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The Effect of International Tourism on Economic Development: An Empirical Analysis

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The expansion of international tourism in developing countries is generally considered to promote their economic development. In this paper, the impact of international tourism on economic development is modelled using an aggregate production function framework. It specifically investigates intersectoral externalities and marginal factor productivity differences between the international tourism sector and the rest of the economy. The net effect of international tourism on GDP per capita is examined via an empirical analysis of 37 developing economies. The results indicate that international tourism may positively affect economic development in these countries.

Key words: economic development, international tourism, panel data analysis, externalities, factor productivity

Introduction

The purpose of this paper is to provide an empirical analysis of the impact of international tourism on economic development in developing countries. The travel and tourism economy generates 10 per cent of global output (World Travel and Tourism Council, 2002) and international tourism arrivals in developing countries have grown by an average of 9.5 per cent per year since 1990 (Roe & Urquhart, 2001). Global international tourism receipts in 2001 were US\$463 billion

with 639 million international tourist arrivals, 200 million of which were in developing countries (World Tourism Organization, 2002). This paper suggests that this may be an area worthy of further investigation by policy makers and researchers as the findings indicate that international tourism may promote economic development in developing countries.

Most earlier studies in this field tend to focus on issues such as employment generation and multiplier effects, often derived from input-output analysis, independently of their

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impact on development; for example De Kadt (1979), Lee (1987), Peppelenbosch and Templeman (1989), Fletcher and Archer (1991), and Sinclair (1998). Input-output studies require very detailed data, rarely available for developing countries; this issue is discussed at length in Archer (1996). Importantly, input-output analysis measures economic impact as a snapshot of a particular time or place. Such an approach is inadequate for a longitudinal examination of international tourism's impact on economic development. The few studies that have specifically examined growth or development have focused on the role of tourism in small island economies, including Bryden (1973), Britton (1982), Archer and Fletcher (1996), Basu (2000), and Taylor (2001).

The work done by Modeste (1995) on the Caribbean is one of few attempts to explicitly measure the impact of international tourism on economic development. Modeste's paper borrows from a framework developed by Feder (1982) on exports and growth, and by Ram (1986) on government size and growth, to conduct an empirical analysis of three Caribbean countries over eight years. The conclusion of his study is 'that economic development is positively affected by growth in the tourism sector' (Modeste, 1995, p. 444). The present paper contributes to the literature by presenting an alternative specification to that used by Modeste and applying it to a larger sample, with different estimation techniques. A framework for analysis is presented which identifies the impact that international tourism may have on the growth of GDP per capita in developing economies. This relationship is addressed with specific attention given to the role of productivity differences and externalities between the international tourism sector and the rest of the economy. The empirical analysis covers 37 developing countries over the period from 1965 to 1992

using Ordinary Least Squares (OLS) and panel data analysis and corroborates the results obtained by Modeste (1995).

This paper examines international tourism rather than domestic tourism for three reasons. Firstly, the theoretical framework developed here addresses effects within the host community that are only present with international tourism, and more strongly with international tourism to less developed nations. These effects include the dynamic learning effects due to the transfer of ideas across boundaries, primarily from developed to developing nations. Secondly, in many developing countries domestic tourism is of minor importance to the economy and unable to serve as a vent for surplus or generate substantial static gains from trade. Thirdly, there is a paucity of reliable statistics on domestic tourism in developing countries.

In the next section of this paper, a number of ways in which international tourism may positively affect economic development are examined in order to provide a conceptual basis for the model developed later. The data used for analysis are then discussed before the results of this analysis are presented. Subsequently, these estimation results are used to calculate tourism's contribution to economic development, before some concluding comments are made in the final section.

Productivity and Externalities

There are a number of ways in which international tourism is likely to promote economic development. Firstly, static gains from trade may be enjoyed by developing countries exploiting a comparative advantage through specialisation in the production of a specific tourism product. Additionally, international tourism may serve as a vent for surplus, allowing gains

to be made from otherwise under-utilised resources. Furthermore, as an export, international tourism may relieve some of the foreign exchange and balance of payments constraints facing developing countries. However, dynamic gains from trade may have the greatest benefits for economic development as the international tourism sector facilitates the intangible flow of ideas across borders and cultures. In economic terms, this flow of ideas may result in higher productivity and positive intersectoral externalities.

In developing countries, the international tourism sector may have higher marginal factor productivity than other sectors in the economy as it is often a leader in the use of modern technology and techniques, skilled labour, and internationally competitive management. Additionally, as an export sector, international tourism is more susceptible to external competition and pressures for productivity improvements, leading to more investment, higher profits, and more rapid economic growth (Al-Yousif, 1997; Islam, 1998). The competitive nature of this market induces innovation, adaptability, and more efficient management of firms' resources, resulting in higher productivity. The spillover of these ideas from the international tourism sector into the rest of the economy is a positive externality and may lead to higher productivity in the economy as a whole and serve as a catalyst for growth in other sectors (Feder, 1982; Sengupta & Espana, 1994).

International tourism can thus be an initiator of economy-wide structural changes in the form of technical innovations, the transmission of new ideas, and the diffusion of human capital, such as skilled, bilingual workers, resulting in skill transfer and positive externalities (Al-Yousif, 1997). The externalities from international tourism may also take the form of an increase in the pace of

modernisation, a broadening of international awareness, and increased understanding for both hosts and tourists (Pepplensbosch & Templeman, 1991).

There may also be a positive demonstration effect in terms of the developed countries' cultural institutions and consumption patterns of tourists. This demonstration effect may lead to the desire for increased consumption and may promote entrepreneurial activity (Belk & Costa, 1995) and economic development, if individuals in the host economy realise that savings, education, and investment are all avenues to increased consumption.

Tourism also has tangible beneficial effects for the local population in the form of improved infrastructure, such as the provision of drinking water, sanitation, hospitals, electricity, telephones, roads, and airports. Such infrastructure developments may have significant health effects on the local labour force, thus increasing human capital and resulting in higher productivity. As such, this improved infrastructure generates positive externalities for other sectors, which are likely to be at least partially captured as increased aggregate output.

One of the most often cited benefits of tourism is its ability to reduce unemployment. In addition to providing jobs, tourism also provides an incentive to pursue education in order to obtain these jobs - resulting in greater human capital, a more productive labour force, and increased absorptive capacity for the acquisition of new skills, technology, and capital. Furthermore, tourism creates 'opportunities for movement by the population into the modern sector from the subsistence agricultural sector' and, hence, accelerates modernisation of the workforce (Clancy, 1999).

The positive externalities associated with international tourism form part of the basis for the analysis presented by Modeste (1995). There is, however, some reason to believe that

the nature and extent of such externalities may depend on the ability of the host country to cope with an influx of foreign ideas and capital, and to harness its positive effects while containing international tourism's potentially harmful effects such as environmental degradation, cultural deterioration, and the dislocation of traditional communities. This ability to harness the positive effects of international tourism may be linked to the host society's absorptive capacity for advanced technology and capital, and may influence the potential for economic development (Adler, 1965; Keller, 1996; Borensztein *et al.*, 1998).

There is also evidence to suggest that positive externalities from international tourism are limited, often reaped by privileged elites, and may be outweighed by negative externalities, including inflation, the harmful consequences of sex tourism, and negative demonstration effects (Bryden, 1973; Clancy, 1999; Taylor, 2001). Tourism may also exert externalities on development which are not captured by GDP per capita, including environmental and distributional issues, which may be just as important as other effects, but are difficult to quantify.

Externalities that can be captured in GDP data are analysed empirically in the rest of this paper. To enable this analysis, a model that captures the contribution of the international tourism sector to economic development and the role of productivity differences and externalities in this process is now developed.

The Model

The model incorporates international tourism in an aggregate production function. The specification allows for the estimation of intersectoral marginal factor productivity

differences and externalities. The model proposed here is based on Feder (1982) in which the contribution of exports to economic growth is investigated. The most important difference is that Feder's work addressed growth, whereas this model addresses development by using per capita terms. Modeste (1995) and Salvatore and Hatcher (1990) provide similar models. The model presented here is used as the basis for the empirical analysis in the rest of this paper.

In the present model, the economy is split into two sectors – the international tourism sector, and the rest of the economy—allowing marginal productivity differences and their effect on economic growth to be estimated for each sector. This model supposes that output in the international tourism sector (T) may have an externality effect on output in the rest of the economy (N), such that the output of the rest of the economy is dependent on the output of international tourism, as shown below

$$T = G(K_T, L_T) \quad (1)$$

$$N = F(K_N, L_N, T) \quad (2)$$

where T = output of the international tourism sector,

N = aggregate output in the rest of the economy,

K_T, K_N = respective sector capital stocks,

L_T, L_N = respective sector labour forces.

As this paper addresses development, rather than growth, it is important to examine output in per capita terms. Therefore, equations (1) and (2) are converted by dividing by L_T and L_N respectively. A Solow production function with constant returns to scale is assumed, giving:

$$t = g(k_t) \quad (1a)$$

$$n = f(k_n, t) \quad (2a)$$

where t = output per head of the international tourism sector,
 n = output per head in the rest of the economy,
 k_t, k_n = capital per worker in the respective sectors.

Because data are not available for the allocation of capital per worker in these two sectors for most developing countries, a specification is developed below which identifies sectoral marginal productivity from aggregate national data. The ratio of marginal productivity of capital per head in the two sectors can be shown thus

$$(g_k/f_k) = \delta + 1 \quad (3)$$

where subscripts denote partial derivatives and δ is the factor by which this ratio differs from one. In a model assuming the economy is in a state of general equilibrium, δ must equal zero and national output would be maximised. However, the two-sector growth model used in this analysis is a disequilibrium model. That is, if efficiency is greater in the international tourism sector than in the rest of the economy, $\delta > 0$. This may be expected due to factor immobility, the transmission of new knowledge, ideas, and technical information, as well as greater access and exposure to international markets, practices, capital flows, and managerial techniques, as discussed in the previous section. Following some mathematical development¹, these equations give:

$$\Delta y/y = f_k \Delta k/y + (\delta/(1 + \delta) + f_t)(\Delta t/y) \quad (4)$$

where f_t describes the marginal externality exerted by international tourism on output per head in the rest of the economy, y = GDP per capita, and k represents capital per worker for the entire economy and is equal to $k_t + k_n$.

Equation (4) implies that the rate of growth of GDP per capita is determined by the accumulation of labour and capital and the benefits from reallocating factors of production from a low productivity sector to a high productivity sector. The specification in equation (4) forms the foundation for the empirical analysis presented in the next section. If marginal productivity is equal in both sectors ($\delta = 0$) and if there are no inter-sectoral externalities ($f_t = 0$), equation (4) reduces to a familiar neo-classical formulation

$$\Delta y/y = f_k \Delta k/y \quad (5)$$

Equation (4) is estimated as

$$\Delta y/y = \alpha(\Delta k/y) + \beta(\Delta t/y) + C \quad (6)$$

where the parameter $\alpha = f_k$, the marginal productivity of capital per head in the rest of the economy, $\beta = (\delta/(1 + \delta) + f_t)$, a parameter representing the marginal factor productivity difference between the two sectors, and C is a constant.

From the literature and issues reviewed in the previous section, the parameter β can be expected to be positive, representing higher marginal productivity in the international tourism sector, and possible positive externalities exerted by international tourism on the output of the rest of the economy. This parameter may be interpreted as the overall effect of international tourism on output per head in the economy.

In order to separately identify the externality effect and the marginal productivity effect of international tourism, the parameter β can be decomposed. With some manipulation this can be achieved by the following equation:

$$\Delta y/y = f_k(\Delta k/y) + (\delta/(1 + \delta) - \theta)(\Delta t/y) + \theta(\Delta t/t) \quad (7)$$

In comparison with (4), the specification in (7) allows both the marginal factor productivity difference and the externality effect to be identified. The parameter θ represents the externality effect and may be expected to be positive due to infrastructure improvements and spill-over effects, resulting in productivity increases in the rest of the economy. Equation (7) is estimated as

$$\Delta y/y = \alpha(\Delta k/y) + \beta_1(\Delta t/y) + \theta(\Delta t/t) + C \quad (8)$$

where $\beta_1 = (\delta/(1 + \delta) - \theta)$, a parameter representing the effect of differences in marginal factor productivity for the two sectors, exclusive of externality effects. This equation implies that the growth rate of GDP per capita is driven by an expansion of the capital-labour ratio plus a combination of higher marginal factor productivity in the international tourism sector and positive externalities on output in the rest of the economy from the expansion of per capita tourism output². The data used in the application of this model are discussed in the next section.

Data

Data for the capital stock per worker and real GDP per capita (both in 1985 international prices) are taken from the Summers and Heston Penn World Tables 5.6 (Summers and Heston, 1995). International tourist arrivals data are used as a proxy for the output of the international tourism sector and are obtained from World Tourism Organisation (2002). The countries and years covered are detailed in Table 1.

The model used in this analysis relies on year-on-year changes in the variables. That

is, the change in tourist arrivals is used as a proxy for the change in tourism output. This proxy assumes that the change in the number of tourists arriving in a country each year is positively correlated with the change in the output of the tourism industry in that country. The use of such first-order differences reduces the potential complication of cointegration. Unless otherwise indicated, five-year moving averages of all variables are used for the empirical analysis reported. The use of moving averages provides a smoothing effect and ameliorates problems from random disturbances, statistical inconsistencies, and lagged responses that may be present when using annual data.

However, the data used for this paper have some limitations. There are many aspects of economic development such as social, distributional, and environmental issues, which are not captured by the GDP per capita data used here. There are further concerns with measurement and comparability, both internationally and intertemporally, of GDP and capital stock data, especially in developing countries. To address some of these difficulties, the Summers and Heston Penn World Tables data set is used here as it provides relatively reliable and extensive internationally comparable data for a large group of countries and eliminates many of the more common impediments to intertemporal comparability. Furthermore, it is one of very few sources of data for capital labour ratios in developing economies.

Obtaining reliable data on international tourism output is also problematic due to the difficulties in defining international tourism, and then in quantifying its impact. International tourism receipts may be used for this purpose. However, the distinction between international tourism, domestic tourism, and non-tourism receipts may be

Table 1 Countries and Years

Country	Years	Country	Years
Argentina	1965–1990	Mauritius	1971–1991
Bolivia	1977–1992	Mexico	1965–1992
Botswana	1977–1986	Morocco	1965–1992
Chile	1969–1992	Nepal	1966–1985
Colombia	1965–1992	Nigeria	1982–1992
Dominican Republic	1974–1992	Panama	1970–1992
Ecuador	1973–1992	Paraguay	1977–1992
Guatemala	1971–1992	Peru	1965–1992
Honduras	1977–1992	Philippines	1965–1992
Hong Kong	1965–1992	Sierra Leone	1973–1992
India	1965–1992	Sri Lanka	1965–1990
Iran	1965–1990	Swaziland	1977–1985
Israel	1965–1992	Syria	1965–1991
Ivory Coast	1971–1992	Thailand	1965–1992
Jamaica	1965–1990	Turkey	1965–1992
Kenya	1965–1992	Venezuela	1965–1992
Republic of Korea	1965–1992	Zambia	1975–1991
Madagascar	1974–1992	Zimbabwe	1977–1992
Malawi	1974–1992		n = 37

difficult to make, leading to overlapping measurements or failure to include receipts in the appropriate category.

Other difficulties in tourism accounting include the prevalence of unpaid and non-accounted services, public and private revenue distribution, balance of payments anomalies, social and private cost differences, the public good nature of many tourism products, as well as the complex social, cultural, and environmental facets of tourism. These factors combine to make international tourism measurement a complicated undertaking and result in a paucity of reliable data.

For these reasons, this analysis uses international tourist arrivals as a proxy for the output of the international tourism sector.

This proxy relies on the assumption that there is a positive correlation between the change in the number of tourist arrivals and the change in the tourism output for a country. While such a proxy does not capture differences in the length of stay or money spent per tourist, it does provide a measure that is widely available and easily compared internationally and intertemporally. This proxy is not affected by exchange rate fluctuations, inflation, and many of the factors that may distort other accounting measures such as receipts or expenditure.

This empirical analysis is also limited by the difficulties common to all models of phenomena as complex and poorly understood as economic development and international tourism. The model is an aggregate representation of

how international tourism may affect economic development.

Furthermore, in its application across countries and over time, this model assumes some commonality in the development process throughout the world and through time. This assumption has been criticised by many, including Kenny and Williams (2001) and Solow (2001). The use of panel data analysis – with multiplicative dummies for country groupings, based on several characteristics – goes some way to addressing the shortcomings of a universalistic perspective and attempts to capture only valid commonalities.

Results

Initially, the model was estimated with OLS as a cross-sectional analysis using full-period averages for each country in the sample³. The results are presented in Table 2 for the conventional neoclassical specification

(equation 5), the general tourism specification (equation 6), and the full tourism specification (equation 8).

The results for equation (6) show that international tourism has played a significant and positive role in the growth of GDP per capita. Adding the tourism term to equation (5) improves the adjusted R^2 from 0.34 to 0.40. This result suggests that the expansion of international tourism to developing countries promotes economic development within the host countries. From equation (8) it appears that the role of externalities is insignificant, but that there are fairly significant intersectoral marginal factor productivity differences. For all three specifications, the significance levels and size of the coefficients of $\Delta k/y$ are consistent. This provides reassurance that the model has not been misspecified and is in accordance with the broad views of development theory.

In the next stage of the analysis, the data were sorted into groups based on three cat-

Table 2 OLS Results for All Countries with Full Period Averages

Variable	Equation 5 $\Delta y/y = \alpha(\Delta k/y)$		Equation 6 $\Delta y/y = \alpha(\Delta k/y) + \beta(\Delta t/y)$		Equation 8 $\Delta y/y = \alpha(\Delta k/y) + \beta_1(\Delta t/y) + \theta(\Delta t/t)$	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
$\Delta k/y$	0.21523	0.000	0.21151	0.000	0.20837	0.000
$\Delta t/y$			3.98	0.051	3.668	0.0078
$\Delta t/t$					0.01012	0.431
Constant	0.00166	0.664	-0.00311	-0.72	-0.002419	0.589
R^2	0.36		0.43		0.44	
Adjusted R^2	0.34		0.40		0.39	
F	19.73		12.79		8.65	
$p > F$	0.000		0.000		0.000	
Number of observations	37		37		37	

egories. These categories are (1) geographic region, (2) relative level of GDP per capita, and (3) relative intensity of international tourism in the country. These groupings reflect the assumption that the relationship between the dependent and independent variables may not be the same for all countries.

Table 3 shows the regional groupings and some descriptive statistics⁴. The contribution of tourism as a percentage of GDP for 2001 is used as a rough indicator of the importance

of tourism in these economies (World Travel and Tourism Council, 2002). The average annual growth of real GDP per capita over the period observed serves as an indicator of the pace of development within these groups and countries.

The countries were also divided into five approximately equally sized groups based on their average level of GDP per capita over the period considered. The composition of these groups and some descriptive statistics are shown in Table 4. The countries with the

Table 3 Regional Groupings

	Average % Growth rate of GDP per Capita	Tourism as a % of GDP in 2001	Africa	Average % Growth rate of GDP per Capita	Tourism as a % of GDP in 2001
Asia					
Hong Kong	5.7	2.1	Botswana	4.5	2.3
India	2.3	2.1	Ivory Coast	-2.5	1.4
Korea	6.8	1.8	Kenya	1.2	3.8
Nepal	1.8	2.7	Madagascar	-3.0	3.2
Philippines	1.0	3.0	Malawi	-0.6	1.0
Sri Lanka	2.5	2.6	Mauritius	3.6	9.5
Thailand	4.2	5.6	Morocco	2.3	5.9
Mean	3.5	2.84	Sierra Leone	-2.4	0.9
South America			Swaziland	-5.0	2.0
Argentina	-0.2	2.7	Zambia	-3.4	2.9
Bolivia	-1.5	2.4	Zimbabwe	-0.6	2.5
Chile	0.9	2.5			
Dominican Republic	0.5	5.1	Mean	-0.5	2.84
Ecuador	-0.7	3.1			
Guatemala	-0.2	3.3	Middle East		
Honduras	-0.1	3.0			
Jamaica	0.0	7.7	Israel	2.6	2.9
Panama	0.3	5.1	Turkey	2.4	5.1
Paraguay	-0.9	2.6			
Peru	-1.0	3.6	Mean	2.5	4.0
Mean	-0.3	3.74			

Table 4 Development Groupings

Variable	Y1	Y2	Y3	Y4	Y5
Country	Argentina Chile	Ecuador Korea	Botswana Dominican Republic	Bolivia Honduras	India Kenya
	Hong Kong	Panama	Guatemala	Ivory Coast	Madagascar
	Israel Mauritius	Peru Swaziland Turkey	Jamaica Paraguay Thailand	Morocco Philippines Sri Lanka	Malawi Nepal Sierra Leone Zambia
Average GDP per capita over the full period (1985 International Dollars)	5981	2917	2180	1565	826
Average Annual % Growth rate of GDP per Capita	2.5	0.5	1.4	0.1	-0.6
Tourism as a % of GDP in 2001	3.94	3.45	4.43	2.97	2.37

highest level of development are in group Y1, and the lowest in group Y5.

A similar approach was taken to grouping the countries based on the average number of international tourist arrivals per capita over the time period considered. The countries are grouped in Table 5, from T1 (the highest average level of tourism per head) to T5 (the lowest level).

Initial panel estimations, including all countries in the sample, produced some unusual results. Table 6 shows the results for a panel data analysis of the full sample with the neoclassical specification, equation (5). For the full sample, the F-statistic shows the model as a whole lacks explanatory power and the slightly negative coefficient of $\Delta k/y$ indicates

that an expansion of the capital labour ratio has had negative impact on economic development for the countries in this sample.

This unexpected result invited further investigation. An examination of the residuals revealed a number of outlying observations from a handful of countries, suggesting that there may be something peculiar about these countries, which distinguishes them from other developing countries. On inspection, it was found that each of these countries exports more than 300,000 barrels of oil per day (United States Department of Energy, 2002) and this may explain some of the results obtained. These countries may have suffered from the 'Dutch Disease' where booming oil exports can have an adverse

Table 5 Tourism Groupings

Variable	T1	T2	T3	T4	T5
Country	Botswana	Guatemala	Argentina	Ivory Coast	India
	Dominican Republic	Honduras	Bolivia	Kenya	Madagascar
	Hong Kong	Morocco	Chile	Korea	Malawi
	Israel	Paraguay	Ecuador	Peru	Nepal
	Jamaica	Thailand	Turkey	Philippines	Sri Lanka
	Mauritius		Zimbabwe	Sierra Leone	Zambia
	Panama				
	Swaziland				
Average Annual International Tourist Arrivals per 1000 capita	223.2	57.5	35.0	19.1	11.9
Average Annual % Growth rate of GDP per Capita	1.5	1.1	0.1	0.5	-0.1
Tourism as a % of GDP in 2001	4.58	4.08	3.05	2.42	2.42

Table 6 Panel Data Analysis with a Neoclassical Specification for the Full Sample

Variable	Equation 5	
	$\Delta y/y = \alpha(\Delta k/y)$	
	Coefficient	p-value
$\Delta k/y$	-0.002044	0.0945
F	0.000	
p > F	0.9454	
Number of observations	605	

effect on the rest of the economy (Corden & Neary, 1982; Gillis *et al.*, 1996).

Major net oil-exporting countries could thus be considered to be from a different statistical population to other developing countries. For this reason, major oil exporting countries were dropped from the sample for the subsequent analysis. The countries dropped were Colombia, Iran, Mexico, Nigeria, Syria, and Venezuela.

Removing these countries from the sample improves the explanatory power of the model overall, as shown by the OLS results for the reduced sample with full-period averages in Table 7. These results should be

Table 7 OLS Results for the Reduced Sample with Full Period Averages

Variable	Equation 5 $\Delta y/y = \alpha(\Delta k/y)$		Equation 6 $\Delta y/y = \alpha(\Delta k/y) + \beta(\Delta t/y)$		Equation 8 $\Delta y/y = \alpha(\Delta k/y) + \beta_1(\Delta t/y) + \theta(\Delta t/t)$	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
$\Delta k/y$	0.18775	0.001	0.17492	0.000	0.17431	0.000
$\Delta t/y$			7.696	0.000	7.478	0.001
$\Delta t/t$					0.00540	0.605
Constant	0.004671	0.235	-0.004104	0.282	-0.00368	0.350
R ²	0.30		0.57		0.57	
Adjusted R ²	0.28		0.54		0.52	
F	12.38		18.29		11.97	
p > F	0.001		0.000		0.000	
Number of observations	31		31		31	

compared with those for the full sample presented in Table 2.

The positive coefficient of $\Delta t/y$ in the specification of equation (6) suggests, once again, that international tourism has had a positive effect on economic development in these countries. Furthermore, the positive and statistically significant coefficient of $\Delta t/y$ in the specification of equation (8), indicates that for this selection of developing countries, the international tourism sector has higher marginal factor productivity than the rest of the economy. These aggregate results indicate that the issue may be worth examining in more detail to find out how tourism affects different countries.

Disaggregated Analysis

The next stage of the analysis employs the panel with a number of multiplicative dummy

variables for each variable and for all the groups presented earlier. The various groups reflect the expectation that countries in different regions or at different levels of development or of tourism intensity may be affected by the expansion of international tourism in different ways. For example, less developed countries may be expected to benefit more from the learning, information, and technology benefits than more developed countries. Yet, at the lowest levels they may be expected to be more vulnerable to the harmful effects of tourism and may struggle to absorb the influx of capital, ideas, and foreigners that is included in the expansion of international tourism.

Firstly, the panel estimation was carried out with dummies for every group and variable. The least significant dummy variables were then dropped until the specification with the greatest explanatory power remained. The results for this specification are presented in Table 8.

Table 8 Panel Data Estimation—With Dummy Variables

Variable	Coefficient	p-value	Variable	Coefficient	p-value
$\Delta k/y$	0.32493737	0.000	TYslopeT4	24.61708	0.000
$\Delta t/y$	10.00205	0.000	TYslopeT5	23.62137	0.001
$\Delta t/t$	-0.14799488	0.023	TYslopeY2	-10.38551	0.005
KslopeAsia	-0.2736896	0.008	TYslopeY3	-10.52606	0.000
KslopeMidEast	-0.1952388	0.102	TYslopeY5	-34.18397	0.000
KslopeT3	-0.162595	0.031	TTslopeAfrica	-0.1163535	0.013
KslopeY2	-0.1837564	0.024	TTslopeMidEast	-0.1024052	0.071
KslopeY4	-0.1627185	0.071	TTslopeT3	0.3492108	0.000
KslopeY5	-0.4551254	0.002	TTslopeY2	0.1521676	0.041
TYslopeAsia	-3.865946	0.111	TTslopeY3	0.2409845	0.003
TYslopeT2	-4.672435	0.005	TTslopeY5	0.2796778	0.001
TYslopeT3	-15.35643	0.001	Constant	0.006714	0.000
		F	3.16		
		p > F	0.0000		
		Number of observations	493		

The base case for the panel data estimation is conceptualised as a South American country, in the highest GDP per capita bracket and in the highest tourism intensity bracket. In the above table, KslopeAsia is the multiplicative dummy variable for the capital-labour ratio variable, $\Delta k/y$, in the Asian group; TYslopeAsia is the multiplicative dummy variable for the marginal factor productivity difference variable, $\Delta t/y$, in the Asian group; TTslopeAfrica is the multiplicative dummy variable for the externality variable, $\Delta t/t$, in the African group, and so on.

In the full specification, β_1 is the coefficient of $\Delta t/y$ and represents the marginal factor productivity difference due to the difference in technology and skills present in the international tourism sector relative to the other sectors of the economy. Productivity differences due to externalities are discussed later as they are not captured by the parameter β_1 ,

but by the parameter θ . As discussed earlier, the parameter β_1 may be expected to be positive. However, the results reveal that this is not always the case.

By region, the results in Table 8 indicate that this parameter is positive and quite large for all regions, however it is slightly smaller for the Asian grouping as indicated by the negative value of TYslopeAsia. This suggests that the allocation of resources to the international tourism sector is closer to optimal in these Asian countries compared with the other regions.

When the marginal factor productivity difference is examined for the various tourism groupings, the difference may be expected to be largest at the lowest levels of tourism. In those countries the allocation of resources to the international tourism sector is likely to be sub-optimal, resulting in higher marginal factor productivity in the

international tourism sector. This marginal productivity may decrease as the tourism industry expands, due to diminishing returns, resulting in a decreasing productivity difference between the two sectors.

The results in Table 8 show that β_1 is generally positive and is particularly high for countries where there is proportionately less international tourism (TYslopeT4 and TYslopeT5). This indicates a sub-optimal allocation of resources, which may be because tourism is a particularly new industry, and as yet under developed, possibly due to higher perceived risk or inadequacies with institutions and infrastructure. It is apparent that as the tourism industry expands, the difference between marginal factor productivity decreases, due to diminishing marginal returns. At the higher tourism levels, factor productivities tend to equalise. However, the coefficient for the intermediate tourism intensity group T3 is not well explained by these reasons and this group may be a statistical anomaly.

For the development groupings, it could be expected that the productivity difference would be greatest for the least developed countries due to higher levels of technology and skills associated with the international tourism sector compared to other sectors in a less developed economy. This difference is expected to decrease as development progresses; as human capital and technology increase in the economy as a whole, other sectors also become more productive.

However, at the lower levels of development an increased allocation of resources to a technologically advanced international tourism sector may lead to lower output per head for the economy as a whole. This could be due to a lack of absorptive capacity in less developed economies where the influx of capital, technology, and skills brought about by an expansion of international tourism

may be more effectively employed in other sectors of the economy.

The issue of absorptive capacity has been raised by many development economists, including Adler (1965), Cohen and Levinthal (1990), Keller (1996), Borensztein *et al.* (1998), and Zhang (2001). A common theme among these authors is that there is often a level of human capital in an economy below which an influx of capital and technology will not be utilised effectively by the host economy. Thus, the productivity gains from international tourism may accrue only when there is sufficient absorptive capacity in the host country to utilise the advanced technologies introduced by tourism.

The results in Table 8 are broadly consistent with expectations and indicate that the relationship between the marginal factor productivity difference and the level of economic development is such that the difference is negative at the lowest levels of development, due to the absorption problem, and is increasing with development.

The parameter θ represents the externality exerted by the international tourism sector on output in the rest of the economy. As discussed earlier, while international tourism may produce negative externalities in some countries, there are also reasons why externalities could be positive. These reasons include the potential for modern technology and techniques used in the international tourism sector to flow onto other sectors and industries, as well as infrastructure improvements and increased international linkages.

The estimation results in Table 8 reveal that the externality coefficient, θ , is generally quite small and often negative. This may reflect the fact that the analysis presented here captures the net externality effect; that is, the results reveal the sum of positive and negative externalities generated by an expansion of the

international tourism sector and suggest that in many cases, the positive effects are outweighed by the negatives.

The results from Table 8 suggest that the effect is negative for all regions, and particularly so for Africa and the Middle East (TTslopeAfrica and TTslopeMidEast). When considering this negative externality, it is important to consider the countries that make up this sample and the type of tourism they experienced during the sample time period. For example, international tourism's negative impact in Swaziland could be attributed to its development into a casino enclave for wealthy South Africans, with significant detriment, both culturally and economically, to the host society (Harrison, 1992b). There is the possibility these economies are experiencing a tourism inspired "Dutch disease" with an adverse effect on other sectors of the economy.

It is possible that the externality effect is less negative for the Asian and South American groups due to the prominence of low impact back-packing in these countries as opposed to the safari and gambling based tourism in many African countries. There is a body of literature which proposes that backpackers have a much less harmful, and probably positive overall impact on the host nation (Meijer, 1989; Harrison, 1992a). Furthermore, the majority of foreign tourists in South America are other South Americans and probably have a smaller impact on their host culture, as they are culturally and economically similar (Lea, 1988; Chant, 1992).

By tourism group, the net externality is negative for all levels of tourism intensity, except for the group T3. As stated earlier, this group may be an anomaly. However, another explanation is possible when the nature of the countries in group T3 (Argentina, Bolivia, Chile, Ecuador, Turkey, and Zimbabwe) is considered. Most of these

countries are in the South American region and the net externality may be less negative in that region due to cultural and economic similarities between hosts and tourists. However, positive externalities due to infrastructure improvements are not diminished by this similarity. This may result in an overall positive externality. This suggests that if the negative impact of international tourism can be minimised, there are potential gains from positive externalities.

The results in Table 8 suggest that the net externality effect is most positive at the lowest level of development (TTslopeY5) and falling as GDP per capita increases. At lower levels of development, the positive learning and demonstration effects from international tourism are likely to be at their strongest and to dominate the negative effects. In the later stages of development, these learning experiences are expected to diminish and to result in reduced benefits from tourism. If the negative externalities from international tourism outweigh the positives at higher levels of development the net externality effect is negative, which comes to the fore in the empirical results.

Overall, Table 8 suggests the marginal factor productivity difference coefficient is generally quite large and positive, that the net externality effect is small and overall likely to be negative, and that the marginal productivity of capital per worker is generally positive. In the next section, the analysis is taken further as the contributions to growth in GDP per capita are calculated for various groupings.

Contributions to Economic Development

From the estimated parameters reported in the previous section, international tourism's contribution to the growth in GDP per capita

can be calculated. These calculations were carried out by taking the estimated coefficient for each variable and multiplying it by the sample mean for that variable to obtain the contribution that variable has made to the growth in GDP per capita over the period. This is then multiplied by 100 to obtain a percentage figure.

Firstly, using the results in Tables 2 and 7 for a cross-sectional analysis with full period averages for each country, this contribution is presented in Table 9. The table indicates that in both samples, international tourism has played a substantial role in economic development, contributing 0.49 per cent out of a total of 0.94 per cent of growth in GDP per capita for the full sample, and 0.92 per cent out of a total 1.03 per cent growth in GDP per capita for the reduced sample.

Contributions to the growth in GDP per capita were also estimated at a less aggregated level for selected cases. The cases presented in the following tables serve to illustrate how the analysis so far may be applied to groups or individual countries⁵.

Table 10 shows the contributions to development, of each of the variables, in the Asian group.

It can be seen that for these countries, the externality effect and marginal factor productivity differences have both played substantial and positive roles in the growth of GDP per capita, contributing 0.46 per cent and 0.44 per cent respectively, out of a total growth in GDP per capita of 3.5 per cent. These results indicate higher marginal productivity in the international tourism sector, as well as a positive externality effect on output in the rest of the economy, which combine to promote the overall economic development of the countries in this group.

Table 11 shows that the contribution to development by international tourism in African countries with a moderate amount of international tourism has been positive overall, in spite of an overall decrease in the level of GDP per capita. However, this is due to large positive marginal factor productivity differences outweighing a substantial negative net externality from international tourism.

The following two tables examine the contributions to development for individual countries. Table 12 presents the OLS results for Argentina and suggests that while factors of production are less productive at the margin in the international tourism sector,

Table 9 Contributions to Development for Pooled Full Period Averages Using the General Tourism Specification

Variable	Full Sample			Reduced Sample		
	Coefficient	Mean	Contribution to Development (%)	Coefficient	Mean	Contribution to Development (%)
	(1)	(2)	$(1) \times (2) \times 100$	(1)	(2)	$(1) \times (2) \times 100$
$\Delta k/y$	0.2115	0.036	0.7623	0.1749	0.030	0.5239
$\Delta t/y$	3.98	0.001	0.4905	7.696	0.001	0.9159
Constant ^a	-0.0031		-0.3113	-0.0041		-0.4104
$\Delta y/y$			0.9414			1.0295

Table 10 Contributions to Development in Asia

Asia AR (1)				
Variable	Coefficient	Mean	Contribution to Development (%)	p-value
	(1)	(2)	(1) × (2) × 100	
$\Delta k/y$	0.0599	0.0762	0.4566	0.221
$\Delta t/y$	3.4599	0.00127	0.4390	0.034
$\Delta t/t$	0.0586	0.0783	0.4584	0.091
Total tourism	$(\Delta t/y) + (\Delta t/t) =$		0.8974	
Constant	0.0206		2.06	0.004
$\Delta y/y$			3.5326	
Adjusted R ²		0.1439		
F		9.29		
p > F		0.0000		
rho		0.8761		
Number of observations		149		

there are still substantial positive externalities, resulting in a positive overall contribution to economic development from the international tourism sector.

Table 13 presents the results for an AR (1) estimation of tourism's contribution to the growth in GDP per capita in Thailand. The earlier panel data analysis suggests that for

Table 11 Contributions to Development in African Countries with Moderate Tourism Intensity

Africa T3 OLS				
Variable	Coefficient	Mean	Contribution to Development (%)	p-value
	(1)	(2)	(1) × (2) × 100	
$\Delta k/y$	0.0557	-0.2021	-1.1249	0.398
$\Delta t/y$	18.5422	0.0027	5.0396	0.064
$\Delta t/t$	-0.5788	0.0493	-2.8560	0.052
Total tourism	$(\Delta t/y) + (\Delta t/t) =$		2.1836	
Constant	-0.0166		-1.66	0.390
$\Delta y/y$			-0.6000	
Adjusted R ²		0.3712		
F		2.97		
p > F		0.1067		
Number of observations		11		

Table 12 Contributions to Development in Argentina

Variable	Argentina OLS		Contribution to Development (%)	p-value
	Coefficient	Mean		
	(1)	(2)	$(1) \times (2) \times 100$	
$\Delta k/y$	0.2559	0.0412	1.0553	0.011
$\Delta t/y$	-33.7129	0.0004	-1.5012	0.04
$\Delta t/t$	0.3737	0.0750	2.8022	0.001
Total tourism	$(\Delta t/y) + (\Delta t/t) =$		1.3010	
Constant	-0.0255		-2.55	0.000
$\Delta y/y$			-0.1935	
Adjusted R ²		0.8007		
F		27.78		
p > F		0.0000		
Number of observations		21		

an Asian country in groups Y3 and T2 the marginal factor productivity difference would be close to zero and that the externality

would be negative. The results indicate that the externality is indeed negative, however, higher marginal factor productivity in the

Table 13 Contributions to Development in Thailand

Variable	Thailand AR (1)		Contribution to Development (%)	p-value
	Coefficient	Mean		
	(1)	(2)	$(1) \times (2) \times 100$	
$\Delta k/y$	0.4137	0.0784	3.2433	0.032
$\Delta t/y$	29.3821	0.0015	4.3106	0.003
$\Delta t/t$	-0.3498	0.0828	-2.8957	0.023
Total tourism	$(\Delta t/y) + (\Delta t/t) =$		1.4149	
Constant	-0.0032		0.32	0.856
$\Delta y/y$			4.2265	
Adjusted R ²		0.3719		
F		5.34		
p > F		0.0077		
rho		0.5475		
Number of observations		23		

international tourism sector has contributed such a large amount to the growth in GDP per capita (4.3 per cent) that the overall impact of international tourism on economic development in Thailand has been positive.

In summary, in most individual cases and for the sample as a whole, the results suggest that international tourism to developing countries does promote economic development within host countries. The results suggest that an increased allocation of resources to the international tourism sector is likely to raise levels of GDP per capita for the host population.

Conclusion

The quantitative analysis reported here suggests that international tourism has generally had a positive effect on economic development. This suggests that international tourism may be worth investigating further as another avenue for raising the quality of life in developing countries.

In most cases, international tourism appears to have a higher marginal factor productivity than the other sectors of the economy. This productivity difference generally increases with the level of development, yet diminishes as the importance of tourism in the economy increases. This suggests that in most cases, GDP per capita in these economies may be increased by a reallocation of resources away from less productive sectors and towards the international tourism sector.

However, this research indicates that tourism can have negative impacts on the host country. These negative impacts are often in the form of spill-overs from the international tourism sector to the rest of the economy. Yet, despite the net externality being predominantly negative, there is some

evidence to suggest that positive externalities are generated by international tourism, particularly at the lowest levels of development. The challenge is to harness these positive effects while minimising the negative effects.

This paper proposes that there are potential benefits for developing countries from the expansion of inbound international tourism. However, this does not constitute a recommendation to expand international tourism across the board. The results presented in this paper are aggregate in nature and rely on GDP per capita as an imperfect measure of economic development.

Tourism is a complex activity and any attempt to model it will be imperfect and must rely on imperfect data. Furthermore, the results of this paper suggest that international tourism may have varying impacts across different countries. This implies limitations to the usefulness of an aggregate analysis which assumes that the relationship between independent and dependent variables is the same across countries. As such, developing countries should consider the costs and benefits of any reallocation of resources to the international tourism sector on a case by case basis, within the context of that particular country. However, it is important that the potential benefits from international tourism are at least considered as an option for development policy makers.

This paper indicates that there is still scope for further research in this field. The findings presented suggest that it is important to look at issues and countries on a disaggregated level, in order to identify the implications for specific cases. Further qualitative and case specific examinations of issues, projects, and countries could be useful in building a fuller picture of the economic impacts of international tourism on developing countries. It is hoped that by exploring another possible

avenue towards development, this paper may draw some attention to a means of alleviating the poverty affecting the more than five billion people living in developing countries.

Notes

- 1 For brevity, the full mathematical manipulations have been omitted from this paper. The authors may be contacted to obtain detailed equations if required.
- 2 This specification differs from Modeste's (1995) in that Modeste develops a growth equation incorporating the tourism sector and translates it into per capita terms simply by dividing each term by the size of the labour force. The resulting specification is such that $\Delta K/L$ is used as a proxy for $\Delta(K/L)$ (Modeste 1995, p. 377), thus, rendering it inconsistent with the production function from which it is derived. Similarly, Salvatore and Hatcher's (1990) model is another application of Feder's (1982) framework to growth of per capita income that departs from the initial production function.
- 3 Prior to estimation, the data and the model were subjected to a number of tests in order to determine their suitability. Firstly, the data set was examined for structural breaks, but none are apparent from the data set itself or are reported in the data source. Secondly, the data were tested for stationarity using a Chow test, following Gould (1999, 2002), and were found to be stationary. Thirdly, the appropriateness of panel data analysis over OLS was tested formally by determining if the relationship between independent and dependent variables was constant across countries and through time. The OLS homogeneity assumption that observations are independently distributed across time was found to be violated. Therefore, the use of panel data analysis is more appropriate. Fourthly, Hausman's (1978) test indicated that fixed effects should be used in the panel data analysis, rather than random effects. Finally, examination of the error structure of the data showed evidence of heteroskedasticity and first order serial correlation. Both of these issues were corrected for by the estimation techniques used.
- 4 Major net oil exporting countries are excluded from these tables. This is discussed later.
- 5 Two cases concern AR (1) estimations, carried out using data that has been transformed via the Prais–Winsten procedure. The estimated parameters are based on

transformed means, whereas the calculations presented are based on the observed means. Consequently, the sum of the products of coefficients and means does not equal the observed mean growth rate of GDP per capita for the sample under consideration. However, the AR (1) results provide a relative indication of the contribution by each of the variables.

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