0.00)	-10.4 (0.00)	207.2 (0.00)	300.9(0.00)
Poverty gap	300.9 (0.00)	-4.6 (0.00)	220.0 (0.00)	322.0(0.00)
Tourism receipts*	1.2 (0.89)	1.8 (0.97)	131.8 (0.44)	74.9 (1.00)
Tourism Arrivals*	-1.8 (0.03)	1.0 (0.84)	147.1 (0.15)	127.0 (0.56)
GDP growth	-13.1 (0.00)	-10.2 (0.00)	325.3 (0.00)	437.5(0.00)
(Log) Tourism receipts	-4.5 (0.00)	-3.0 (0.00)	178.0(0.00)	132.0 (0.43)
(Log) Tourism Arrivals	-4.9 (0.00)	-2.5 (0.00)	187.4 (0.00)	165.9 (0.01)

Descriptive statistics

Tables 2 and 3 report the summary statistics and the correlation among variables respectively. Table 2 presents the summary statistics of GDPG, H, PG, (log) TA, and (log) TR. In particularly, skewness measures the asymmetry of the probability distribution about the mean, while kurtosis is a descriptor of the shape of a probability distribution. When kurtosis in excess of three, it implies that the data is fat tailed. According to Table 2, the skewness of PG and H showed that the distributions of PG and H are positively skewed and have fat tails. And kurtosis of PG, GDPG, and H are excess of three, which imply that they are more flatness than normal distribution. And also, the Sharpiro-Wilk test rejected the normality hypothesis, suggesting that TA and TR do not follow the normal distribution.

Furthermore, Table 3 reported the correlation between each variable. Two poverty ratios show high correlation, 0.912. And as we expect, poverty ratio and tourism variables show a negative correlation, which implies that tourism has the potential on alleviating poverty, while GDPG does not show significant negative correlation with poverty ratio.

Table 2 Descriptive statistics1995-2012.

	(log)TA	(log) TR	H	PG	GDPG (annual %)
Mean	13.883	20.366	11.496	4.179	4.309
Maximum	17.871	24.637	76.020	31.070	20.654
Minimum	8.006	14.557	0	0	-16.700
Std. Dev.	1.872	1.932	13.569	5.543	4.286
Skewness	-.425	-.475	1.778	2.303	-.884
Kurtosis	3.039	2.994	6.105	9.400	6.116
Observations	1170	1143	830	825	1172

Table 3 Correlation among variables.

	H	PG	(log) TA	(log) TR	GDPG
H	1				
PG	.913	1			
(log)TA	-.446	-.476	1		
(log)TR	-.503	-.531	.886	1	
GDPG	.060	-.005	.002	.005	1

Regression Models

This paper performs a panel regression estimate to examine the tourism-poverty link with incorporating the potential influences of GDPG into the estimating equation. During the period from 1995 to 2012, the correlation between the poverty and tourism receipts among the 66th low income countries is established as following.

Eq. (1):

$$Poverty_{it} = \alpha + \beta_1 Tourism_{it} + \beta_2 GDPG_{it} + \varepsilon_{it}$$

Where *i* is the cross section of each country; *t* denotes the time period, year; Povertyit and Tourismit present the poverty level and tourism development level of country *i* in the year *t* perceptively; GDPG denotes the GDP growth rate; α is the intercept term, which represents the contribution of other important factors on poverty reduction; εit is the random error term; β_1 and β_2 represent the output elasticity of tourism and GDPG respectively, which reflect the contribution of

each input element to the reduction of poverty. Specifically, TR and TA express the tourism development level ($Tourism_{it}$), H and PG express the poverty level ($Poverty_{it}$). Eq. (1) is the basic panel data model, according to F-test and Hausman statistic value the null hypothesis is rejected, which suggest establishing the fixed effects model. By considering the influence of global event such as financial crisis, finally, the fixed effect model is selected as the empirical model to investigate the tourism effect on poverty reduction.

Model PG:

$$PG_{it} = \alpha + \beta_{11} Tourism_{it} + \beta_{12} GDPG_{it} + k_i + f_t + \varepsilon_{it}$$

Where k_i is the country fixed effects, which captures a country's unobserved and time invariant characteristics; f_t is the year fixed effects (year dummy) that absorb the common effects of external and global factors that are common to all countries; PG_{it} is the poverty gap at $1.90 a day (constant 2011 PPP) of country i in year t. However, PG could only reflect the depth of poverty while H could only show the breadth of poverty, but not reflect income change until exceed the poverty line. Thus, this paper selects both to express the poverty level ($Poverty_{it}$). In order to facilitate the expression, the corresponding two estimation models are named as Model H and Model PG respectively. Similarly, Model PG is used to test the relationship between H and two types of tourism variables.

Model H:

$$H_{it} = \alpha + \beta_{21} Tourism_{it} + \beta_{22} GDPG_{it} + k_i + f_t + \varepsilon_{it}$$

The coefficient is expected to be significantly negative and different with zero if tourism can significantly affect poverty, since high TA or TR would reduce poverty level. Model H and Model PG assume that the impact of tourism on poverty is the same for all sample countries over time, which can be estimated based on OLS. However, whether the effects of tourism on poverty reduction vary over the level of poverty is still unknown. Thus, the study also uses a quantile regression method to analyze whether the tourism–poverty link is sensitive to different quantiles of poverty.

Results

In order to compare the contribution of tourism and other input factors on poverty alleviation, Table 4 and 5 present the regression coefficients of TR, TA, and GDPG based on Model H and Model PG respectively. In addition, Table 4 and 5 also report the estimation result of the fixed effect mean regression model to capture the difference in regression models. Furthermore, in order to directly reflect and compare the contribution of input factors at different poverty levels, the coefficient of each input element is described by a graph as shown in Figure 1.

Table 4 presents the estimation results for determinants of H of 66 developing countries during the period from 1995 to 2012. Two tourism variables, TA and TR are estimated under different quantiles τ from 0.1 to 0.9. The results of quantile regression show that both tourism variables and GDPG are statistically significant and have expected signs: all of them have negative effect on poverty. However, the results of fixed effects regression show that GDPG are negative but statistically insignificant. The quantile regression is preferred because it not merely about conditional mean of a covariate and more robust against outliers in the response measurements. The absolute value of estimated tourism coefficients are diverse from 0.060 to 3.125, in particular, TA show higher effect than TR. Although GDPG also show positive effect on poverty reduction, the maximum absolute value is only 0.086. Similarly, Table 5 reports the estimation results based on poverty ration (PG). The minimum absolute value of tourism coefficient is 0.071 while the maximum absolute value of GDPG coefficient is 0.062, which indicate that tourism has higher effects than GDPG on poverty alleviation at all quantile levels. In sum, Table 4 and 5 indicate that first tourism has the positive effect on reducing poverty. TR and TA have significant negative effects on both poverty variables (H and PG). The statistically significant negative sign of tourism coefficients of under all quantiles τ from 0.1 to 0.9 suggest that the positive effect of tourism on poverty alleviation is consistent. Second, tourism development contributes more than GDPG on poverty alleviation. No matter in Model H or Model PG, the effects of tourism development are higher than GDPG in all poverty quantiles, which indicates that

tourism development is a more important force to reduce poverty rather than GDP growth.

Table 4 Regression results: tourism development on poverty alleviation (Model H).

Regression Model	Quantile	Dependent variable: Poverty headcount ratio at $1.9 a day (Log)Tourism Receipts Model			(Log) Tourism Arrivals Model		
		Tourism	GDPG	Pseudo R^2	Tourism	GDPG	Pseudo R^2
Quantile Regression	Low quantile t =0.10	-.060*** (.00)	-.031*** (.00)	.586	-1.270*** (.00)	-.043*** (.00)	.575
	Low quantile t = .20	-.799*** (.00)	-.045*** (.00)	.612	-1.522*** (.00)	-.044*** (.00)	.605
	Low quantile t = .30	-1.602*** (.00)	-.083*** (.00)	.635	-2.323*** (.00)	-.086*** (.00)	.629
	Median quantile t = .40	-1.849*** (.00)	-.114*** (.00)	.657	-3.125*** (.00)	-.080*** (.00)	.656
	Median quantile t = .50	-1.652*** (.00)	-.095*** (.00)	.681	-2.801*** (.00)	-.066*** (.00)	.684
	Median quantile t = .60	-1.754*** (.00)	-.085*** (.00)	.706	-2.825*** (.00)	-.064*** (.00)	.713
	High quantile t = .70	-2.084*** (.00)	-.061*** (.00)	.733	-2.180*** (.00)	-.051*** (.00)	.741
	High quantile t = .80	-1.698*** (.00)	-.034*** (.00)	.770	-2.255*** (.00)	-.039*** (.00)	.779
	High quantile t = .90	-1.606*** (.00)	-.055*** (.00)	.829	-2.621*** (.00)	-.049*** (.00)	.834
Fixed Effect Regression	None	-3.063*** (.00)	-.079 (.153)	.405 (R^2)	-2.162*** (.00)	-.084 (.146)	.391(R^2)

Note: Figures in parentheses are p-values. *Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level.

Table 5 Regression results: tourism development on poverty alleviation (Model PG).

	Quantile	Dependent variable: Poverty Gap (Log)Tourism Receipts Model			(Log) Tourism Arrivals Model		
		Tourism	GDPG	Pseudo R2	Tourism	GDPG	Pseudo R2
Quantile Regression	Low quantile t =0.10	-.071*** (.00)	-.011*** (.00)	.532	-.265*** (.00)	-.014*** (.00)	.515
	Low quantile t = .20	-.200*** (.00)	-.014*** (.00)	.559	-.400*** (.00)	-.009*** (.00)	.547
	Low quantile t = .30	-.402*** (.00)	-.023*** (.00)	.581	-.670*** (.00)	-.031*** (.00)	.572
	Median quantile t = .40	-.498*** (.00)	-.045*** (.00)	.605	-.910*** (.00)	-.035*** (.00)	.602
	Median quantile t = .50	-.585*** (.00)	-.062*** (.00)	.633	-.961*** (.00)	-.037*** (.00)	.634
	Median quantile t = .60	-.398*** (.00)	-.038*** (.00)	.668	-.789*** (.00)	-.030*** (.00)	.672
	High quantile t = .70	-.489*** (.00)	-.029*** (.00)	.705	-.920*** (.00)	-.024*** (.00)	.709
	High quantile t = .80	-.515*** (.00)	-.016*** (.00)	.749	-.935*** (.00)	-.021*** (.00)	.752
	High quantile t = .90	-.675*** (.00)	-.026*** (.00)	.802	-.995*** (.00)	-.020*** (.00)	.802
Fixed Effect Regression	None	-.910*** (.00)	-.061* (.014)	.326(R2)	-.793*** (.00)	-.063* (.016)	.320(R2)

Note: Figures in parentheses are p-values. *Significant at the 10% level. **Significant at the 5% level. ***Significant at the 1% level.

Figure 1 describes the contribution of each determinants of poverty by a scatter diagram, which makes easier to compare the poverty reduction effects of each input factor. According to Figure 1, two tourism variables present the heterogeneous effect in terms of different quantiles of poverty. The contribution of tourism to reduce poverty is basically decreasing with the decrease of poverty level, but it shows different performances at different poverty quantiles as shown in Figure 1. In the case of Model H, the contribution of TR to eliminate poverty is the

greatest (-2.084) when poverty quantile is at medium levels (τ = 0.4 ~ 0.6), and it slightly reduces when poverty is at high levels (τ = 0.7 ~ 0.9), but is basically stable. However, when poverty is in the low quantiles (τ = 0.1 ~ 0.3), the effect of tourism sharply decreases and reaches the lowest point -0.06 at τ is equal to 0.1. Similarly, the heterogeneous effect of tourism also is consistent in Model PG. Thus, tourism shows different effects on different quantiles of poverty. In addition, higher tourism effects are found in Model H rather than Model PG. The coefficients of TA are diverse from -0.265 to -0.995, and -1.270 to -3.125 in the Model PG and Model H respectively. And also, the coefficients of TR have greater absolute values in Model H at all quantile levels, suggesting tourism has stronger positive effect on eliminating H rather PG. Furthermore, TA shows higher effect on poverty reduction than TR at all quantile levels in both Model H and Model PG. This indicates that the relative strong dependence of poverty alleviation on TA. In sum, Figure 1 confirms that first, tourism has heterogeneous effect on poverty in terms of different poverty quantiles, especially, the highest poverty reduction effect is found on the middle level quantiles while at low level quantiles poverty seems not benefit a lot from tourism development; second, tourism has higher effect on reducing poverty headcount ratio rather than poverty gap; third TA contributes more on poverty reduction rather than TR in both estimation models.

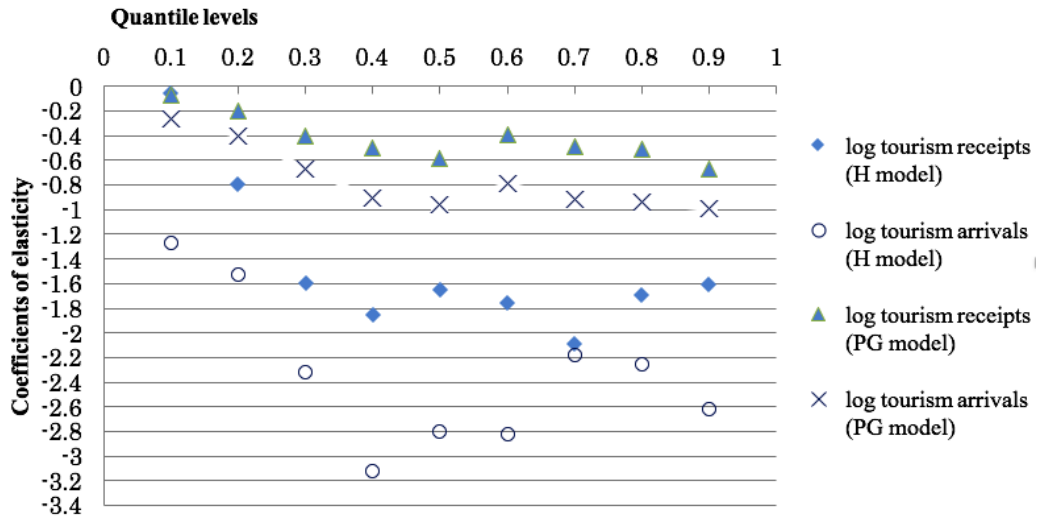

Figure 1 The estimated value of beta at different quantiles.

Conclusion and implications

The study first examined whether tourism can contribute to eliminating poverty rate of developing countries. And then, the research question that whether distinct poverty levels matter for the impact of tourism on poverty reduction has been tested. Because of only few researches have reported the effect of tourism on poverty on global panel data and no researches have considered the different impact of tourism development on distinct poverty quantiles, this study adds another important piece of evidence to tourism-poverty nexus debate and national poverty reduction policy in the perspective of tourism development.

The first research question we addressed is whether tourism has positive impact on poverty alleviation in developing countries. We used tourism arrivals and tourism receipts as tourism variables, and poverty headcount ration and poverty gap as poverty variables, the estimated results of global panel data suggest that tourism has a significant effect on poverty alleviation. And tourism matters for poverty reduction more than GDP growth. The second question is whether this positive effect consistent with national poverty levels. The results based on quantile regression suggest that the level of poverty matters for determining the effect of tourism on poverty alleviation. Both estimated models (Model H and Model PG) indicate that positive effect of tourism on poverty reduction shrinks with the decreasing

level of poverty. The higher poverty eliminating effects are found at the middle and high quantiles of poverty, which in middle quantiles the impact of tourism on poverty reduction is the greatest. However, at the very low quantiles of poverty, although the poverty reduction impact is positive, the absolute values of coefficients are almost close to zero, which imply that tourism development does not influence poverty ratio so much.

According to the findings, tourism development does not guarantee to reduce extreme poverty with the same effect in all developing countries. The effect of tourism on poverty reduction varies cross countries regard to their poverty level. This implies that the countries with high or middle poverty level could gain benefit from tourism development while for those low poverty level developing countries tourism seems not such matters for reducing poverty. Croes (2014) also stated that tourism development is an important factor of poverty reduction under a certain condition that is lower level of economic development. (Croes, 2014; Croes and Vanegas, 2008). Thus, this study suggests that developing countries has a relative lower poverty level (H and PG) should better to seek an alternative way to solve the issue of poverty. This is also confirmed with several previous studies, such as Mbaiwa (2005), Wattanakuljarus and Coxhead (2008), and Croes (2014). Suggesting that for those countries enjoying a relative high income, tourism has no impact on the poor in some countries such as Botswana (Mbaiwa, 2005), Thailand (Wattanakuljarus and Coxhead, 2008) and Costa Rica (Croes, 2014). On the other hand, in countries with relatively high or middle level of poverty, development tourism, especially increase the number of tourists could lead to a higher impact on poverty alleviation. Although tourism receipts also have positive effect on poverty alleviation, the number of tourists is a stronger force on eliminating poverty. Thus this study suggests that developing courtiers with high or middle poverty level can enjoy the impact of tourism on poverty alleviation, and a higher poverty reduction effects can be obtained from increasing the number of tourists.

In sum, this paper suggests that tourism is an important factor in reducing poverty ratio. Especially, the important role of tourism arrivals has been neglected in both academic research and strategy paper. And the role of poverty level also should be concerned in anti-poverty policy decision.

The possible reason why tourism has a higher effect on reducing poverty might be the participation of NGOs and Government, which are seeking and creating the direct link between tourism development and poverty reduction. National economic growth, such as GDP does not guarantee equal distribution to all income classes. As Oxfam Report 2016 illustrated that the richest 62 individuals had the same wealth as 3.6 billion people in 2015 and the gap between wealthy and bottom poor has been rapidly widening. Moreover, one of the conclusions of book 《Capital in the Twenty-First Century》 written by Piketty and Ganser (2014) also suggested that the wealth accumulation of the rich class is showing an accelerated growth trend, indicating that the global inequality crisis will reach new extremes. Although inequality and corruption may also prevent tourism from contributing to poverty alleviation in a national level, the participation of NGOs and Government helped to build the direct link between tourism development and poverty reduction. For instance, UNWTO, World Bank are assisting low income countries to reduce poverty through tourism development. The projects like community base tourism, ecotourism, and green tourism certainty contribute to overcoming extreme poverty, which are aiming at benefit the poor directly and reducing the amount leakages of tourism earnings go to tour operators or investor. The study by Li, Chen, Li, and Goh (2016) also suggested that tourism can reduce regional income inequality in low income countries based on empirical results.

From the macroeconomic perspective, this study focuses on the moderating effect of poverty level on tourism-poverty link. Especially, this research highlighted the positive effect of tourism on tourism alleviation. The limitations of this study may be that lack of case studies experiences to explian how tourism contribute to poverty alleviation. Futhermore, as Chakravarty (2003) suggested that poverty is not one dimensional issue, it also includes the perspectives like education, sanitation, and human rights etc. Thus, in the future research needs to examine the impacts of tourism on micro-level. And in order to reach the goal of pro-poor tourism, how to

minimize the damage of mass tourism to a minimum is also need to be analyzed.

References

Akinboade, O.A. & Braimoh, L.A. 2010, "International tourism and economic development in South Africa: A Granger causality test", International Journal of Tourism Research, vol. 12, no. 2, pp. 149-163.

Alegre, J. & Sard, M. 2015, "When demand drops and prices rise. Tourist packages in the Balearic Islands during the economic crisis", Tourism Management, vol. 46, pp. 375-385.

Aramberri, J. 2001, "The host should get lost: Paradigms in the tourism theory", Annals of Tourism Research, vol. 28, no. 3, pp. 738-761.

Arvin, B.M. & Barillas, F. 2002, "Foreign aid, poverty reduction, and democracy", Applied Economics, vol. 34, no. 17, pp. 2151-2156.

Ashley, C. & Maxwell, S. 2001, "Rethinking rural development", Development policy review, vol. 19, no. 4, pp. 395-425.

Ashley, C. & Mitchell, J. 2009, Tourism and poverty reduction: Pathways to prosperity, Taylor & Francis.

Banerjee, O., Cicowiez, M. & Gachot, S. 2015, "A quantitative framework for assessing public investment in tourism–An application to Haiti", Tourism Management, vol. 51, pp. 157-173.

Blake, A., Arbache, J.S., Sinclair, M.T. & Teles, V. 2008, "Tourism and poverty relief", Annals of Tourism Research, vol. 35, no. 1, pp. 107-126.

Bloom, D.E., Sachs, J.D., Collier, P. & Udry, C. 1998, "Geography, demography, and economic growth in Africa", Brookings papers on economic activity, vol. 1998, no. 2, pp. 207-295.

Brida, J.G. & Scuderi, R. 2013, "Determinants of tourist expenditure: a review of micro econometric models", Tourism Management Perspectives, vol. 6, pp. 28-40.

Chege, P. & Mwisukha, A. 2013, "Benefits of slum tourism in Kibera slum in Nairobi, Kenya".

Croes, R. 2014, "The role of tourism in poverty reduction: an empirical assessment", Tourism Economics, vol. 20, no. 2, pp. 207-226.

Croes, R. & Vanegas, M. 2008, "Cointegration and causality between tourism and poverty reduction", Journal of Travel Research.

Croes, R. & Vanegas, M. 2008, "Cointegration and causality between tourism and poverty reduction", Journal of Travel Research.

Donaldson, J.A. 2007, "Tourism, development and poverty reduction in Guizhou and Yunnan", The China Quarterly, vol. 190, pp. 333-351.

Dritsakis, N. 2004, "Tourism as a long-run economic growth factor: an empirical investigation for Greece using causality analysis", Tourism Economics, vol. 10, no. 3, pp. 305-316.

Durbarry, R. 2004, "Tourism and economic growth: the case of Mauritius", Tourism Economics, vol. 10, no. 4, pp. 389-401.

Eugenio-Martin, J.L., Martin-Morales, N. & Sinclair, M.T. 2008, "The role of economic development in tourism demand", Tourism Economics, vol. 14, no. 4, pp. 673-690.

Eugenio-Martin, J.L., Martín Morales, N. & Scarpa, R. 2004, "Tourism and economic growth in Latin American countries: A panel data approach".

Gao, T., Wang, J., Liang, Y. & Liu, Y. 2009, "Method and modeling of econometric analysis-application and case study of eviews".

Gascón, J. 2015, "Pro‐Poor Tourism as a Strategy to Fight Rural Poverty: A Critique", Journal of Agrarian Change, vol. 15, no. 4, pp. 499-518.

Gascón, J. 2015, "Pro‐Poor Tourism as a Strategy to Fight Rural Poverty: A Critique", Journal of Agrarian Change, vol. 15, no. 4, pp. 499-518.

Gohar, A. & Kondolf, G.M. 2016, "Sustainable Tourism along the Red Sea: Still Possible?", Civil Engineering and Architecture, vol. 4, no. 2, pp. 39-46.

Hawkins, D.E. & Mann, S. 2007, "The World Bank's role in tourism development", Annals of Tourism Research, vol. 34, no. 2, pp. 348-363.

Hawkins, D.E. & Mann, S. 2007, "The World Bank's role in tourism development", Annals of Tourism Research, vol. 34, no. 2, pp. 348-363.

Holden, A. 2013, Tourism, poverty and development, Routledge.

Huan, T., Beaman, J., Chang, L. & Hsu, S. 2008, "Robust and alternative estimators for "better" estimates for expenditures and other "long tail" distributions", Tourism Management, vol. 29, no. 4, pp. 795-806.

Incera, A.C. & Fernández, M.F. 2015, "Tourism and income distribution: Evidence from a developed regional economy", Tourism Management, vol. 48, pp. 11-20.

Katircioglu, S.T. 2009, "Revisiting the tourism-led-growth hypothesis for Turkey using the bounds test and Johansen approach for cointegration", Tourism Management, vol. 30, no. 1, pp. 17-20.

Khatiwada, L.K. & Silva, J.A. 2015, "Mitigating gender inequality in rural regions: the effects of tourism employment in Namibia", International Journal of Tourism Research, vol. 17, no. 5, pp. 442-450.

Kim, H., Park, J., Lee, S.K. & Jang, S.S. 2012, "Do expectations of future wealth increase outbound tourism? Evidence from Korea", Tourism Management, vol. 33, no. 5, pp. 1141-1147.

Koenker, R. 2004, "Quantile regression for longitudinal data", Journal of Multivariate Analysis, vol. 91, no. 1, pp. 74-89.

Koenker, R. & Bassett Jr, G. 1978, "Regression quantiles", Econometrica: journal of the Econometric Society, , pp. 33-50.

Koenker, R. & Hallock, K. 2001, "Quantile regression: An introduction", Journal of Economic erspectives, vol. 15, no. 4, pp. 43-56.

Leontief, W. 1987, "Input-output analysis", The new palgrave. A dictionary of economics, vol. 2, pp. 860-864.

Li, H., Chen, J.L., Li, G. & Goh, C. 2016, "Tourism and regional income inequality: Evidence from China", Annals of Tourism Research, vol. 58, pp. 81-99.

Maathai, W. 2011, "Challenge for Africa", Sustainability Science, vol. 6, no. 1, pp. 1-2.

Mansperger, M. 1995, "Tourism and cultural change in small-scale societies", Human organization, vol. 54, no. 1, pp. 87-94.

Mbaiwa, J.E. 2005, "Enclave tourism and its socio-economic impacts in the Okavango Delta, Botswana", Tourism Management, vol. 26, no. 2, pp. 157-172.

Mitchell, J. & Ashley, C. 2010, Tourism and poverty reduction: Pathways to prosperity, Earthscan.

Mthembu, M.B.J. "Rural tourism development: a viable formula for poverty alleviation in Bergville", Inkanyiso: Journal of Humanities and Social Sciences, vol. 4, no. 1, pp. 63-74.

Muganda, M., Sahli, M. & A Smith, K. 2010, "Tourism's contribution to poverty alleviation: A community perspective from Tanzania", Development Southern Africa, vol. 27, no. 5, pp. 629-646.

Nair, V., Munikrishnan, U.T., Rajaratnam, S.D. & King, N. 2015, "Redefining rural tourism in Malaysia: A conceptual perspective", Asia Pacific Journal of Tourism Research, vol. 20, no. 3, pp. 314-337.

Novelli, M. & Hellwig, A. 2011, "The UN Millennium Development Goals, tourism and development: the tour operators' perspective", Current Issues in Tourism, vol. 14, no. 3, pp. 205-220.

Oh, C. 2005, "The contribution of tourism development to economic growth in the Korean economy", Tourism management, vol. 26, no. 1, pp. 39-44.

Piketty, T., Goldhammer, A. & Ganser, L. 2014, "Capital in the twenty-first century".

Ruiz-Ballesteros, E. & Hernández-Ramírez, M. 2010, "Tourism that empowers? Commodification and appropriation in Ecuador's turismo comunitario", Critique of Anthropology, vol. 30, no. 2, pp. 201-229.

Saayman, M. & Saayman, A. 2012, "Determinants of spending: An evaluation of three major sporting events", International Journal of Tourism Research, vol. 14, no. 2, pp. 124-138.

Scheyvens, R. 2011, "The challenge of sustainable tourism development in the Maldives: Understanding the social and political dimensions of sustainability", Asia Pacific Viewpoint, vol. 52, no. 2, pp. 148-164.

Scheyvens, R. 2007, "Exploring the tourism-poverty nexus", Current Issues in Tourism, vol. 10, no. 2-3, pp. 231-254.

Sinclair, M.T. 1998, "Tourism and economic development: A survey", The journal of development studies, vol. 34, no. 5, pp. 1-51.

Smith, D. 2011, "Desmond Tutu Attacks South African Government over Dalai Lama Ban", The Guardian, October, vol. 5, pp. 2011.

Smith, S.L. 1994, "The tourism product", Annals of Tourism Research, vol. 21, no. 3, pp. 582-595.

Sroypetch, S., Carr, N. & Duncan, T. 2016, "Host and backpacker perceptions of environmental impacts of backpacker tourism: A case study of the Yasawa Islands, Fiji", Tourism and Hospitality Research, pp. 1467358416636932.

Sugiyarto, G., Blake, A. & Sinclair, M.T. 2003, "Tourism and globalization: economic impact in Indonesia", Annals of Tourism Research, vol. 30, no. 3, pp. 683-701.

Tosun, C., Timothy, D.J. & Öztürk, Y. 2003, "Tourism growth, national development and regional inequality in Turkey", Journal of Sustainable Tourism, vol. 11, no. 2-3, pp. 133-161.

UNWTO, I. 2015, World Tourism Barometer, Volume 13, January 2015.

Vanegas, S., Gartner, W. & Senauer, B. 2015, "Tourism and poverty reduction: an economic sector analysis for Costa Rica and Nicaragua", Tourism Economics, vol. 21, no. 1, pp. 159-182.

Vanhove, N. 1997, "MASS TOURISM", Tourism, development and growth: The challenge of sustainability, pp. 50.

Wattanakuljarus, A. & Coxhead, I. 2008, "Is tourism-based development good for the poor? A general equilibrium analysis for Thailand", Journal of Policy Modeling, vol. 30, no. 6, pp. 929-955.

Williams, S. 1998, Tourism geography, Psychology Press.

Winters, P., Corral, L. & Mora, A.M. 2013, "Assessing the role of tourism in poverty alleviation: A research agenda", Development Policy Review, vol. 31, no. 2, pp. 177-202.

Zhao, W. & Ritchie, J.B. 2007, "Tourism and poverty alleviation: An integrative research framework", Current Issues in Tourism, vol. 10, no. 2-3, pp. 119-143.