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## Conference Paper

# Tourism and Development: A recent phenomenon built on old (institutional) roots?

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# NOTA DI LAVORO

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**Tourism and Development:  
A Recent Phenomenon Built  
on Old (Institutional) Roots?**

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By **Rinaldo Brau, Adriana Di Liberto  
and Francesco Pigliaru**, Università di  
Cagliari and CRENoS, Italy

## GLOBAL CHALLENGES Series

Editor: Gianmarco I.P. Ottaviano

### Tourism and Development:

### A Recent Phenomenon Built on Old (Institutional) Roots?

By Rinaldo Brau, Adriana Di Liberto and Francesco Pigliaru, Università di Cagliari and CRENoS, Italy

#### Summary

Is tourism an opportunity for lagging countries in *the elusive quest for growth* (Easterly, 2002)? Recent empirical evidence suggests that the answer is a cautious yes. Aggregate cross-country data show that tourism specialization is likely to be associated with higher per capita GDP growth rates than those observed in industrialized countries. However, this evidence ignores the importance of institutional quality and results are likely to be biased by omitted variable problems. In this paper we frame our starting question within the general debate about the importance of good/bad institutions as fundamental determinants of economic growth (Acemoglu et al., 2001) and ask whether previous positive results of tourism on growth are in fact driven by the presence of growth enhancing institutions. Our empirical analysis exploits newly available datasets and controls the robustness of previous results on growth and tourism in the presence of several institutional quality variables. By means of descriptive statistics and some simple cross-country regressions we confirm that the quality of institutions is important for growth. Yet our results strongly suggest that the weight of tourism in an economy is an independent and robust predictor of higher-than-average growth.

**Keywords:** Economic Development, Tourism Specialization, Institutions

**JEL Classification:** O11, O50, O47, F43, L83

*We thank the participants to the ATR conference held in Brunico (27-29 September 2009) for their comments and suggestions. We also thank Manuela Deidda for excellent research assistantship*

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# Tourism and Development: A recent phenomenon built on old (institutional) roots?<sup>1</sup>

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This Draft  
November 2009

**Abstract** Is tourism an opportunity for lagging countries in *the elusive quest for growth* (Easterly, 2002)? Recent empirical evidence suggests that the answer is a cautious yes. Aggregate cross-country data show that tourism specialization is likely to be associated with higher per capita GDP growth rates than those observed in industrialized countries. However, this evidence ignores the importance of institutional quality and results are likely to be biased by omitted variable problems. In this paper we frame our starting question within the general debate about the importance of good/bad institutions as fundamental determinants of economic growth (Acemoglu et al., 2001) and ask whether previous positive results of tourism on growth are in fact driven by the presence of growth enhancing institutions. Our empirical analysis exploits newly available datasets and controls the robustness of previous results on growth and tourism in the presence of several institutional quality variables. By means of descriptive statistics and some simple cross-country regressions we confirm that the quality of institutions is important for growth. Yet our results strongly suggest that the weight of tourism in an economy is an independent and robust predictor of higher-than-average growth.

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<sup>1</sup> Corresponding author: Francesco Pigliaru ([pigliaru@unica.it](mailto:pigliaru@unica.it)). We thank the participants to the ATR conference held in Brunico (27-29 September 2009) for their comments and suggestions. We also thank Manuela Deidda for excellent research assistantship.

## 1. Introduction

The vast empirical literature on economic growth does not usually focus on the expansion of the tourism sector as a valuable strategy for development. Exceptions do exist, however – among them are Srinivisan (1986), Briguglio (1995), Armstrong et al. (1998).

More recently, different studies – both analytical and empirical – go a step further by pointing out the possibility that tourism can make an economy grow at a rate comparable to, or even faster than, the ones associated with other types of specialization, in which the potential for sector-specific technological progress is higher. For instance, using a well-known two-sector endogenous growth model (Lucas, 1988) it is easy to show that a sufficiently low elasticity of substitution,<sup>2</sup> and/or tourism being a luxury good, may make the international terms of trade move in favour of tourism fast enough to more than offset the sector disadvantage in productivity growth. A similar effect is considered in a recent paper by Acemoglu and Guerrieri (2008), who propose a two-sector model where the less dynamic sector, due to the relative prices move in favour of this sector, can have a price-weighted value which grows faster than the other (industrial) sector.<sup>3</sup>

Mechanisms of this nature are consistent with the recent empirical evidence that shows that tourism specialization is – to say the least – not harmful for economic growth. Several papers show indeed that the subset of countries with a significant tourism sector perform well in large cross-country dataset from 1980 onwards, though with different emphasis.<sup>4</sup> For instance, Brau *et al.* (2007) report that economies with a large tourism sector have grown at an average annual rate of 2.2% in per capita GDP over the 1980-2003 period, with the average country in the sample growing at 1.0% and the OECD countries at 1.9% .

Are these empirical findings robust enough to suggest trustworthy guidelines for action for less developed countries with a strong potential for tourism-led growth? The answer is no. The currently available evidence is lacking in at least one important respect: it does not carefully evaluate which *necessary* conditions are to be met for tourism to become a viable economic opportunity – and how difficult these conditions are for less developed countries.

Some recent and influential research on cross-country growth suggests where to focus in order to identify conditions of this kind – conditions which distinguish countries which are able to exploit a given potential for tourism development from countries which fail. Consider in particular the empirical literature prompted by Acemoglu et al. (2001), in which the role of formal institutions -- and of their

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<sup>2</sup> See Lanza and Pigliaru (1994).

<sup>3</sup> A few recent models also consider transitional dynamics of tourism economies. See Cerina (2007), Valente (2008), Lozano, Gomes and Rey-Maqueira (2008).

<sup>4</sup> The main references are Brau, Lanza and Pigliaru (2007), Sequeira and Nunes (2008), Figini and Vici (forthcoming), and Sequeira and Campos (2007).

roots in long gone historical events -- are regarded as the key for development.<sup>5</sup> As summarized by Easterly and Levine (2003), this line of research offers a very strong and general perspective about the way rich endowments of natural resources can influence economic performances. Namely,

tropics, germs, and crops do not explain economic development beyond their impact on institutions. ... we are struck by the way that endowments and policies have no independent effect once we control for institutions.... (pp. 26-37).

In this view, complex interactions between endowments and historical episodes shape formal institutions in the very long run. Once established, institutions turn out to be very persistent and play a key role in determining economic performances. In a nutshell, endowments play a crucial role at a certain point in history but this role is exhausted once a country's institutional framework is in place.<sup>6</sup>

This possible lack of an *independent* effect of endowments on performance is a result that cannot be overlooked when assessing the economic potential of tourism for less developed countries. The reason is twofold. First of all, natural endowments do matter in tourism development too. As we shall see, the large majority of countries specialized in tourism are able to do so due to their large endowments of natural resources – indeed, many of them are small tropical islands, with a typically high ratio of coastline to overall surface. Second, international tourism is a rather recent phenomenon, one which became significant when in most countries the persistent formal institutions analyzed by Acemoglu *et al.* (2001) had already been shaped.

Given these two characteristics of tourism development, the “institutional hypothesis” of Acemoglu, Easterly *et al.* implies a well defined viewpoint on the current evidence on tourism-led growth – namely, it might be that *only* those tourism countries which rely on good institutions inherited from the past can be successful in exploiting their endowment-based potential. As Mehlum, Moene and Torvik (2006) put it, in this view “the quality of institutions determines whether [a newly discovered] natural resource abundance is a blessing or a curse” (p. 1119).

In other words, a successful tourism sector might simply signal the presence of growth-friendly formal institutions, rather than an independent influence of tourism on economic performance. If so, tourism would be a lever for economic growth rather hard to handle for many of today's less developed countries, where institutions are often weak.

As far as we know, the available empirical analysis on tourism and growth has not tested this important hypothesis. As a consequence, the existing results on the relationship between tourism and economic

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<sup>5</sup> The importance of institutional quality (or “social infrastructure”) in the explanation of development has gained more and more attention in the last few years, starting from the seminal contribution by Hall and Jones (1999). Recent contributions are – among many others – Rodrick *et al.* (2004), Tabellini (2008), Bosker and Garretsen (2009).

<sup>6</sup> As Gylfason and Zoega put it, “Acemoglu *et al.* (2001) claim that once institutions are accounted for there is no room left for other explanations of economic growth having to do with economic policy or geography” (p. 1093).

development are likely to be seriously affected by omitted variable bias, and might yield misleading implication for developmental policies.<sup>7</sup>

To address these issues, our empirical strategy is as follows. First, we build a large cross-country database where information about 210 countries has been collected for the period 1960-2007. Country indicators come from various editions of the UN World Development Indicators (WDI), from the last release (6.3) of the Penn World Table, and the recently updated World Bank's "Worldwide Governance Indicators (WGI)" dataset (see Kaufmann, Kraay and Mastruzzi, 2009) that provides different indicators of institutional quality.

Second, we use this large cross-country dataset to evaluate the economic performance of tourism countries over the period 1980-2007 and to assess the robustness of previous results on the effects of tourism specialization on aggregate growth. Once this is accomplished, we investigate the role played by institutional quality in the whole sample and in the relatively high-growth group of the tourism countries. Our aim here is to control to what extent tourism countries had to rely on good institutions to perform successfully, or whether the presence of an important large tourism sector has independently contributed to these countries' growth performance.

The paper is organized as follows. The next section provides an exploratory descriptive analysis on the role of the tourism sector for growth while the third focuses on the institutional characteristics of tourism versus non-tourism countries. Our econometric investigation starts in section four, and section five includes some final observations.

## **2. Tourism and growth: the statistical evidence.**

As is well known from the empirical growth literature, many ambitious research questions are hampered by the lack of country-level simultaneous information on a sufficiently large set of variables. We have tried to overcome this problem by building a large cross-country database where information on up to 210 countries has been collected for the period 1960-2007. Most variables have been collected from various editions of the UN World Development Indicators (WDI) and from the last release (6.3) of the Penn World Table. Institutional variables are described in section 3, while the full report of all variables is given in Appendix I.

The role of tourism as a lever for export-led growth is measured by the ratio of the average share of international receipts to GDP. In order to simplify the descriptive analysis of our dataset and to easily identify the major "tourism countries" (TCs, from now on) within the sample, we use a threshold value

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<sup>7</sup> From a slightly related perspective, Eugenio-Martin Martin-Morales and Sinclair (2008) find that only those countries with a sufficient level of economic development are likely to be able to fully develop their tourism sector.

of our variable. Table 1 classifies as TCs 33 countries whose degree of tourism specialization is equal or greater than 8% on average over the period 1980-2004 – all of them are typical tourist destinations. Our choice of a 8% threshold instead of the, perhaps, more standard 10% is due to the fact that the latter would have excluded important destinations for international tourism such as Mauritius, Belize and Guyana. None of the descriptive results of this section would significantly change if different thresholds (namely, 10%, 15%) were used. Finally, the econometric analysis of the next section will make no use of any threshold: the index of tourism specialization will be used as a continuous variable. A glance at Table 1 immediately yields two key characteristics shared by many countries of our tourism sub-sample: 24 out of 33 are “small” countries according to the definition adopted by Easterly and Kraay (2000) (i.e., their population does not exceed one million) and 18 of them are small islands states. Clearly, these two characteristics together are the underpinnings of their natural resource-driven comparative advantage in tourism. A large portion of their surface is apt for tourism development, and therefore tourism can potentially be a driving component of their aggregate economic performance.

**Table 1: List of countries according to the degree of tourism specialization**

Tourist Countries ITS>8	Index of Tourism Specialization	Average population (thousand)	GDP coverage	Institution index coverage
Palau	47.9	NA	80-07	ACC, CL
Virgin Islands, U.S.	45.9	97.0	NA	NA
Macau	44.6	252.0	80-07	CORR, LAW
Aruba	43.1	NA	NA	NA
Maldives	43.0	158.1	80-07	ACC, CL, COR, EFFECT, LAW, REG, STAB
Bahamas	39.5	210.1	80-07	ACC, CL, COR, EFFECT, GADP, LAW, REG, STAB
St. Lucia	39.1	115.5	80-07	ACC, CL, COR, EFFECT, LAW, REG, STAB
Antigua and Barbuda	39.0	63.0	80-07	ACC, CL, COR, LAW
Bhutan	33.3	487.9	80-07	ACC, CL, COR, EFFECT, LAW, REG, STAB
Bermuda	31.6	54.0	80-07	COR, LAW
St. Kitts and Nevis	30.2	44.4	80-07	ACC, CL, COR, EFFECT, LAW, REG
Barbados	28.5	249.0	80-07	ACC, CL, COR, GADP, LAW, REG, STAB
Seychelles	24.6	64.4	80-07	ACC, CL, COR, EFFECT, GADP, LAW, REG, STAB
Vanuatu	22.5	117.2	80-07	ACC, CL, COR, EFFECT, LAW, REG, STAB
St. Vincent & Grenadines	22.1	100.4	80-07	ACC, CL, COR, EFFECT, LAW, REG, STAB
Grenada	19.7	90.1	80-07	ACC, CL, COR, EFFECT, LAW, REG, STAB
Malta	19.4	364.0	80-07	ACC, CL, COR, EFFECT, GADP, LAW, REG, STAB
Cyprus	18.0	611.0	80-07	ACC, CL, COR, EFFECT, GADP, LAW, REG, STAB
Jamaica	16.0	2133.0	80-07	ACC, CL, COR, EFFECT, GADP, LAW, REG, STAB
Fiji	13.6	633.7	80-07	ACC, CL, COR, EFFECT, GADP, LAW, REG, STAB
Samoa	13.5	155.0	80-07	ACC, CL, COR, EFFECT, LAW, REG, STAB
Dominica	12.3	73.3	80-07	ACC, CL, COR, EFFECT, LAW, REG
Croatia	11.6	4588.0	90-07	ACC, CL, COR, EFFECT, LAW, REG, STAB
Georgia	11.0	5073.0	95-07	ACC, CL, COR, EFFECT, LAW, REG, STAB
Dominican Rep	10.3	5717.9	80-07	ACC, CL, COR, EFFECT, GADP, LAW, REG, STAB
Jordan	10.0	2181.0	80-07	ACC, CL, COR, EFFECT, GADP, LAW, REG, STAB
Singapore	9.9	2414.0	80-07	ACC, CL, COR, EFFECT, GADP, LAW, REG, STAB
Belize	9.8	146.0	80-07	ACC, CL, COR, EFFECT, LAW, REG, STAB
Albania	9.4	2671.3	80-07	ACC, CL, COR, EFFECT, LAW, REG, STAB
Mauritius	9.3	966.0	80-07	ACC, CL, COR, EFFECT, GADP, LAW, REG, STAB
Eritrea	8.7	2381.5	95-07	ACC, CL, COR, EFFECT, LAW, REG, STAB
Lebanon	8.2	2698.3	80-07	ACC, CL, COR, EFFECT, LAW, REG, STAB
Guyana	8.0	760.9	80-07	ACC, CL, COR, EFFECT, GADP, LAW, REG, STAB

Notes: **ACC:** Voice & accountability index, 1996; **CL:** Civil Liberties index, 2000; **COR:** index of Corruption, 1998; **EFFECT:** government effectiveness, 1996; **GADP:** index of government anti-diversion policies, **LAW:** Rule of Law, 1998; **REG:** Regulatory quality, 1996; **STAB:** Political Stability and absence of violence, 1996.

Source: Kaufmann, Kraay and Mastruzzi (2009) for **ACC, COR, EFFECT, LAW, REG, STAB**); Hall and Jones (1999) for **GADP**; Freedom House (2000) for **CL**.



Table 1 also reports the availability of data on economic performance and institutional quality (more on the latter in the next section) for each of the 33 tourism countries (TCs from now on). Unfortunately, important information are missing for a number of them. For instance, 1980 GDP data are not available for 5 countries, some of whom are among those where specialization in tourism is highest. Had we included pre-1980 data, a larger significant decrease in our cross-country sample would have ensued, with a number of tourism countries excluded. Conversely, starting later (in 1995 for example) in order to further increase the cross-country dimension would have implied too short a time-span, inappropriate when growth (and thus long run) analysis are performed. That's why in the remainder of this section we focus on the largest possible sample (in terms of number of countries) within the 1980-2007 period. Using the twenty-eight years time-span will leave us with 28 TC's.

Table 2 reports the absolute per capita GDP level in our initial and final year (1980 and 2007), the relative (to OECD average) per capita GDP level in the same two years and the average annual GDP growth rate for the whole sample and four different sub-samples . The economic performance of TCs is thus compared to the performance of a number of significant sub-sets of countries – namely, OECD, “Oil countries”, and Less Developed Countries (LDCs).

**Table 2: GDP levels and growth rates by group of countries.**

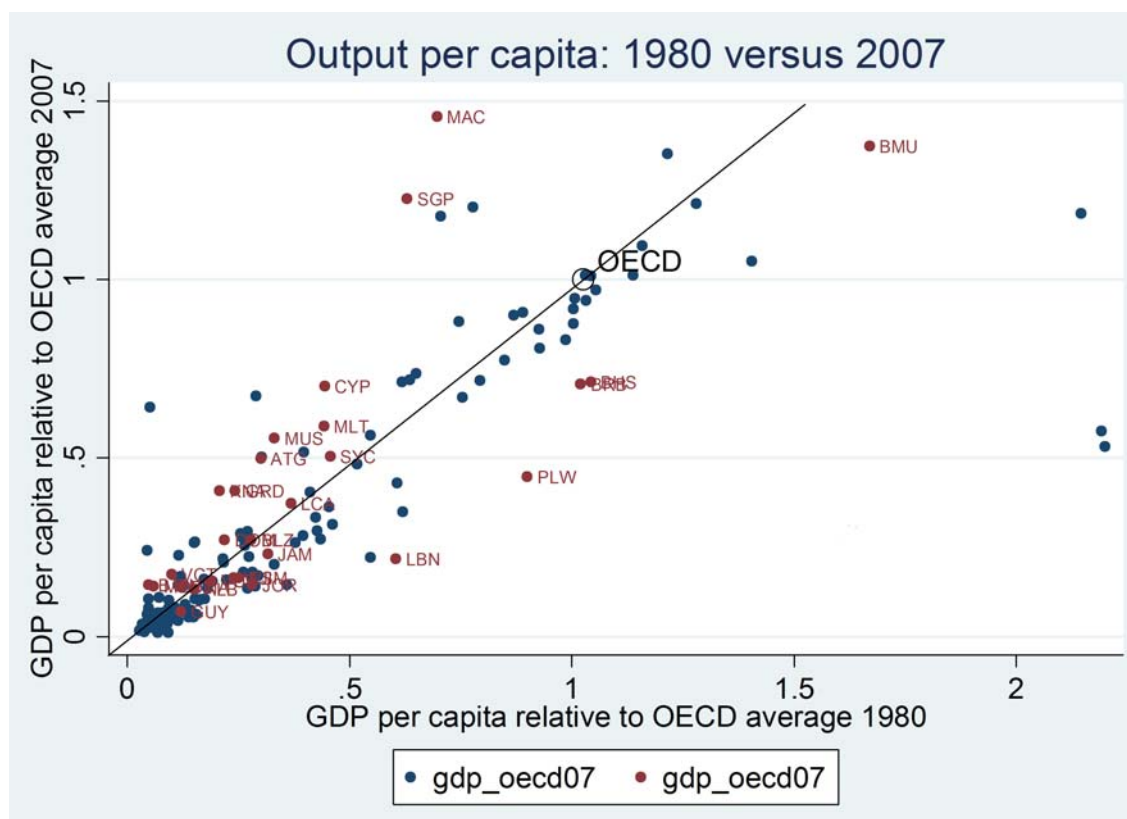
Country group	gdp-1980	gdp-2007	GDP in 1980 (relative to OECD average)	GDP in 2007 (relative to OECD average)	Real per capita GDP growth 1980--2007 (%) - countries' average	Real per capita GDP growth 1980--2007 (%) - country group average	Number of Countries
OECD	19943	35556	1.00	1.00	2.18%	2.22%	23
OIL	27808	22220	1.39	0.62	-0.05%	-0.86%	15
LDC	1703	2233	0.09	0.06	0.76%	1.04%	53
Tourism (>8%)	8338	15727	0.42	0.44	2.52%	2.44%	28
ALL	9336	13829	0.47	0.39	1.50%	1.51%	162

Our data show how, back in 1980, per-capita GDP in TCs amounted to 42% of the OECD mean; by 2007 their relative position has increased to 44%. Even if this is not a dramatic improvement, tourism economies are nevertheless the only group of countries that does not worsen its the relative position with respect to OECD countries. In fact, average growth rates tell us that the TCs are the fastest growing group, with 2.52% per year, 3.2 times the LDC group's rate, and 1.7 times the overall average rate. Growth rates in OECD countries have been lower on average, at 2.18% per year. The low growth rate of the overall sample (1.50% per year) is mainly due to the poor performance of the OIL (15 countries, growing on average at -0.05% per year) and the LDC (53 countries, growing on average at 0.76% per year) groups. In sum, in 1980 the TCs were a group of relatively poor countries, and they are still so almost thirty years later. Nevertheless, Table 2 shows that during the period under analysis being

successful in the international tourism market is undoubtedly associated with faster-than-average growth.<sup>8</sup>

Figure 1 yields a clearer picture, enabling us to identify the economic performance of each individual TC. In this figure, the relative (to OECD average) GDP levels in 1980 are plotted against the same values in 2007, our final year. TCs are identified by their country code (in red) while remaining countries are included by a simple dot. Points lying along the 45 degrees line would refer to cases in which the relative position of an individual country has not changed between 1980 to 2007, i.e. its 1980-2007 GDP growth rate has been exactly equal to the average of OECD countries. Countries which are above the 45 degrees line have improved their relative position whereas countries below have experienced a decline (in relative terms). Figure 1 shows that in recent years an ample share of TC's have reduced their gap with respect to industrialized countries.

**Figure 1: Relative per capita GDP:1980 versus 2007**



Before moving on to a more detailed analysis of the 1980-2007 period, it is worth assessing how recent tourism development is as a relevant economic phenomenon. Tourism is indeed a rather recent opportunity. A beach in a tropical location had little or no market value a few decades ago, while it is

<sup>8</sup> This result is robust to the threshold of tourism receipts on GDP we adopt to classify a country as “tourism country”.

very valuable nowadays. Sometimes in between, tourism became a significant new opportunity to growth, especially for a number of less developed countries. To be more specific on the time profile of the impact of tourism development on growth rates, we analyze the cross-country data starting in 1960. Unfortunately, we have data of this time length for 12 TCs only. Taking them as a group, we compute the average growth rates for each of the four decades from 1960 to 2000, and compare them with those of a benchmark group, namely the 21 countries which were part of the OECD in 1960. The ratio of the average growth rates of the TCs to those of the OECD countries shows that while in the Sixties the TCs grew at a rate slightly lower than that of the OECD countries (the ratio between the two rates being 0.91), in the Seventies tourism boomed, with an average GDP growth rate of the TCs's equal to 5.9%, 2.5 times that of the OECD countries. The 12 TCs grew slightly faster than the OECD-21 group in the Eighties and the Nineties too, but not as much as they did in the Seventies. Our guess is that the Seventies were the crucial decade in which the opportunity for tourism development materialized in the international marketplace.<sup>9</sup> As we noticed in the Introduction, this finding is important since it confirms that tourism development took place in a period in which formal institutions were well established in most countries.

### **3. Tourism countries and institutions: data and descriptive evidence**

Let us now frame our analysis within the recent debate on the economic role of the quality of institutions. To assess the institutional quality of the TCs, we have considered several indicators and data sources.

One of the widest used institutional indicators in empirical growth analysis is probably the GADP index used by Knack and Keefer (1995) and Hall and Jones (1999), which is an index of government anti-diversion policies obtained as the average of the five categories “law and order”, “bureaucratic quality” (as a measure of government capability to protect private investment), “corruption”, “risk of expropriation”, and “government repudiation of contracts (as a measure of government potential diverter of private investment)”. The GADP index has the advantage of being a summary measure of different dimensions, as the institutional quality of countries is a complex and difficult to measure phenomenon. However, this index is only available for a sample of 130 countries and unfortunately only 12 of the 33 countries classified as TCs according to the index used in the Table 1 above.

Given this limitation, we are also using the World Bank’s “Worldwide Governance Indicators (WGI)” dataset (see Kaufmann, Kraay and Mastruzzi, 2009) that provides a set of six different indicators of institutional quality. A new and improved version of this dataset has been released very recently, in 2009. Differently from GADP, these variables are available for a large sample of countries (up to the

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<sup>9</sup> Due to lack of data for the earlier decades, we could not use PPP values in this computation of relative growth rates.

full set of 210 countries).<sup>10</sup> Kaufmann et al. (2009) calculate six different indexes, namely “control of corruption” (henceforth *CORRUPTION*), “governmental accountability”, “political stability”, “government effectiveness”, “regulatory quality” and “rule of law” (henceforth, *LAW*). Indexes have been calculated biannually since 1996. In our analysis these variables are taken from their first available value, i.e. 1996, with the only exception of *CORRUPTION* and *LAW*, for which we use 1998 as their first value.<sup>11</sup> The last column in Table 1 lists the available indexes of institutional quality for tourism countries. Moreover, as expected, these different institutional indicators (including *GADP*) are highly correlated. As shown by Table 3, positive correlation coefficients range from 0.67 to 0.96.

**Table 3: Correlation matrix: quality of institutions indicators**

Quality of institutions: Correlation Matrix							
	<i>GADP</i>	<i>Corruption</i>	<i>Law</i>	<i>Regulation</i>	<i>Effectiveness</i>	<i>Stability</i>	<i>Accountability</i>
<i>GADP</i>	1						
<i>Corruption</i>	0.8726	1					
<i>Law</i>	0.8585	0.9589	1				
<i>Regulation</i>	0.6932	0.7346	0.7491	1			
<i>Effectiveness</i>	0.9048	0.9309	0.9172	0.7693	1		
<i>Stability</i>	0.6811	0.7811	0.8277	0.6664	0.7427	1	
<i>Accountability</i>	0.6814	0.741	0.7675	0.7159	0.7173	0.7506	1

The similarities and differences existing across the different sub-groups of countries in terms of our institutional quality indexes are investigated in Table 4. First of all, the data show that institutions in tourism countries are of higher quality than the average sample. When computed for the 12 TCs for which *GADP* data are available, the *GADP* index takes a value virtually identical to the sample mean (0.60). However, when we consider the other indexes of institutional quality, the TCs’ values are always significantly larger than the sample mean.<sup>12</sup> Unsurprisingly, only the OECD group has indexes of institutional quality systematically higher than those of the TCs.

**Table 4: Institutional variables by group of countries**

Group	<i>GADP</i>	<i>Corruption</i>	<i>Law</i>	<i>Regulation</i>	<i>Effectiveness</i>	<i>Stability</i>	<i>Accountability</i>
<b>OECD</b>	0.93 (22)	1.78 (23)	1.63 (23)	1.03 (23)	1.87 (23)	1.08 (23)	1.26 (23)
<b>OIL</b>	0.52 (14)	-0.38 (17)	-0.40 (17)	-0.51 (17)	-0.47 (17)	-0.69 (17)	-1.09 (17)
<b>LDC's</b>	0.46 (47)	-0.79 (62)	-0.85 (62)	-0.75 (62)	-0.72 (62)	-0.62 (62)	-0.74 (62)
<b>Tourism Countries (&gt;8%)</b>	0.60 (12)	0.33 (30)	0.21 (30)	0.31 (30)	-0.06 (26)	0.48 (25)	0.35 (29)
<b>Sample mean</b>	0.60 (137)	-0.01 (191)	-0.05 (191)	-0.02 (191)	-0.04 (181)	-0.10 (179)	-0.04 (192)

Note: Number of countries for each index and group in brackets.

<sup>10</sup> The aggregation procedure by means of which the many individual data sources (441 individual variables) are combined into these six aggregate governance indicators is described in details in Kaufmann *et al.* (2009).

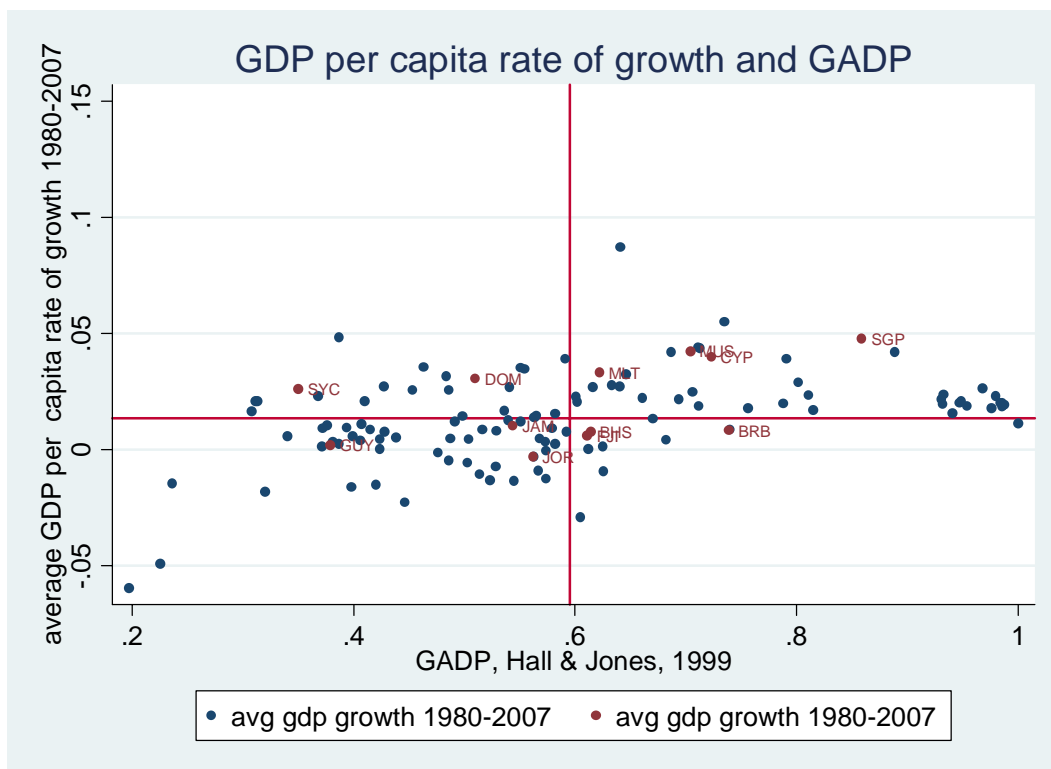
<sup>11</sup> In these two cases the use of the 1996 value would have caused a significant reduction in the sample size. However, let us remark that observed changes over time in these indexes of governance are relatively small, and the correlation coefficient between our *CORRUPTION* indicator in 1996 and 1998 is 0.93. For *LAW* is even higher, 0.95.

<sup>12</sup> These governance indicators are oriented so that higher values correspond to better outcomes, on a scale from -2.5 to 2.5 (Kaufmann et al, 2009)..

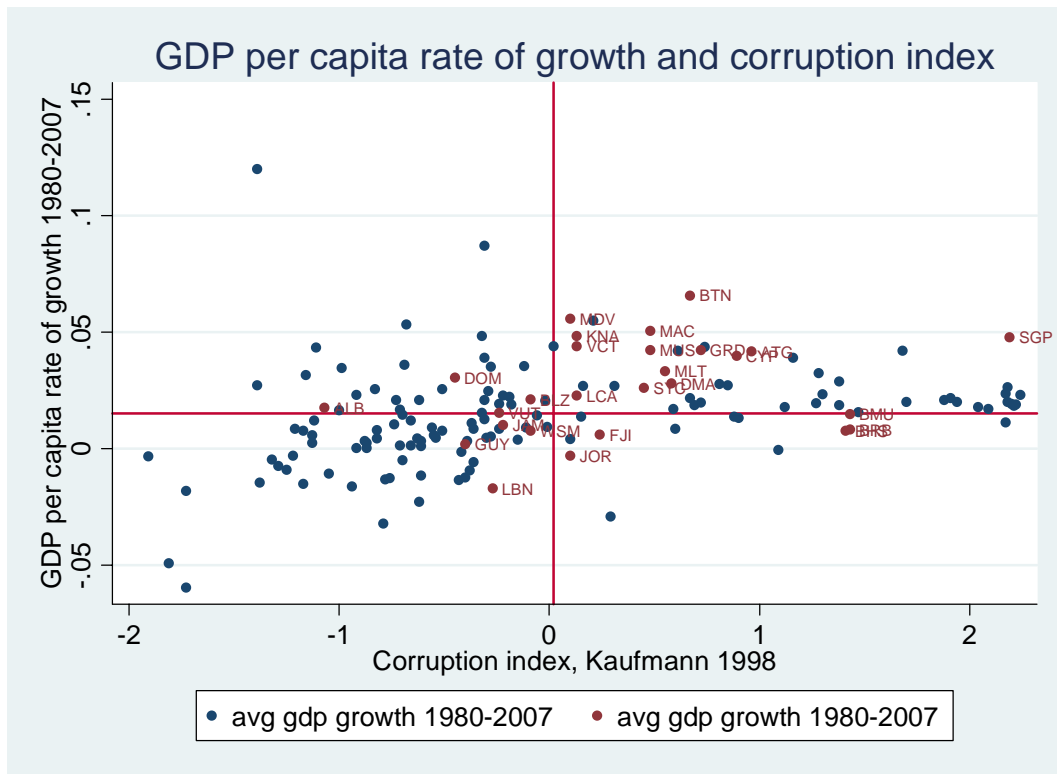
Is there any positive correlation between growth and institutional quality for the TCs? Figures 2 and 3 show this relationship between average growth rates of per capita GDP (1980-2007) and two different institutional indexes, GADP and CORRUPTION respectively. As in Figure 1, tourism countries are identified by their country code (in red) while remaining countries are included through a simple dot. To facilitate the reading, in both cases we have drawn one horizontal and one vertical straight line. The first one identifies the sample average growth rate value, while the second line corresponds to the sample average value of the institutional quality indicator. As we have seen above, the correlation between these two indexes is high (0.88), but information for CORRUPTION (reported in Figure 3) is available for many more countries than GADP.

Figure 3 is especially telling. It reveals two key characteristics of the relationship between tourism, institutions and aggregate growth. First, among the countries with lower than average institutional quality, very few are TCs. Second, among those with higher than average institutional quality, quite a few are TCs and most of these TCs enjoy higher than average growth.

**Figure 2: Relationship between countries' average growth rates and GADP (1980-2007)**



**Figure 3: Relationship between countries' average growth rates and Corruption (1980-2007)**



Overall, the descriptive evidence presented so far provides some insights on the importance of tourism and institutional quality for growth. However, the summary statistics presented cannot tell us whether tourism specialization and institutions independently matter for growth, or whether, by contrast, “institutional quality seems to be a sufficient statistic for accounting for economic development.” (Easterly and Levine, 2003), and TCs are performing well via tourism development just because they have appropriate institutions. In the next section, we address by means of regression analysis this specific question, which, as said in the Introduction, represents an open issue within the growth-institutions literature .

#### 4. Tourism and growth: the econometric evidence

In order to assess its role in cross-country growth, we add the above-defined variable on the weight of international tourism in each country’s economy to the following a standard “beta-convergence” growth regression:

$$(1) \quad GRGDP_i = \alpha + \beta GDP80_i + \delta TOURISM_i + \gamma INSTITUTIONS_i + X_i + \varepsilon_i$$

As in most of the relevant empirical literature on endowments, institutions and cross-country economic

performances,<sup>13</sup> we do not apply panel estimators to equation (1) since the institutional indicators, key variables for our analysis, are not available for a long enough time span and their within variation is likely to be very small as compared to the between variation. Moreover, recent Monte Carlo analysis show that, for growth analysis like ours, the OLS estimator is more robust to the presence of possible misspecifications and perform best in terms of possible bias than currently popular panel estimators.<sup>14</sup> Therefore, we opt for a the standard cross-country OLS growth regressions approach.

where the dependent variable is the average growth rate of per capita GDP adjusted for purchasing power parity (GRGDP) between 1980 and 2007.<sup>15</sup> In the regressors' set we always include GDP80, which is the logarithm of initial per capita GDP for country  $i$ . The beta coefficient on GDP80 should capture the role of the standard neoclassical convergence process within the growth period analyzed. Moreover, with the vector  $X$  of additional explanatory variables we control the robustness of the results about the effects of tourism specialization. In order to minimize likely endogeneity problems, if not stated otherwise, these additional indicators are taken at their 1980 value, i.e. at the beginning of the period under scrutiny.

The choice of additional indicators is not an easy or obvious one. In fact, a typical problem of the empirical growth literature is model indeterminacy, as there is no consensus on which growth determinants ought to be included in a growth model and the choice of regressors is not neutral. As highlighted by Durlauf, Johnson & Temple (2005), the absence of a significant relationship between growth and other variables in many studies is often due to the model specification.<sup>16</sup> For this reason, we begin our analysis by using the most parsimonious specification, that is running our growth OLS regression excluding other potential determinants of growth.

In the following, we proceed in two steps. First, we use our new dataset to reproduce and assess the main, previously known empirical results on growth and tourism (Tables 5 and 6). Second, we use equation (1) to assess whether those results are robust to the inclusion of several indicators on institutional quality (Tables 7 and 8).

Model 1 in Table 5 shows that the estimated parameter of the tourist sector specialization is positive and strongly significant, whilst the convergence parameter is not significant.

An obvious choice among possible additional regressors is some indicator of physical investments. We introduce in model 2 the (log of) ratio of investment to GDP since the standard growth model implies the inclusion of this variable among the explanatory variables of a convergence regression.<sup>17</sup> From a strictly economic point of view, in the present framework the positive effect of tourism specialization

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<sup>13</sup> See, among many others, Easterly and Levine (2004), Rodrick et al. (2004), Tabellini (2008).

<sup>14</sup> See Hauk and Wacziarg (2009).

<sup>15</sup> Hence, we are excluding those countries for which GDP data are available only for more recent years.

<sup>16</sup> Durlauf, Johnson & Temple (2005) list 145 variables which have been found to be statistically significant in different studies.

<sup>17</sup> For more on this see Mankiw Romer & Weil (1992) and Durlauf et al. (2005).

could in principle be driven by the effect of physical capital investments required by the development of the tourism sector. As can be seen, including the ratio of investment to GDP in 1980 in model 2 does not change the previous results. Our tourism indicator remains positive and significant, even though the estimated coefficient for the investment variable displays the expected positive sign (not statistically significant).

**Table 5.**

Dependent variable: annual average GDP growth rate 1980-2007							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GDP80	-0.0013 (0.002)	-0.0021 (0.002)	-0.0023 (0.002)	-0.0012 (0.002)	-0.0040* (0.002)	-0.0011 (0.002)	-0.0042* (0.002)
TOURISM	0.0006*** (0.000)	0.0006*** (0.000)	0.0007*** (0.000)	0.0008*** (0.000)	0.0010** (0.001)	0.0008*** (0.000)	0.0011** (0.001)
Ininv80		0.0036 (0.005)	0.0045 (0.004)	0.0019 (0.004)	-0.0024 (0.006)	0.0024 (0.005)	-0.0019 (0.006)
Intrade80			-0.0054* (0.003)				
interpop_tur				0.0000*** (0.000)	0.0000*** (0.000)		
GENROLL_SECONDARY70					0.0003*** (0.000)		0.0003*** (0.000)
POPULATION80						0.0000*** (0.000)	0.0000*** (0.000)
Constant	0.0225 (0.016)	0.0195 (0.017)	0.0395 (0.025)	0.0125 (0.017)	0.0384 (0.024)	0.0112 (0.017)	0.0394 (0.024)
Observations	156	156	156	155	121	155	121
R-squared	0.068	0.079	0.104	0.214	0.267	0.193	0.238

**Notes:**

Robust standard errors in parentheses;  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Besides, the inclusion of a measure of openness to trade in model 3 (measured as the share of the sum between imports and exports over GDP) does not change the main results. The inclusion of this variable in empirical cross-countries studies on tourism and growth as a robustness check makes sense since, as seen in our descriptive analysis, tourism countries are in most cases small (and consequently open) economies. We must therefore be sure that the positive and significant coefficient on tourism is not just driven by the positive role of trade. However, surprisingly this variable does not show the expected sign and in many specifications (see also results in tables 6, 7 and 8) is not significant. For this reason it has been excluded from most of the following models.

Another important control in this framework is population. In our sample, the size of nations in 1980 goes from forty-four thousand people of St. Kitts and Nevis to almost a billion of China. In particular, even though empirical evidence often finds different results<sup>18</sup> a number of theoretical models predict that growth rates are positively correlated with size due to scale effects (Galor and Weil, 2000).

<sup>18</sup> For example, Easterly and Kraay (2000) find that cross country data do not show any obvious scale effect for growth rates related to population. This result is criticized by Brau, Lanza and Pigliaru (2005, 2007), who show that Easterly and Kraay findings only hold when smallness is associated with tourism specialization.



Together with scale effects, the large vs. small states debate may also stress the importance of openness to international trade and volatility in determining growth processes. However, this debate has also been extended to the tourism framework since, as said above, many tourism countries are, in fact, small countries. In our sample the most populous tourism country in 1980 is the Dominican Republic, which has less than six million inhabitants.<sup>19</sup> Including the population in our analysis is important also because our index of specialization is likely to under-represent the importance of tourism in large countries. In fact, receipts from inbound tourism are technically part of exports. Given that the share of exports on GDP is usually higher for small (open) countries, the same applies also to the share of international receipts on GDP.<sup>20</sup> Hence, in order to disentangle these kind of effects we need to introduce some measure of the size of nations in our analysis. We have considered two different indicators and included them alternatively as additional controls (see models 4 to 7). The first is a simple measure of the size of the population in 1980, the second is an interaction term between tourism and population. It can be easily verified that both variables are positive and highly significant in these specifications. Though, more importantly, the tourism sector parameter remains positive and strongly significant. Finally, even if this considerably reduces our sample, in models 5 and 7 we also include secondary school enrollment rates in 1970 as a measure of human capital. A better choice would have been the use of some stock variable indicator such as literacy rates or educational attainments. However, this would have further reduced our sample<sup>21</sup> and very few tourist countries would have survived the selection. Thus, a second best choice is to use lagged values (ten years) of enrolment rates in secondary school. The variable is positively signed (consistently with the findings suggested by most theoretical studies) and statistically significant.

In Table 6 we replicate the analysis introducing continental dummies in the specifications reported in Table 5. Continental dummies should control for all unobservable components that are characterized geographically and their exclusion may thus represent an important misspecification. Overall, results do not change significantly. The only exception is represented by the coefficient of human capital that becomes non significant. More importantly, our tourism specialization coefficient is again always positive and statistically significant.

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<sup>19</sup> As said in section 2, tourism countries are those countries with an index of tourist specialization equal or greater than 8%. Among 31 tourist countries only 9 have more than one million inhabitants.

<sup>20</sup> From a strictly theoretical perspective, small countries tend to have a smaller opportunity cost of specialisation in tourism (Candela and Cellini, 1997).

<sup>21</sup> Both the use of the Barro and Lee (2000) dataset or of World Bank indicators reduces the sample from 121 observation, as currently in model 5 and 7, to 100.

**Table 6.**

Dependent variable: annual average GDP growth rate 1980-2007							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
GDP80	-0.00575** (0.00226)	-0.0056** (0.002)	-0.0056** (0.002)	-0.0038* (0.002)	-0.0036 (0.003)	-0.0043** (0.002)	-0.0041 (0.003)
TOURISM	0.000567*** (0.000181)	0.0006*** (0.000)	0.0006*** (0.000)	0.0008*** (0.000)	0.0010** (0.000)	0.0008*** (0.000)	0.0011** (0.000)
Ininv80		-0.0017 (0.005)	-0.0013 (0.005)	-0.0018 (0.005)	-0.0037 (0.006)	-0.0018 (0.005)	-0.0036 (0.006)
Intrade80			-0.0012 (0.003)				
interpop_tur				0.0000*** (0.000)	0.0000*** (0.000)		
GENROLL_SECONDARY70					0.0002 (0.000)		0.0001 (0.000)
POPULATION80						0.0000*** (0.000)	0.0000*** (0.000)
Constant	0.0764*** (0.0229)	0.0806*** (0.029)	0.0826*** (0.031)	0.0564** (0.028)	0.0516* (0.030)	0.0605** (0.028)	0.0592** (0.030)
Continental dummies	YES	YES	YES	YES	YES	YES	YES
Observations	156	156	156	155	121	155	121
R-squared	0.213	0.215	0.216	0.296	0.319	0.291	0.310

**Notes:**

Robust standard errors in parentheses;

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

**4.1. Tourism vs institutions or tourism and institutions?**

Let us now move to the main contribution of this paper by introducing various measures of institutional quality. We firstly introduce an index of social infrastructure, GADP, which is a widely used cross-country index of property right protection (see Knack and Keefer, 1995; Hall and Jones, 1999; Tabellini, 2008). In addition to this index, we also use six alternative measures of social infrastructure recently reported in the latest update of the Worldwide Governance Indicators for 2008. As we have seen in section 2 above, these measures are highly correlated with GADP.<sup>22</sup>

In Table 7 we report how our previous results (see Tables 5 and 6) are modified when we use GADP as our measure of institutional quality.

In general, introducing GADP in our model specifications improves our estimates. The R<sup>2</sup> of regressions increases considerably in all models. Including GADP in model 1 Table 1 increases the R<sup>2</sup> from 0.21 to 0.25<sup>23</sup>. The convergence coefficient is always significant and with the expected negative sign. The institutional variable itself is always positive and highly significant. Major differences concern the coefficient of the ratio of investment to GDP (not significant in some specification), of the human capital index (never significant), and a somehow reduced statistical significance of coefficient of the tourism variable. As for this latter finding, it is worth noticing however that the results in Tables 5-6

<sup>22</sup> See comments on Table 1 above.<sup>23</sup> We control if the increase in R<sup>2</sup> is due to the different sample specification caused by the introduction of the variable GADP. Replicating the analysis of Table 7 excluding GADP but using the implied reduced sample of countries we obtain the same result.

and in Table 7 are not directly comparable because the use of GADP modifies significantly our sample: in particular, the number of TCs drops from 28 to just 12.

To avoid such a large drop in the number of TCs, we substitute GADP with the six institutional indicators from the WGI dataset. Using these six indexes has two additional advantages. First, we can check whether our results are robust to the use of alternative institutional indicators. Second, the WGI indicators capture different dimensions of governance and institutions. The concept of institutional quality being a complex one, we can check whether some specific institutional characteristics especially matter for growth.

Results are shown in Table 8. For each indicator we only report the results of two different specifications.<sup>24</sup>

Overall, Table 8 confirms the robustness of our previous results. All the coefficients of our institutional indicators are positive and highly significant, and most of the additional variables are also significant and with the expected sign. The only variable which stays below statistical significance is again human capital. This result is perhaps not so surprising given that institutional quality and education are likely to be highly correlated. In fact, the connection between education and institutions is currently a strongly debated issue in both economics and political science.<sup>25</sup> Since this is not the focus of this paper, we do not further investigate this issue here. More importantly, its estimated coefficient of our tourism variable is again positive and highly significant in almost all models.

In sum, our estimates strongly confirm the existence of a positive effect of tourism on per capita GDP levels. This result is robust to the use of a number of plausible and possible model specification and to the use of different subsamples. Moreover, and more importantly, while the inclusion of different measures of institutional quality confirms that institutions represent an important determinant of long run growth rates, tourism still maintains its strong positive correlation with growth. Therefore, this analysis support the hypothesis that, to some significant extent, the positive effect of tourism development on aggregate growth acts independently from a country's institutional quality.

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<sup>24</sup> The full set of results is available upon request.

<sup>25</sup> Different models suggest that education teaches people to interact with others and produce better institutions (see Glaser et al., 2007). However, as suggested by different studies (Tabellini, 2008; Guiso et al., 2008), our result may also suggest that controlling for institutional quality is important and that human capital can act as a proxy for it.

**Table 7.**

Dependent variable: annual average GDP growth rate 1980-2007											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
GDP80	-0.0059** (0.002)	-0.0074*** (0.003)	-0.0047** (0.002)	-0.0057*** (0.002)	-0.0083** (0.003)	-0.0085*** (0.003)	-0.0087*** (0.003)	-0.0056** (0.003)	-0.0083*** (0.003)	-0.0066** (0.003)	-0.0091*** (0.003)
TOURISM	0.0006** (0.000)	0.0005* (0.000)	0.0006* (0.000)	0.0006 (0.000)	0.0006* (0.000)	0.0006* (0.000)	0.0005 (0.000)	0.0006* (0.000)	0.0004 (0.000)	0.0006* (0.000)	0.0006 (0.000)
GADP	0.0644*** (0.013)	0.0615*** (0.013)	0.0495*** (0.012)	0.0516*** (0.015)	0.0617*** (0.020)	0.0610*** (0.020)	0.0626*** (0.020)	0.0548*** (0.020)	0.0712*** (0.022)	0.0550*** (0.020)	0.0724*** (0.022)
Ininv80		0.0065** (0.003)	0.0048 (0.003)	0.0042 (0.003)		0.0025 (0.003)	0.0019 (0.004)	0.0028 (0.004)	0.0016 (0.004)	0.0026 (0.004)	0.0014 (0.004)
interpop_tur			0.0000*** (0.000)	0.0000*** (0.000)				0.0000*** (0.000)	0.0000*** (0.000)		
GENROLL_SECONDARY70				0.0001 (0.000)					0.0000 (0.000)		-0.0000 (0.000)
Intrade80							0.0026 (0.002)				
POPULATION80										0.0000*** (0.000)	0.0000** (0.000)
Constant	0.0230 (0.015)	0.0187 (0.014)	0.0048 (0.012)	0.0108 (0.014)	0.0432* (0.024)	0.0376 (0.026)	0.0320 (0.027)	0.0084 (0.024)	0.0227 (0.024)	0.0188 (0.023)	0.0339 (0.024)
Continental dummies					YES	YES	YES	YES	YES	YES	YES
Observations	125	125	125	113	125	125	125	125	113	125	113
R-squared	0.246	0.281	0.396	0.464	0.376	0.380	0.386	0.438	0.512	0.422	0.495

**Notes:**

Robust standard errors in parentheses;

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 8.**

Dependent variable: annual average GDP growth rate 1980-2007												
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
GDP80	-0.0074*** (0.002)	-0.0076*** (0.002)	-0.0112*** (0.002)	-0.0102*** (0.002)	-0.0047** (0.002)	-0.0042* (0.002)	-0.0094*** (0.002)	-0.0080*** (0.002)	-0.0113*** (0.002)	-0.0102*** (0.003)	-0.0056*** (0.002)	-0.0048* (0.003)
TOURISM	0.0007*** (0.000)	0.0007** (0.000)	0.0005*** (0.000)	0.0005 (0.000)	0.0008*** (0.000)	0.0009** (0.000)	0.0007*** (0.000)	0.0010*** (0.000)	0.0005*** (0.000)	0.0005 (0.000)	0.0004** (0.000)	0.0006 (0.000)
REGULATION96	0.0104*** (0.003)	0.0101*** (0.003)										
lninv80	-0.0021 (0.005)	-0.0036 (0.006)	-0.0036 (0.005)	-0.0041 (0.006)	-0.0027 (0.005)	-0.0037 (0.006)	-0.0027 (0.005)	-0.0044 (0.006)	-0.0035 (0.005)	-0.0038 (0.006)	-0.0025 (0.005)	-0.0045 (0.006)
interpop_tur	0.0000*** (0.000)	0.0000*** (0.000)	0.0000*** (0.000)	0.0000*** (0.000)	0.0000*** (0.000)	0.0000*** (0.000)	0.0000*** (0.000)	0.0000*** (0.000)	0.0000*** (0.000)	0.0000*** (0.000)	0.0000*** (0.000)	0.0000*** (0.000)
GENROLL_SECONDARY70		0.0001 (0.000)		-0.0000 (0.000)		0.0001 (0.000)		0.0001 (0.000)		-0.0001 (0.000)		0.0001 (0.000)
CORRUPTION98			0.0146*** (0.002)	0.0142*** (0.004)								
ACCOUNTABILITY96					0.0035 (0.003)	0.0041 (0.004)						
EFFECTIVENESS96							0.0134*** (0.003)	0.0114*** (0.004)				
LAW98									0.0149*** (0.003)	0.0150*** (0.004)		
STABILITY96											0.0078*** (0.003)	0.0072** (0.003)
Constant	0.0838*** (0.027)	0.0879*** (0.028)	0.1106*** (0.026)	0.1037*** (0.026)	0.0629** (0.028)	0.0586** (0.026)	0.0877*** (0.026)	0.0797*** (0.026)	0.1128*** (0.027)	0.1073*** (0.028)	0.0691** (0.029)	0.0654** (0.030)
Continental dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	149	120	155	121	152	120	148	119	155	121	146	121
R-squared	0.385	0.410	0.424	0.415	0.301	0.331	0.391	0.402	0.440	0.424	0.348	0.373

**Notes:**

Robust standard errors in parentheses;  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## 5. Conclusions

A recent debate has questioned whether tourism represents a favourable economic option for countries (especially less developed ones) searching for reliable aggregate growth paths. The available evidence shows indeed that countries who rely on tourism are characterized by an above-average growth performance, even after having controlled for many determinants of growth such as initial level of income, investments, openness to trade.

A first goal of this paper was to further investigate the robustness of these findings by means of an updated, large sample of countries covering the period 1980-2007. We always found a positive and highly significant growth-effect of our index of the weight of the tourism sector in the economy. Differently from some previous studies this result is very robust in all specifications, even when a large number of controls is included.

Secondly, we have analysed a so far neglected but important issue: namely, whether tourism exerts an independent influence on aggregate growth, or whether the observed positive correlation merely reflects the fact that, to be economically successful in tourism as well as in most economic activities, a country is required to be endowed with adequate formal institutions. The lack of consideration of institutional indicators in this specific literature is quite surprising. A large and very influential literature now exists pointing out that economic opportunities associated with natural endowments are constrained by a country's institutional quality. As a consequence, in principle it might be that once the role of institutions is taken into account, no role is left for tourism as an independent determinant of aggregate growth.

This hypothesis is not confirmed by our results. Even though, as expected, institutions have a substantial explanatory power in accounting for the growth performance of our sample, the average importance of tourism in the economy still has a significant and robust positive effect on the countries' average rate of growth. This result tells us that tourism – and therefore the underlying endowments – adds something significant to aggregate growth beyond the influence exerted by institutional quality.

A possible extension of if this work would be to further increase our dataset so as to identify a set of *candidate* tourism countries and then investigate the specific channels through which institutions affect both the development of a successful tourism sector and a successful growth pattern. We aim to investigate these research questions in the next future.

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## Appendix I: Data

*GDP80* – per capita GDP adjusted for purchasing power parity in 1980. Source: World Development Indicators, 2006.

*TOURISM* - average share of international receipts on GDP (average value 1980-2004). Source: World Development Indicators, 2006.

*GADP* - index of government anti-diversion policies obtained as the average of five categories: “law and order”, bureaucratic quality (as a measure of government capability to protect private investment), corruption, risk of expropriation, and “government repudiation of contracts (as a measure of government potential diverter of private investment. Source: Hall and Jones, 1999.

*Voice and Accountability (ACCOUNTABILITY96)* – capturing perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media. Source: Kaufmann, D., Kraay A. and Mastruzzi M., 2009.

*Political Stability and Absence of Violence (STABILITY96)* – capturing perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. Source: Kaufmann, D., Kraay A. and Mastruzzi M., 2009.

*Government Effectiveness (EFFECTIVENESS96)* – capturing perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Source: Kaufmann, D., Kraay A. and Mastruzzi M., 2009.

*Regulatory Quality (REGULATION96)* – capturing perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. Source: Kaufmann, D., Kraay A. and Mastruzzi M., 2009.

*Rule of Law (LAW98)* – capturing perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence. Source: Kaufmann, D., Kraay A. and Mastruzzi M., 2009.

*Control of Corruption (CORRUPTION98)* – capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Source: Kaufmann, D., Kraay A. and Mastruzzi M., 2009.

*Population (POPULATION80)* Total population is given by all residents regardless of legal status or citizenship--except for refugees not permanently settled in the country of asylum, who are generally considered part of the population of their country of origin. Source: World Development Indicators, 2006.

*Gross enrolment rate, secondary education (GENROLL\_SECONDARY70)* Gross enrollment ratio is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. Source: World Development Indicators, 2004.

*Average share of trade (Intrade)* Trade is the sum of exports and imports of goods and services measured as a share of gross domestic product. Source: World Development Indicators, 2006.

*Gross capital formation (formerly gross domestic investment) (Linv80)* ratio of investment to GDP in 1980. Consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Source: World Development Indicators, 2006.

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