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Abstract

On Average, tourism-specialized countries grow more than others. This is not consistent with the core of modern economic growth theory that suggests that economic growth is linked to sectors with high-tech intensity and large scale. In this paper, we use appropriate panel data methods to study the relationship between tourism and economic growth. In general we show that tourism is a positive determinant of economic growth both in a broad sample of countries and in a sample of poor countries. However, contrary to previous contributions, tourism is not more relevant in small countries than in a general sample.

Key-Words: Tourism, Economic Growth, Panel Data.

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1 Introduction

Recently, researchers have been interested in the relationship between tourism specialization and economic growth, empirically supporting a direct effect from the first to the second. However this seems to be an inconsistent fact with economic theory as, in particular, endogenous growth theory suggests that economic growth is linked with: (1) sectors with high intensity in R&D and thus high productivity; (2) large scale. In fact, these features are not shared by tourism-intensive countries. On the contrary, the tourism sector is thought not to be a technologically intensive one and countries specialized in tourism are in general small countries (see for instance Easterly and Kraay, 2000 and Lanza and Pigliaru, 1999). Some explanations have appeared linked to a terms-of-trade effect (Brau *et al.*, 2003 and Copeland, 1991) and a natural resources abundance approach (Lanza and Pigliaru, 1999 and Sinclair, 1998). The first one supports that a tourism boom tends to increase demand for non-tradable goods and this improves terms of trade which increase growth and welfare. The second argues that tourism is linked with the existence of renewable resources (beaches, mountains, rivers, historical and cultural heritage). Thus countries with relative abundance of natural, cultural or historical resources have comparative advantage in specializing in tourism.

An increasing number of articles have been analyzing the relationship and causality between tourism and the economic growth rate both in specific countries (e.g. Ghali, 1974, for Hawaii; Balaguer and Jordá, 2002, for Spain; Durbarry, 2004, for Mauritius and Gunduz and Hatemi-J, 2005 for Turkey) and in broader samples (e.g. Eugenio-Martin *et al.*, 2004 for Latin America). The former used standard time-series methods to conclude that tourism had fostered growth in the specific countries studied, while the latter used a dynamic panel data estimator - the differenced GMM from Arellano and Bond (1991) - to provide evidence that the increasing number of tourists *per capita* caused more economic growth in the low and medium-income countries of Latin America. The test done by Brau *et al.* (2003) for a broad cross-section of countries is not robust to the possible existence of endogeneity of tourism. Tourism may be correlated with human capital, geographic or cultural features, for instance, and may not be an independent determinant of growth. Thus, having data for different countries, panel data methods are the correct approach to deal with possible endogeneity of tourism. However, due to the persistence of the output series, Temple *et. al.* (2001) suggest that for a broad cross-section of countries, one should use the System-GMM estimator from Blundell and Bond (1998).

The fact is that, on average, tourism-specialized countries grow more than others. The next Table shows average growth rates between 1980 and 2002 for all countries for which data are available and for subsets of countries specialized in tourism. Data are from a panel of countries through 5 five-years periods: 1980-84, 1985-89, 1990-94, 1995-99 and 2000-2002 and show that there is a clear positive correlation between tourism specialization and economic growth.

Table 1: Specialization in Tourism and Growth

	Observations	g_Y
Total	1018	0.8%
Specialized Countries		
$T/X \geq 10\%$	684	1.0%
$T/X \geq 25\%$	560	1.3%
$T/X \geq 50\%$	521	1.5%

Note: T/X measures proportion of Tourism receipts in Exports; g_Y is the growth rate of real *per capita* GDP.
Sources: Summers-Heston (2002) and World Development Indicators (2004)

In this article we employ appropriate panel data techniques that deal with endogeneity (simultaneity, omitted variables, country-specific effects and measurement errors) problems and closely follow empirical growth literature to test the influence of tourism variables in economic growth in a broad panel data.[1] Adding to previous literature, which often used arrivals of tourists *per capita* as a *proxy* for tourism intensity, we also use variables linked to the proportion of tourism in Exports and in GDP. Thus, as far as we know, this is the first attempt to evaluate the worldwide impact of tourism, recurring to dynamic panel data techniques that deal with endogeneity and following the empirical economic growth literature.[2] Additionally, we consider different sub-samples of countries to test if tourism is more important for economic growth in small and poor countries, as previous contributions argued that these sub-samples of countries should benefit more from tourism than the average country.

In Section 2, we present data, method and variables. In Section 3, we present the results. Section 4 concludes and motivates future research.

2 Data and Methods

2.1 Specification and Methods

We have used panel data methods to analyze this issue. The use of panel data allows not only the increase of degrees of freedom and better estimators' large sample properties, but also the reduction of endogeneity, due to the consideration of specific-country effects, omitted variables, reverse causality and measurement error.

[1] The use of panel data techniques in empirical economic growth literature began with Islam (1995).

[2] This means that we study economic growth empirically through the implementation of a growth regression that evaluates the contribution of different determinants of economic growth. The seminal article from Barro (1991) began this tradition.

We estimate the following equation:

$$Y_{i,t} = \alpha + \beta_0 Y_{i,t-1} + \beta_1' CS_{i,t} + \beta_3 tourism_{i,t} + \eta_i + \varepsilon_{i,t} \quad (1)$$

where $Y_{i,t}$ is the natural logarithm of *per capita* GDP at constant prices, calculated using the chain index, $CS_{i,t}$ is a conditioning set that includes various covariates that previous literature used as determinants of economic growth, $tourism_{i,t}$ is one of three different measures of tourism intensity in logs, η_i is an unobserved country-specific effect and $\varepsilon_{i,t}$ is the error term. We have also added time dummies to all regressions.[3]

We present results for two different estimators: the GMM Blundell and Bond (1998) estimator and the corrected Least Square Dummy Variables (LSDVC) or fixed effects approach developed by Bruno (2005a, b). The essential difference is that while the first accounts for time-varying endogenous effects and is more appropriate for large samples (large N), the second accounts for endogeneity due to fixed-effects but is more consistent for samples with a small number of cross-sections.

Under the assumptions that (a) the error term is not serially correlated and (b) the explanatory variables are weakly exogenous (i.e., the explanatory variables are assumed to be uncorrelated with future realizations of the error term), the GMM dynamic panel uses the following moment conditions: $E[Y_{i,t-s}\Delta\varepsilon_{i,t}] = 0$ and $E[X_{i,t-s}\Delta\varepsilon_{i,t}] = 0$, for $s \geq 2; t = 3, ..., T$; $i = 1, ..., N$, where X is the complete matrix of covariates, which includes CS and $tourism$. Because we use the system GMM estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998), there are the following additional moment

[3] In the next sub-section, we discuss the composition of the conditioning set and different measures of tourism intensity.

restrictions for the levels equation: $E[\Delta Y_{i,t-1}(\eta_i + \varepsilon_{i,t})] = 0$ and $E[\Delta X_{i,t-1}(\eta_i + \varepsilon_{i,t})] = 0$, for $t = 3, ..., T$.[4] It is worth noting that these conditions allow for the *levels* of output to be correlated with the unobserved country-specific effects. Thus, we use these moment conditions and employ a GMM procedure to generate consistent and efficient parameter estimates. Temple *et al.* (2001) argues that this estimator is appropriate to economic growth empirical models.

Consistency of the GMM estimator depends on the validity of the instruments. To address this issue, we consider two specification tests: the first is the Hansen test of over-identifying restrictions, which tests the overall validity of the instruments (the null is that the instruments are valid); the second is the second-order autocorrelation test for the error term, which tests the null according to which there is no autocorrelation. Overall, both specification tests indicate that the instruments used are valid (see Tables A.1.1, A.1.2 and A.1.5 in Appendix A).

The Bruno (2005b) estimator has been shown to outperform GMM estimators in panels with the features of this one. Monte-Carlo experiments shown in Judson and Owen (1999) and in Bruno (2005b) indicate a corrected LSDV (Least Square Dummy Variable) or fixed-effects estimator as better than GMM ones. In fact, in a panel with small cross-section (due to low availability of data, total sample includes near 90 countries) and small time-series (5 periods), GMM estimators would create many instruments, implying an over-fitting bias.[5]

[4]This estimator is preferable to the difference estimator if the dependent variable is highly persistent, as is the case for output.

[5]To avoid the over-fitting bias that arises from the high number of instruments in System GMM, we restrict the number of lagged instruments to two by variable. These specification options do not change our conclusions. In Tables A.1.1, A.1.2 and A.1.5 in Appendix A, we also present the number of instruments introduced in each regression. According to these numbers, we must be confident in a quite small "overfitting" bias. However, this would not happen in small samples for which we present results.

We present here the basic ideas of the estimator developed by Bruno (2005b). The departure point is the inconsistency of LSDV in dynamic panel data models (Nickel, 1981). The approximation terms to the bias are all evaluated at the unobserved true parameter values, which are of no direct use for estimation. Thus, to make the approximation terms operational, Kiviet (1995) suggests replacing the true parameters by the estimates from some consistent estimators. Monte Carlo experiments showed that the resulting bias-corrected LSDV estimator (LSDVC) often outperforms IV-GMM estimators in terms of bias and root mean squared error (RMSE). We use an approximation of $O(N^{-1}T^{-2})$, which is the best approximation provided in Bruno (2005b), and we initialize the estimation with the Blundell and Bond (1998) estimator. Results do not change significantly with the choice of the consistent initial estimator, nor with the choice of the approximation. This estimator is suitable for unbalanced panels.

2.2 Data, Variables and Conditioning Sets

2.2.1 Data on Tourism Specialization

Data on Tourism Specialization are from the World Development Indicators (World Bank, 2004) from 1980 to 2002, all time lengths available in the source. We have considered 5 five-year periods to avoid measurement errors and the effects of cycles in variables. This is usual in empirical economic growth literature. We have considered a broad sample and two smaller samples: Small Countries (less than an initial level of 5 million inhabitants); Poor Countries (for which GDP *per capita* is below average in the majority of periods considered). The three variables used are:

In face of this, for small samples, we present only the corrected LSDV results.

Tourist Arrivals as Population Proportion (TA) - The number of International inbound tourists over population. International inbound tourists are the number of visitors who travel to a country other than that where they have their usual residence for a period not exceeding 12 months and whose main purpose in visiting is other than an activity remunerated from within the country visited. This proportion is calculated as a ratio to total population (World Bank, 2004);

Tourism receipts in % of Exports (TR_1) - International tourism receipts are expenditures by international inbound visitors, including payments to national carriers for international transport. These receipts should include any other prepayment made for goods or services received in the destination country. They also may include receipts from same-day visitors, except in cases where these are so important as to justify a separate classification. Their share in exports is calculated as a ratio to exports of goods and services (World Bank, 2004);

Tourism receipts in % of GDP (TR_2) - the same as the previous one but their share in GDP is calculated using the previous variable and the ratio of exports of goods and services to GDP (World Bank, 2004).

2.2.2 Conditioning Information Sets

To test the significance of tourism in explaining economic growth, we have used several variables that are standard in literature (Barro, 1991 and Barro and Sala-i-Martin, 1995) and are related to the main determinants of growth. Thus, we have used Real Gross Domestic Product *per capita* in the previous period $(Y_{i,t-1})$ to measure conditional convergence (from which a positive sign is expected with a less-than-unity absolute value) and the following Conditioning Information Set (CS_1) of variables:

- Investment-Output ratio (I/Y) - is used as a proxy for physical capital investment, and a positive sign is expected;
- Government Consumption-Output ratio (G/Y) - is used to measure long-run crowding-out and the effect of Government Consumption in long-run growth; a negative effect is traditionally reported, but a positive effect was shown in panel data estimations in Caselli *et al.* (1996);
- Secondary Years of Schooling above 25 years (Syr) - is used as a proxy for human capital; there is a discussion in the literature about the effect of human capital; there are positive and negative effects reported;
- Life Expectancy ($Life$) - it is used as a proxy for health, which has been interpreted both as a determinant of productivity and as a determinant of the savings behavior of the households; it usually has a positive effect, but Caselli *et al.* (1996) reported a non-significant effect;
- Black Market Premium ($1 + BMP$) - is used to measure market distortions in the economy and the overall negative impact of institutions;
- International Country Risk Guide ($ICRG$) - is used as an alternative measure of institutions; as it is negatively related with country risk, it is expected to have a positive relationship;[6]

[6] We note that $ICRG$ is a more general measure for institutions than BMP because it includes 22 different indicators of country risk. Nevertheless, it is less used in previous empirical contributions. Its introduction comes at the expense of a significant number of observations. It is increasingly used in development (see e.g. the influential article of Hall and Jones, 1999).

As a robustness check, we have included in some regressions two additional variables in the conditioning information set, treating the CS_2 as CS_1 plus the following variables:

Exports plus Imports to output ratio (Openness) - is used to measure the impact of openness of the economy in its growth performance, and a positive sign is expected, although this is not consensual in the literature (e.g. Edwards, 1998);

Inflation (consumer prices) $(1 + \pi)$ - is used to measure the effect of high inflations in reducing the economic growth rates (e.g. Levine *et. al.*, 2000).

All variables except the average years of schooling are introduced as log transformations. Output, investment-output ratio, government expenditures ratio and openness are from the Penn World Tables 6.1. Secondary Years of Schooling above 25 years comes from Barro and Lee (2000). Life Expectancy, International Risk Country Guide, and Inflation (consumer prices) come from the World Development Indicators 2004 (World Bank, 2004). Black Market Premium is taken from the World Development Network Database 2001 (World Bank, 2001).

2.2.3 Sample and Descriptive Statistics

The next table presents descriptive statistics for tourism variables. Descriptive statistics for other variables included in the conditioning sets are presented in the Appendix.

Table 2: Descriptive Statistics

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
GDP_{pc}	1031	5969	6069	304.3	37689
TA	705	0.511	1.190	0	13.49
TR_1	744	12.04	14.84	0.055	85.60
TR_2	580	4.769	8.216	0.016	66.55

Note: Values for Descriptive Statistics are in levels.

In the next section we present the results, beginning with results for the whole sample, and then for subsamples of small and poor countries.

3 Results

In this section we present the main results obtained. The results on the variables in the conditioning information sets are often consistent with previous empirical literature on economic growth. In particular, the investment ratio positively influences growth, while the government expenditures ratio and the black market premium negatively influence growth.

The rate of convergence oscillates around 2.44% in the System GMM estimator - Table A.A.1, column 0 - in line with the one obtained by Temple *et al.* (2001) - 2.38% in their Table 1, column (v) - and closer to OLS estimates than to the Differenced GMM estimates of Caselli *et al.* (1996).[7]

The Influence of Life Expectancy and Schooling is almost always non-significant. Schooling seems to be negatively related to growth in samples of small and poor countries. This is not inconsistent with previous contributions, as different results have been reported in the literature. We have tested alternative specifications, such as the exclusion of life expectancy and the consideration of other variables for schooling (namely average years above 15 years old - $syr15$) and these changes did not change results on the significance of the tourism variable. Nevertheless, $syr15$ proved to be positively related to growth in one specification applied to the broad sample.

[7] As in these references, the rate of convergence λ is obtained equating $e^{-\lambda T}$ to 0.885 (in the case of column 0 in Table A.1.1, Appendix A), where $T = 5$.

The impact of the inclusion of tourism in convergence is small and its direction is not obvious, depending on the variable used. Nevertheless, the corrected LSDV estimator predicts even a small convergence rate or no conditional convergence at all, especially in samples of small and poor countries. In general, and in particular in the Corrected LSDV estimations, the introduction of tourism variables acted in order to decrease significance of other covariates, namely the impact of the government share of output (G/Y) and the impact of the Black Market Premium (BMP) in poor countries.

Complete regressions are presented in Appendix, and to focus the article, we will only be interested on the tourism effect from now on. To avoid excessive length and to focus the article in its main issue, we are not presenting complete regressions for the conditioning information set 2, when we use the alternative measure of institutions ($ICRG$). We also present only the benchmark regressions in the small and poor countries case.[8] We also note that the specification tests in GMM indicate that instruments are valid as in general we do not reject the null of the Hansen Test nor the null of the AR(2) test.

3.1 Results from All Countries

The next Table shows different estimators of the three variables linked with tourism specialization in a regression with economic growth as a dependent variable.

[8] Although results do not influence our conclusions, they are obviously available upon request.

Table 3: Regressions Between Tourism and Growth

System GMM				
tourism	CS^1		CS^2	
Institutions measure	BMP	ICRG	BMP	ICRG
$\ln(TA)$	0.01	-0.02	0.03**	0.00
	(1.05)	(-0.82)	(2.07)	(0.25)
$\ln(TR_1)$	0.04**	0.01	0.05***	0.02
	(2.24)	(0.61)	(3.13)	(0.82)
$\ln(TR_2)$	0.03*	-0.01	0.03***	0.01
	(1.82)	(-0.66)	(2.64)	(0.54)

Corrected FE				
tourism	CS^1		CS^2	
Institutions measure	BMP	ICRG	BMP	ICRG
$\ln(TA)$	0.09***	0.09***	0.11***	0.09***
	(4.44)	(3.75)	(4.14)	(2.62)
$\ln(TR_1)$	0.05***	0.02	0.05***	0.02
	(3.89)	(1.30)	(3.32)	(1.50)
$\ln(TR_2)$	0.04**	0.02	0.04***	0.02
	(2.48)	(1.40)	(2.89)	(1.53)

Notes: *** stands for a 1% significance level; ** for 5% and * for 10%. Regressions include several controls, constant and time dummies. Complete Regressions are presented in Appendix (see Tables A.1.1 to A.1.6).

These results indicate that in general tourism specialization is an important determinant of long-run economic growth, implying that a 1% increase in the proportion of tourism returns on GDP (or in exports) accounts for a 0.03% to 0.05% increase in output growth rate. Simultaneously, a 1% increase in the proportion of tourist arrivals tends to increase near 0.1% in economic growth rate. The corrected LSDV approach attributes a greater role to tourism than the System GMM approach. Also, when institutions are measured by black market premium, tourism returns assume a greater role than when institutions are measured by international country risk guide composite indicator. These results seem to indicate that the only measure of tourism intensity that is not particularly affected by the measure of institutions is the number of arrivals as a proportion of population. Thus, bad institutions (measured as country risk) may affect the effectiveness of returns from tourism but not the effectiveness of tourist arrivals.[9]

These conclusions confirm for a broad cross-section of countries observed through a time-span of 5 five-year periods between 1980 and 2002 what has been shown for some countries, on their own, and for groups of developing countries in previous contributions.

3.2 Results for the Sub-Samples: Small and Poor Countries

In the next Tables we show results for the small samples considered. In these small samples we analyze the Corrected LSDV approach, as when the number of countries to be considered decreases, this is clearly the most appropriate estimator. The first case to be considered is the Small Countries case. We considered a country as small if it had less than 5 million inhabitants in the first period considered. According to the explanation in the literature, we should expect a stronger relationship within this sub-sample than in the broad sample. According to this explanation, small countries are relatively well-endowed with renewable natural resources and consequently benefit more from the specialization in tourism.

[9] Eilat and Einov (2004), in an article on the determinants of international tourism, have discovered that political risk is very important to tourism.

Table 4: Regressions Between Tourism and Growth

Small Countries - Corrected FE				
tourism	CS^1		CS^2	
Institutions measure	BMP	ICRG	BMP	ICRG
$\ln(TA)$	0.08***	0.09***	0.08*	0.04***
	(2.65)	(2.54)	(1.81)	(3.13)
$\ln(TR_1)$	0.05*	0.02	0.05	0.04
	(1.87)	(0.71)	(1.48)	(1.02)
$\ln(TR_2)$	0.06*	0.03	0.06*	0.06
	(1.79)	(0.93)	(1.78)	(1.52)

Notes: *** stands for a 1% significance level; ** for 5% and * for 10%. Regressions include several controls, constant and time dummies. Complete Regressions are presented in Appendix (see Tables A.2.1 to A.2.2).

In general, the effect of tourism decreases when small countries are considered, in the opposite direction of what literature have suggested for these countries. In particular only the number of arrivals as a population proportion continues to have a strong and positive effect in the economic growth rate.[10] This seems to suggest that the explanation linked with the natural resources relative abundance is not confirmed by data.

The next table shows results on a sample of poor countries. We have considered that a country is poor if it spends more time below the average *per capita* GDP (5969 USD) than above.

[10] We have also tested a sample of countries with less than 1 million inhabitants. Results showed that tourism specialization never has a positive contribution on economic growth. Results are available upon request.

Table 5: Regressions Between Tourism and Growth

Poor Countries - Corrected FE				
tourism	CS^1		CS^2	
Institutions measure	BMP	ICRG	BMP	ICRG
$\ln(TA)$	0.09***	0.08**	0.10***	0.09**
	(3.45)	(2.20)	(3.05)	(2.12)
$\ln(TR_1)$	0.06***	0.03*	0.06**	0.04*
	(3.28)	(1.81)	(2.55)	(1.89)
$\ln(TR_2)$	0.05***	0.03	0.05***	0.03*
	(2.73)	(1.62)	(3.00)	(1.85)

Notes: *** stands for a 1% significance level; ** for 5% and * for 10%. Regressions include several controls, constant and time dummies. Complete Regressions are presented in Appendix (see Tables A.3.1 to A.3.2).

These results support the idea that tourism is an opportunity for poor countries. In fact, almost all tourism variables are significantly and positively related to economic growth in all specifications (the exception is proportion of tourism returns on GDP with a positive t-ratio of 1.62). In this group of countries it is clear that the introduction of the specialization in tourism as a determinant of economic growth decreases the influence of the government expenditure and of the Black Market Premium.

4 Conclusion and Prospects

In general, we support the time-series evidence that has been published for a number of countries, according to which tourism specialization enhances growth performance of countries. We come to this conclusion using two recently developed estimators that complement each other in terms of costs and benefits: the System GMM Blundell-Bond (1998) estimator and the Corrected LSDV estimator developed in Bruno (2005b), and applying them to a broad sample of countries during all the available time periods.

When testing for the two most important conclusions brought out by previous contributions, according to which tourism specialization is important for small countries (as small countries are relatively abundant in Natural Resources) and for poor countries, we reject the first and confirm the second conclusion. In fact, small countries do not seem to benefit from tourism specialization more than does the average country. On the contrary, poor countries always benefit from tourism specialization, both in terms of arrivals and in terms of returns. In addition, it seems that tourism specialization is a good option to promote economic growth in poor countries, as it appears to hinder the negative effects of government and bad institutions.

These results add to previous contributions the consideration of recent empirical methods appropriate to study economic growth. The results are generally in line with previous time-series attempts.[11] However, they question the proposition according to which small countries benefit more from tourism than others. Finally, they emphasize the possible contradiction between empirical results and economic growth theory regarding the relationship between growth and tourism specialization.

This opens at least two potentially fruitful research avenues. The first one is to explore the relationship between tourism and the traditional determinants of economic growth, e.g., human capital, both theoretically and empirically. The second one is to explore the determinants of tourism growth and in particular to calculate the productivity within the tourism firms. There is also a significant scope of evolution in constructing models of economic growth that incorporate the positive influence of tourism in economic growth.

It is worth noting that establishing the relationship between tourism and economic growth is essential concerning the importance that policy makers are attributing to this

[11] A first attempt to use panel data methods applied to this broad sample led to different results due to the presence of the Nickel (1981) bias in Fixed effects estimations (see Sequeira and Campos, 2005).

sector and the rates at which it is growing.

References

[1] Arellano, M. and S. Bond (1991), "Some Tests of Specification for Panel Data: Monte Carlo evidence and an Application to Employment Equations", *Review of Economic Studies*, 58: 277-297.

[2] Arellano, M. and O. Bover (1995), "Another Look at the Instrumental Variables Estimation of Error-Components Model", *Journal of Econometrics*, 68: 29-52.

[3] Balaguer, J. and M. Cantavella-Jordá (2002), "Tourism as a Long-Run Economic Growth Factor: The Spanish Case", *Applied Economics*, 34: 877-884.

[4] Barro, R. (1991), "Economic growth in a cross section of countries", *Quarterly Journal of Economics*, May, vol. CVI, n. 2:407-444.

[5] Barro, R. and J. Lee (2000), *International Data on Educational Attainment: Updates and Implications,* Working-Paper 42, Centre for International Development at Havard University, April.

[6] Barro, R. and X. Sala-i-Martin (1995), *Economic Growth*, the MIT Press.

[7] Blundell, R. and S. Bond (1998), "Initial Conditions and Moment restrictions in Dynamic Panel Data Models", *Journal of Econometrics*, 87:115-143.

[8] Brau, R., A. Lanza, and F. Pigliaru (2003), *How Fast Are The Tourism Countries Growing? The Cross Country Evidence*, FEEM working paper n^{o}85.2003, http://ssrn.com/abstract=453340.

[9] Bruno, G. (2005a), "Aproximating the Bias of LSDV estimator for Dynamic Unbalanced Panel Data Models", *Economics Letter*, 87:361-366.

[10] Bruno, G. (2005b), "Estimation and Inference in Dynamic Unbalanced Panel Data Models with a Small Number of Individuals", *Stata Journal*, 5(4):473-500.

[11] Caselli, F., G. Gerardo and F. Lefort (1996), "Re-opening the convergence debate: a new look at cross country growth empirics", *Journal of Economic Growth* 1: 363-389.

[12] Copeland, B. (1991), "Tourism, Welfare and De-industrialization in a Small Open Economy", *Economica*, 58: 515-29.

[13] Durbarry, R. (2004), "Tourism and Economic Growth: the case of Mauritius", *Tourism Economics*, 10(4): 389-401.

[14] Easterly, W. And A. Kraay (2000), "Small States, Small Problems?" Income, Growth and Volatility in Small States, *World Development*, 28: 2013-27.

[15] Edwards, S. (1998), "Openess, productivity and growth: what do we really know?", *Economic Journal*, 108: 383-398.

[16] Eilat, Y. and L. Einav (2004), "Determinants of International Tourism: a three-dimensional panel data analysis", *Applied Economics*, 36: 1315-1327.

[17] Eugenio-Martín, J., N. Morales and R. Scarpa (2004), *Tourism and Economic Growth in Latin American Countries: A Panel Data Approach*, Nota de Lavoro 26.2004, http://ssrn.com/abstract=504482.

[18] Ghali, M. (1974), "Tourism and Economic Growth: An Empirical Study", *Economic Development and Cultural Change*, pp. 527-538.

[19] Hall, R. and C. Jones (1999), "Why do Some Countries produce so Much more Output per Worker than Others", *Quarterly Journal of Economics*, vol. 114, number 1: 83-116.

[20] Gunduz, L. and A. Hatemi-J (2005), "Is the Tourism-Led Growth Hypothesis valid for Turkey?", *Applied Economics Letters*, 12: 499-504.

[21] Islam, N. (1995), "Growth Empirics: A Panel Data Approach", *Quarterly Journal of Economics*, November, 1127-1170.

[22] Judson, R. and A. Owen (1999), "Estimating Dynamic Panel Data Models: A Guide for Macroeconomists", *Economics Letters,* 65:9-15.

[23] Kiviet, J. F. (1995), "On Bias, Inconsistency and Efficiency of Various Estimators in Dynamic Panel Data Models", *Journal of Econometrics,* 68:53-78.

[24] Lanza, A. and F. Pigliaru (1999), *Why are Tourism Countries Small and Fast Growing*, http://ssrn.com/abstract=146028.

[25] Levine, R., N. Loayza and T. Beck (2000), "Financial Intermediation and Growth: Causality and Causes", *Journal of Monetary Economics,* 46:31-77.

[26] Nickel, S. (1981), "Biases in Dynamic Models with Fixed Effects", *Econometrica,* 49:1417-1426.

[27] Sequeira, T. and C. Campos (2005), *International Tourism and Economic Growth: A Panel Data Approach*, Nota di Lavoro 141.2005, Fondazione Eni Enrico Mattei.

[28] Sinclair, M. (1998), "Tourism and Economic Development: a Survey", *Journal of Development Studies*, 34: 1-51.

[29] Summers, R. and A. Heston (2002), *Penn World Table,* Center for International Comparisons, University of Pennsylvania.

[30] Temple, J., S. Bond and A. Hoeffler (2001), *GMM Estimation of Empirical Growth Models*, Working-Paper.

[31] World Bank (2004), *World Development Indicators*, CD Database.

[32] World Bank (2001), *World Development Network Database*, World Bank On-Line.

A Appendix

A.1 Broad Sample

Table A.1.1: Convergence Regressions (System GMM) - CS_1

Dep Var.: $\ln(Y_{i,t})$	(0)	(1)	(2)	(3)
$\ln(Y_{i,t-1})$	0.885***	0.873***	0.879***	0.918***
	(29.47)	(17.27)	(15.33)	(15.70)
$\ln(I/Y)$	0.104***	0.112**	0.091	0.089*
	(3.73)	(2.02)	(1.43)	(1.79)
$\ln(G/Y)$	-0.035	-0.067*	-0.05	-0.074*
	(-1.26)	(-1.80)	(-1.14)	(-1.72)
syr	0.026	0.016	0.049	0.014
	(1.28)	(0.58)	(1.44)	(0.45)
$\ln(1+BMP)$	-0.022***	-0.021**	-0.016*	-0.022**
	(-3.22)	(-2.55)	(-1.71)	(-2.38)
$\ln(Life)$	0.284**	0.262	0.151	0.115
	(2.21)	(1.17)	(0.65)	(0.49)
TA	–	0.015	–	–
		(1.05)		
TR_1	–	–	0.043**	–
			(2.24)	
TR_2	–	–	–	0.028*
				(1.82)
AR(1) Test	-3.64***	-2.92***	-1.91	-2.98***
(p-value)	(0.000)	(0.003)	(0.056)	(0.003)
AR(2) Test	-0.82	0.15	-0.52	-1.87*
(p-value)	(0.414)	(0.883)	(0.602)	(0.062)
Hansen Test	85.5	53.39	52.47	47.03
(p-value)	(0.289)	(0.309)	(0.305)	(0.513)
Observations	589	334	350	312
Countries	94	93	93	91
Instruments	92	59	59	59

Notes: *** stands for a 1% significance level; ** for 5% and * for 10%. t-statistics based on the white heteroscedastic-consistent variance-covariance matrix appear in parentheses.

Table A.1.2: Convergence Regressions (System GMM) - CS_2

Dep Var.: $\ln(Y_{i,t})$	(0)	(1)	(2)	(3)
$\ln(Y_{i,t-1})$	0.913***	0.872***	0.926***	0.924***
	(26.49)	(17.32)	(21.66)	(20.62)
$\ln(I/Y)$	0.092***	0.092**	0.074	0.106**
	(3.55)	(1.96)	(1.34)	(2.47)
$\ln(G/Y)$	-0.029	-0.053	-0.021	-0.050
	(-1.08)	(-1.51)	(-0.47)	(-1.20)
syr	0.012	0.006	0.024	0.008
	(0.61)	(0.26)	(0.96)	(0.032)
$\ln(1+BMP)$	-0.004	0.000	-0.001	0.001
	(-0.58)	(0.36)	(-0.17)	(0.26)
$\ln(Life)$	0.290**	0.313*	0.188	0.173
	(2.18)	(1.80)	(1.08)	(0.98)
$\ln(1+\pi)$	-0.033***	-0.034***	-0.028***	-0.035***
	(-3.32)	(-4.20)	(-2.82)	(-4.43)
$\ln(open)$	-0.018	-0.036	-0.006	-0.048*
	(-0.75)	(-1.20)	(-0.21)	(-1.69)
TA	–	0.031**	–	–
		(2.07)		
TR_1	–	–	0.048**	–
			(3.13)	
TR_2	–	–	–	0.034***
				(2.69)
AR(1) Test (p-value)	-3.68***	-2.97***	-2.05**	-2.76***
	(0.000)	(0.003)	(0.040)	(0.006)
AR(2) Test (p-value)	-1.23	0.39	-0.09	-1.29
	(0.220)	(0.698)	(0.373)	(0.199)
Hansen Test (p-value)	83.77	62.46	73.58	64.00
	(0.975)	(0.601)	(0.244)	(0.547)
Observations	532	321	336	302
Countries	94	92	93	90
Instruments	124	79	79	79

Notes: *** stands for a 1% significance level; ** for 5% and * for 10%. t-statistics based on the white heteroscedastic-consistent variance-covariance matrix appear in parentheses.

Table A.1.3: Convergence Regressions (Corrected FE) - CS_1

Dep Var.: $\ln(Y_{i,t})$	(0)	(1)	(2)	(3)
$\ln(Y_{i,t-1})$	1.025***	0.870***	1.000***	0.932***
	(17.11)	(7.96)	(10.34)	(4.81)
$\ln(I/Y)$	0.089***	0.064**	0.057*	0.102***
	(5.90)	(2.35)	(1.82)	(3.56)
$\ln(G/Y)$	-0.042**	-0.022	-0.004	-0.029
	(-1.99)	(-0.81)	(-0.13)	(-0.65)
syr	-0.024	-0.031	-0.029	-0.028
	(-1.11)	(-0.95)	(-1.07)	(-0.60)
$\ln(1+BMP)$	-0.015***	0.001	0.006	-0.000
	(-3.27)	(0.16)	(-0.82)	(-0.06)
$\ln(Life)$	0.163	0.289	0.367*	0.321
	(0.96)	(1.57)	(1.95)	(0.61)
TA	–	0.095***	–	–
		(4.44)		
TR_1	–	–	0.049***	–
			(3.89)	
TR_2	–	–	–	0.042***
				(2.48)
Observations	589	334	350	312
Countries	94	93	93	91

Notes: *** stands for a 1% significance level; ** for 5% and * for 10%. t-statistics based on the white heteroscedastic-consistent variance-covariance matrix appear in parentheses.

Table A.1.4: Convergence Regressions (Corrected FE) - CS_2

Dep Var.: $\ln(Y_{i,t})$	(0)	(1)	(2)	(3)
$\ln(Y_{i,t-1})$	1.062***	0.891***	1.067***	0.954***
	(27.85)	(5.89)	(10.12)	(6.30)
$\ln(I/Y)$	0.070***	0.041	0.016	0.085**
	(3.56)	(1.40)	(0.48)	(2.56)
$\ln(G/Y)$	-0.026	-0.017	-0.011	-0.020
	(-1.19)	(-0.71)	(-0.35)	(-0.72)
syr	-0.033*	-0.034	-0.039	-0.029
	(-1.88)	(-1.02)	(-1.31)	(-0.78)
$\ln(1+BMP)$	-0.009	0.005	-0.004	0.002
	(-1.61)	(0.63)	(-0.49)	(0.26)
$\ln(Life)$	0.142	0.312	0.303	0.219
	(0.92)	(1.45)	(1.16)	(0.77)
$\ln(1+\pi)$	-0.024***	-0.022***	-0.016*	-0.015**
	(-3.24)	(-3.02)	(-1.85)	(-2.14)
$\ln(open)$	-0.030	-0.009	0.005	-0.014
	(-1.55)	(-0.27)	(0.17)	(-0.32)
TA	–	0.106***	–	–
		(4.14)		
TR_1	–	–	0.047***	–
			(3.32)	
TR_2	–	–	–	0.041***
				(2.98)
Observations	532	321	336	302
Countries	94	92	93	90

Notes: *** stands for a 1% significance level; ** for 5% and * for 10%. t-statistics based on the white heteroscedastic-consistent variance-covariance matrix appear in parentheses.

Table A.1.5: Convergence Regressions (System GMM) - CS_1

Alternative Measure of Institutions ($ICRG$)

Dep Var.: $\ln(Y_{i,t})$	(0)	(1)	(2)	(3)
$\ln(Y_{i,t-1})$	0.870***	0.869***	0.872***	0.832***
	(16.62)	(15.03)	(16.17)	(12.95)
$\ln(I/Y)$	0.155**	0.133**	0.141**	0.119**
	(2.15)	(2.24)	(2.16)	(2.16)
$\ln(G/Y)$	-0.077	-0.103**	-0.088**	-0.109***
	(-1.63)	(-2.66)	(-2.11)	(-2.80)
syr	0.011	0.006	0.007	0.007
	(0.40)	(0.26)	(0.29)	(0.22)
$\ln(ICRG)$	0.191*	0.144	0.195**	0.139
	(1.84)	(1.46)	(2.11)	(1.59)
$\ln(Life)$	0.184	0.507**	0.200	0.605**
	(0.84)	(2.23)	(0.93)	(2.48)
TA	–	-0.017	–	–
		(-0.82)		
TR_1	–	–	0.013	–
			(0.61)	
TR_2	–	–	–	-0.013
				(-0.66)
AR(1) Test (p-value)	-2.15**	-3.13***	-1.94*	-2.25**
	(0.031)	(0.002)	(0.052)	(0.025)
AR(2) Test (p-value)	-0.64	0.15	-0.73	-1.57
	(0.564)	(0.880)	(0.464)	(0.115)
Hansen Test (p-value)	38.81	40.64	42.73	39.96
	(0.478)	(0.574)	(0.483)	(0.604)
Observations	330	313	327	290
Countries	87	85	86	83
Instruments	49	54	54	54

Notes: *** stands for a 1% significance level; ** for 5% and * for 10%. t-statistics based on the white heteroscedastic-consistent variance-covariance matrix appear in parentheses.

Table A.1.6: Convergence Regressions (Corrected FE) - CS_1

Dep Var.: $\ln(Y_{i,t})$	(0)	(1)	(2)	(3)
$\ln(Y_{i,t-1})$	0.971***	0.898***	0.985***	0.959***
	(6.21)	(6.89)	(6.42)	(5.58)
$\ln(I/Y)$	0.020	0.061**	0.015	0.095***
	(0.62)	(2.11)	(0.45)	(2.65)
$\ln(G/Y)$	-0.034	-0.049*	-0.034	-0.043
	(-084)	(-1.74)	(-0.93)	(-1.39)
syr	-0.048	-0.040	-0.040	-0.048
	(-1.23)	(-1.18)	(-1.31)	(-1.18)
$\ln(ICRG)$	0.313***	0.150*	0.294***	0.190***
	(3.78)	(1.82)	(3.83)	(2.91)
$\ln(Life)$	0.059	0.228	0.119	0.116
	(0.15)	(0.86)	(0.32)	(0.33)
TA	–	0.087***	–	–
		(3.75)	0.021	
TR_1	–	–	(1.30)	–
TR_2	–	–		0.021
				(1.40)
Observations	330	313	327	290
Countries	87	85	86	83

Notes: *** stands for a 1% significance level; ** for 5% and * for 10%. t-statistics based on the white heteroscedastic-consistent variance-covariance matrix appear in parentheses.

A.2 Small Countries

Table A.2.1: Convergence Regressions (Corrected FE) - CS_1

Dep Var.: $\ln(Y_{i,t})$	(0)	(1)	(2)	(3)
$\ln(Y_{i,t-1})$	1.226***	1.166***	1.265***	1.380***
	(30.21)	(12.27)	(16.34)	(12.32)
$\ln(I/Y)$	0.068**	0.036	0.002	0.080*
	(2.59)	(0.90)	(0.03)	(1.71)
$\ln(G/Y)$	-0.057**	-0.031	-0.003	-0.032
	(-2.13)	(-0.80)	(-0.07)	(-0.69)
syr	-0.117***	-0.141***	-0.136**	-0.171***
	(-3.86)	(-2.88)	(-2.57)	(-3.47)
$\log(1+BMP)$	-0.010	-0.005	-0.136**	-0.011
	(-1.33)	(-0.53)	(-2.57)	(-0.98)
$\ln(Life)$	0.069	0.086	0.257	-0.025
	(0.41)	(0.43)	(1.08)	(-0.09)
TA	–	0.077***	–	–
		(2.65)		
TR_1	–	–	0.060*	–
			(1.79)	
TR_2	–	–	–	0.055*
				(1.87)
Observations	276	159	170	149
Countries	47	47	47	45

Notes: *** stands for a 1% significance level; ** for 5% and * for 10%. t-statistics based on the white heteroscedastic-consistent variance-covariance matrix appear in parentheses.

A.3 Poor Countries

Table A.3.1: Convergence Regressions (Corrected FE) - CS_1

Dep Var.: $\ln(Y_{i,t})$	(0)	(1)	(2)	(3)
$\ln(Y_{i,t-1})$	1.133***	1.013***	1.096***	1.052***
	(40.40)	(9.20)	(11.62)	(8.75)
$\ln(I/Y)$	0.079***	0.054	0.038	0.093***
	(4.45)	(1.54)	(0.94)	(2.79)
$\ln(G/Y)$	-0.076***	-0.006	0.034	-0.030
	(-3.07)	(-0.11)	(0.67)	(-0.60)
syr	-0.090***	-0.081*	-0.076	-0.092**
	(-2.99)	(-1.73)	(-1.52)	(-2.03)
$\log(1+BMP)$	-0.017***	-0.001	-0.006	0.003
	(-3.00)	(-0.07)	(-0.59)	(0.25)
$\ln(Life)$	0.172	0.220	0.387	0.292
	(1.32)	(0.85)	(1.35)	(0.89)
TA	–	0.092***	–	–
		(3.45)		
TR_1	–	–	0.063***	–
			(3.28)	
TR_2	–	–	–	0.055***
				(2.73)
Observations	376	206	222	195
Countries	59	58	58	58

Notes: *** stands for a 1% significance level; ** for 5% and * for 10%. t-statistics based on the white heteroscedastic-consistent variance-covariance matrix appear in parentheses.

B Descriptive Statistics for Variables in CS_1 and CS_2

Table B.1: Descriptive Statistics

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
$\ln(I/Y)$	1039	2.54	0.70	-0.04	3.92
$\ln(G/Y)$	1039	2.89	0.58	0.96	5.02
syr	940	1.20	1.13	0.01	5.09
$\ln(1+BMP)$	963	2.16	1.89	-1.05	10.84
$\ln(Life)$	1536	4.09	0.22	3.46	4.40
$\ln(Open)$	1041	4.00	1.02	-19.26	5.84
$\ln(1+\pi)$	1075	2.24	1.24	-3.80	8.80
$\ln(ICRG)$	605	4.11	0.26	2.93	4.56