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REGIONAL PUBLIC SPENDING FOR TOURISM IN ITALY: AN EMPIRICAL ANALYSIS [^]

by *Roberto Cellini* and *Gianpiero Torrisi*

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Abstract: The authors analyse the effects of public spending for tourism in the regions of Italy by adopting a cross-sectional regression analysis approach. The evaluation is made possible by the availability of a databank under the project 'Conti Pubblici Territoriali' ('Regional Public Account') of the Ministry of Economic Development, wherein the spending of all public institutions is aggregated for each region and classified according to different criteria, including the sectoral criterion. Furthermore, the effects of public spending for tourism on the tourism attractiveness of various regions are also investigated. Generally, the effectiveness of public spending appears to be deficient.

Keywords: regional tourism; public spending; regional public accounts; Italy
JEL Classification: R53, R58, L83, C21, M49.

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INTRODUCTION

Starting from the mid-1990s, under the Italian Project 'Conti Pubblici Territoriali' (CPT, i.e., Regional Public Account or RPA), data on public spending at the regional level have been collected by aggregating, on a regional basis, all the spending centres, namely, the national government, the regional and local administrations, public enterprises and other public institutions. Public expenditures have also been reclassified according to different perspectives, in particular, according to both the economic sectors to which they are devoted and their functional categories. The novelty of the RPA project is relevant: data on (1) the total amount of public expenditure for each region (independent of the level of government that has spent the money) and (2) the specific sector to which each type of expenditure is directed are now easily available.

In this study, we aim to analyse the effects of public spending in a specific sector, namely, the tourism sector. A comprehensive body of applied research is available regarding the effect of tourism development on regional growth and the preconditions that guide effective investment (Adams and Parmenter, 1995; Soukiazis and Proenca, 2008; just to mention two different studies, in the context of different countries). However, as far as we know, no report focusing on the effectiveness of *public spending* on tourism at the regional level is available. We take up Italy as a case study.

Tourism is of primary importance in Italy: according to the most recent available data (Mercury-Turistica, 2011, referring to 2010), the final consumption related to tourism is estimated to be close to 95 billion Euros, almost 10% of the total consumption; the value added generated in tourism is approximately 100 billion Euros,

nearly 7% of the Italian value added; the number of people employed in tourism is greater than 2.3 millions, nearly 10% of the total number of people employed. Nevertheless, the financial effort of the public sector to enhance tourism activity is relatively limited, as the available data clearly show. Moreover, evaluation of the effectiveness of public spending is worth analysing.

The RPA Project enables availability of data regarding public spending in both capital and current accounts for the period 1996–2007. If we aggregate the public expenditures in capital accounts over time, then, based on the permanent inventory principle, we can obtain a 'financial' measure of the stock of public capital accumulated over the period of time considered. If this computation is carried out for a specific sector –namely, the tourism sector– we obtain a measure of the public capital specific to this sector. In the present study, this information is studied in comparison with other measures of tangible and intangible forms of capital; furthermore, it is used to evaluate the effects of public spending for tourism (PSFT) on the dynamics of specific inputs, in addition to the effects on the final performance of different regions in the context of tourism activity, as measured by tourists' presence and sectoral value added .

Two preliminary points related to the methodology are worth underlining. First, we are aware that the definition of the tourism sector is not trivial and that several theoretical and empirical studies that show the difficulty of defining and measuring the tourism sector may be listed (for e.g., Leiper, 1979; Cooper et al., 2008). The data considered here pertain to PSFT, based on the international standard convention of Classification of the Functions of Government (COFOG) in relation to public intervention in the hotel, restaurant and tourism fields, as defined by Eurostat (2007, p. 183). Second, considering the tourism performance of various territorial areas, we are

aware that alternative variables may be considered to measure and evaluate the success of the tourism activity of various regions; here, we focus on tourist overnight stays and the value added in the sector, considering that these variables appear to be the most appropriate, to have a prime idea of the general effectiveness of public intervention. Alternative choices would be more appropriate in the presence of more specific questions concerning particular tourism activities and their effects.

Our study provides an informative analysis about the relationship among the different inputs in the tourism industry and the relative importance of the different types of infrastructure in attracting tourism. A wide-ranging debate, dating back to Hansen (1965), for instance, on the relative importance of general economic infrastructures versus sector-specific structures; or the relative importance of "core" economic infrastructure versus non-core infrastructure, such as social organisations (for a review, see Torrisi, 2010), is still alive. Clear-cut conclusions emerge from the present study. The measures of expenditures from the public capital for tourism accumulated at the regional level over the period under consideration (that is, the cumulative expenditure in capital account for tourism) are very weakly correlated with any specific infrastructure; moreover, their links with the magnitude and dynamics of tourist presence are weak. On the basis of our results, we can easily draw some conclusions regarding the effectiveness of policy interventions; a greater amount of caution is necessary to draw clear-cut policy prescriptions.

The outline of the article is as follows: Section 2 presents the data related to public spending, with a particular focus on the features of the RPA data and the data related to tourists' presence at the regional level in Italy; Sections 3 and 4 provide the

multivariate analyses, which are based on cross-sectional (or cross-regional) regression exercises. Section 5 comprises the comments and conclusions.

DATA

THE REGIONAL PUBLIC ACCOUNT DATABASE

The RPA database[1] provides financial data on revenues and expenditures in the current and capital accounts of the public sector at the regional level. Data are available for the period 1996–2007. The collected data are divided both (i) according to a *sector-based* classification, broken down into 30 items (including tourism, following the Eurostat criterion), which can be mapped with reference to the COFOG and (ii) according to the *economic functional categories* (seven categories, such as general administration, wages and so on, are in current accounts; and seven others are in capital accounts, such as investment in machinery and houses, transfer to firms to support investment, and so on).

The RPA information system has been developed to create a structured, centralized database that would ensure full accessibility and exploratory flexibility of the data, for both the network of data producers (the regional teams and the central national team) and external users. The project primarily aims to evaluate the real adoption of the principles of additionality in the allocation of European funds. However, the information can easily be used to evaluate (ex-ante and ex-post) the regional policies, their bases and their effects. The data “have contributed to filling the historical gap in information sources concerning the territorial distribution of public expenses” (Ministry of Economic Development , 2007, p. 7; our translation).

The *reference universe* of the RPA consists of two parts: General Government and the Public Sector. Essentially, the General Government is composed of entities that primarily deliver non-market services, whereas the definition of 'Public Sector' supplements and expands on that proposed by the European Union (EU) for the verification of the principle of additionality. Hence, the latter comprises, in addition to the General Government, a 'non-general-government' sector, consisting of central and local entities that operate in the public services sector and are subject to direct or indirect control. The numbers of the entities that make up these universes and the precise boundary between general government and non-general-government can vary over time, according to the legal nature of the entities themselves and the laws that govern the various sectors of public action. In the RPA database, the EU criteria are expanded to achieve a broader coverage, thereby including, at the central level, a significant number of public enterprises held by the state and, at the local level, several thousand entities not previously covered in a comprehensive manner by any other statistical source. As part of the RPA project, the entities within the various groups of the public sector are subject to periodic monitoring.

In this study, we consider the Public Sector in its broad definition used by the RPA. The benefits of considering such a vast universe of public institutions can be expressed primarily in terms of the knowledge and information acquired therein.

PUBLIC EXPENDITURE FOR TOURISM

Expenditures for tourism include spending for the general administration of tourism, such as the promotion of tourism attraction and related activities; the organization of tourism flows and dissemination of information related to the same (in current

accounts); and the building and restoring (or renewing) of tourist-accommodation structures (which represents the major part of spending in capital accounts).

During the period under consideration, PSFT has increased from 1,320 (in 1996) to 1,755 billion Euros (in 2006), with a nominal increase of approximately 33%. In relative terms, the tourism sector accounts for a very small part (nearly 0.20%) of public expenditure, ranging from 0.18% to 0.25% through the years under consideration.[2] Expenses in capital account represent 50%–52% of the PSFT, a value much larger than the percentage of the entire public spending: if we consider the entire Public Sector, the ratio between capital-account and current-account public expenditure ranges between 0.16 and 0.19 in the years under consideration; this means that the expenses in capital account are about 14%–16% of the total public spending (versus approximately 50% in the specific sector of tourism). The meaning of these data is clear: the financial efforts in capital account, compared to those in the current account, are very large in the case of tourism. This evidence, in itself, represents a positive element because it indicates that specific investments are supported, instead of general current expenses.[3]

By cumulating the expenditure in capital accounts over time, we obtain a datum (denoted as *TOURKAP*[4]), which, on the basis of the permanent inventory technique, is interpretable as the accumulated stock of public capital for tourism over the considered time. Of course, we are aware that this datum could simply be interpreted as the accumulated value of public expenditure and that its interpretation as a measure for a capital stock could be questionable under certain circumstances. First, occasionally, public expenditure does not translate into physical structures, even if it is in a capital account. Second, the depreciation rate is assumed to be zero in our computation. Third, we do not consider the stock at the initial period (therefore, the cumulative spending is

more correctly interpretable as the increase in the stock of public capital, rather than the stock capital in itself). Fourth, we do not consider the autocorrelation of expenditure in subsequent periods. However, the tradition of considering the cumulative expenses in capital accounts as a measure of the capital is rather widespread in economics literature (refer Romp and De Haan, 2007, for a discussion; and Picci, 1997; 1999; for a report on the Italian situation).

Of course, the *TOURKAP* data depend on the dimensions of the region and they have to be normalized (according to the size of the region, as measured by its surface or population) if the dimension is not explicitly accounted for in the analysis.[5] Expenses for tourism, in particular, can be related to *space-serving* structures or *population-serving* structures, so that we cannot clearly say ex-ante whether normalization according to the territorial surface is more appropriate than that based on population (for the difference between *space-serving* and *population-serving* public capital, see Golden and Picci (2005) and references therein). However, the simple correlation between the cross-sectional series of the cumulative public expenditure, normalized alternatively according to the surface area and according to the population, is 0.885, so that different choices of normalization are immaterial to the final results. Appendix A (and specifically Columns 1 and 2 of Table A.2) reports the series of the cumulative public expenditure. Data on per capita PSFT at the regional level, in capital accounts, show a great deal of variability ranging (e.g., in the per capita case) from 0.31 (Lazio) to 24.49 (Valdaosta), with an average value of 1.44.

A partially different picture emerges when the cumulative expenses normalized according to tourists' presence are considered. Such a normalization yields values that can be interpreted as the reciprocal of the average productivity of public spending in

capital account (Table A.2, Col. 3, in Appendix A): Veneto, Lazio and Emilia R. are the regions with the lowest public capital for tourism per tourist's presence (i.e., in which public spending is more productive), whereas Molise, Basilicata and Valdaosta are at the opposite end. However, the situation is relatively stable over time: the situations in 2004 and at the beginning of the period under consideration herein are very similar. The stability of this distribution over years shows that the public expenditures have not had any "redistribution" effect in terms of tourist presence across regions.

However, several infrastructures and general infrastructure-related factors are relevant for tourism (e.g., Gunn, 1988; Inskeep, 1991). Thus, we consider the indices computed by Marrocu et al. (2006) with reference to the entire public capital. Marrocu et al. (2006) built these indices from the data regarding public expenditure in capital accounts at the regional level (for all sectors) available from the RPA by combining the results of their computation with data from the National Statistical System of Italy (Sistema Statistico Nazionale or SISTAN) related to the situation in 1995. They also computed the ratio between public and private capitals so that computation of the index for the total capital (i.e., the private capital plus the public capital) is possible at the regional level. The data computed by Marrocu et al. are original because SISTAN does not provide any detailed series for the capital stock at the regional level. The meaning of 'capital' adopted by Marrocu et al. is very broad because it includes both tangible and intangible forms of capital (see Marrocu et al., 2006, Figures 1 and 2, page 212; the data cover the period 1996–2002). We denote the indices for public capital and total capital (per capita) computed by Marrocu et al. by *XKPUBPOP* and *XKTOTPOP*, respectively. The data are reported here in Table A.3 in Appendix A. Notice that the public capital (in per capita terms) appears to be larger in the southern regions of Italy compared to that in

the northern ones because of the larger dimension of public spending in capital accounts. This does not hold for the total (public plus private) capital. The simple cross-sectional correlation between total capital and public capital is equal to 0.275, which is relatively low.

Table 1 provides the simple correlation between the two capital variables (*XKPUBPOP* and *XKTOTPOP*) and some selected indices of public infrastructures, which we computed based on the databank of the National Institute of Statistics (Istituto Nazionale di Statistica or ISTAT; 2006). The selected public infrastructures have been normalized according to the territorial surface and the resident population; however, the substantial conclusions remain unchanged.

Insert about here:

Table 1. - Simple correlation between the indices for public and total capitals and the indices for other infrastructures.

Some points are worth stressing. First, the indices for transport infrastructures show low degrees of correlation with the total and public capitals, even being negative in several cases; this simply confirms that transport infrastructures are a "small" part of the total capital and a smaller part of the public capital. Second, the availability of beds and structures of accommodation (appropriately normalized) shows a good degree of correlation with the index of total capital, whereas the correlation is weaker with the index of public capital. In other words, the regions with a better endowment of (total) capital also appear to have a good endowment of accommodation structures for tourists. This means that the situation is not a case of clear regional specialization: in the case of regional specialization in –say– tourism or manufacture, we would expect a negative

correlation coefficient. Third, the values of correlation between our index for public capital specific to tourism and the indices of general capital are 0.280 and 0.403 (for total capital and public capital, respectively), which is high in the latter case. Thus, the efforts of the public sector in the context of capital accumulation in the tourism sector are associated with a high endowment of total capital and this can be interpreted as a sign of the lack of clear regional specialization patterns. Finally, in several sectors, such as tourism, the financial efforts of public intervention appear to be uncorrelated with the physical endowment of structures or with the construction of new structures, as previously reported by Barca et al. (2006) in the context of lack of correlation, for instance, in the cases of health, school, water and energy.

TOURIST PRESENCE IN ITALIAN REGIONS

Tourist presence, as measured by the total overnight stays, cannot be evaluated simply in aggregate terms: otherwise, due to the different dimensions of the regions, Veneto, Trentino A.A. and Emilia R. would be seen as steadily attracting the highest numbers, whereas Molise, Basilicata and Valdaosta would display the lowest numbers. Thus, tourists' presence should be normalized according to resident population or territorial size for it to be meaningful. Table 2 shows the results of normalization.

The rankings of the regions according to the tourism density (tourists per sq. hm) or touristicity rate (tourists per resident) are relatively stable over time (although not perfectly static).[6] The highest tourist densities are found in Trentino A.A., Veneto and Liguria, whereas the highest touristicity rates are in Trentino A.A., Valdaosta and Veneto. Molise and Basilicata are at the bottom of the lists.

Insert about here:

Table 2. - Tourist presence normalized according to territorial surface or resident population: Rankings of Italian regions

Table 3 provides data on the ratio between tourists' presence and availability of beds (in all accommodation structures); in this case, the ratio can easily be interpreted as a productivity measure, which ranges between the minimum values in Calabria and Molise to the highest scores of Trentino A.A. and Lazio. However, in this case, an opposite interpretation could be appropriate as well: Calabria and Molise appear to be over-endowed, with Trentino A.A. and Lazio appearing at the opposite end of the list. In what follows, we examine the determinants of these variables, specifically, the role of public spending.

Insert about here:

Table 3. - Tourist presence per bed

A PARAMETRIC ANALYSIS OF CROSS-REGIONAL PUBLIC SPENDING

In this section, we aim to evaluate the effectiveness of public spending in capital accounts (a) on the accumulation of tourism structures; and (b) directly on the number (and growth rate) of tourists' presence. Accordingly, we adopt a cross-sectional (or, more precisely, a cross-regional) regression approach. The entire analysis has been carried out in per capita terms, if not otherwise stated.

Let us start with the evidence concerning the tourists' presence. Cross-sectional regressions were carried out, in which the dependent variable (the percentage variation of tourists per resident) was regressed against the constant term, the value of tourists per

resident at the initial level, and one additional regressor. Table 4 shows the coefficients (and the significance statistics) of the additional regressor. The standard errors are robust *à la* White. In formal terms, Table 4 considers each of the following regressions:

$$(1) \qquad \dot{y}_i = \alpha_o + \alpha_1 y_{0i} + \alpha_2 x_i + e_i$$

where y denotes the tourist presence per resident (y dot is its percentage variation in 1996–2007; y_0 is its value at the initial period), x is an additional regressor (in several cases, it is the growth rate of a variable) and e is the residual. The results, particularly, the estimates of the coefficient α_2, are provided in Table 4, whose interpretation is quite easy. For example, the percentage variation of the hotel (per resident) significantly explains the percentage variation of tourists per resident (when the initial level of tourists per resident is considered along with the constant term), whereas the percentage variation of extra-hotel structures is not significant. The most interesting results can be listed as follows.

First, the percentage variation in the density of accommodation possibilities, as measured by the number of beds in hotel and extra-hotel structures, has a marginally positive and significant contribution to the growth rate of tourists (per resident); interestingly, a similar conclusion does not hold for the percentage variation of the number of hotel and extra-hotel structures. A positive and significant contribution is made by the percentage variation of the share of luxury (four- and five-star) hotels. These pieces of evidence concur to provide a clear-cut picture: they clearly confirm that the quality of accommodation structures is an important element in tourism growth, as documented by a large body of theoretical and empirical research. Quality –more

specifically, upgrading– of accommodation structures, implies structures of higher level and larger size. A long list of reasons why a larger share of luxury hotels is associated with better performance at the micro- and macro-levels can be provided: for instance, four- and five-star hotels offer facilities for different types of tourism and, hence, display a smaller degree of seasonality in occupancy rate; they pay greater attention to environmental aspects and attract more responsible tourists; moreover, they have a large propensity to innovate (for e.g., Alvarez Gil and Burgons Jimenez, 2001; Gossling et al., 2002; Orfila Sintes et al., 2005; Cuccia, 2011).

Second, the physical infrastructures of transport do not exert any positive effect on the growth rate of tourists. This holds both for the first principal component of general structures (reported in Table 4), and for specific infrastructures, such as roads, railways and ports (not reported for the sake of brevity). This result is only partially surprising, considering that the economic literature regarding the impact of transport infrastructures on tourism flows contains mixed results. Giannoni and Maupertuis (2007) offer an evaluation of the role of infrastructures in attracting tourism flows, in addition to considering their impact on the environment (especially in small islands).[7]

Insert about here:

Table 4. - Marginal effect of some factors on the growth rate of tourists per resident in Italian regions

Third, a non-significant effect emerges in our present analysis for "cultural endowments" also, as measured by a dummy variable that captures the presence of site(s) included in the World Heritage List of the United Nations Educational, Scientific and Cultural Organization (UNESCO). In this context, we have to emphasise that a

large and recent body of economic literature is available on the effects of UNESCO recognition on tourism attraction. The reported results lend themselves to different interpretations; some of the relevant references include the studies by Arezki et al. (2009), Yang et al. (2010), Cellini (2011) and Frey and Pamini (2011). Our present analysis supports the absence of any significant impact of UNESCO recognition on the growth of tourism. However, the main purpose of the UNESCO recognition *per se* is not tourism promotion. Hence, if the recognition has negligible effects on tourism, the responsibility falls on the local communities, which are unable to enhance the positive externalities of the recognition in terms of tourism attraction. A similar result, reiterating the limited effect of UNESCO recognition on tourism growth, has been reported by Cuccia (2011) and Cuccia and Rizzo (2011b), who consider different destinations in Sicily (Italy) through a case-study approach; they point out that only destinations that are able to improve the governance system at the local level can derive benefits arising from UNESCO recognition, in terms of a durable and sustainable growth of tourism flows.

Fourth, the index of aggregate capital (in all sectors, not only tourism) has a positive effect, whereas that of private capital has a negative effect; furthermore, the total (public plus private) capital has a non-significant result. This outcome can be explained by observing that private capital is higher in regions with low specialization in tourism.

Fifth, the final three rows of Table 4 report results in relation to two important general factors that are able to influence tourist visits to Italian regions, namely, financial support from the EU, in current and in capital account, and economic growth. In the context of European subsidies, EU funds contribute to improvements in the

infrastructure endowment and, hence, they may exert indirect beneficial effects on tourism attraction. At this point, we conducted two additional regressions using the average current EU transfers received by each region during the period 1996–2007 in per capita terms (*EUCUPOP*) and the accumulated value of EU transfers in capital accounts, at the regional level, during the same period, in per capita terms (*EUKAPOP*). Although both variables show a positive sign (as expected), they are not significant at the 5% level. Nonetheless, in contrast to the EU transfers in capital accounts, which are definitely not significant, our measure of the EU transfers in current accounts is significant at the 10% level and has a relatively high magnitude. Therefore, our results suggest that the EU's direct financial role in promoting tourism in Italian regions is relatively weak and is strictly limited to transfers in current accounts.

In the context of economic performance, using the average growth rate of GDP at the regional level (*GROWTH*) in the period 1996–2007 as a proxy for economic performance, our estimate yields a negative not-significant coefficient. This leads to the conclusion that the change in the number of tourists is not driven by internal economic performance.

Finally, the cumulative PSFT in capital account does not exert any significant effect, both when considered in per-resident terms and in terms normalized to the territorial size. The PSFT in current account exerts a negative influence on the percentage growth of tourists per resident; such a negative effect is significant when the normalization is based on the territorial size. However, the fact that PSFT has no positive effect on tourists' presence does not imply that it is not effective: it simply means that it has *no direct effect*.

In fact, investigating whether PSFT exerts any effect on the structures that have shown a positive impact on tourists' presence is interesting. Specifically, based on the evidence from Table 4, checking whether public spending affects (the change of) hotels, beds, workers involved in tourism and so on is necessary.

Thus, different estimation exercises have been conducted by considering variables in level, in first difference or in growth rate, and according to different normalization methods. The results are substantially similar across the different regression exercises and we report (in Table 5) only the specification with reference to percentage variation. We consider the following (cross-regional) regression:

$$(2) \qquad \dot{x}_i = \beta_o + \beta_1 x_{0i} + \beta_2 \, TOURKAPPOP_i + u_i$$

in which the percentage growth rate of variable x (over the period 1996–2007) is regressed against (i) the constant term, (ii) the value of x at the initial time (i.e., x in 1996 is denoted by x_0 in Eq. 2 and by X_0 in Table 5) and (iii) the cumulative public spending in capital account. For instance, the first row of Table 5 shows that the cumulative spending in capital account is not significant in explaining the percentage growth rate of hotels (per resident), when the constant term and the initial number of hotels per resident are taken into consideration (note also that the value of number of hotels per resident in 1996 has exerted a negative effect on its growth rate, which is significant at the 6% level, that is, the density of hotels grew at a higher rate when the number was lower in the initial period; thus, a type of beta-convergence has taken place).

Insert about here

Table 5. - Marginal effect of TOURKAPPOP on some factors potentially affecting the growth rate of tourists per resident in Italian regions

The effect of the growth in the number of beds on the growth in the number of tourists is significant (as already documented by Table 4), but the growth of beds is *not* affected significantly by public spending in capital accounts (contrary to what one would expect). This holds for beds in the complete set of accommodation structures, as well as in the sets of hotel and extra-hotel structures considered separately. The same result, namely, a lack of significance of the public spending in capital account, holds with reference to the number of accommodation-providing structures (hotel, extra-hotel and total). Moreover, the qualitative improvement of accommodation structures (as measured by the variations in the shares of four- and five-star hotels) is not affected significantly by public spending in capital account.

We have focused on the public spending in capital accounts because this type of spending should ideally have affected the variations of infrastructure. Thus, to analyse the effects of PSFT in current account is of interest. Accordingly, we have repeated the regression analysis reported in Table 5, adding the regressor of current PSFT (per resident; we use the average value for the period 1996–2007) in each regression. The inclusion of this additional regressor does not modify the conclusions: in most cases, it is not significant; in some cases, it is significant (with a negative sign); and precisely in the latter cases, public spending in capital accounts becomes significantly positive. However, our interpretation does not change: public spending is, in general, not significant; in some cases, the results are not robust and their signs and significance change if different types of public spending are considered together. When PSFT in

capital accounts appears to have had a significant positive (marginal) effect on the accumulation of structures, the public spending in current accounts appears to exert a marginally significant negative impact.

MULTIVARIATE ANALYSIS OF THE TOURISM SUCCESS OF ITALIAN REGIONS

In this section, we present some cross-sectional regression exercises, aimed at estimating the determinants of tourists' presence (per resident) and the value generated in the tourism sector at the regional level for the twenty Italian regions. This analysis complements the evidence presented in previous sections, and maintains the ultimate goal of evaluating the effectiveness of PSFT.

Different variables can be adopted to measure and evaluate the "performance" of tourism activity: tourist arrivals or overnight stays; occupancy rates of rooms or beds; expenditure or value added in the tourism sector; Keynesian multiplier of tourism expenditure and so on. Each of these measures has its pros and cons and each is nearly appropriate depending on the specific purpose of analysis (Cooper et al., 2008, especially Chapters 4 and 6). Here, we choose to consider overnight stays and value added in tourism, because such variables appear to be appropriate for obtaining a general image about the success of public intervention in widely different areas, such as the various Italian regions.

Table 6 provides the results of the regressions in which the percentage variation of tourists' overnight stays per resident population (in 2007 w.r.t. 1996) is the dependent variable. This table is an extension of Table 4 in the multivariate context. The

variables that have robust coefficients, and appear to have a strong effect on the dynamics of tourists' presence, are the percentage variations in the number of hotels and the percentage variation in the number of workers in the tourism sector. These variables have to be inserted as explanatory factors in any regression considered in Table 6. Interestingly, the initial level of tourist presence is always not significant. Regarding the public spending variables, the spending in capital accounts is marginally insignificant (Column 2), whereas the public spending in current accounts appears to be negative and statistically significant (Column 3). If inserted jointly (Column 4), the public spending in current accounts continues to have a significantly negative coefficient, whereas the public spending in capital accounts becomes positive and significant at the 5% level. However, the joint inclusion of PSFT in both capital and current accounts does not improve the explanatory power of the regression (in comparison to the case in which no variables of public spending are inserted) and the information criteria suggest that one should prefer the specification without public spending variables. Tests on the omitted variables, carried out with reference to the specification of Column 1 in Table 6 (reported in Table 6.bis) support the choice of that specification as the preferable one. In particular, transportation infrastructures and the presence of sites included in the UNESCO World Heritage List are not significant.

Insert about here:

Table 6. - The variation of tourists' presence per resident (1996-2007): multivariate analysis

and

Table 6.bis - Omitted variable test w.r.t. Column 1 of Table 6

However, as already mentioned, the presence of tourists is neither the only way nor, perhaps, the most efficient one to measure and evaluate the success of tourism in different regions. Data on the value added generated in the sector of tourism are also considered. More specifically, we consider the value added in tourism (source: ISTAT, 2008),[8] normalized with reference to the resident population (*VATURPOP*), in addition to investigating its determinants. Table 7 provides the results of some regression analyses.

Insert about here:

Table 7. – Determinants of the regional Value-Added (per capita) in the tourism sector (2007)

The numbers of both beds (per resident) and workers in the tourism sector and the total aggregate capital per resident are always significant (and are inserted in any regression considered). Interestingly, if the tourism-specific capital is considered instead of the total capital, it turns out to have a negative (and significant!) sign (see Columns 2 versus 1). From Columns 3 and 4, we can clearly see that public spending does not contribute to the value added in the tourism sector. If these public expenses are considered together, both become significant; although public spending in current accounts has a positive effect, public spending in capital accounts has a negative effect. This can be interpreted as being the result of the two variables having complementary and opposite effects on the dependent variable. Note that the simultaneous inclusion of these two variables does not affect the signs and significance levels of the other regressors; furthermore, the explanatory power of the regression does not improve significantly after the two public spending variables are inserted. Moreover, the Akaike

and the Schwarz criteria lead us to consider the specification of Column 1 to be preferable to the specification of Column 5. Thus, the inclusion of both variables of public spending is, in any case, questionable. A list of the robustness checks for the regression exercises conducted in our study is provided in Appendix B.

COMMENTS AND CONCLUDING REMARKS

In this study, we have adopted a cross-sectional regression approach to analyse the effectiveness of public spending for tourism in different regions of Italy. The exercise has been made possible by the availability of a databank established under the project "Conti Pubblici Territoriali" (Regional Public Account), in which the spending details of all public centres are aggregated and reclassified according to different criteria. In particular, we can easily know the expenditure for each region made by different public entities, in addition to knowing the type and category of the expenditure.

The novelty of the databank represents a notable feature of the present analysis. In fact, the aggregation of expenditures by different subjects is important, because tourism is an activity in which several subjects are involved and the fragmentation of public intervention, at least in Italy, is a very critical facet of policy-making for tourism. Overcoming the fragmentation of data is an important step; however, this does not mean that the actions of public subjects have been (or will be in the future) coordinated.

The results we have obtained herein have an exploratory nature, at the present stage. However, some points have emerged clearly.

The data show that the financial effort of public intervention for tourism is very limited: aggregate public spending for tourism for the years 1996–2007 amounts to

0.18%–0.25% of the total public spending –a negligible percentage, provided that tourism activities contribute to almost 10% of the Italian GDP, according to the most recent statistics. More importantly, the financial content of public intervention appears to be effective on neither the tourist presence nor the endowment of accommodation infrastructures that affect tourism attractiveness. Furthermore, public spending classified as devoted to the tourism sector has weak association with the size and dynamics of the general physical infrastructures.

Two comments are necessary here. First, our results on tourism are consistent with the results obtained by other studies. Generally, the public spending in Italian regions appears to have a questionable impact on the dynamics of income and productivity in different territorial areas (Picci, 1997, 1999; Barca et al., 2006; Torrisi, 2011). In several sectors, similar to that in tourism, the financial efforts of public intervention appear to be uncorrelated with the physical endowment of structures or with the construction of new structures. In the specific case of tourism, the lack of significance can be explained by the fact that tourism activities include a large bundle of goods, services and structures and the focus on only a subset of specific structures may be misleading.

Second, with specific reference to tourism, we may suggest that the financial efforts of the public sector are less significant than interventions on specific different lines. In particular, the most important and effective task of the public sector in tourism is represented by the supply of appropriate institutional arrangements and effective system governance: tourism is a very large and composite basket of goods and services, involving a multiplicity of private and public subjects on the supply side. Hence, as recently stressed, for example, by Beaumont and Dredge (2010) and Cuccia and Rizzo

(2011a,b), a common and coordinated action of policy-making at the different layers of the government is necessary. An effective coordination among all the subjects that concur to offer the tourism product is not easy to organize. In this perspective, the role of policy-making is particularly important to overcome the fragmentation of action – both vertical fragmentation, between central and local governments; and horizontal fragmentation, among actors at the same level– and to enhance the positive externalities of different actions. In other words, the manner in which monetary (and non-monetary) efforts are made is more important than the amount of the public financial resources.

A final remark concerns the evidence of relative stability of the distribution of public spending for tourism and the performance of tourism across regions over time, as measured by tourist overnight stays or value added in tourism. This means that policy-making, as depicted by financial efforts, has had neither redistributive effects on tourist presence across regions nor supportive effects for "champion destinations".

A minimal amount of financial resources, in association with the absence of clearly defined strategies, could be a good summary of the Italian policy in relation to tourism. The success of different regions appears to be linked to the ability of the private sector to enhance and upgrade the accommodation structures. Even in this context, the public action has appeared to be ineffective, according to our data and cross-sectional analysis.

REFERENCES

Adams, P. D. and Parmenter, B. R. (1995), 'An applied general equilibrium analysis of the economic effects of tourism in a quite small, quite open economy', *Applied Economics*, Vol. 27, pp. 985 – 994

Alvarez Gil, M.J., Burgos Jimenez, J. and Cespedes Lorente, J.J. (2001) 'An Analysis of Environmental Organizational Context and Performance of Spanish Hotels', *Omega*, Vol. 29, pp. 457-71.

Anselin, L. (1999). 'Spatial Econometrics', Mimeo available at www.csiss.org/learning_resources/content/papers/baltchap.pdf.

Arezki, R., Cherif, R. and Piotrowski, J. (2009), 'Tourism Specialization and Economic Development: Evidence from the UNESCO World Heritage List', IMF working paper 09/176.

Ashauer, D. (1989), 'Is Public Expenditure Productive?', *Journal of Monetary Economics*, Vol. 23, pp. 177-200.

Barca, F., Cappiello, F., Ravoni, L. and Volpe, M. (2006), *Federalismo, Equità, Sviluppo: I risultati delle politiche pubbliche analizzati e misurati dei Conti Pubblici Territoriali*, Il Mulino, Bologna.

Beaumont, N. and Dredge, D. (2010), 'Local Tourism Governance: A Comparison of Three Network Approaches', *Journal of Sustainable Tourism*, Vol. 18, pp. 7-28.

Cellini, R. (2011), 'Is Unesco Recognition Effective in Fostering Tourism? A Comment on Yang, Lin and Han', *Tourism Management*, Vol. 32, pp. 452-54.

Cooper, C., Fletcher, J., Fyall, A., Gilbert, D. and Wanhill, S. (2008), *Tourism: Principles and Practice*, Prentice Hall – Pearson, Harlow.

Cuccia, T. (2011), **'**Patrimonio Unesco e promozione del turismo e delle industrie creative nei centri minori: Le città barocche del Val di Noto (Sicilia)', Paper presented at the 32nd Conference of Aisre, Turin.

Cuccia, T. and Rizzo, I. (2011a), 'Cultural Seasonality in Cultural Destinations: Empirical Evidence from Sicily', *Tourism Management*, Vol. 32, pp. 589-95.

Cuccia, T. and Rizzo, I. (2011b), 'Heritage and Tourism: Theoretical and Empirical Issues', *Tourismos*, vol. 6, pp. 37-56.

Durbin, J. (1954), 'Errors in Variables', *Review of the International Statistical Institute*, Vol. 22, pp**.** 23-32.

Eurostat (2007), *Manual on Sources and Methods for the Compilation of Cofog Statistics*, European Commission, Bruxelles.

Frey, B. and Pamini, P. (2011) 'World Heritage: Where are We? An Empirical Analysis', University of Zurich Working Paper Series, Econ11.

Giannoni, S. and Maupertuis, M.A. (2007), 'Environmental Quality and Optimal Investment in Tourism Infrastructures: A Small Island Perspective', *Tourism Economics*, Vol. 13, p. 499-514.

Golden M., and Picci L. (2005), 'Proposal for a new Measure of Corruption Illustrated with Italian Data', *Economics and Politics*, Vol. 17, pp. 37-75.

Gossling, S., Borgstrom Hansson, C., Horstmeir, O. and Saggel, S. (2002), 'Ecological Footprint Analysis as a Tool to Assess Tourism Sustainability', *Ecological Economics*, Vol. 43, pp. 199-211.

Gunn C. (1988), *Tourism Planning*, Taylor and Francis, New York.

Hansen, L. (1982), 'Large Sample Properties of Generalized Method of Moments Estimators', *Econometrica*, Vol. 50, pp. 1029-1054.

Hansen, N. M. (1965), 'The Structure and Determinants of Local Public Investment Expenditures', *Review of economics and statistics*, Vol. 2, pp. 150-162.

Hausman, J. (1978), 'Specication Tests in Econometrics', *Econometrica*, Vol. 46, pp**.** 1251-1271

Inskeep, E. (1991), *Tourism Planning: An Integrated and Sustainable Development Approach*, Van Nostrand Reinhold, New York.

ISTAT (2006), *Le Infrastrutture in Italia. Un'analisi della dotazione e della funzionalità*, ISTAT, Roma.

ISTAT (2008), *Conti economici regionali*, Istat, Roma.

Khadaroo, J. and Seetanah, B. (2007), 'Transport Infrastructures and Tourism Development', *Annals of Tourism Research*, Vol. 43, pp. 1021-32.

Leiper, N. (1979), 'The Framework of Tourism: Towards a Definition of Tourism, Tourist, and the Tourist Industry', *Annals of Tourism Research*, Vol. 6, pp. 390-407.

Marocu, E., Paci, R and Pigliaru, F. (2006), 'Gli effetti del capitale pubblico sulle regioni italiane', in: Baraca et al. (Eds.) *Federalismo, Equità, Sviluppo: I risultati delle politiche pubbliche analizzati e misurati dei Conti Pubblici Territoriali*, Il Mulino, Bologna, pp. 191-216.

Mercury - Turistica (2011), *Rapporto sul turismo italiano 2010*, Firenze, Mercury.

Ministero dello sviluppo economico (2007), *Guida ai Conti Pubblici Territoriali*, Roma,

Moran, P.A.P. (1948), 'The Interpretation of Statistical Maps', *Biometrika*, Vol. 35, pp. 255-260.

Moran, P.A.P. (1950a), 'Notes on Continuous Stochastic Phenomena', *Biometrika*, Vol. 37, pp. 17-23.

Moran, P.A.P. (1950b), 'A test for the Serial Dependence of Residuals', *Biometrika*, Vol. 37, pp. 178-181.

Orfila Sintes, F., Crespì Cladera, R. and Martinez Ros, E. (2005), 'Innovation Activity in the Hotel Industry: Evidence from Balearic Islands', *Tourism Management*, Vol. 26, pp. 851-65.

Picci, L. (1995), 'Lo stock di capitale nelle regioni italiane', *DSE Working Paper* No. 229, Dipartimento di Scienze Economiche Università di Bologna.

Picci, L. (1997), 'Infrastrutture e produttività: il caso italiano', *Rivista di Politica Economica*, Vol. 87, pp. 67-88.

Picci, L. (1999), 'Productivity and Infrastrucuture in Italian Regions', *Giornale degli Economisti e Annali di Economia*, Vol. 58, pp.329-53.

Romp, W. and. De Haan, J. (2007), 'Public Capital and Economic Growth: A Critical Survey', *Perspektiven der Wirtschaftspolitik*, Vol. 8, pp. 6-52.

Sargan, J. (1958), 'The Estimation of Economic Relationships Using Instrumental Variables', *Econometrica*, Vol. 26, pp. 393-415

Smeral, E. (2003), 'A Structural View of Tourism Growth', *Tourism Economics*, Vol. 9, pp. 77-93.

Smeral, E. and Weber, A. (2000), 'Forecasting International Tourism: Trends to 2010', *Annals of Tourism Research*, Vol. 27, pp. 982-1006.

Soukiazis, E. and Proenca, S. (2008), 'Tourism as an Alternative Source of Regional Growth in Portugal: A Panel Data Analysis at NUTS II and III Levels', *Portuguese Economic Journal*, Vol. 7, pp. 43-61.

Torrisi, G. (2009), 'Public Infrastructure: Definition, Classification and Measurement Issues', *Economics, Management, and Financial Markets*, Vol. 4, pp. 100-124.

Torrisi, G. (2010), 'Infrastructures and Economic Performance: A Critical Comparison Across Four Approaches', *Theoretical and Practical Research in Economic Fields*, Vol. 0, pp. 86-96.

Torrisi, G. (2011), 'A Multilevel Analysis on the Economic Impact of Public Infrastructures and Corruption in Italia Regions', *The IUP Journal of Infrastructure*, Vol. 9, pp. 17-51.

Wu, D. (1973), 'Alternative Tests of Independence Between Stochastic Regressors and Disturbances', *Econometrica*, Vol. 41, pp. 733-750.

Yang, C.H., Lin, H.L. and Han, C.C. (2010), 'Analysis of International Tourist Arrivals in China: The role of World Heritage Sites', *Tourism Management*, Vol. 31, pp. 827-37.

APPENDIX A

Insert here:

Table A.1 – List of variables

Table A.2 – Cumulated public expenditure in capital account for tourism (TOURKAP), normalised according to different criteria

Table A.3 - Indices of public capital and total capital (per capita) in Italian regions

APPENDIX B (ROBUSTNESS CHECKS)

There are several reasons why the estimates in this paper may not accurately represent the effect of the variables of interest, especially those regarding the financial measure of the stock of public capital belonging to the tourism sector. In this Appendix, we present a series of robustness checks that address three particularly important issues that could lead to biased estimates, namely, (1) endogeneity between the change of tourists per resident population and public spending for tourism, (2) alternative measures of public capital for tourism, and (3) spatial effects. According to these checks, we do not find evidence that our estimates are biased.

The endogeneity between the change in tourists per capita and tourism spending.

In our estimates, we assumed that expenditure for tourism (both in current and in capital accounts) was exogenous with respect to tourist visits. Nevertheless, public spending for tourism could, at least partially, follow rather than precede tourism growth in terms of tourists' presence. If so, it is well known that the OLS estimates of all coefficients are inconsistent. To address this issue, a two-step procedure has been followed.

Let us start with expenditure in capital accounts. First, a three-year-lagged value of *TOURKAP* (*TOURKAP04*) has been used as an instrument of *TOURKAP* (2007 datum) to run a 2SLS regression –per equation (1) – of the growth rate of tourists per resident over the period from 1996 to 2007 against (i) a constant term, (ii) its value at the initial time, and (iii) *TOURKAP*. In this regard, Anderson's (1951) under-identification statistic shows a value of 19.557 with a *p*-value of 0.000, meaning that the model is identified, that is to say that the instruments are 'relevant' in the sense that they are correlated with the (assumed) endogenous regressors. On the other hand, the Sargan (1958)-Hansen (1982) *J* statistics for over-identifying restrictions lead to conclude that the instruments are valid instruments, i.e., that they are uncorrelated with the error term, and that the excluded instruments are correctly excluded from the estimated equation. It shows a value of 0.00, meaning that the equation is exactly identified. Step two explicitly tests the exogeneity assumption by means both of Wu (1973)-Hausman (1978) and Durbin (1954)-Wu (1973)-Hausman (1978) statistics focusing on the principal hypothesis that tourism infrastructures are (exogenous variables and) not accommodating factors. Both tests cannot reject the null hypothesis that tourism investments are exogenous at an usual level of significance: Wu-Hausman F(1,16)=0.223 (p=0.643); Durbin-Wu-Hausman Chi-sq(1)=0.275 (p=0.600).

Similarly, to investigate the endogeneity of expenditure in current accounts—*CGTURAVE*—a 2SLS regression of the growth rate of tourists per resident over the period 1996-2007 against a constant term, along with its value at the initial time and *TOURCUR*, has been run using the number of workers in the tourism sector in 1996 normalized by resident population, *WORKTOURPOP96*, as an instrument. On theoretical grounds, this choice is supported by the argument that 'wages' is one of the most (numerically) important categories of expenditure in current accounts during the period considered. Moreover, both under-identification and weak identification tests report values of 12.244 (p=0.0005) and 0.000 (meaning the equation is exactly identified), respectively. The tests do not reject the null hypothesis that spending in current accounts for tourism is exogenous (Wu-Hausman F(1,16)=0.336 (p=0.570); Durbin-Wu-Hausman Chi-sq(1)=0.411 (p=0.521). Hence, our estimates do not appear to be affected by endogeneity.

An alternative measure of tourism capital.

Results concerning tourism spending could be biased due to the intrinsic weakness of the variables utilised as proxies for tourism facilities. A major concern is about the appropriateness of public spending for tourism in capital accounts –as a whole– representing public capital for tourism. Indeed, one could doubt that certain categories of public spending, such as (long-term) marketing spending or transfers, might be treated as *public capital*. To address this issue,

different regressions have been carried out, considering an alternative (restrictive) measure of the stock of public capital accumulated over the period 1996- 2007. This measure consists in the cumulated value of only 'building and real estate' spending (*TOURKAPB*) excluding, for example, the whole set of loans, public holdings, and transfers in capital accounts. Nevertheless, regressions using such an alternative proxy do not show any substantial change in the statistical significance of the coefficients. Table B.1 reports the estimates based on this variable, considered in absolute terms and normalised both according to the size of the population and the size of the surface area. Hence, we conclude that the main results of ours do not heavily depend, in terms of statistical significance, on the particular proxy we adopted for tourism capital.

Insert about here
Table B.1 - Marginal effect of building and real estate spending for tourism on the growth rate of tourists per resident in Italian regions

Spatial effects.
As a final robustness check, we address the issue of spatial effects in our cross-section regressions. Indeed, given the explicit spatial nature of our data, it would be plausible that our regressions showed a systematic bias in capturing the effects of variables considered, based on geographical grounds. In that case, spatially specific regression techniques would be required. To investigate this possibility, we test for spatial autocorrelation of residuals relative to each regression. More precisely, building on Anselin (1999), we performed the test on residuals based on the Moran's *I* statistic that, in matrix notation, can be expressed as follows:

$$(\text{A.1}) \qquad I = \frac{N}{S_0}\frac{\varepsilon' W \varepsilon}{\varepsilon' \varepsilon}$$

where N is the number of geographical units considered, $S_0 = \sum_i \sum_j w_{ij}$ is a standardisation factor that corresponds to the sum of the weights for the nonzero cross-products, ε indexed the vector of residuals, and W is a spatial weights matrix. Moran's *I* tests have been computed for all regressions reported in the paper both in the cumulative and in the consecutive distance bands case for four different distance bands. For example, the results reported in Table B.2 below refer to regressions reported in Table 4.

Insert about here
Table B.2 - Moran's *I* on the residual of regressions (1) reported in Table 4

The results reported in Table B.2 confirm that the hypothesis of spatial independence cannot be rejected for all estimates reported in Table 4. Furthermore, Moran's test performed in a generalised way to all estimates (file available upon request to the authors), confirms that, overall, the error structure of our estimates is not spatially biased. More details on the mentioned test may be found in Moran (1948, 1950a, 1950b).

TABLES

Table 1. - Simple correlation between the indices for public and total capitals and the indices for other infrastructures.

	Corr. with XKTOTPOP	Corr. with XKPUBPOP
IND_ROADSUP	-.347	.384
IND_ROADPOP	*-.056*	*.673*
IND_HIGHWSUP	.102	-.346
IND_HIGHWPOP	*.205*	*-.147*
IND_RAILSUP	-.0820	-.344
IND_RAILPOP	*-.052*	*.606*
IND_PORTSUP	-.597	-.124
IND_PORTPOP	*-.548*	*.117*
IND_AIRPSUP	-.311	-.589
IND_AIRPPOP	*-.035*	*-.233*
INFRASTRUPRC	-.371	-.544
IND_HOTTOTPOP	*.466*	*-.132*
IND_TOTBEDPOP	*.479*	*-.207*
IND_TOURKAPPOP	*.403*	*.2802*
IND_CGTURAVEPOP	*.376*	*.0844*

Note: IND_(*) denotes an index for variable (*) computed for each region and having average value equal to 100; ROAD denotes the total kms of road, HIGHW denotes the total kms of highways, RAIL denotes the total kms of rails, PORTS denotes the number of ports, and AIRP denotes the total number of airports. INFRASTRUPRC is the first principal component computed on the above mentioned five variables –each of them normalised according to the territorial surface. HOTTOT is the total number of accommodation structures (hotel and extra-hotel) and TOTBED denotes the corresponding number of beds. All notations for considered variables are reported in Appendix A.1, in alphabetical order.

Table 2. - Tourist presence normalized according to territorial surface or resident population: Rankings of Italian regions

Presence 1996 per sq. hm		Presence 2007 per sq. hm		Presence 1996 per resident		Presence 2007 per resident	
Molise	1.043	Molise	1.469	Molise	1.4155	Molise	2.037
Basilicata	1.0675	Basilicata	1.858	Basilicata	1.7567	Piemonte	2.370
Sardegna	3.1338	Piemonte	4.062	Puglia	1.8345	Basilicata	2.821
Piemonte	3.1904	Sardegna	4.918	Piemonte	1.9088	Sicilia	2.910
Calabria	3.2447	Sicilia	5.679	Sicilia	2.0099	Lombardia	3.001
Puglia	3.8407	Calabria	5.789	Calabria	2.3794	Puglia	3.139
Sicilia	3.9167	Puglia	5.929	Lombardia	2.5692	Campania	3.415
Abruzzo	5.1459	Abruzzo	6.829	Campania	3.1660	Calabria	4.369
Umbria	5.3674	Umbria	7.393	Lazio	3.9337	Abruzzo	5.630
Lombardia	9.584	Valdaosta	9.519	Abruzzo	4.4189	Lazio	5.844
FriuliVG	10.2583	Friuli VG	11.119	Sardegna	4.5787	Sardegna	7.141
Valdaosta	10.792	Lombardia	12.006	Umbria	5.5614	Marche	7.161
Marche	11.5526	Marche	14.014	FriuliVG	6.8407	Friuli VG	7.202
Lazio	11.7559	Campania	14.545	Marche	7.7632	Liguria	8.813
Campania	13.308	Emilia R	17.254	Emilia R	8.6288	Marche	8.843
Toscana	13.749	Toscana	18.130	Toscana	9.0481	Emilia R	9.039
Emilia R	15.234	Lazio	18.659	Liguria	9.5031	Toscana	11.460
Veneto	23.1916	Liguria	26.139	Veneto	9.6362	Veneto	12.889
TrentinoAA	25.253	TrentinoA.A.	30.864	Valdaosta	9.9506	Valdaosta	24.890
Liguria	28.3779	Veneto	33.454	TrentinoAA	37.6913	TrentinoA.A.	42.220

Table 3. - Tourist presence per bed

Tourist overnight stays per bed (1996)		Tourist overnight stays per bed (2007)	
Calabria	26.744	Calabria	44.785
Molise	37.508	Molise	47.523
Basilicata	43.876	Basilicata	48.766
Sardegna	56.840	Puglia	54.752
Abruzzo	56.865	Friuli VG	57.018
Piemonte	60.468	Piemonte	57.392
Marche	60.707	Marche	59.854
Puglia	64.298	Valdaosta	60.721
Valdaosta	66.670	Sardegna	62.625
Friuli VG	77.924	Abruzzo	70.993
Sicilia	86.647	Umbria	75.665
Toscana	89.787	Sicilia	80.492
EmiliaR	91.945	Toscana	86.244
Lombardia	93.941	Emilia R	88.395
TrentinoAA	94.312	Friuli VG	89.754
Umbria	96.670	Lombardia	90.023
Liguria	98.809	Veneto	97.230
Lazio	102.490	Campania	104.701
Veneto	103.531	Trentino AA	111.824
Campania	110.132	Lazio	117.945

Table 4. - Marginal effect of some factors on the growth rate of tourists per resident in Italian regions

X	Constant α_o	Coefficent α_2	R2
PV_HOTTOTPOP	0.412 (0.000)*	-0.003 (0.870)	0.270
PV_TOTBEDPOP	0.277 (0.021)*	0.326 (0.032)*	0.398
PV_SHARE4-5STARH	0.162 (0.114)	0.250 (0.001)*	0.572
PV_WORKTOURPOP	0.255 (0.005)*	0.369 (0.001)*	0.431
INFRASTRUPRC	0.404 (0.000)*	0.003 (0.911)	0.270
UNESCODU	0.451 (0.002)*	-0.005 (0.636)	0.280
XKPUBPOP	0.129 (0.155)	0.002 (0.018)*	0.480
XKPRIVPOP	0.885 (0.000)*	-0.002 (0.007)*	0.502
XKTOTPOP	0.704 (0.070)	-0.0001 (0.388)	0.300
TOURKAPPOP	0.408 (0.000)*	0.004 (0.766)	0.274
TOURKAPSUP	0.422 (0.000)*	-129.7 (0.710)	0.274
TOURCURPOP	0.406 (0.000)*	-1398.6 (0.110)	0.294
CGTURAVESUP	0.504 (0.000)*	-4994.1 (0.004)*	0.434
EUCUPOP	0.3542 (0.000)*	163.173 (0.076)	0.390
EUKAPPOP	0.393 (0.000)*	11.582 (0.477)	0.292
GROWTH	0.984 (0.012)*	-16.697 (0.101)	0.352

Note: The table reports the estimates of the coefficients a_0 and α_2 in eq. (1). One separate regression is carried out for each regressor, considered along with the initial level of tourists' presence per resident, and the constant term. Estimates are robust *à la* White. The *p*-value is in parentheses. Starred variables are significant at the 5% level.

Table 5. - Marginal effect of TOURKAPPOP on some factors potentially affecting the growth rate of tourists per resident in Italian regions

X	Constant	X0	TOURKAPPOP	R2
PV_HOTPOP	0.047 (0.395)	-77.71 (0.060)$^{+}$	0.011 (0.212)	0.319
PV_EXHOTPOP	5.218 (0.013)*	-595.2 (0.002)*	-0.126 (0.119)	0.096
PV_HOTTOTPOP	1.806 (0.019)*	-150.8 (0.033)*	-0.012 (0.735)	0.094
PV_HOTBEDPOP	0.296 (0.004)*	-4.386 (0.118)	0.028 (0.288)	0.258
PV_EXHBEDPOP	0.397 (0.002)*	-2.975 (0.355)	0.006 (0.841)	0.172
PV_TOTBEDPOP	0.341 (0.000)*	-2.642 (0.098^{+})	0.032 (0.263)	0.294
PV_WORKTOURPOP	0.325 (0.000)*	-109.1 (0.089^{+})	0.012 (0.601)	0.399
PV_SHARE4-5STARH	0.715 (0.031)*	0.001 (0.382)	-0.019 (0.122)	0.178

Note: This table reports the estimates of beta coefficients in eq. (2). One separate regression is carried out for each additional regressor reported in the table. Estimates are robust *à la* White. Variables denoted by * or + are significant at the 5% or 10% level, respectively.

Table 6. - The variation of tourists' presence per resident (1996-2007): multivariate analysis

Dependent variable: VPPRESPOP	(1)	(2)	(3)	(4)
COSTANT	0.165	0.192	0.214	0.223
	(4.47)	(4.37)	(5.30)	(6.09)
	[0.000]*	[0.001]*	[0.000]*	[0.000]*
VPH	0.770	0.780	0.769	0.707
	(3.48)	(3.23)	(3.42)	(4.05)
	[0.003]*	[0.005]*	[0.004]*	[0.001]*
VPWORKTOURPOP	0.324	0.284	0.251	0.242
	(3.43)	(2.30)	(1.89)	(2.72)
	[0.003]*	[0.034]	[0.076]+	[0.015]*
TOURKAPPOP	===	-0.006	===	0.039
		(-1.15)		(2.46)
		[0.264]		[0.026]*
CGTURAVEPOP	===		-1.35Ee-4	-0.051
			(-3.09)	(-3.46)
			[0.007]	[0.003]*
N	20	20	20	20
R2	0.61	0.63	0.65	0.69
Akaike	-0.52			-0.56
Schwarz	-0.36			-0.32

Note: Student-*t* in parentheses; the *p*-value is in square brackets. Variables denoted by * or + are significant at the 5% or 10% level, respectively.

Table 6.bis - Omitted variable test w.r.t. Column 1 of Table 6

Dependent variable: VPPRESPOP	
TOURKAPPOP	*F*=0.575 [0.459]
CGTURAVEPOP	*F*=1.681 [0.213]
XKTOTPOP	*F*=0.564 [0.463]]
INFRASTRUPRC	*F*=0.004 [0.948]
UNESCODU	*F*=0.296 [0.593]

Note: an *F*-test is reported, with its *p*-value, on the addition of each of these variables in the specification considered by Column 1 of Table 6.

Table 7. – Determinants of the regional Value-Added (per capita) in the tourism sector (2007)

	(1)	(2)	(3)	(4)	(5)
COSTANT	-3.88e-4	2.9e-4	3.41e-4	-3.81e-4	-4.05e-4
	(-2.47)	(5.28)	(-2.10)	(-2.17)	(-2.36)
	[0.024]*	[0.000]*	[0.053]$^{+}$	[0.046]*	[0.033]*
PLETT07POP	1.81e-3	2.51e-3	2.61e-3	1.91e-3	2.23e-3
	(3.72)	(2.35)	(3.25)	(2.27)	(2.88)
	[0.002]*	[0.031]*	[0.005]*	[0.038]*	[0.012]*
WORKTOURPOP	0.159	0.255	0.161	0.159	0.183
	(3.62)	(4.53)	(3.28)	(3.41)	(4.89)
	[0.002]*	[0.003]	[0.005]*	[0.004]*	[0.001]*
XKTOTPOP	2.08e-6	===	1.86e-6	2.05e-6	1.98e-6
	(4.70)		(4.05)	(4.03)	(4.17)
	[0.000]*		[0.001]*	[0.001]*	[0.001]*
TOURKAPPOP	===	-2.46e-5	-1.55e-5	===	-5.363-5
		(-2.24)	(-1.44)		(-3.36)
		[0.039]*	[0.168]		[0.005]*
CGTURAVEPOP	===	===	===	-0.218	5.51
				(-0.19)	(3.09)
				[0.849]	[0.008]
N	20	20	20	20	20
R2	0.95	0.92	0.95	0.95	0.97
F	106.6*	70.09*	86.05*	75.09*	95.84
Akaike	-14.86				-15.18
Schwarz	-14.67				-14.88

Note. Dependent variable is VATURPOP in 2007; Student t-statistics are in parentheses and p-values are in square brackets; significant variables at the 5% level are starred.

Table A.1 – List of variables

AIRP: number of airports
EXHOT: number of tourist accommodation structures different from hotels
EXHOTBED: number of beds in EXHOT
HIGHW: kms of highways
HOT: number of hotel
HOTBED number of beds in HOT
HOTTOT: number of tourist accommodation structures (HOT+EXH)
INFRASTRUPRC: first principal component computed on transport infrastructures (roads, highways, rail, ports, airports)
PORTS: number of ports
PRES##: tourist presences in year ##
RAIL: kms of railways
ROAD: kms of roads
SHARE4-5STARH: share of 4 and 5 star hotel on the number of hotel
TOTBED: number of beds in HOTTOT
TOURCUR: average annual public spending (1996 to 2007) for tourism in current account
TOURKAP: Cumulated public spending for tourism in capital account (1996 to 2007)
UNESCODU: dummy variable for the presence of sites included in the UNESCO World Heritage List
VATUR: value added in the sector of tourism
WORKTOUR: workers employed in the tourism sector
XKPUB: Index for total public capital stock per capita
XKTOT: Index for total capital stock per capita

D* : Variation over time (2006 or 2007 w.r.t. 1996) of variable *
IND_*: Index for variable *
PV_*: Percentage variation of variable * (2006 or 2007 w.r.t. 1996)
*POP : * per resident
*SUP : * normalised according to the territorial surface

Table A.2 – Cumulated public expenditure in capital account for tourism (TOURKAP), normalised according to different criteria

(a) TOURKAP/pop07		(b) TOURKAP/sup		(c) TOURKAP/pres07	
Lazio	0.31	Umbria	89.4	Veneto	5.31
Campania	0.39	Puglia	89.7	Lazio	5.34
Puglia	0.42	Lazio	99.6	Emilia R	6.02
Lombardia	0.45	Emilia R	104	Marche	8.60
Emilia R	0.54	Marche	121	Toscana	9.23
Friuli VG	0.68	Toscana	167	Campania	1.17
Marche	0.76	Campania	170	Umbria	1.21
Umbria	0.86	Calabria	173	Puglia	1.51
Toscana	1.05	Friuli VG	178	Lombardia	1.52
Calabria	1.30	Lombardia	182	Liguria	1.84
Sicilia	1.58	Basilicata	193	Friuli	2.48
Liguria	1.62	Abruzzo	205	Trentino AA	2.59
Abruzzo	1.69	Molise	214	Calabria	2.99
Veneto	1.78	Veneto	276	Abruzzo	3.00
Piemonte	2.19	Sicilia	309	Sicilia	5.44
Molise	2.97	Sardegna	344	Sardegna	7.00
Basilicata	3.25	Piemonte	376	Piemonte	9.26
Sardegna	5.00	Liguria	481	Valdaosta	9.84
Trentino AA	10.92	Trentino AA	799	Basilicata	10.4
Valdaosta	24.49	Valdaosta	937	Molise	14.6

Note: The cumulated spending is divided as follows: (a) per 100 residents in 2007; (b) per 100 sq. hm of territorial size; (c) per 10,000 tourists' presence in 2007.

Table A.3 - Indices of public capital and total capital (per capita) in Italian regions

Region	XKPUBPOP	XKTOTPOP
Piemonte	88.00	440.00
Valdaosta	88.00	440.00
Lombardia	67.00	478.57
Trentino A A	231.00	624.32
Veneto	66.00	440.00
Friuli V G	134.00	496.29
Liguria	146.00	442.42
Emilia R	73.00	456.25
Toscana	83.00	395.23
Umbra	115.00	383.33
Marche	94.00	391.66
Lazio	116.00	446.15
Abruzzo	119.00	383.87
Molise	198.00	421.27
Campania	107.00	314.70
Puglia	83.00	286.20
Basilicata	236.00	393.33
Calabria	137.00	318.60
Sicilia	104.00	315.15
Sardegna	180.00	382.97
Simple Average	123.25	412.52
Italy	100.00	313.12

Note: The normalisation is such that Italy has XKPUBPOP equal to 100.

Table B.1 - Marginal effect of building and real estate spending for tourism on the growth rate of tourists per resident in Italian regions

Variables	(a1)	(a2)	(a3)
CONSTANT	0.108* (0.003)	0.402* (0.000)	0.400* (0.000)
PRE96POP	0.006* (0.037)	-0.015* (0.029)	-0.015* (0.038)
TOURKAPB	0002 (0.593)	==	==
TOURKAPBPOP	==	61.08527 (0.627)	==
TOURKAPBSUP	==	==	30.490 (0.853)
N	20	20	20
R2	0.279	0.275	0.270
F	3.27	2.54	2.85

Notes: estimates are robust à la White. The P-value is in parentheses. Starred variables are significant at the 5% level.

Table B.2 - Moran's *I* on the residual of regressions (1) reported in Table 4

Residuals of regression having the following variables as explanatory	Moran's *I* Distance bands			
	(0-1]	(0-2]	(0-3]	(0-4]
PV_HOTTOTPOP	-0.120 (0.904)	0.035 (0.647)	-0.182 (0.302)	0.026 (0.364)
PV_HOTBEDPOP	0.097 (0.789)	-0.217 (0.389)	-0.172 (0.341)	-0.076 (0.782)
PV_WORKTOURPOP	0.077 (0.813)	-0.033 (0.915)	-0.142 (0.467)	0.034 (0.305)
PV_SHARE4-5STARH	0.010 (0.912)	0 (0.786)	-0.108 ((0.662)	-0.057 (0.958)
INFRASTRUPRC	-0.136 (0.881)	0.009 (0.748)	-0.192 (0.265)	0.014 (0.440)
UNESCODU	-0.029 (0.967)	0.086 (0.470)	-0-131 (0.533)	0.063 (0.180)
XKPUBPOP	0.571 (0.256)	0.098 (0.419)	-0.151 (0.426)	0.041 (0.269)
XKPRIVPOP	-0.288 (0.671)	-0.012 (0.829)	-0.264 (0.088)	0.083 (0.111)
XKTOTPOP	-0.301 (0.658)	0.002 (0.775)	-0.218 (0.187)	0.041 (0.278)
TOURKAPPOP	-0.127 (0.895)	0.027 (0.676)	-0.187 (0.285)	0.032 (0.327)
TOURKAPSUP	-0.170 (0.833)	-0.002 (0.791)	-0.197 (0.248)	-0.001 (0.545)
CGTURAVEPOP	-0.064 (0.984)	-0.038 (0.940)	-0.197 (0.245)	-0.013 (0.644)
CGTURAVESUP	0.186 (0.670)	-0.015 (0.844)	-0.176 (0.323)	-0.016 (0.670)
EUCUPOP	-0.076 (0.967)	0.035 (0.645)	-0.167 (0.364)	0.039 (0.288)
EUCAPPOP	0.194 (0.658)	0.078 (0.492)	-0.179 (0.311)	0.043 (0.263)
GROWTH	0.194 (0.658)	0.078 (0.492)	-0.179 (0.311)	0.043 (0.263)

Note: Note: Moran's *I*s have been computed using linear geographic coordinates of *capoluoghi* (regional capital) relative to the Italian waypoint available at http://xoomer.alice.it/ntpal/GPS/ISTAT/links.html (retrieved on 18/09/2010). *P*-values of 2 tail distribution are in parentheses.

ENDNOTES

[1] The RPA project officially started in 1994, with the 'Delibera' (Decision) N. 8/1994 of the 'Osservatorio per le Politiche Regionali' (Regional Policy Committee); in 2004, starting with the 2005-2007 National Statistics Programme (NSP), the RPA became a product of the National Statistical System (SISTAN). Currently, the project and the databank are run by the Italian Ministry of Economic Development.

[2] Considering the public spending measured by RPA, as a whole, it can be observed that the total public expenditures in Italy have increased from 651,040 billion Euros in 1996 to 958,021 in 2006, with a nominal increase of approximately 47%. At the moment, the registered value for 2007 is equal to 709,599 (with a nominal decrease of approximately 26% with reference to 2006); probably, this datum will be amended, even if the nominal decrease has to be expected, ahead of the public finance–reduction policies. Just to satisfy curiosity, the sector that includes the highest share of public spending is social security (i.e., essentially pensions; approximately 27%–28%), whereas the sector with the lowest share is fishing (less than 0.1%); in a dynamic perspective, the sector with the highest growth rate is professional education (nearly +180%), whereas the sector with the lowest growth rate is fishing (approximately –50%).

[3]However, the variability of the share of public expenses for tourism in current versus capital accounts is really wide across regions: the shares of public expenses in current account vary between approximately 14% in Basilicata to 85% in Lazio.

[4] All notations for considered variables are reported in Appendix A, Table A.1, in alphabetical order.

[5] The twenty Italian regions have very different dimensions: the populations range from 120,000 inhabitants in Valdaosta to over nine million in Lombardia, and the surface area ranges from 326 to 2,570 thousand sq. km (Valdaosta and Sicily, respectively).

[6] Reports on tourism in Italy are provided, for example, by Mercury–Turistica (2011 or previous editions). According to the data, the regions in which tourists' presence showed the highest percentage growth rate (in 2007 w.r.t. 1996) are Calabria, Basilicata and Lazio, whereas the lowest rates are shown by Friuli V.G., Liguria and Valdaosta.

[7] Contrary to our present results, Khadaroo and Seetanah (2007), in a recent analysis on Mauritius, find that the creation of transport infrastructures has a significant impact on tourist arrivals. We may suggest that a key point in the evaluation of this issue is the dimension of the destination considered: Mauritius comprises small islands, with a clear specialization in tourism; Italian regions are much larger areas, in which several economic activities are present, and the "general" infrastructures are not planned to fit the specific needs of tourism.

[8] ISTAT uses the Eurostat criteria to compute the data on value added in tourism.

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