International tourism and long-term economic growth: Analysis by heterogeneous dynamic panel data

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ABSTRACT:

In terms of literature, tourism led growth hypothesis remains unexplored and the empirical results of recent research are controversial. This communication aims to contribute to the debate on the relationship between international tourism and economic development. The objective is to analyze, relationship between international tourism and economic growth in Southern and Eastern Mediterranean Countries (SEMC). using the heterogeneous dynamic panel data, the results show that the impact of international tourism on income per capita is mixed and varies depending on the measurement of tourism used (flow or revenue).

Keywords: tourism led growth hypothesis, SEMC, panel data.

JEL classification: L83, F43, C23

1. INTRODUCTION

Tourism is often presented as a promising growth area for the economic and social development of developing countries. At the present time, the development of tourism activities in the world varies greatly from one region to another, and even from one country to another in the same region. And the economic gains they generate are uneven: in some developing countries tourism is the bulk of GDP, while in others it is only beginning to grow.

In this context, empirical studies dealing with different aspects of the relationship between tourism and growth have multiplied in the recent period (on the link between tourism and growth only, see Balaguer and Cantavelle-Jorda, 2002). If This growth originates above all in the gains made by tourism .The emergence of new economic models has also provided new analytical tools for a renewed approach to these questions (the theories of endogenous growth make it possible to establish a link between international tourism and growth for example), while the availability of international databases provided the necessary support for these studies. These international databases include either balance of payments data or data from surveys or censuses of passengers crossing borders and / or staying on the spot.

In this context, our work aims to contribute to the existing debate on the impact of international tourism on short and long term economic growth by applying a heterogeneous dynamic panel analysis. This study aims to draw the necessary lessons for the countries of the south and east of the Mediterranean.

In the panel analysis, we try to test the hypothesis that international tourism has a positive influence on real GDP byinhabitant .

This article is organized as follows. Section 2 presents literature review. Section 3 to 5 presents the empirical specification, methodology and description of data. Section 6 examines the relationship between tourism and growth in the context of data Panel on a sample of southern and eastern Mediterranean countries. Ultimately, the conclusions will be reported in Section 7.

2. THE LITERATURE REVIEW

Over the past decade, a growing number of empirical research has highlighted the relationship between tourism development and economic growth in developed and developing countries.

As in the case of the export-led growth (ELG) hypothesis, a tourism-led growth assumption (TLG) suggests several arguments. It is argued that tourism activity generates currencies that can be used for importing capital goods, in order to produce goods and services in the economy and thus contribute to economic growth. If tourist revenues could be used to import capital goods or basic inputs for the production of goods in all areas of the economy, then it can be said that these revenues play a fundamental role in economic development.

Thus, given the potential of tourism, it becomes clear that non-tourism regions in a country would benefit from this growth, following the distribution of the wealth produced by tourism. However, although more and more work is now being done on this question, the empirical literature does not appear to be homogeneous both in the results, in the methods used, and in the variables used to measure the impact of international tourism. In this section, we present a summary of the main empirical findings on the relationship between international tourism and economic growth.

The first attempt to analyze the long-term empirical relationship between economic growth and international tourism was carried out by Balaguer and Cantavella-Jorda (2002). Using Johansen's cointegration method on Spain's quarterly data between 1975 and 1997, these authors found a stable long-term relationship between tourism receipts and economic growth. Moreover, they showed that external competitiveness (measured by the real effective exchange rate) is a fundamental variable of Spanish economic growth in the long term.

Inspired by the Balaguer and Cantavella-Jorda model (2002), Dritsakis (2004) analyzed the causal relationship between real GDP tourism receipts and Greece's real effective exchange rate over the quarterly period 1960-2000 And found a cointegration and two-way relationship between tourism receipts and economic growth. However, this study is not immune to certain criticisms that we can address. In particular, the author confines himself to estimates without resorting to robustness tests to validate the relevance of the estimates.

By adopting a different empirical specification, Durbarry (2004), for the case of Mauritius, used a production function linking economic growth with other variables recommended by growth theory; Including physical capital and human capital, as well as the main components of exports, including international tourism. The conclusion to be drawn from this study is that tourism has a positive and statistically significant impact on Mauritian economic development.

Given the contrasting results obtained by analyzing the TLG hypothesis, Nowak and al. (2007), made a first attempt to examine the TKIG (Tourism / Imports of Capital Goods / Growth) mechanism for the Spanish economy (1960-2003). It should be noted that this study departs from the existing literature of

Tourism Led Growth in two ways: First, it includes imports of capital goods as one of the additional factors influencing the analysis of the relationship between tourism International growth and economic growth. Then, it uses a different methodology (Granger causality tests based on the vector model with error correction).

The results are in favor of the TKIG hypothesis, since they show that tourism exports finance imports of capital goods and, in turn, affect Spanish economic growth. They also show that the TLG hypothesis can not be rejected. Consequently, both channels of the impact of tourism exports on growth (improved productive efficiency of resources, that is to say the TLG hypothesis, and the increase in the quantity of productive resources, that is to say the TKIG hypothesis) seem to apply to the Spanish economy.

Concerning Turkey, Zortuk (2009) used the cointegration method of Johansen, for quarterly data (1990T1-2008T3). He found that there is a long-term equilibrium relationship between GDP growth and tourist arrivals. This author also showed that there is a unidirectional causality of tourist arrivals towards economic growth.

For the same problem, Katricioglu (2009) used ARDL modeling to examine the relationship between tourism and the economic growth of the Maltese economy during the annual period from 1960 to 2006. Unlike many works, this study uses The use of tourist establishments as a measure of the volume of international tourism, due to the fact that a problem of multi-collinearity emerges when tourism receipts are used. He showed the existence of a long-term cointegration relationship between tourist arrivals and economic growth. This study also showed the existence of a two-way causality between tourist arrivals and Malta's economic growth. This confirms the validity of the TLG hypothesis for the case of this country.

Similarly, Chen and Chiou-Wei (2009) examined the causal relationship between tourism receipts, real GDP and real exchange rate in the two Asian countries: Taiwan and South Korea during the period 1975T1-2007T1. These two authors have proposed a different econometric approach to arrive at some elements of response to the debate we are dealing with about the nature of the relationship between international tourism and economic growth. The applied model is of the GARCH-M type which relies on a quadratic specification of the conditional variance of the random variables. It thus allows to integrate the factors of uncertainties. The results indicate that the TLG hypothesis is supported for the case of Taiwan, while a reciprocal causal relationship is found for the case of South Korea.

At the same time, other studies using panel data econometrics have shown the positive contribution of tourism to economic growth. Brau, Lanza and Pigliaru (2007) analyzed more empirically the empirical relationship between growth, country size and tourism specialization using a sample of 143 countries, which 29 small countries, during the period 1980-2003. These authors point out that tourism countries are growing faster than other sub-groups considered in the analysis (OECD, oil-exporting countries, developing countries, small countries). They also indicate that small countries are likely to grow faster only if they are highly specialized in tourism. So, unlike some previous studies, The size in itself is not good for growth.

Using a Convergence Approach based on the Barro and Sala-i-Martin model (1992), Proenca and Soukiazis (2008) analyzed the impact of tourism on per capita income growth for the four Southern (Greece, Italy, Portugal and Spain) between 1990 and 2004. They showed using panel data techniques that a 1% increase in tourism receipts will lead to a 0.026 percentage point increase in per capita income in these countries. In addition, these authors concluded that tourism can be considered as an alternative solution to accelerate growth for these four countries. It can also be seen as a convergence factor, thus reducing asymmetries between countries.

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Samimi and al. (2011) used the P-VAR approach to examine the TLG hypothesis in 20 developing countries for a period from 1995 to 2009, it was able to establish a two-way relationship between tourist arrivals and growth Long-term economic growth, therefore ,, Tourism could be used by developing countries to stimulate economic growth. However, this study is empirically criticized. Indeed, the analysis carried out does not include important control variables that can have a decisive effect on growth.

Similarly, Fayissa, Nsiah and Tadesse (2009) used a panel of 17 Latin American countries for an annual period from 1995 to 2004. They examined the impact of the tourism industry on growth and Economic development in a structure of the conventional neo-classical model. They found that tourism receipts contribute positively to economic growth in the countries of Latin America.

Based on the production function of Feder (1982) and the empirical work of Durbarry (2004), Cortés-Jiménez and Pulina (2010) analyzed the export-led growth (ELG) Tourism (TLG) taking into account other relevant factors, including physical and human capital, for the case of Spain and Italy over the period 1964-2000 and 1954-2000 respectively.

This analysis led them to conclude that in the long term the ELG and TLG assumptions are confirmed for both countries. Indeed, Traditional exports and inbound tourism can be seen as important factors in improving economic growth. Another result of this work reveals the existence of a two-way causal relationship between traditional exports, tourism expansion and economic growth. In addition, physical capital and human capital are also key factors for long-term growth for Spain and Italy .

Despite these series of studies concluding that the Tourism Led Growth hypothesis is valid, other studies have failed to resolve the issue. Thus, Oh (2005) disagreed with the existence of a long-term relationship between tourism receipts and economic growth using an Engle and Granger approach on South Korean data covering the period 1975 To 2001. According to this study, the tourism-driven growth assumption is not verifiable for the Korean economy.

Through a multivariate model, Lee and Chien (2008) studied the stability of long-term relationships between tourism development, real GDP and the real exchange rate in Taiwan for the period 1959-2003. They found that this relationship is not stable over time and that there are structural breaks due to exogenous shocks.

Similarly, Katircioglu (2009) used Johansen's cointegration approach to study the relationship between tourist arrivals, real GDP and the real exchange rate on a sample of Turkey's annual data between 1960 and 2006. It reveals That the TLG hypothesis is not confirmed for Turkey. This result is in contradiction with those obtained by Gunduz and Hatemi-J (2005) and Ongan and Demiroz (2005) and Zortuk (2009).

Using the same methodology as for the case of Spain, Nowak et al. (2011) examined the causal link between tourism exports, imports of capital goods and economic growth in the case of Tunisia over the period 1975-2007.

The results show that there is no TLG mechanism in Tunisia, whereas the TKIG mechanism appears as a short-term phenomenon only .In other words, tourism exports have contributed significantly to the financing of imports of capital goods, but they have not been the main engine of long-term economic growth. In addition, the results support the tourism-led economic growth (GLT) hypothesis in this country. Note that this conclusion is in contradiction with the work of Belloumi (2010).

In a recent work, He and Zheng (2011) used VAR modeling, studying the link between tourism development and economic growth in the case of Sichuan over the period (1990-2009). They showed that

the role of tourism development in promoting economic growth is not obvious, while that of economic growth to promote tourism development is large.

Otherwise,Sequeira and Campos (2007), using panel analysis, examined the relationship between tourism specialization and economic growth for a very large sample of 509 observations covering the period 1980 to 1999. This sample Includes small islands, small countries, rich countries, poor countries, African countries, Asian countries, Latin American countries and European countries. They concluded that tourism alone can not explain the higher rates of growth in countries specializing in tourism. The results were the same for all samples, the tourism-related variables did not have a significant impact on economic growth.

In the same framework, Lee and Chang (2008) applied panel cointegration techniques for a broader sample of developed and developing countries between 1990 and 2002.They showed that tourism development has a greater impact on GDP in non-OECD countries than in OECD countries. In addition, the authors have resulted in unidirectional tourism development relationships to economic growth in OECD countries, two-way relationships in non-OECD countries with only weak relationships in Asia. In light of these results, they concluded that, with the exception of Asian countries, other groups of countries can benefit from tourism development.

Chang, Khamkaew and Mcaleer (2010) studied whether tourism specialization is important for economic development in East Asia and Pacific, Europe and Central Asia, Latin America and the Caribbean, the Middle East and North Africa, North America, South Asia and sub-Saharan Africa, representing a sample of 131 countries over the period 1991-2008. They showed , based on panel data regressions, that tourism growth does not always lead to economic growth. The impact of tourism is significantly positive in the two regimes, the regime with the lower tourism specialization level of 14.97% (regime 1) and the regime with the degree of tourism specialization between 14.97% and 17.50 % (Regime 2). While the relationship is not significant at regime level 3 with a degree of specialization higher than 17.50%. According to these authors, if the economy is too dependent on the tourism sector, the development of this sector can not lead to strong economic growth since the overall contribution of tourism to the economy could be reduced by many factors such as Capital flight, degree of trade openness, investment and public consumption.

Figini and Vici (2009) provided an empirical assessment of the relationship between tourism specialization and economic growth. These two authors used a panel of 150 countries covering the period 1980-2005. They came to a different conclusion than that obtained by Brau, Lanza and Pigliaru, BLP, (2007). They showed that there was no significant relationship between tourism specialization and economic growth during the period 1990-2005. According to these authors, such a discrepancy can be explained by three reasons. First, a data problem related to the way tourism data was collected by BLP. Secondly, an error in specification of the BLP model related to the endogeneity and omission bias of the explanatory variables. Third, this divergence is due to the period of analysis that is different between the two works.

In a more recent study, Tang and Abosedra (2015) examined the link between tourism and economic growth in Morocco and Tunisia over the period 1990-2010 in the context of panel data cointegration. The findings of the study indicate that in both countries economic growth, tourism and the stock of productive capital are cointegrated. In addition, the results show that tourism Granger-causes economic growth, thus supporting the tourism-led growth hypothesis in Morocco and Tunisia.

At the end of this analysis, we will retain that the empirical literature, through the different approaches presented, provides inconclusive results in the analysis of the relationship between international tourism and long-term economic growth. Similarly, the "rigorous" econometric tools used in most studies leave us with the opportunity to continue this research in order to find or give more solid answers in this debate.

The following section proposes an empirical assessment of the link between international tourism and economic growth in a tourism-dependent zone, namely some countries in the southern and eastern Mediterranean.

3. Model specification

Our objective in this section is to study the determinants of growth where the emphasis is on the role of tourism development. For this we will adopt the framework set up by Mankiw, Romer and Weil (1992), who have shown that the validity of the Solow model can be improved by the inclusion of human capital.

Consider the following Cobb-Douglas production function:

$$Y_t = K_t^{\alpha} H_t^{\beta} (A_t L_t)^{1-\alpha-\beta} \qquad (1)$$

Whereα et βRepresents the elasticity of factors physical capital and human capital.. $(1-\alpha-\beta)$ Represents the elasticity of a productive unit of labor relative to the level of production **Y** is the quantity of production, **K** is the stock of physical capital **H** the stock of human capital, **L** is the supply of labor and **A**coefficient reflecting the technological level and the efficiency of the economy and **t** Represents the time index .

Either s_k The share of income invested in capital and s_h That invested in human capital, the evolution of the economy is defined by:

$$\begin{aligned} \dot{k}(t) &= s_k y(t) - (n+g+d)k(t) \\ \dot{h}(t) &= s_h y(t) - (n+g+d)k(t) \end{aligned} \qquad (2)$$

Where **d**is the depreciation rate. Mankiw, Romer and Weil (1992) Poses as hypothesesthe decreasing returns for all types of capital$(\alpha+\beta \leq 1)$. It is this hypothesis which makes it possible to obtain a stationary state.

In the stationary state, $\dot{k} = \dot{h} = 0$. The economy is converging towards :

$$\begin{aligned} k^* &= \left(\frac{s_k^{1-\beta} s_h^{\beta}}{n+g+d}\right)^{1/(1-\alpha-\beta)} \\ h^* &= \left(\frac{s_k^{\alpha} s_h^{1-\alpha}}{n+g+d}\right)^{1/(1-\alpha-\beta)} \end{aligned} \qquad (3)$$

By substituting these two expressions in the production equation (1), the income by head can be rewritten as (in log):

$$\ln\left[\frac{Y(t)}{L(t)}\right] = \ln A(0) + gt - \frac{\alpha+\beta}{1-\alpha-\beta}\ln(n+g+d) + \frac{\alpha}{1-\alpha-\beta}\ln(s_k) + \frac{\beta}{1-\alpha-\beta}\ln(s_h) \qquad (4)$$

Equation (4) shows that long-run income by head is a function of population growth and the stock of human capital and physical capital. Therefore, Mankiw, Romer and Weil rely on this specification to show that when human capital is added, the magnitude of the response from the long-term income level to the savings rate and population growth rate is More important. These authors also argue that the increased Solow model explains the large income disparities observed internationally. The analysis of Mankiw and al. Is based on the following "convergence equation":

$$\ln\left[\frac{y(T)}{y(0)}\right] = a + \theta\frac{\alpha}{1-\alpha-\beta}\ln s_k + \theta\frac{\beta}{1-\alpha-\beta}\ln s_h - \theta\frac{\alpha+\beta}{1-\alpha-\beta}\ln(n+g+\delta) - \theta\ln y(0) + \varepsilon \qquad (5)$$

Where y (0) is the initial income.

By introducing other explanatory variables, the empirical specification used in this section is as follows:

$$lny_{it} = a + \varphi lny_{it-1} + \phi X_{it} + \psi tourisme_{it} + u_{it} \qquad (6)$$

With y_{it} The real GDP by head of country i at time t, X_{it} Is the set of variables usually used in the literature as determinants of economic growth, $tourism_{it}$Represents the different measures of tourism intensity and u_{it} is the term of the error .

4. Presentation of the estimation method

The previous empirical specification (Equation 6) requires the use of estimation techniques on panel data or individual-temporal data. The double individual and temporal dimension implies an increase of the available information, this makes it possible to improve the accuracy of the estimated parameters. The panel data has the advantage of taking into account the specifics of each country using observable and individually specific variables. They also distinguish differentiated effects from unobservable variables, time-specific or country-specific effects.

The pooled mean group (PMG) method (Pesaran andal., 1999, Bassanini and al., 2001) avoids having to average the data and thus gives much greater accuracy to the estimates. It nevertheless limits the problems of serial correlation by explicitly modeling the short-term effects (by integrating the first differences of the independent variables), which may vary from one country to another, as well as long-term effects, Equality is imposed. However, the risk of under-modeling remains.

Heterogeneity can be problematic when a relationship is estimated for countries that have been aggregated. The heterogeneity of countries is of particular importance for short-term relationships (to the extent that economic growth can be affected by country-specific determinants), but less so for long-term relationships (which can be assumed That they are more homogeneous from one country to another). The PMG estimator provides a solution to the problem of country heterogeneity while taking into account the distinction between short-term and long-term dynamics. The estimation procedure, referred to as the « Delayed Autoregressive Model » requires: (i) that there is a long-term relationship between the variables considered; And (ii) the dynamic specification of the model is expanded so that the repressors are strictly exogenous and the residues are not serially correlated. An autoregressive model with distributed delays of order p = 1 and q = 1 can be written in terms of an error correction model as follows (Pesaran and al, 1999):

$$\Delta y_{it} = \pi_i (y_{it-1} - \theta_{0i} - \sum_{r=1}^{R} \theta_{ri}\, x_{rit}) - \sum_{r=1}^{R} \vartheta_{r1i}\, \Delta x_{rit} + \varepsilon_{it} \qquad (7)$$

Where the term in parentheses refers to the long-term component. If the maximum length of the process is a - hypothesis retained in this thesis - the previous expression is still simplified.

The adjustment coefficient is defined by the formula$\pi_i = -(1 - \lambda_i)$And long-term coefficients by:

$$\theta_{0i} = \frac{\mu_i}{1 - \lambda_i}, \quad \theta_{ri} = \frac{\vartheta_{r0i} + \vartheta_{r1i}}{1 - \lambda_i}$$

Where r = 1, ..., R denotes the number of explanatory variables.

By making the hypothesis That there is a long-term relationship between y_{it} (Economic growth) and x_{it} (Tourism indicator and other variables likely to influence growth), with identical coefficients between groups and perturbations ε_{it} Distributed normally and independently between countries,

, The parameters of (A.1) can be estimated by the maximum likelihood method using the Newton-Raphson algorithm (Pesaran and al, 1999, 2001). The PMG estimator requires that the element of θr be common to all

countries, whereas the estimator based on the Mean Group (MG) method imposes no restriction on the vector parameter.

This MG estimator produces consistent estimates when the group size of the panel tends to infinity (Pesaran and Smith, 1995) - which is not the case for the small sample considered here. Therefore, for the purposes of this analysis, we estimate that the PMG estimator offers the best compromise between consistency and efficiency.

5. Choice of variables and description of data

We perform an econometric analysis on a sample of seven countries in the southern and eastern Mediterranean (Algeria, Egypt, Jordan, Morocco, Syrian, Tunisia, Turkey) from 1980 to 2010. The basic variables used in our empirical analysis are derived from the neoclassical growth theory (Barro, 1991, Barro and Xala-I-Martin, 1996, Mankiw, Romer and Weil, 1992). In the following, we present the fundamental variables used in the empirical analysis:

Dependent variable:

- Economic growth (y) is measured by real GDP per capita (in constant USA dollar, 2000). This endogenous variable was extracted from the World Bank (World Development Indicators database, 2012).

Independent variables:

- Stock of human capital (KH): Measuring human capital is particularly difficult to assess. At the level of the empirical literature, several indicators are used to quantify human capital. This is mainly due to the school enrollment rate (Berthélemy, Dessus and Varoudakis (1997), Bassanini and Scarpetta (2002)) and Barro, 1991, Mankiw, Romer and Weil (1992). In our study, we used the average number of years of schooling in the labor force as an approximate variable for the stock of human capital. This variable is assumed to have a positive influence on economic growth. It is extracted from the statistical database of Barro and Lee (2010) on educational attainment.

- Physical capital (I /Y): given that the stock of physical capital is not directly available for several countries in our sample, the investment rate or percentage of gross fixed capital formation on GDP (I/Y) was used as a proxy to evaluate investment in physical capital. Its sign should be positive. This variable was taken from WDI (2012).

- Population growth rate (Pop): According to Barro (2000), economic growth is negatively related to the fertility rate. Thus, having more children in the same family will generate a higher rate of population growth. An increase in the population growth rate may be responsible for the fall in GDP per capita. This variable was extracted from the World Bank database (WDI [2012]).

- Public expenditure on consumption in relation to GDP (DP / GDP): the question of the effect of the size of the State on growth is very discussed in the economic literature. We used this indicator to measure the long-term displacement effect and the possible negative effects of public consumption on long-term income by head. This variable was extracted from the World Bank database (WDI [2012]).

Tourism indicators:

To capture the effects of tourism on economic growth, we consider variables that make it possible to better estimate the importance of tourism, in particular (Sequeira and Campos, 2007):

- Tourist arrivals relative to the population (A / POP): this proportion represents the tourist flow. It is calculated on the basis of the ratio of tourist arrivals to total population (source: UNWTO and WDI).

- Tourism receipts as a percentage of GDP (RT / GDP): this indicator represents an assessment of the direct monetary impact of foreign-sourced tourism expenditure (source: UNWTO and WDI).

- Tourism receipts as a percentage of exports (RT / EXP): this is the expenditure of international tourists, including payments to national transport companies. This share in exports is calculated by reference to a ratio on exports of goods and services (source: UNWTO and WDI).

It should be emphasized that all variables have been stabilized by expressing them in logarithmic form.

6. ANALYSIS OF RESULTS

6.1 Descriptive analysis of data

Table 1 presents, for the period 1980 to 2010, the descriptive statistics of all the variables used in our empirical analysis for the different groups in the sample. Reading these tables shows that the SEMCs have a very low average income by head (1874.9 US $ 2000) compared to the OECD countries (US $ 19999.34). In terms of tourism development indicators, the average ratio of international tourist arrivals per capita is higher in OECD countries (81.39869) than in the PSEM group (22.09902), while The average value of the other two variables, in particular, the ratio of tourism receipts as a percentage of GDP is higher for the SEMC than for the OECD.

Table 1: Descriptive statistics for the SEMCs

Variable	Obs	Mean	Std, Dev,	Min	Max
Y	180	1874,957	992,7592	856,6008	5323,683
POP	180	2,235463	1,062918	0,5901647	11,18066
KH	180	5,377603	1,573838	1,7926	9,196094
I/Y	180	23,44885	4,756832	14,39531	43,21786
DP/GDP	180	16,19383	4,943885	7,515593	31,06241
A/POP	180	22,09902	19,80277	2,088188	87,93285
RT/EXP	179	18,39675	5,76999	4,61685	37,45578
RT/GDP	179	5,861149	3,087135	0,4753647	13,22535

6.2 Heterogeneous dynamic panel analysis

Before proceedingon to model estimation using the PMG and MG methods, stationarity and cointegration tests must be used to avoid spurious regression between different variables to be tested.

6.2.1 The results of unit root panel tests

Taking into account the stationarity of the variables on temporal panel data has become very common in econometric practice today. It thus aims to ensure the stability of the variables studied. As part of our modeling, we will use the first and second-generation unit root tests recommended in the literature, namely Levin, Lin and Chu (2002), Im, Pesaran and Shin (2003), ADF, Philips Perron (Maddala and Wu (1999) and Choi (2001)), Hadri (2000) and Pesaran (2003).

The results of the individual unit root tests for the SEMC sample are presented in Table 2.

Table 2: unit root panel tests

Variables		unit root panel tests: SEMCs											
		Levin, Lin & Chu		IPS		ADF		Philip Perron		Hadri		Pesaran	
		With Trend	Without trend	With Trend	Without trend	With Trend	Without trend	With Trend	Without trend	With Trend	Without trend	With Trend	Without trend
ln_y	At the level	0.50099	2.85667	0.76842	4.81285	14.0421	2.35072	7.28201	1.09040	5.24158***	8.03236***	-0,97	-0,558
	In first difference	-11.4139***	-11.5308***	-12.1223***	-11.7129***	156.169***	109.602***	180.806***	109.133***	0.92320	1.65901**	-3,266***	-3,798***
Ln_I/Y	At the level	-0.56384	-0.95097	-1.77267**	-2.06048**	24.0783**	26.0603**	7.14411	11.7324	2.18553**	2.40449***	-0,419	-1,332*
	In first difference	-5.14204***	-6.45328***	-5.90729***	-7.23270***	52.3154***	69.4801***	58.1375***	66.1573***	0.81580	-0.93072	-2,879***	-3,865***
Ln_KH	At the level	5.83781	-2.48990	3.55991	-0.53141***	3.58154	10.3917	208.710***	46.1938***	8.68866***	8.98864***	-2,181**	-3,266***
	In first difference	35.9677	-22.6314***	-3.76180***	-22.9954***	37.1744***	177.380***	330.815***	170.210***	12.2865***	3.92181***	-8,46***	-9,185***
LN_DP/GDP	At the level	-0.06463	0.10129	0.18953	0.96347	9.43240	7.77304	8.39560	8.23792	4.05678***	5.20286***	-0,325	-0,789
	In first difference	-8.70670***	-9.54929***	-9.62645***	-9.84891***	87.3557***	99.1262***	94.6498***	99.7886***	2.52501***	0.75744	-3,436***	-3,932***
POP	At the level	3.99835	-6.60458***	0.20221	-4.12338***	22.1723**	44.8293***	17.9442	11.2956	2.57597***	5.81877***	3.631***	-3.707***
	In first difference	-5.93563***	-1.06166	-11.8151***	-8.20203***	147.358***	84.3660***	549.340***	78.9645***	12.0719***	1.59002*	-5.694***	-5.787***
ln_A/POP	At the level	-2.84727***	-1.34014*	-1.66766	1.18206	17.6248	15.2719	14.7244	5.70712	5.86193	6.28900	0.927	0.400
	In first difference	-7.01534***	-8.72069***	-9.93832***	-8.68567***	96.5825***	90.2736***	356.074***	124.521***	2.77499***	3.57627***	-1.156	-3.496***
ln_RT/EXP	At the level	-4.48157***	-2.46281***	-4.26458***	-1.69325**	40.0456***	19.7736*	15.8923	19.5040*	4.00892***	3.71509**	-0.178	-1.473*
	In first difference	-8.66282***	-11.0629***	-9.48938***	-11.1350***	89.9565***	114.504***	192.333***	141.014***	2.23024***	-0.41236	-0.990	-1.895**
ln_RT/GDP	At the level	-3.58117***	-3.35256***	-2.52751***	-3.01325***	25.1988**	29.7586***	19.1400*	36.8313***	4.81963***	6.22576***	0.207	-0.419
	In first difference	-6.80207***	-8.79066***	-8.74502***	-10.0033***	82.*7573**	102.697***	362.518***	150.737***	3.32210***	0.58616	-3.824***	-4.258***

**** Significant at the threshold of 1% ** Significant at the threshold of 5% ; * Significant at the threshold of 10*For the case of our sample, the results of the tests are mixed for the majority of the variables. Indeed, the test Levin, Lin and Chu (2002) indicates that the variables ln_A/POP, ln_RT /GDP, POP are stationary in level, whereas the other variables are stationary in first differences.

Then, according to the IPS, ADF and Philips Perron tests, the variable ln_arriv is non-stationary. Moreover, the Phillips Perron test shows that the hypothesis of the presence of unit root is accepted for the two variables ln_RT / EXP and POP.

On the other hand, the Hadri test, whose specificity is based on the null hypothesis of stationarity, shows that all variables are stationary in first differences.

Generally, based on the Pesaran test results, which are more robust and allow to take account of possible dependencies between individuals, it can be concluded that the majority of the variables are considered non-stationary and integrated from order 1 to The exception of POP.

The verification of the non-stationarity properties for all the variables of the panel leads us to study the existence of a long-term relation between the integrated variables of order 1.

6.2.2 The results of the cointegration tests

The same principle that has just been presented to test the stationarity of variables is used to test the existence of possible cointegration relations for both homogeneous and heterogeneous panels. In order to do so, we adopt two categories of tests: the Pedroni tests (1995, 1997) in order to take into account the heterogeneity using parameters which may differ between the countries and the Kao tests (1999) Homogeneous cointegration vectors between countries.

Table 3 presents the results of the cointegration tests of Pedroni and the Kao test: For the group of PSEM, the ADF statistic leads to reject the null hypothesis of absence of cointegration relation in both specifications

(Model 1 and Model 2). Similarly, the Kao test rejects the null hypothesis at the 1% threshold in model 1 and at the 10% threshold in model 2.

Table 3 : Cointegration test of panel data

	Model 1 (LN_Y LN_I/Y LN_KH LN_DP/GDP LN_A/POP)		Model 2 (LN_Y LN_I/Y LN_KH LN_DP/GDP LNRT/GDP)	
Test	**Test Statistique**	**Prob.**	**Test Statistique**	**Prob.**
Pedroni Tests (1999,2004)				
Panel ADF-Statistic	-1.870737	0.03**	-2.258949	0.01***
Group ADF-Statistic	-0.849183	0.19	-1.834376	0.03**
Kao tests (1999)				
ADF-statitic	-2.349848	0.00***	-1.531816	0.06*

Overall, we conclude that there is at least a long-term relationship between real GDP per capita and the explanatory variables in the SEMCs. This suggests the appropriateness of using an error-correction model to highlight the short-term and long-term relationships between economic growth and international tourism.

6.2.3 Interpretation of Results

The results of the estimation of the models by the PMG and MG method are presented in Table 4. The fact that the time series are shorter significantly limits the number of variables that could be taken into account in the regressions.

In the light of the results obtained for the SEMCs, it can be seen that the adjustment coefficients are indeed negative and significant, which validates our use of the Error correction Model (ECM). Indeed, the significance of the adjustment coefficients validates the existence of a long-term relationship in the co-integration process, and the movements between the different variables of the model are considered permanent.

In the long run, results from the PMG method show that all explanatory variables have the expected sign and are significant in model 1. Human capital as a factor of production plays a crucial role in long-term economic growth . Indeed, the coefficient relative to the stock of human capital (number of years of study of the active population) appears positive and significant at the 1% threshold. This corroborates the theoretical assertions of Romer (1990) that the stock of human capital contributes to long-term growth because of its use in technological innovation activities. In addition, tourist arrivals relative to the population have a positive and very significant impact (at the 1% threshold). This shows that tourism arrivals have a positive influence on economic growth. This result is robust because it is significant in all estimates. On the other hand, the impact of tourism receipts is insignificant in all estimates.

In conclusion, the regressions including the tourist flow indicator provide an overview of the link between tourism development and economic growth. Table 4 confirms in general that tourism flows, unlike tourism receipts, affect long-term economic growth in the SEMCs.

Table 4 : Results of estimates (PMG and MG)

	PMG	**MG**	**PMG**	**MG**
Model	**Model1**	**Model1**	**Model 2**	**Model 2**
Long term				
ln_I/Y	0.538**	0.643*	2.420	0.359
	(0.2406)	(0.3664)	(2.512)	(0.2378)
Ln_KH	0.543***	-0.278	3.857	1.159***
	(0.1816)	(0.2716)	(3.169)	(0.4134)
LN_DP/GDP	- 1.530***	-1.268**	0.313	0.422
	(0.4952)	(0.6174)	(0.8346)	(0.7650)
Ln_A/POP	0.394***	0.569**		
	(0.0833)	(0.2760)		
Ln_RT/GDP			- 1.154	0.241
			(1.329)	(0.1939)
EC	-0.087***	-0.2760** (0.1140)	-0.0061	-0.055
	(0.0219)		(0.0097)	(0.0574)
Hausman Test	27.42		4.84	
	[0.0000]		[0.3041]	
Nombre of countries	6	6	6	6
Nombre of observations	168	168	167	167
Log Likelihood	378.869		371.1901	

Note: Values in parentheses () are standard deviations. *** significant at the threshold of 1% ** significant at the threshold of 5%; * Significant at the 10% threshold.

7. CONCLUSION

In this work, we studied the relationship between tourism and economic growth. In the empirical literature, numerous studies have focused on the relationship between international tourism and economic growth.

Our analysis of the literature review showed that none of the studies in question yielded conclusive results on the impact of international tourism on long-term economic growth. In order to contribute to this economic debate, we analyzed the relationship between international tourism and growth from the analysis of dynamic panel data.

Our objective is to verify the impact of international tourism on real GDP per capita using recent estimation techniques on heterogeneous dynamic panel data for a period from 1980 to 2010. The results of the different econometric approaches reveal that the " Impact of international tourism on the standard of living is mixed and varies according to the measure of tourism used (flow or receipts). Indeed, the indicator of international tourist flows has a positive and very significant impact on real GDP per capita, whatever the estimator. Moreover, the tourist indicator (RT / GDP) does not appear significant for the SEMCs.

Finally, this study showed that there is still a need to assess the empirical relationship between international tourism, growth in SEMCs as well as in other regions. Therefore, a similar study is recommended for other countries and tourism regions around the world for comparison with previous research results.

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