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Tourism development and economic growth: A closer look at panels

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Abstract

This paper applies the new heterogeneous panel cointegration technique to re-investigate the long-run comovements and causal relationships between tourism development and economic growth for OECD and nonOECD countries (including those in Asia, Latin America and Sub-Sahara Africa) for the 1990–2002 period. On the global scale, after allowing for the heterogeneous country effect, a cointegrated relationship between GDP and tourism development is substantiated. It is also determined that tourism development has a greater impact on GDP in nonOECD countries than in OECD countries, and when the variable is tourism receipts, the greatest impact is in Sub-Sahara African countries. Additionally, the real effective exchange rate has significant effects on economic growth. Finally, in the long run, the panel causality test shows unidirectional causality relationships from tourism development to economic growth in OECD countries, bidirectional relationships in nonOECD countries, but only weak relationships in Asia. Our empirical findings have major policy implications.

Keywords: Tourism development; GDP; Panel cointegration; Panel causality

1. Introduction

Tourism business development has been the focus of study in recent times. A general consensus has emerged that it not only increases foreign exchange income, but also creates employment opportunities, stimulates the growth of the tourism industry and by virtue of this, triggers overall economic growth. As such, tourism development has become an important target for most governments. According to the estimates of the World Tourism Organization (WTO, 2000), the number of international people movements around the world will surge to 1602 million by 2020, while tourism receipts will reach some US$200 billion. Furthermore, the World Tourism Travel Council (WTTC, 2005) expects that the scale of the world tourism industry, which made up roughly 10.4% of the world's GDP in 2004, will increase to 10.9% in 2014. When all components of the tourism industry are taken into account, i.e., tourism consumption, investment, government spending and exports, the industry grew 5.9% in 2004 alone, reaching US$5.5 trillion. The 10-year growth forecast is for US$9.5 trillion in 2014. For these very reasons, thoroughly investigating all aspects of tourism development and economic growth is extremely important for governments.

The purpose of this paper is to empirically re-examine the long-run comovements and the causal relationships between economic growth and tourism development in a multivariate model with tourism real receipts per capita (*TOUR1*; Balaguer & Cantavella-Jorda, 2002), the number of international tourist arrivals per capita (*TOUR2*; Eugenio-Martín & Morales, 2004),[1] real effective exchange rate (*RQ*),[2] i.e., a proxy variable for external competitive-

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[1]International tourist arrivals often involve social costs for a host country. We discuss this in detail in Section 2.

[2]Since the exchange rate measures the effective prices of goods and services in tourism rival country, most previous studies have adopted the real exchange rate as the proxy variable to compare tourism activity between two countries (see Dritsakis, 2004). In our paper, we investigate tourism development, and it covers tourism activity throughout the whole world. Therefore, we adopt the real effective exchange rate as the proxy variable for external competitiveness to avoid biasing our results because

ness (Balaguer & Cantavella-Jorda, 2002) and real GDP per capita (*GDP*) using the new heterogeneous panel cointegration technique. We affirm the first two variables measure the benefits of tourism, whereas the exchange rate measures the effective prices of goods and services in competing tourism destination countries (Dritsakis, 2004). The updated data for 23 OECD countries and 32 nonOECD countries (including 5 Asian, 11 Latin American and 16 Sub-Sahara African countries) are applied for the 1990–2002 period.[3] Of importance is the usage of annual data that avoids any problems that could be derived from seasonality which give rise to underemployment, underutilization of facilities and, in turn, lowered productivity from tourism (Vanegas & Croes, 2003).

First, the issue is whether tourism benefits have different and more significant impacts on destination countries due to their specific features. The initial incentive to delve into this issue was inspired by Sinclair and Stabler (1997) who argued that the most obvious distinction between developed and developing economies is that, under existing conditional differences,[4] a rapid injection of tourist expenditures into developing economies has a different and much more significant impact than if equivalent sums are spent in developed economies. Next, the second objective is to consider "regional effects" as being determined by geographical groups in 32 nonOECD countries divided into 3 areas as proposed earlier in this paper.[5] It is expected that the empirical results will leads to different policy implications and strategies for all 3 regions. More precisely, the overall purpose of this paper is to study how relevant the tourism sector is for the economic growth of each of these regions and vice-versa.

Earlier studies about the relationships between tourism development and economic growth are currently "unfortunately blurry" due to there being different results for different countries in the same subject or region, different time periods within the same country and different methodologies in different regions (see Table 1).[6] However, such country analysis is invaluable for those countries when they design their specific strategy. However, when the world is more like a global village, Kim, Chen, and Jang (2006) called for further in-depth studies, suggesting researchers might like to compare inter-country relationships between economic development and tourism activity. Responding to Kim et al. (2006), for a better understanding of the relationship between groups of countries and their interactions, it is recommended that the panel data approach be taken.

Therefore, instead of a time-series or traditional fixed or random effect panel data approach, cointegration tests for a panel of countries are used. Theoretically, panel cointegration tests have many advantages over the traditional panel models: For one, cointegration tests are more powerful and allow an increase in the amount of information coming from the cross-sections. This means they have the ability to estimate long-run relationships that link the variables in the cointegration tests and estimates, which permits heterogeneity among individual members of the panel and heterogeneity in both the long-run cointegration vectors and the dynamics (Baltagi & Kao, 2000; Banerjee, 1999; Pedroni, 2000, 2004; Perman & Stern, 2003). Second, most previous studies that have used the traditional panel model had a disadvantage in the sense that they cannot account for much of the dynamics regardless of whether they are time averaged (Sarantis & Stewart, 2001). Third, for these very reasons, in the empirical process, in addition to implementing the panel-based error correction model (ECM), the panel unit root tests are used along with heterogeneous panel cointegration tests, and in this way, one can find the short-run and long-run causalities between economic and tourism development when considering the properties of the data (Dritsakis, 2004).

Hence, by using the panel fully modified OLS (hereafter FMOLS) that deals with the problem of endogeneity of the regressors and after allowing for a country-specific effect, the results provide evidence supporting a long-run steady-state relationship between GDP and tourism development. This means that the two variables are causally related at least in one direction (Engle & Granger, 1987). However, does economic growth cause tourism development or does tourism development lead to economic growth? Based on previous research, three different empirical results can be found: bidirectional causality between tourism and economic growth and unidirectional causality with either the tourism-led growth or economic-driven tourism growth hypotheses. As for policy implications, if there is clear-cut unidirectional causality from tourism development to economic development, then making strides in tourism growth (tourism-led economic growth) is the most practical approach. If the outcome shows the opposite direction of causality, then every effort should be made for overall economic growth as this, in turn, will result in the expansion of the tourism industry. If there is no causal relationship between tourism growth and economic development, then there is no feedback effect between each other. Finally, if the relationship is bidirectional, and

(*footnote continued*)
of a single country's dominant position with regard to the exchange rate (Balaguer & Cantavella-Jorda, 2002; Sinclair, 1998).

[3]This is because the data span of international tourism receipts is subject to the *World Development Indicators* database.

[4]Like the levels of income and unemployment as well as an unequal distribution of income and wealth.

[5]According to the WTTC reports, in Latin America, tourism is expected to generate US$133.4 billion in economic activity in 2005 and to escalate even further to US$228.4 billion by 2015. In Sub-Sahara Africa, the figure is US$73.6 billion in 2005 and is expected to double for an astonishing US$147.2 billion by 2015. In China, tourism is expected to generate US$265.1 billion in 2005, representing 4.3% of the total world market share, and this is expected to more than triple to an overwhelming US$875.1 billion by 2015. These are all areas where tourism demand will sharply grow up in future.

[6]For instance, Lee and Kwon (1995) found that the development of tourism usually makes a positive contribution to economic growth in South Korea, but Oh (2005) does not attest to the notion of tourism-led economic growth.

Table 1
Comparison of the empirical results for tourism development and economic growth

Samples	Authors	Empirical method	Period	Countries	Causal relationship
One country	Balaguer and Cantavella-Jorda (2002)	Error correction model	1975–1997	Spain	Tourism ⇒ growth
	Dritsakis (2004)	Error correction model	1960–2000	Greece	Tourism ⇔ growth
	Durbarry (2004)	Error correction model	1952–1999	Mauritius	Tourism ⇔ growth
	Kim et al. (2006)	Granger causality test	1971–2003	Taiwan	Tourism ⇔ growth
	Narayan (2004)	Error correction model	1970–2000	Fiji	Growth ⇒ tourism
	Ghali (1976)	OLS	1953–1970	Hawaii	Tourism ⇒ growth
	Oh (2005)	Granger causality test	1975–2001	Korea	Growth ⇒ tourism
Cross-section	Lanza et al. (2003)	Almost ideal demand system (AIDS)	1977–1992	13 OECD countries	Tourism ⇒ growth
	Eugenio-Martín and Morales (2004)	Panel GLS	1980–1997	Latin American countries	Tourism ⇒ growth (in low- and medium-income countries but not in high-income countries)

Note: "Tourism ⇒ growth" denotes causality running from tourism development to economic growth. "Growth ⇒ tourism" denotes causality running from economic growth to tourism development. "Tourism ⇔ growth" denotes bidirectional causality between tourism development and economic growth.

tourism and economic growth have a reciprocal causal relationship, then a push in both areas would benefit both.

Table 1 presents previously reported empirical results for the relation between tourism and economic growth. No explicit result is clearly apparent. Further, Oh (2005) argued that even though Balaguer and Cantavella-Jorda (2002) examined the role of tourism in relation to the long-term economic development of Spain, it is uncertain whether their hypothesis of tourism-led economic growth is applicable to other countries. Additionally, there are several theoretical justifications for regional differences in the level of tourism and economic development. For example, different empirical results yield different policy implications, which not only help identify the innate characteristics of the tourism industries, but can also be used as the basis for deciding how governments can best resolve double-edged policies in the tourism business and economic development (Vanegas & Croes, 2003). Furthermore, Eugenio-Martín and Morales (2004) have underscored the fact that the tourism sector is conducive to economic growth in medium- and low-income countries though not necessarily in developed countries in Latin America. With this in mind, dissimilarities in the degree of economic development in various regions are considered to determine if tourism development and the growth relationship differs for developed and developing economies (Yildirim, Sezgin, & Ocal, 2005). More specifically, in most developing countries, to satisfy the demand for tourist goods and services,[7] the current level of tourism development must increase. This would provide two significant positive effects on the economy, namely economic growth and employment; worth noting too is that tourism is likely to grow much faster in developing countries than in developed countries and, especially recently, generally tends to play a major role in the economy of poor countries (Sinclair & Stabler, 1997).

Continuing on the same theme, Eugenio-Martín and Morales (2004) have emphasized that growing demand for tourism presents critical challenges. They argue that there are three main areas about which policy makers need to be concerned: tourism infrastructure, education and safety—the three areas in which developed countries have a comparative advantage over developing ones. As mentioned above, these issues most likely vary because of regional differences. In some cases, the natural environment and socio-cultural features are key factors that lure tourists, (Sinclair, 1998), and both are aspects in which developing countries may have a comparative edge over developed ones.

The remainder of this paper is organized as follows: Section 2 reviews various studies related to tourism development; Section 3 briefly discusses the panel unit root test and the panel cointegration procedures. Section 4 provides the empirical results, and finally, Section 5 presents the conclusions and outlines some of the more important policy implications.

2. Tourism development: various studies

Sinclair (1998) suggested that when we attempt to identify and interpret the relationship between tourism and economic activity, we must consider it from two viewpoints, the advantages and disadvantages of tourism development. Tourism, like any other impetus for economic development, potentially has both positive and negative influences on communities and their residents. Generally speaking, the positive contributions that tourism can make

[7]Tourist goods and service include accommodation, food, transportation facilities and entertainment services.

include the provision of hard currency, which may help to alleviate a gap in foreign exchange and finance imports of capital goods, increases in personal income, higher tax revenues and additional employment opportunities. Beyond this, tourism expansion also affects the demand for certain goods and services (Syriopoulos, 1995), including transportation facilities, such as roads and airports (Eugenio-Martín & Morales, 2004), much of which is specific to tourism as opposed to a more general use. Apart from this, tourism expenditure by foreign tourists can enhance domestic tourism construction as well as bring about an accumulation of physical capital, and the needs for skilled labor in the tourism sectors will cause human capital investment to increase. Thus, the tourism sector may contribute significantly to economic growth.

Contrary to many of the predictions in the extant literature, as Hazari and Ng (1993) pointed out, tourism affects most of the tertiary and nondurable goods consumption sector. It should follow that the possible effects from an increase in domestic prices that normally tend to reduce welfare would be more than compensated for by the positive effects on the country's overall welfare. Meanwhile, expenditures by foreign tourists may also alter domestic consumption patterns via the so-called demonstration effect, and this can, in fact, be inflationary. These foreign demands for nontraded goods by tourists may create a monopoly power distortion hence causing welfare reduction effect (Balaguer & Cantavella-Jorda, 2002; Hazari & Sgro, 2004). Taking a broader perspective, Sinclair (1998) suggested that the costs incurred from an expansion of the tourism industry (including much of the expenditure for the provision and maintenance of infrastructure in the form of additional water, roads, airports, sanitation and energy), is specific to tourism rather than for more general usage. Meanwhile, there are costs incurred from specialized education in such fields as communications, catering, hospitality, transportation and management skills. In addition to requiring a great deal of physical capital, the tourism sector requires various types of skilled labor, and thus, the destination country will raise the human capital investment in tourism industry.

Tourism imposes still other costs on the host country. Such costs include increased pollution, congestion, or despoliation of fragile environments (Gursoy & Rutherford, 2004). Dunn and Dunn (2002) also maintain that crime and violence are another major problem affecting the tourism industry in some countries, and as such, they incur costs for crime control and maintaining and improving public security. As the natural environment is an important component of tourism, it represents a double-edged problem for policy makers, who may find it hard to make relevant decisions since many tourists are attracted by nature, yet at the same time, many citizens of the host country along with environmentalists wish to keep the natural environment intact (Jenner & Smith, 1992; Pearce, 1985). Many like Sinclair (1998), point out that developing countries are in a superior position when it comes to offering natural resources such as wildlife, coral reefs and spectacular natural sights, like canyons, caves, falls, deserts and natural springs.

In short, associated with the economic benefits of tourism are the adverse economic, socio-cultural and environmental impact extensively reported by Liu and Var (1986), Long, Perdue, and Allen (1990) and Milne (1990). They proposed taking a wide range of economic, environmental and social costs of tourism development into account. Thus, the costs with respect to societal decay are sacrifices that particular groups or regions must bear as a result of the implementation of mass tourism in developing countries. The other case of social cost or spillover effects of tourism development are on flora, fauna, rainfall, local customs and other ecological and sociological factors that ultimately touch the welfare of the citizens. Also among the adverse effects are congestion due to the traffic from additional vehicles, noise pollution arising from additional operations of airports, motor boats, and so on.

The discussion thus far has centered on a detailed appraisal of the economic performance as well as the potential environmental, social, cultural and political benefits and costs of tourism development.

3. Methodology

3.1. Panel unit root tests

Investigations into the unit root in panel data have recently attracted attention. As Abuaf and Jorion (1990) pointed out, the power of unit root tests may be increased by exploiting cross-sectional information. Levin, Lin, and Chu (2002, henceforth LL) have proposed a panel-based ADF test that restricts parameters γ_i by keeping them identical across cross-sectional regions as represented in the following:

$$\Delta y_{it} = c_i + \gamma_i y_{i\,t-1} + \sum_{j=1}^{k} c_j \Delta y_{i\,t-j} + e_{it}, \tag{1}$$

where $t = 1,\ldots,T$ time periods, and $i = 1,\ldots N$ members of the panel. LL test the null hypothesis of $\gamma_i = \gamma = 0$ for all i, against the alternate $\gamma_1 = \gamma_2 \ldots = \gamma < 0$ for all i, with the test based on the statistics $t_\gamma = \hat{\gamma}/s.e.(\hat{\gamma})$. However, one drawback is that γ is restricted by being kept identical across regions under both the null and alternative hypotheses.

For that reason, Im, Pesaran, and Shin (2003, henceforth IPS) have relaxed the assumption of there being identical first-order autoregressive coefficients in the LL test and allow γ to vary across regions under the alternative hypothesis. IPS test the null hypothesis $\gamma_i = 0$ for all i, against the alternative $\gamma_i < 0$ for all i. The IPS test is based on the mean-group approach which uses the average of the t_{γ_i} statistics to obtain the following $\bar{Z}$ statistic:

$$\bar{Z} = \sqrt{N}(\bar{t} - E(\bar{t}))/\sqrt{Var(\bar{t})}, \tag{2}$$

where $\bar{t} = (1/N)\sum_{i=1}^{N} t_{\gamma_i}$, the terms $E(\bar{t})$ and $Var(\bar{t})$ are, respectively, the mean and variance of each t_{γ_i} statistic, and they are generated by simulations. They are tabulated in IPS. The term $\bar{Z}$ converges to a standard normal distribution. Based on Monte Carlo experiment results, IPS demonstrate that their test has more favorable finite sample properties than the LL test.

Hadri (2000) argues differently, claiming that the null should be reversed so as to become the stationary hypothesis in order to have a test with stronger power. The Lagrange multiplier (LM) statistic of Hadri (2000) can be written as

$$L\hat{M} = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{\frac{1}{T^2}\sum_{t=1}^{T} S_{it}^2}{\hat{\sigma}_{\varepsilon}^2}\right), \quad S_{it} = \sum_{j=1}^{t} \hat{e}_{ij}, \tag{3}$$

where $\hat{\sigma}_{\varepsilon}^2$ is the consistent Newey and West (1987) estimate of the long-run variance of the disturbance terms. Hadri (2000) implements heterogeneous and serially correlated errors on account of their better power. In this research, the above three panel unit root tests are used to determine whether the panel data in our model are stationary.

3.2. Panel cointegration tests

Pedroni (1999) considers the following time series panel regression:

$$y_{it} = c_i + \delta_i t + X_{it}\alpha_i + e_{it}, \tag{4}$$

where y_{it} and X_{it} are the observable variables with the dimension $(NT) \times 1$ and $(NT) \times m$, respectively; e_{it} is the residual. An individual-specific linear trend is $\delta_i t$. The slope coefficients α_i are also allowed to vary by individual country. Thus, in general, the cointegrating vectors may be heterogeneous across panel members (Pedroni, 2004). Pedroni (1999) developed asymptotic and finite-sample properties of the testing statistics to examine the null hypothesis of noncointegration in a panel. The tests allow for heterogeneity among individual panel members, including heterogeneity in both the long-run cointegrating vectors and in the dynamics since there is no reason to believe that all parameters are the same across countries.

Pedroni (1999) suggested two types of test. The first is based on the within-dimension approach and includes four statistics. They are the panel v-statistic, panel ρ-statistic, panel PP-statistic and the panel ADF-statistic. These statistics pool the autoregressive coefficients across different members for the unit root tests on the estimated residuals. The second test by Pedroni (1999) is based on the between-dimension approach, which includes three statistics. They are the group ρ-statistic, group PP-statistic and the group ADF-statistic. These statistics are based on estimators that simply average the individually estimated coefficients of each member.[8] These seven tests are distributed as standard normal asymptotic tests and require standardization based on the moments of the underlying Brownian motion function. The statistics diverge to a negative infinity, which means that large negative values reject the null, except for the panel v-statistic which is a one-sided test where large positive values reject the null of no cointegration. Pedroni (1999) also tabulated the critical values.

In Eq. (4) above, the term $\hat{e}_{it}$ is the estimated residual; the other terms are fully defined in Pedroni (1999). All seven tests are distributed as standard normal asymptotic tests. This requires a standardization based on the moments of the underlying Brownian motion function. The panel v-statistic is a one-sided test where large positive values reject the null of no cointegration. The remaining statistics diverge to negative infinity, which means that large negative values reject the null. The critical values are also calculated in Pedroni (1999).

4. Empirical investigation

4.1. Panel unit root and panel cointegration

The sample countries are listed in Table 2, on the basis of the economic development.[9] Table 2 provides the data for real receipts per capita, where the number of tourists per capita is the average over the 1990–2002 period. Given that tourism demand is expected to grow yearly between 2006 and 2015, world market share represents the expected world market share in 2005, and percent of GDP and employment make up the travel and tourism economy in 2005; it is found that the real receipts per capita, the number of tourists per capita, the expected world market share, percent of GDP as well as employment represent the travel and tourism economy in 2005, the OECD countries are higher than their nonOECD counterparts, but the reverse is true for the travel and tourism demand growth rate. More specifically, in Austria, Singapore, Belize and South Africa in OECD, Asian, Latin American and Sub-Sahara African countries, the more receipts per capita there are, the greater is the number of tourists per capita.

Since the regional effect is considered one of the main objectives of this paper, the 32 nonOECD countries are classified into geographical groups. Annual data for all variables are obtained from the *World Development Indicators* (WDI, 2004). The unit is expressed in US dollars. All the variables are expressed in natural logarithms so that elasticities can also be determined.

Table 3 presents the results from the panel unit root test. At the 5% significance level, one finds that except for *GDP*, *TOUR1* and *RQ* in the LL test for OECD countries, no matter if there is a time effect or not, the IPS and Hadri test

[8]The details of the panel v-statistic, panel ρ-statistic, panel PP-statistic, panel ADF-statistic, group ρ-statistic, group PP-statistic and the group ADF-statistic are available in Pedroni (1999).

[9]Therefore, Japan is included among the OECD countries.

Table 2
Performance vis-à-vis economic and tourism development in sample countries

Countries	Real receipts per capita	Number of tourists per capita	Tourism demand growth	World market share	Percent of GDP	Percent of employment
OECD						
Australia	369.36	0.20	5.10	1.60	71.40	77.30
Austria	1,540.21	2.27	3.10	1.30	16.70	18.60
Belgium	488.43	0.57	3.50	1.20	10.50	11.20
Canada	275.68	0.58	4.40	2.90	11.80	12.80
Denmark	690.90	0.40	3.20	0.60	9.40	9.30
Finland	277.33	0.40	3.80	0.50	10.40	10.90
France	462.13	1.13	4.10	5.90	12.50	15.10
Germany	205.63	0.20	4.20	7.10	9.60	10.30
Greece	499.55	1.03	4.10	0.60	16.20	18.20
Iceland	645.28	0.75	3.40	0.10	19.40	22.00
Ireland	579.82	1.39	5.10	0.50	9.30	8.50
Italy	442.34	0.57	3.10	4.40	11.40	12.20
Japan	28.64	0.03	2.70	8.60	9.60	11.30
Luxembourg	4046.89	1.95	5.40	0.10	10.50	12.40
Netherlands	384.87	0.49	3.80	1.60	9.50	9.20
New Zealand	479.77	0.39	4.60	0.30	14.90	16.70
Norway	473.02	0.63	3.40	0.60	8.90	10.80
Portugal	454.55	1.01	4.10	0.70	17.30	20.20
Spain	646.45	1.04	5.90	4.00	18.90	20.30
Sweden	407.48	0.34	4.40	0.80	8.10	7.60
Switzerland	1,148.66	1.64	3.20	1.20	14.30	18.50
UK	284.33	0.38	3.30	5.70	10.10	9.30
US	232.49	0.17	4.00	25.60	10.80	11.90
Asia						
China	8.38	0.02	9.20	4.30	11.70	8.60
Malaysia	149.11	0.37	7.10	0.50	15.60	13.70
Pakistan	1.04	0.01	6.50	0.10	5.90	4.80
Philippines	28.86	0.03	5.40	0.20	7.30	9.40
Singapore	1741.44	1.67	6.20	0.40	10.60	8.30
Latin America						
Belize	388.26	0.66	3.90	0.90	20.00	19.70
Bolivia	19.00	0.04	4.50	0.00	9.20	7.60
Chile	60.39	0.10	4.80	0.10	6.50	6.80
Colombia	20.88	0.02	4.50	0.20	6.60	5.90
Costa Rica	183.22	0.23	5.50	0.10	13.70	13.30
Ecuador	26.78	0.04	4.40	0.10	8.60	7.40
Guyana	95.45	0.12	1.60	0.00	9.30	7.70
Nicaragua	23.08	0.07	4.30	0.00	6.90	5.60
Paraguay	71.34	0.07	4.80	0.00	7.30	6.40
Uruguay	262.52	0.57	5.30	0.00	9.80	10.70
Venezuela	46.01	0.03	3.00	0.20	8.80	8.10
Sub-Sahara Africa						
Burundi	0.40	0.01	5.50	0.00	4.90	3.80
Cameroon	4.24	0.01	6.00	0.00	5.00	4.20
Central African	1.68	0.00	5.10	0.00	3.00	2.40
Congo	5.53	0.00	6.10	0.00	7.90	6.70
Côte d'Ivoire	5.51	0.02	5.70	0.00	4.50	3.80
Gabon	5.98	0.13	4.10	0.00	12.70	12.70
Gambia	30.67	0.07	3.40	0.00	23.20	18.60
Ghana	12.90	0.02	5.20	0.00	10.80	11.50
Lesotho	13.29	0.09	4.40	0.00	7.50	6.20
Malawi	2.06	0.02	4.60	0.00	7.30	5.70
Nigeria	0.93	0.00	3.30	0.10	7.70	6.40
Sierra Leone	6.71	0.01	5.50	0.00	5.70	4.50
South Africa	51.05	0.11	5.70	0.50	9.00	8.30
Togo	6.07	0.02	4.50	0.00	4.70	3.80
Uganda	3.46	0.01	6.10	0.00	9.20	7.30
Zambia	26.25	0.03	2.80	0.00	3.30	2.90

Note: Data source: real receipts per capita and number of tourists per capita are the average for 1990–2002 and are taken from WDI (2004); the remainders are from the World Tourism Travel Council. Tourism demand is expected to grow by the value quoted per annum between 2006 and 2015. World market share represents the expected world market share (individual country/world) in 2005. The percent of GDP and employment are that the travel and tourism economy in 2005 is expected to account for GDP and total employment, respectively.

Table 3
Panel unit root tests

Variables	LL		IPS		Hadri	
	No time effects	Time fixed effects	No time effects	Time fixed effects	No time effects	Time fixed effects
OECD						
GDP	6.903	−5.366**	1.152	−1.131	6.743**	7.067**
TOUR1	−3.146**	−3.891**	−0.735	0.842	6.622**	8.071**
TOUR2	−0.906	3.321	1.446	1.057	10.343**	9.331**
RQ	5.518	−2.272**	0.298	1.941	6.762**	6.665**
NonOECD						
GDP	−1.549	8.997	2.790	0.929	13.374**	10.991**
TOUR1	1.899	1.050	2.249	−0.607	9.840**	10.488**
TOUR2	2.096	−0.817	−0.489	0.734	8.874**	9.884**
RQ	1.199	3.901	0.414	2.569	7.271**	8.067**
Asia						
GDP	0.728	−0.365	1.292	0.414	4.199**	4.116**
TOUR1	2.575	0.353	1.181	−0.490	4.669**	3.367**
TOUR2	0.461	2.103	−0.029	0.450	3.899**	4.222**
RQ	0.679	−0.986	0.772	0.145	2.011**	3.010**
Latin America						
GDP	5.322	0.687	4.315	−0.239	7.851**	6.761**
TOUR1	2.520	6.114	2.235	−0.599	7.686**	4.120**
TOUR2	−0.303	5.885	0.546	1.452	5.560**	5.519**
RQ	2.127	0.058	0.843	0.111	5.396**	4.855**
Sub-Sahara Africa						
GDP	3.763	2.837	2.453	−0.325	9.461**	7.746**
TOUR1	−1.613	1.398	0.503	0.524	6.728**	7.899**
TOUR2	1.707	5.975	−1.228	0.311	6.154**	7.007**
RQ	0.541	2.327	0.184	1.926	4.644**	5.679**

Note: All variables are in natural logarithms.
**Denotes statistical significance at the 5% level. The null hypothesis of these tests is that the panel series has a unit root (nonstationary) except in the case of the Hadri test.

statistics significantly confirm that four series have a panel unit root.[10] Next, using these results, *GDP*, *TOUR1* (or *TOUR2*) and *RQ* are tested for cointegration in order to determine whether there is a long-run relationship to control for in the econometric specification. The econometric terms of the equation of Balaguer and Cantavella-Jorda (2002) are revised as

$$GDP_{it} = \alpha_{1i} + \alpha_{2i}\, TOUR_{it} + \alpha_{3i}\, RQ_{it} + \delta_i t + \varepsilon_{it}, \tag{5}$$

which allows for cointegrating vectors of differing magnitudes between countries, as well as for country (α_{1i}) and trend-effects ($\delta_i t$). Trend effects are intended to capture any disturbances that are common across different panel members, such as global disturbance and international business cycles. Eq. (5) describes a cointegrated regression that allows for heterogeneity in the panel since heterogenous slope coefficients, fixed effects and individual specific deterministic trends are all permitted (Pedroni, 1999, 2004). Finally, α is the parameter of the model to be estimated, and ε_{it} is the residual.

[10]The null hypothesis of these tests is that the panel series has a unit root (nonstationary series) except with the Hadri test which has no unit root in panel series.

Table 4 shows the panel cointegration estimates. Pedroni (1999) showed that the panel-ADF and group-ADF statistics have better small sample properties than the other statistics, and hence, they are more reliable. Table 4 shows that the panel-ADF and group-ADF statistics significantly reject the null of no cointegration whether or not there is a time effect. From Table 4, we also find more evidence in support of panel cointegration relations between *GDP* and *TOUR1* (or *TOUR2*), with the distinguishing criteria based on whether the sample countries are developed or developing, i.e., OECD or nonOECD countries, respectively. However, when the regional effect for three regions in the nonOECD countries are taken into account, the proof of panel cointegration test no longer disappears, but at least one statistic rejects the null of noncointegration. This paper uses panel cointegration relationships in the empirical model, which is also consistent with the different tourism variables in different regions. The next step is to estimate such relationships.

In the literature, to take the averages across time and across countries is the essence of the panel time series; however, taking the averages over cross-sectional units can be very sensitive to outliers (Nieh & Ho, 2006). To make up for this weakness, the FMOLS method is used to estimate

Table 4
Panel cointegration tests

Tourism variable	No time dummy		Time dummy	
	TOUR1	*TOUR2*	*TOUR1*	*TOUR2*
OECD				
Panel variance	2.878**	−0.252	3.103**	1.601*
Panel ρ	3.204	2.696	2.980	1.460
Panel PP	−0.790	−2.597**	−0.967	−6.810**
Panel ADF	−3.608**	−3.277**	−2.088**	−7.315**
Group ρ	4.763	4.487	4.823	4.643
Group PP	−1.422*	−3.458**	−0.655	−1.941**
Group ADF	−3.892**	−5.026**	−3.820**	−6.030**
NonOECD				
Panel variance	3.866**	12.375**	7.143**	8.210**
Panel ρ	4.282	3.280	3.241	3.977
Panel PP	1.159	−1.895**	−1.267	−0.098
Panel ADF	−0.716	−0.939	−4.369**	−1.383*
Group ρ	4.695	5.279	3.787	5.039**
Group PP	−8.674**	−3.521**	−12.204**	−1.956**
Group ADF	−5.931**	−4.478**	−6.512**	−5.166**
Asia				
Panel variance	1.373*	3.596**	1.643**	2.927**
Panel ρ	1.763	1.746	1.685	1.632
Panel PP	0.868	0.516	0.957	0.813
Panel ADF	1.458	−1.379*	0.931	−1.798**
Group ρ	2.113	2.314	1.932	1.927
Group PP	−1.576*	0.079	−0.561	−0.562
Group ADF	−0.577	−1.717**	−2.986**	−2.235**
Latin America				
Panel variance	2.385**	1.929**	0.739	3.618**
Panel ρ	3.509	1.947	0.911	2.261
Panel PP	4.175	−0.230	−0.237	−0.061
Panel ADF	0.490	−0.242	−0.347	0.231
Group ρ	3.175	3.189	2.348	2.708
Group PP	−0.599	−0.784	−3.207**	−1.584*
Group ADF	−2.460**	−2.434**	−2.284**	−2.349**
Sub-Sahara Africa				
Panel variance	−0.018	−0.165	6.534**	5.063**
Panel ρ	1.477	4.061	2.932	2.801
Panel PP	−2.964**	3.323	2.144	2.578
Panel ADF	−2.228**	6.102	3.351	4.509
Group ρ	3.231	3.424	3.557	3.989
Group PP	−4.777**	−3.182**	−0.223	−0.379
Group ADF	−3.762**	−4.396**	−0.137	−2.443**

Note: Statistics are asymptotically distributed as normal. The variance ratio test is right sided, while the others are left-sided.
** and * indicate that the null of no cointegration is rejected at the 5% and 10% level, respectively.

the long-run relationships.[11] Table 5 lists some qualitative results concerning the point estimates from all individual country regressions with (without) time dummies. For regressions which exclude time dummies, 40 out of the 55 countries in Model 1 (containing the relations between *GDP*, *TOUR1* and *RQ*) have signs $\alpha_2>0$; for example, in the OECD countries. The parameters are positively significant in 15 out of 23 countries at the 10% level.[12] A large numbers of the results agree with the sign of the parameters $\alpha_2>0$, $\alpha_3>0$. Turning to Model 2 (containing the relations between GDP, TOUR2 and RQ), the tourism variable is the number of international tourist arrivals per capita; here, the ratio of the parameters ($\alpha_2>0$) that are positively significant is lower when compared with that of *TOUR1*, no matter if there are time dummies or not. Over two-thirds of the OECD countries compared with one-third of the nonOECD countries have $\alpha_3>0$, and the ratio for Latin American countries is the largest.

Table 5
Individual regressions with (without) time dummies

Countries	OECD	NonOECD	Asia	Latin America	Sub-Sahara Africa
Model 1: (*GDP*, *TOUR1*, *RQ*)					
No time dummy					
$\alpha_2>0$	15/23	25/32	2/5	3/11	10/16
$\alpha_2<0$	1/23	2/32	2/5	3/11	1/16
$\alpha_3>0$	19/23	17/32	4/5	8/11	13/16
$\alpha_3<0$	1/23	3/32	0/5	1/11	1/16
Time dummy					
$\alpha_2>0$	10/23	22/32	3/5	6/11	8/16
$\alpha_2<0$	2/23	3/32	0/5	0/11	2/16
$\alpha_3>0$	21/23	11/32	3/5	9/11	12/16
$\alpha_3<0$	1/23	6/32	0/5	0/11	1/16
Model 2: (*GDP*, *TOUR2*, *RQ*)					
No time dummy					
$\alpha_2>0$	14/23	9/32	2/5	8/11	5/16
$\alpha_2<0$	3/23	11/32	1/5	0/11	4/16
$\alpha_3>0$	18/23	15/32	4/5	9/11	13/16
$\alpha_3<0$	0/23	6/32	0/5	1/11	0/16
Time dummy					
$\alpha_2>0$	9/23	9/32	3/5	6/11	9/16
$\alpha_2<0$	5/23	7/32	0/5	0/11	5/16
$\alpha_3>0$	21/23	11/32	4/5	11/11	14/16
$\alpha_3<0$	0/23	10/32	0/5	0/11	1/16

Note: Statistical significance is at the 10% level.

Banerjee, Dolado, Galbraith, and Hendry (1993) pointed out that when the data are integrated of order one in a time series dimension, one can obtain consistent, but inefficient estimation of the long-run parameters from static regressions. Interestingly, Perman and Stern (2003) and Lee (2005) suggested that in addition to an efficient gain, there are further advantages that can be derived from estimating a dynamic model. A dynamic model not only yields information about long-run relationships, but also estimates short-run dynamics and the speed of adjustment to

[11]Here, traditional panel data cannot determine the independent variable which probably exists with endogenous features. Thus, nonstationary data cannot be analyzed using the traditional panel data approach (Perman & Stern, 2003).

[12]We only report the coefficients which significantly reject the null because if they are not statistically robust, then the coefficients will be zero. There are very many countries in this paper, and this involves the use of many models, too. Due to space constraints, we cannot show all of the results. Thus, only the panel regression results at the core of this article are presented here. The other results are available upon request.

Table 6
Long-run parameter estimates for the full panel

	OECD	NonOECD	Asia	Latin America	Sub-Sahara Africa
Model 1: (*GDP*, *TOUR1*, *RQ*)					
No time dummy					
α_2	0.36** (11.84)	0.50** (52.69)	0.13 (−0.62)	0.15 (1.10)	0.30** (8.23)
α_3	1.01** (18.34)	0.69** (14.31)	1.60** (10.39)	1.22** (19.29)	1.28** (23.76)
Time dummy					
α_2	0.17** (14.36)	0.50** (35.21)	0.17** (8.98)	0.09** (8.90)	0.18** (6.75)
α_3	0.86** (41.42)	0.87** (6.39)	0.80** (9.31)	1.13** (19.79)	0.60** (16.77)
Model 2: (*GDP*, *TOUR2*, *RQ*)					
No time dummy					
α_2	0.24** (26.41)	0.61** (5.38)	0.32** (4.06)	0.36** (16.36)	0.03** (2.44)
α_3	1.40** (35.22)	0.04** (15.74)	1.22** (5.15)	1.08** (29.12)	1.46** (22.09)
Time dummy					
α_2	0.13** (13.47)	0.17 (−0.30)	0.24** (6.89)	0.23** (12.08)	0.08 (0.83)
α_3	0.93** (42.44)	1.08 (−0.83)	1.14** (13.60)	1.46** (18.52)	0.90** (18.53)

Note: *t*-values are in parentheses.
** Indicates statistical significance at the 5% level.

equilibrium. Table 6 presents the long-run parameter estimates for the full panel, whether there are different regions or not, and with and without time dummies. All parameters shown match the theory. Not only are the signs right, but also they are significant, except for some individual cases, such as α_2 in Asian and Latin American countries without time dummies in Model 1, or α_2 and α_3 in nonOECD countries with time dummies in Model 2.

From the above estimates, it can be inferred that the effects of multiplier effects on income are extremely important. No matter if there are time dummies or not, the full panel estimates of the elasticity of economic growth with respect to tourism development (parameter α_2) range from 0.13 to 0.36 in OECD countries and from 0.17 to 0.61 in nonOECD countries, except for those with time dummies in Model 2. These findings should be read as: a 1% sustained growth rate in foreign exchange earnings from tourism indicates an estimated increase of 0.13–0.36% in domestic real income in the long run in OECD countries and an estimated increase of 0.17–0.61% in domestic real income in nonOECD countries. These results show that panel estimations of increases in tourism can indeed capture long-run relationships.

Just like the influence of exports on economic growth reported in most empirical studies, external competition plays a relevant role when analyzing possible long-run relationships. No matter if it is with or without a time dummy, full panel estimates of the elasticity of economic growth with respect to the real effective exchange rate (parameter α_3) range from 0.86 to 1.4 in OECD countries and 0.04 to 1.08 in nonOECD countries, though they fail to reject the null in Model 2 with a time dummy. Therefore, the estimates of the corresponding elasticities should indicate that, in general, a competitive increase in our sample economy should have a significant effect on the economic growth rate.

For the FMLOS estimates, the parameters $\alpha_2 > 0$ in nonOECD countries are larger than those in OECD countries with or without a time dummy, which clearly indicates that tourism development has a larger impact on GDP in nonOECD countries than in OECD countries. Moreover, if α_3 is close to 1, then it means the real effective exchange rate has the common scale impact on GDP. Therefore, with a higher exchange rate, the destination country has an increased number of foreign exchange tourism receipts; aside from this, the tourism industry provided by the recipient or host country is more competitive in terms of price, which means it makes a more positive contribution to GDP.[13] With regard to different regions, in Model 1, we find tourism development has the largest influence on GDP in the Sub-Sahara African countries, except for α_3 with a time dummy; nevertheless, the results from Model 2 are confusing. It appears that, based on Model 1, for Sub-Sahara Africa, the best strategy is to raise tourism receipts because that would make the most obvious contribution to economic growth. This demonstrates that when investigating these relations with each other, one must be careful about selecting the most appropriate tourism development policy.

In addition, in different regions, the parameters α_2 for Asian and Latin American countries in Model 1 with no time dummy are insignificant, and the coefficients for Sub-Sahara African countries in Model 2 with the time dummy are insignificant too. In such a situation, there seems to be an interaction with the same tourism variable in different districts, which may lead to biased results.[14] This finding is

[13]Coshall (2000) has found that raising the real effective exchange rate can also increase travel costs, bring in fewer tourists and be further harmful to tourism development.

[14]Same reasoning, Oh (2005) queries whether Balaguer and Cantavella-Jorda (2002) ever examined the role of tourism in the long-term economic

consistent with that of Eugenio-Martín and Morales (2004) who claimed that the tourism sector is adequate for the economic growth of medium- or low-income countries, but not necessarily in Latin America. Additionally, Lanza, Templec, and Urgad (2003) indicated that specialization in tourism may not be detrimental to the economic welfare of OECD countries. However, the existence of long run cointegrating relationships indicates that tourism development and GDP have at least one causal relationship. Therefore, the Granger causality model with a dynamic ECM can be estimated.

4.2. Panel causality test

Once the variables are cointegrated, the next step is to implement the causality test. A panel-based ECM is used to account for the long-run relationships using the two-step procedure of Engle and Granger (1987). The first step is the estimation of the long-run model for Eq. (5) in order to obtain the estimated residuals $\hat{\varepsilon}_{it}$ (error correction terms). The second step is the estimation of the Granger causality model with a dynamic error correction as follows:

$$\Delta GDP_{it} = \theta_{1j} + \lambda_{1i}\varepsilon_{it-1} + \sum_k \theta_{11ik}\Delta GDP_{it-k} + \sum_k \theta_{12ik}\Delta TOUR_{it-k} + \sum\nolimits_k \theta_{13ik}\Delta RQ_{it-k} + u_{1it}, \quad (6)$$

and

$$\Delta TOUR_{it} = \theta_{2j} + \lambda_{2i}\varepsilon_{it-1} + \sum\nolimits_k \theta_{21ik}\Delta GDP_{it-k} + \sum\nolimits_k \theta_{22ik}\Delta TOUR_{it-k} + \sum_k \theta_{23ik}\Delta RQ_{it-k} + u_{2it}. \quad (7)$$

Since this is a dynamic panel data model, one must use an instrumental variable estimator to deal with correlations between the error terms and the lagged dependent variables (Christopoulos & Tsionas, 2004). The lag length $k = 2$ is necessary to satisfy the classical assumptions about the error terms.[15] Thus, three and four periods are used as instruments for the lagged dependent variables, but the real effective exchange rate equations are omitted.

The sources of causation can be identified by testing for the significance of the coefficients of the dependent variables in Eqs. (6) and (7). First, the short-run effect can be considered transitory. For short-run causality, H_0: $\theta_{12ik} = 0$ is tested for all i and k in Eq. (6) or H_0: $\theta_{12ik} = 0$ for all i and k in Eq. (7). Next, long-run causality can be tested by looking at the significance of the speed of adjustment λ, which is the coefficient of the error correction term. The significance of λ indicates the long-run relationship of the cointegrated process, and so movements along this path can be considered permanent. For long-run causality, H_0: $\lambda_{1i} = 0$ for all i in Eq. (6) or H_0: $\lambda_{2i} = 0$ for all i in Eq. (7) is tested. Finally, the joint test ($\lambda_1/\Delta TOUR$ or $\lambda_2/\Delta GDP$) is used to re-check for strong causality, where the variables bear the burden of a short-run adjustment so as to re-establish a long-run equilibrium, following a shock to the system.[16]

Because all the variables enter the model in stationary form, a standard F-test is used to test the null hypothesis. The results show that none of the estimated country-specific parameters are significant.[17] Table 7 shows the short-run and long-run results of a panel causality test between *GDP* and *TOUR1*. There are short-run causalities running at the 5% level from *TOUR1* to *GDP*, thus implying unidirectional causality from tourism to economic growth. In the long run, the same results are reported. In this case, there are long-run bidirectional causality relationships between *GDP* and *TOUR1* in nonOECD countries, but there are no short-run causality relationships.

Table 8 shows that the short-run as well as long-run relations presents bidirectional causality relationships between GDP and TOUR2 in nonOECD countries, but

Table 7
Panel causality tests (*GDP* and *TOUR1*)

Dependent variable	Source of causation (independent variable)				
	Short run		Long run		
	ΔGDP	$\Delta TOUR1$	ε	$\varepsilon/\Delta GDP$	$\varepsilon/\Delta TOUR1$
OECD					
ΔGDP	—	5.627**	19.725**	—	6.619**
$\Delta TOUR1$	1.031	—	2.393	1.923	—
NonOECD					
ΔGDP	—	0.873	43.475**	—	24.852**
$\Delta TOUR1$	1.783	—	3.251*	3.508**	—
Asia					
ΔGDP	—	0.483	20.770**	—	8.707**
$\Delta TOUR1$	0.417	—	0.065	0.308	—
Latin America					
ΔGDP	—	14.360**	42.467**	—	16.620**
$\Delta TOUR1$	2.862*	—	11.814**	7.064**	—
Sub-Sahara Africa					
ΔGDP	—	0.867	5.987**	—	4.113**
$\Delta TOUR1$	7.931**	—	1.278	5.610**	—

** and * Indicate that statistical significance at the 5% and 10% level, respectively.

(*footnote continued*)
development in Spain, but it is uncertain the tourism-led economic growth hypothesis is applicable to other countries.

[15]It is well known that standard estimation techniques, like the least square dummy variable (LSDV) often yield biased and inconsistent estimators in the case of panel data. For this reason, we must use an instrumental variables estimator to deal with correlations between the error terms and the lagged dependent variables (Christopoulos & Tsionas, 2004). For this examination, the test process is started by $k = 1$, until the error terms have no serial correlation as well as the overidentified; finally, we find lag 2 ($k = 2$) can satisfy the classical assumptions on the error term.

[16]See Asafu-Adjaye (2000).

[17]Canning and Pedroni (1999) provided a detailed discussion.

Table 8
Panel causality tests (*GDP* and *TOUR2*)

Dependent variable	Source of causation (independent variable)				
	Short run		Long run		
	Δ*GDP*	Δ*TOUR2*	ε	ε/Δ*GDP*	ε/Δ*TOUR2*
OECD					
Δ*GDP*	—	0.146	44.725**	—	17.066**
Δ*TOUR2*	1.256	—	0.465	0.934	—
NonOECD					
Δ*GDP*	—	7.133**	17.097**	—	9.480**
Δ*TOUR2*	3.911**	—	7.944**	8.078**	—
Asia					
Δ*GDP*	—	1.290	0.660	—	1.722
Δ*TOUR2*	1.820	—	0.987	1.243	—
Latin America					
Δ*GDP*	—	3.669**	3.793**	—	3.517**
Δ*TOUR2*	4.772**	—	4.242**	3.549**	—
Sub-Sahara Africa					
Δ*GDP*	—	4.750**	18.047**	—	7.270**
Δ*TOUR1*	0.651	—	12.090**	4.594**	—

**Indicates statistical significance at the 5% level.

the long-run results are similar to those in Table 7. But, what is the situation in OECD countries? Except for long-run causalities running from TOUR2 to GDP, the evidences of causality relationships between GDP and tourism development are insufficient for other cases. Fortunately, however, the explicit relation between *GDP* and *TOUR1* is stronger than that between GDP and TOUR2, results which clearly back up those of Lanza et al. (2003), who observed that tourism activity has a positive influence on economic growth in OECD countries. Overall, in the long run, no matter if the tourism variable is *TOUR1* or *TOUR2*, the evidence substantiates an unidirectional causality from tourism growth to economic development in OECD countries, but bidirectional causality relationships in nonOECD countries.

From Table 8, in terms of policy recommendation emerges: if policy makers want to encourage growth, they should expand their tourism industry as much as possible and focus their attention on long-run policies. For example, it is essential to increase investment in tourism infrastructure, such as water, electricity and telephone, in transportation facilities, like roads or public transport systems, in transportation and management skills, political stability, crime control, natural resource management, environmental conservation and in the preservation of local culture (Vanegas & Croes, 2003). Additionally, the government should try to upgrade, develop and enhance the domestic tourism economy by implementing strategies to alleviate initial risks and provide capital needs for private firms operating in tourism, to stimulate private investment in the tourism industry by lowering costs to acquire capital and land, including loan guarantees, tax exemptions and lower tax rates. Should outcomes show reverse causality, then economic growth may be necessary for the expansion of the tourism industry, as in nonOECD countries. In those cases, the government should first concentrate on economic growth, and this will naturally yield the feedback effects for the development of tourism and bidirectional causality relationships between the two variables.

On the question of regional comparisons, as shown in Table 8, when the proxy variable is *TOUR1* (Model 1), there are long-run causalities running from *TOUR1* to *GDP*, a clear sign of unidirectional causality from tourism growth to economic development. However, we obtain identical evidence with Model 2, except there is an absence of causal relationships in Asia, be they short run or long run. Hence, in nonOECD countries, the relationships between tourism activity and economic growth are weak in Asia. Aside from determining the regional effects, from the global standpoint, all countries can concurrently enjoy the benefits of tourism development and economic growth, but this is not necessarily the case in Asia.

5. Concluding remarks

The existence of long-run relationships between tourism development and real GDP per capita signifies that both variables are causally related at least in one direction. However, does economic growth result in tourism development or vice versa? This paper investigated not only whether tourism benefits have a different and more significant impact on the destination country in terms of economic development, but also whether regional effects should be considered a product of geographical groups in nonOECD countries—consisting of 5 Asian countries, 11 Latin American countries and 16 Sub-Sahara African countries. This allows for a discussion from a global perspective.

The paper differs from previous studies since it applies a new heterogeneous panel cointegration technique to re-investigate the long-run comovements and the causal relationships between real international tourism receipts per capita (or the number of international tourist arrivals per capita) and real GDP per capita for the 1990–2002 period. With respect to globalization, it is preferable to compare the relations between tourism and economic activity with groups of countries rather than in an individual country. In other words, the regional effects are considered and determined within the scope of the model's ability. Moreover the natural environment or social cost problems raised from tourism activity promotion are included in the contents of this paper. In particular, the long-run parameter estimates are presented for the full panel, which represent an important finding since, until now, it has never been reported that tourism in OECD countries is the equivalent for nonOECD countries within the parameters discussed. These results show that panel estimations of increases in tourism can indeed capture long-run relationships.

To conclude, there is solid evidence of the panel cointegration relations between tourism development and GDP in the sample countries—both OECD and nonOECD countries. As for the FMLOS estimates, the parameters $\alpha_2 > 0$ in nonOECD countries are considerably larger than those in OECD countries with or without the time dummies. This indicates that tourism development has a higher impact on GDP in nonOECD countries than in OECD countries. Equally important, as concerns regional effects, tourism activity has the largest impact on GDP in Sub-Sahara African countries when the tourism variable is tourism receipts. Thus, for this group of countries, the best strategy is to raise tourism receipts. Furthermore, and worth noting too, in general, the real exchange rate shows an increase in our sample economies and has significant effects on the economic growth rates.

Finally, the panel causality test shows that in the long run, no matter if the tourism variable is the value of international tourism real receipts per capita or the number of international tourist arrivals per capita, unidirectional causality relationships exist from tourism growth to economic development in OECD countries, but bidirectional causality relationships are found between the two variables in nonOECD countries. In light of these results, all governments should commit to helping their tourism industry expand as much as possible, and at the same time, they should focus their attention on long-run policies. Aside from achieving regional effects, from the global standpoint, all countries can reap benefits from tourism development and economic growth, but this may not necessarily be the case in Asian countries.

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