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Elena Bellini, Ugo Gasparino, Barbara Del Corpo
and William Malizia

NOTA DI LAVORO 85.2007

SEPTEMBER 2007

KTHC – Knowledge, Technology, Human Capital

Elena Bellini, Ugo Gasparino, Barbara Del Corpo and William Malizia,
Fondazione Eni Enrico Mattei

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Summary

In recent years, interest in tourism has spread rapidly throughout many small and medium European cities, which previously have not necessarily considered themselves as tourist destinations. Tourism is increasingly seen as a potential lever towards high economic growth, measured both in terms of income and employment. In the present Working Paper we report the analysis on the economic impact undertaken in the framework of the PICTURE Project, showing the results of a novel econometric exercise to statistically assess the impacts of cultural tourism upon European municipalities. More precisely the analysis aims at estimating the effects of tourism specialisation on local income and prices. The Working Paper is built as follows. Section 1 presents and discusses secondary data about tourism facts and figures, including the economic impact of tourism upon European economies, with a focus on cultural tourism. An extensive review of literature, which identifies the main categories of impacts and the currently available methodologies to assess them, is undertaken. Section 2 focuses on the state of the art. Section 3 describes the database built for the analysis, sources and variables. In order to visually represent the spatial variability of the main parameters, a series of thematic maps at NUTS 3 level("Maps of European tourism"), using GIS (Geographical Information System) are also included in the Working Paper. Section 4 shows the results of the econometric analysis of European panel data for the estimation of the effects of tourism specialisation on both local incomes and prices. Section 5 concludes.

Keywords: Cultural Tourism, Economic Growth

JEL Classification: O4, R0, L83

PICTURE- Pro-active management of the Impact of Cultural Tourism upon Urban Resources and Economies, financed by the European Commission, Sixth Framework Programme of Research. Contract n° SSP1-CT-2003-502491.The present research has been developed for Task 1.4 Effects of cultural tourism upon urban economies. www.picture-project.com
For further details on the analysis of the impacts of tourism, see „D13-Impact of Cultural Tourism upon urban economies" and related Annexes at www.picture-project.com
We are mostly indebted to Dino Pinelli for fruitful discussions and for his insightful contribution and support in the early stages of this work.

Address for correspondence:

Elena Bellini
Fondazione Eni Enrico Mattei
Via Po 53 bis
10124 Torino
Italy
Phone: +39 011 8129639
Fax: +39 011 8395315
E-mail: elena.bellini@feem.it

1 Cultural tourism and economic growth

Within the last 50 years, tourism industry has become a sector of major economic importance. In this section we will focus on the rapidly expanding international tourism.

In 2005 arrivals of international tourists exceeded worldwide 800 million, achieving an all-time record. With respect to the previous year, the total number of international arrivals increased by more than 40 million. The additional arrivals are geographically located as follows: more than 17 million in Europe, 11 million in Asia and the Pacific, 8 million in the Americas, 3 million in Africa and in the Middle East (Table 1). As emerges from international tourism related statistics, European Countries are the most visited global destinations, receiving about 55% of the worldwide international tourists. This high share is, however, partially a consequence of the close proximity of the European Countries, which stimulates intra-European cross-border travels, recorded as international (WTO, 2006). International tourist arrivals in European Countries rose from 25.3 million in 1950 to about 440 million in 2005 and are forecasted to reach 717 million in 2020, which means that they are expected to nearly double in two decades (2000-2020). This corresponds to an average annual growth rate around 3%.

	International tourist arrivals [millions]					**Market share (%)**	**Average annual growth (%)**
	1990	**1995**	**2000**	**2004**	**2005**	**2005**	**2000/2005**
Europe	265.6	315	395.8	424.4	441.5	54.8%	+2.2%
Northern Europe	31.6	40.1	45.8	49.6	52.9	6.6%	+2.9%
Western Europe	108.6	112.2	139.7	139	142.7	17.7%	+0.4%
Central/Eastern Europe	31.5	60	69.6	86.3	87.9	10.9%	+4.8%
Southern/Mediterranean Europe	93.9	102.7	140.8	149.5	158	19.6%	+2.3%
World	439	540	687	764	806	100%	+3.3%

Table 1: international tourist arrivals across European macro-regions (WTO, 2006)

A disaggregation in terms of motivation for travelling recognizes that in 2005, nearly half of the international tourist arrivals corresponded to trips for *leisure, recreation and holidays*, reaching a total of 402 million. *Business travel* accounted for 16% of the total (125 million), and another 26% (212 million) consisted of travel for *other motives*, such as visiting friends and relatives, religious purposes/pilgrimages, health treatment, etc. (WTO, 2006). As we can see, international statistical bodies are not used to distinguish between 'leisure' and culturally motivated tourists. It is therefore difficult to say how much of the previous numbers can be led back to cultural tourists in European small and medium-sized cities.

Looking at the typology of the chosen destinations, multi-choice surveys tend to show that European holiday-makers tend to have a preference for the seaside (63%), followed by mountains (25%), towns of art (25%) and countryside (23%). This ranking explains the success of tourism in the Mediterranean area, which offers seaside resorts and historical/cultural attractions. Tourism in the Mediterranean accounts for more than one third of all the international tourist arrivals in European Countries and about a quarter in terms of total income. Setting, climate, cultural interest and environment are the criteria justifying tourists' preference for those destinations. France, Spain and Italy are in fact within the top-five most popular tourist destinations worldwide (Table 2).

Rank	**International tourist arrivals [millions]**		**Difference 2005/2004 (%)**
	2004	**2005**	
1 France	75.1	76.0	+1.2%
2 Spain	52.4	55.6	+6%
3 United States	46.1	49.4	+7.2%
4 China	41.8	46.8	+12.1%
5 Italy	37.1	36.5	-1.5%
6 UK	27.8	30.0	+8%
7 Mexico	20.6	21.9	+6.3%
8 Germany	20.1	21.5	+6.8%
9 Turkey	16.8	20.3	+20.5%
10 Austria	19.4	20.0	+3%

Table 2: international tourist arrivals (WTO, 2006)

1.1 Economic impact of tourism in Europe

European official statistics offices – the EU statistics (Eurostat) as well as the statistical offices of the Member States – provide data for the various branches of the economy, which describe all the relevant economic items of that sector (e.g., production, employees, number and type of enterprise). In branches such as manufacturing, handicraft and agriculture, the statistical data reflect the development of demand and supply correctly because a consumer's decision to buy, for example, a car leads to a sale in the automobile industry. In all these branches, it is therefore possible to evaluate the economic importance of the sector in absolute terms or as percentage contribution to GDP. In contrast, the statistical treatment of tourism substantially differs. A consumer's decision to go on holiday or on a business journey leads to a turnover in several economic sectors. To satisfy her/his needs, a traveller may buy a variety of services, beginning with services from Internet providers or travel agencies, followed by transportation services and the hotel in the destination, not to mention the activities she/he is going to undertake, as well as the purchase of other goods before and during the trip. These tourism-related services are covered by separate statistics and are not aggregated to a figure representing the total demand or supply of the tourism sector. To measure tourism, physical indicators such as the number of arrivals (World Tourism Organisation) and overnight stays (Eurostat) are usually used, but not indicators representing the monetary flows (Leidner, 2004).

To achieve conclusive results concerning the European tourism sector as a whole, data concerning demand and supply in the overall tourism sector are needed. The European Commission undertook an initiative to make the Member States provide such data by offering financial aid for the development of "Tourism Satellite Accounts" (TSA). When all Member States will use the Eurostat concept of TSA, an analysis of the tourism sector in Europe could be written on a more reliable database and the necessary information for the evaluation of developments in the tourism sector and political decisions will become available (Leidner, 2004).

It is commonly acknowledged that tourism represents one of the world's major industries giving a significant contribution to economic growth, balance of payments, employment, and regional balances in individual countries and across regions.

Worldwide the number of jobs that can be traced back to tourism is estimated over 200 million (8% of the total employment); its Gross Domestic Product (GDP) share is more than 10%. By 2013 the *travel and tourism industr*[3]*y* is expected to include 240 million employed people and a total demand at constant prices is supposed to be 50% higher than the current one (WTTC, 2004).

[3] The term "*travel and tourism industry*" is used to characterize the economic activities that belong to tourism in a narrow sense, e.g., travel agencies and tour operators, as well as accommodation establishments, restaurants, cafés, bars, etc. The term "*travel and tourism economy*" is used instead for the tourism sector in a broader sense and includes related sectors such as transport and other branches that are dependent on the *travel and tourism industry*. The former captures the explicitly defined production-side 'industry' contribution (i.e., *direct* impact only), for comparison with all other industries, while the latter captures the broader 'economy-wide' impact, *direct* and *indirect*, of Travel & Tourism. See the example next page.

It has been estimated by the World Tourism Organization that the European Union earns nearly 280 billion € from international tourism, which represents more than 50% of total international tourism receipts worldwide (Table 3).

	International tourist receipts [billions €]		**Receipts per arrival [€]**
	2004	**2005**	**2005**
Northern Europe	39.3	43.3	820
Western Europe	94.6	98	690
Central/Eastern Europe	23.3	26	300
Southern/Mediterranean Europe	106.9	112.7	710
Europe	**264.1**	**279.9**	630
World	509	547	680

Table 3: international tourist receipts (WTO, 2006)

Tourism Satellite Accounting researches undertaken by the Oxford Economic Forecasting (OEF) for the World Travel & Tourism Council (WTTC) found that, if all forms of tourism are taken into account (i.e., not only international cross-border travels), in 2005 the *travel and tourism industry* generated more than 1,705 billion € of economic activity (i.e., total demand) in the European Union (WTTC, 2005). Consequently, total travel and tourism demand in Europe represents 33.2% of world tourism market share. Provisional data for 2006 show an increase, which led to 1,727 billion € of economic activity, growing by 3.8% compared to 2005.

The same study estimates that the **direct** contribution to the Gross Domestic Product (GDP) of the European Union's *travel and tourism industry* is about 4.2% (generating 8.9 million jobs, 4.5% of total employment). However, since travel and tourism touches all sectors of the economy, its real impact is even greater, increasing to 11.5% of the European Union's GDP (24.3 million jobs, 12.1% of total employment) if the *travel and tourism economy* impacts of tourism are accounted for (i.e., **direct** and **indirect** effects related to the tourism activities, WTTC, 2005).

With 8.9 million people directly employed in the EU tourism sector in 2005, tourism's direct contribution in terms of employment is particularly significant. The tourism industry and the related services on the whole account for 24.3 million employees; they are seen as a major opportunity for job creation, particularly in less-developed and peripheral regions. The Organisation for Economic Co-operation and Development (OECD), for instance, estimated that the tourism industry could create 5-6 new jobs, mainly in restaurants and hotels, every time the turnover increases by 150,000 €.

In structural terms, European tourism is largely a sector dominated by Small and Medium Enterprises (SME), with over 99% of this kind of firms. In 1997, tourist SMEs represented 7.4% of the total number of SMEs in Europe and accounted for 6.5% of the total turnover of European SMEs (Leidner, 2004).

From the demand side, the following Travel & Tourism consumptions (i.e., total Travel & Tourism expenditures made by and on behalf of visitors – goods and services – in the resident economy) were evaluated (Table 4).

Travel & Tourism - Expenditure profile	**billions €**
Personal Travel & Tourism. More formally known as 'Travel & Tourism Personal Consumption', this category includes all personal spending by an economy's resident on Travel & Tourism services (lodging, transportation, entertainment, meals, financial services, etc.) and goods (durable and non-durable) used for Travel & Tourism activities. Spending may occur before, during or after a trip. Spending covers all Travel & Tourism, outbound and domestic.	737.1
Business Travel. Formally know as 'Intermediate Consumption of Travel & Tourism' or more simply 'business travel', this category of expenditures by government and industry includes spending on goods and services (transportation, accommodation, meals, entertainment, etc.) for employees' business travel purposes.	191.0
Visitors Export. Expenditures by international visitors on goods and services within the resident economy.	286.0

Table 4: expenditure amount of different typologies of tourists (processing from WTTC, 2006)

1.2 Economic Impact of Cultural Tourism in Europe

While contributions from business, national and international tourists are differentiated in the Tourism Satellite Accounting presented by the World Travel & Tourism Council, no disaggregation in terms of 'leisure' and culturally-motivated tourists is available. This is generally true for all the main statistical sources on international and/or national tourism. Consequently, one has to rely on supplementary data in order to estimate the percentage of the tourism-related economic impact that could be culturally driven.

To split culturally-motivated from 'leisure' tourists is, however, not so easy as holiday destinations often emerge from balancing a number of goals and criteria that could be – after climate, distance/travelling and accommodation costs – leisure, environmental and/or heritage-related. The trend to a more culture-oriented and nature-based tourism is even more difficult to evaluate, due to the lack of generally accepted definitions on the one hand and due to tourists' behaviour on the other, as in many cases they choose a mixture of culture and recreation during the same holiday (Leidner, 2004). The possibility to clearly discriminate a leisure from a culturally-motivated tourist could therefore be an exception more than the norm. Consequently, quantitative estimation of

the economic impact of cultural tourism can diverge, mainly as a result of how ‘cultural tourists’ are defined and accounted for.

Following a survey of the European Commission, roughly 30% of tourist destinations are chosen by virtue of the presence of heritage sites which can be visited, and this number increases up to 45/50% if we include the wider cultural sector, such as festivals or important cultural events (Klein, 2001). According to other estimates, more than 50% of tourist activity in Europe is driven by cultural heritage (Europa Nostra, 2006). More ‘radical’ positions even state that there is no other type of tourism except for the cultural one: «People do not come to America because of our airports, hotels, recreational activities […]. They come here for our culture: no matter if our culture is high, low or medium-end, real or fancy […] they just come to America» (Keillor, 1995). Obviously this can be the case of other regions in the world (Europa Inform, 2004).

Other questions could be related to the typical spending patterns and total expenditures of leisure and culturally-motivated tourists (daily and over the whole length of stay). Tourists that classify themselves as ‘cultural tourists’ seem to have a significantly higher income than the average tourist and to spend more money on holiday - not for cultural purposes but in general (Leidner, 2004).

This kind of questions has been approached in the analysis of three PICTURE case studies carried out in the framework of task 1.4 of the project (Bergen, Elche and Syracuse (see D13 - Annex 2, 3 and 4, respectively, available for download at http://www.picture-project.com).

2 Summary of literature

This section reviews and summarises the existing literature on the economic assessment of tourism with the objectives of constructing an inventory of methodologies available to assess them.

In the present Working paper, we only refer to "advanced approaches"[4].

Firstly, we assume a static setting, and assume that there is no spare capacity: prices respond to increasing demand (general equilibrium), leading to reallocation of resources across sectors. We then move from a static to a dynamic setting and survey those contributions that look at the relationship between tourism specialisation and long-run growth.

2.1 The general equilibrium analysis

In what follows, we consider two classes of models. In both, local economies have different quantities of local amenities (either natural resources - such as beaches, mountains, landscapes or cultural resources – such as monuments, museums, a particular architecture, etc.). In the first class of models, local amenities attract tourism flows but do not induce migration flows. These models allow a careful analysis of both the aggregate welfare and distributional consequences of tourism on local economies. We then relax the assumption of labour immobility and consider models where local amenities affect migration flows. These models do not consider tourism *per se*, yet they are crucial for assessing the value of the amenity for the local economy. We finally discuss relevant empirical findings.

2.1.1 Local amenities and tourism impacts in general equilibrium models with no labour mobility

This section discusses the models analysing welfare and distributional effects of the growth of tourism flows. In this set of models, local amenities affect tourism flows but do not induce any migration flow.

General equilibrium models of tourism follow the 'Dutch disease' literature (Corden and Neary, 1982), which studies the economic consequences of an export boom. Despite tourism can be considered as an 'invisible export' (Archer, 1988), tourism-related transactions have some peculiarities that need to be discussed before presenting the model.

Export goods cross national boundaries and are consumed by residents in foreign countries. On the contrary, tourists move across national boundaries and consume on-site local amenities, together with a bundle of locally provided goods and services. This crucial difference has three main consequences:

[4] For the simpler and most usually implemented in practise methodologies based on the "partial equilibrium" setting, see, e.g., "D13-Impact of Cultural Tourism upon urban economies" at http://www.picture-project.com.

- priced goods and services are consumed together with unpriced (site-specific) amenities;
- normally non-tradable industries (such as restaurants and hotels) are affected directly (and not only indirectly through the increase of residents' income, as in the case of an export boom);
- tourists select the destination based on the price of a bundle of goods (and not on the price of the export good).

Copeland (1991) considers a model with three final goods: agriculture, manufacturing (which are both tradable) and services (which are non-tradable in the absence of tourism). The economy is assumed to be small in world markets for tradable goods, implying that their prices are fixed at world level. The prices of non-tradable goods are instead determined by local supply and demand. The economy is characterised by a vector of factor endowments (land, labour, capital) that are freely mobile across these three sectors.

Tourist demand is determined by the prices of both tradable and non-tradable goods and by local amenities (which are assumed to be exogenous and unpriced). The existence of local amenities plays a key role, as they make tourist destination a differentiated product. As goods and services are consumed jointly with the unique amenities of the destination locality, tourism demand is not perfectly elastic (despite the small size of the economy), and price effects on tourist demand are negative: when the price of non-tradable goods increases the tourist demand for non-tradable goods decreases (as overall tourist inflows decrease in response to the increase in local prices and remaining tourists substitute towards other goods).

In what follows we firstly discuss the welfare effect of tourism growth. We start from a basic model with no international mobility of production factors (factors are supplied inelastically), no foreign ownership of local factors and no taxation; then remove these three assumptions (Section 2.1.1.1). Secondly, in Section 2.1.1.2, we discuss the distributional effects, using both a general and a restricted model.

2.1.1.1 Aggregate welfare effects

In the basic model (with no foreign ownership of local factors, no international mobility of factors, no taxes) an increase in tourism is welfare-improving as prices of local services increase with respect to prices of tradable goods (thereby affecting the economy's real exchange of rate). In fact, an increase of tourism is welfare improving *if and only if* it leads to an increase of the price of non-tradable goods. Since priced goods are consumed jointly with local (unpriced) amenities, local services increase partly reflecting the rents created by the local amenities. If there were no service sector there would be no welfare gain: goods that were previously exported directly (i.e., sold abroad to foreigners) would be simply exported indirectly (i.e., sold locally to tourists) at the same price.

Copeland (1991) distinguishes two channels through which tourism affects the price of local services: a *direct* effect, due to the increase in tourists' demand, holding constant the residents' spending; and an *indirect* effect, due to the increased demand of residents following the increase of real incomes. If services are a superior good, the indirect effect reinforces the direct effect. The opposite is true if services are an inferior good (which

can be the case if residents take vacation abroad). However, for the market to be stable, the direct effect must be dominant.

We now relax some of the assumptions of the basic model.

Firstly, we introduce the possibility that non-locals own parts of local endowments of factors (e.g., hotels, restaurants and other services can be owned by 'foreigners'). In this case, part of the returns to the foreign-owned factor is repatriated (i.e., it leaves the area of concern). As a result, welfare gains from tourism are dampened the more, the bigger the share of income repatriated. It is possible that the share of repatriated income is sufficiently large to lead to a negative effect of tourism on welfare. This is the case when initial tourist spending on services is less than total foreign earnings repatriated (i.e., if non-residents take out of the economy more than they spend in services).

Secondly, we introduce the possibility that a subset of factors is internationally mobile. If some factors are internationally mobile, the supply curve of services is elastic and increased demand is adjusted through both prices and quantities. Since tourism improves local welfare only through an increase of the price of services, the gains from tourism are dampened: the rents created by local amenities are dissipated through factors mobility. However, differently from the case of foreign-owned factors, in this case there is no possibility of a negative welfare effect of tourism.

Finally, we introduce the possibility of taxation in the form of commodity taxes or subsidies. Such taxes are often rebated when goods are exported. This is usually not possible (or very costly) when goods are sold to tourists. Copeland (1991) shows that when tourists pay a tax-inclusive price on goods consumed in the destination, the increase in tourism has two major effects on welfare. As usual, there is an (usually positive) effect on the price of services. This effect may be smaller than in the basic case due to the distortions introduced with the taxation (but not negative, if taxes are not too high). Secondly, tax revenues increase represents an additional contribution to welfare. Copeland (1991) shows that in this case an increase in tourism can produce benefits, even if there is no change in the price of non-tradable goods. Taxes provide a means to extract the rents created by local amenities, even when the price of services is relatively insensitive to changes in demand (either because tourism expenditure is relatively small or factors are highly mobile).

2.1.1.2 Distributional effects of tourism

We have analyzed above the aggregate welfare effect of tourism expansion. In this section we turn to the distributional effects.

Copeland (1991) shows that in the general case (with international mobility of factors) the results are not 'unambiguous'. However, a more restricted model (with sector specific factors) does yield interesting insights.

The model has three factors of production: labour, land and capital. Capital is internationally mobile, while land and labour are not. The service sector employs both land and (service-specific) capital; agriculture uses agriculture-specific land and manufacturing uses capital. Labour is used by all sectors and is assumed to be fully mobile across sectors. This model does reflect important characteristics of each sector: factors used in agriculture are much less mobile than those used in manufacturing, while

the service sector (hotels, restaurants, etc.) relies on both capital (mobile) and local amenities (land).

It can be shown that:

- tourism expansion stimulates output in the service sector (and attracts foreign capital for services);
- manufacturing capital leaves the local economy, leading to a reduction of manufacturing output;
- all social gains from an increase in tourism accrue to the owners of the land specific to services;
- due to the increase in the price of services, real return to all other locally owned factors decreases.

In such a restricted, but quite realistic model, an increase in tourism is undesirable for everybody apart from owners of non-mobile factors specific to services.

There are three qualifications to be made with respect to these results.

Firstly these results hold, provided there is no super-complementarity between land and labour (and between land and capital) in the service sector. Super-complementarity condition requires that a 1% increase in the rental rate for land reduces the use of labour in the service sector by a higher percentage than the decline in the use of land itself. This super-complementarity is often considered implausible and sometimes ruled out by assumption (Jones *et al*, 1987).

Secondly, if foreigners own a large share of service-specific land, then the welfare effect of tourism expansion can be negative (see previous section).

Thirdly, complete de-industrialisation cannot be ruled out. In this case, the increased demand for labour in services leads to an increase in nominal wages, which implies a reduction in the real return to land in the agricultural sector and a dampening of the increase in the real return to land in the service sector. However, even in this case, unless services employ a sufficiently small share of labour, all the gains from tourism still tend to accrue to owners of land in the service sector.

2.1.1.3 Empirical findings

To our knowledge, no econometric study has been undertaken with the specific aim of estimating, starting from available statistical economical data, the impact of tourism on local output and prices.

However, Computable General Equilibrium models (CGE) have recently been used to simulate the effect of tourism expansion on economic variables in a general equilibrium setting. CGE models combine a general equilibrium setting (market clear and agents maximise their objective function) with numerical simulation and therefore expand the IO model to include behavioural equations.

CGE models are built and calibrated to actual data. Policy changes or exogenous shocks are then imposed to the model and results are given in terms of quantities (outputs and demands) and price changes with respect to the baseline. As IO, CGE models are able to

simulate the response of the economy to exogenous shocks. However, differently from IO models, the assumption of spare capacity can be removed: prices are allowed to respond to increasing demand and resources to reallocate across sectors.

Zhou *et al* (1997) simulate the effect of a 10% decrease in tourism expenditure in Hawaii, using both an IO and a CGE modelling approach. They find that the decline in expenditure affects the industries closely related to tourism such as hotels and restaurants, transportation and food and drink industries. However, the IO model shows larger effects than the CGE model. This happens because CGE models allow prices to decrease in response to the decline demand and a reallocation of resources takes place.

Blake (2004) uses a GCE model of the Spanish economy to simulate the impact of a 10% increase in tourism expenditure. This results in an increase in welfare equal to 0.05% of GDP over the long term. As before hotels and restaurants (output increases by 3-4%), transportation (+ 3% in air transport) and food and beverages are the most heavily affected sectors. Some displacement effect does take place as manufacturing output decreases by more than 1%. Tax analysis shows that foreign tourism activities are highly taxed, but domestic tourism is in fact subsidised, because of low tax rates on tourism and subsidies to domestic travel. Yet, increasing taxation on foreign tourists may increase welfare as it reduces some of the distortions created by the low levels of tax on domestic tourism.

Adams and Parmenter (1995) simulate the effect of a 10% increase in tourist arrivals on the economic industrial and regional structure of Australia. As expected in Copeland (1991) some sector gain and other lose out. As in Blake (2004) and Zhou *et al* (1997), hotels, restaurants and transportation industry are directly affected by tourism and gain sensibly. Others are affected only indirectly (clothing and food) but still gain. Finally, traditional export industries reduce their output in response to the appreciation of the real exchange rate and increased competition for production factors. They show that Queensland, the most popular tourist destination in Australia, would experience an overall negative effect on output. This is due to the decline of traditional export industries, which are even more heavily concentrated in the region.

2.1.2 Tourism impacts in general equilibrium models with labour mobility

In this section we relax the assumption of no labour mobility. We discuss very general models where local amenities affect both aspects related to quality of life (consumption amenity) and productivity levels (production amenity). The seminal paper is Roback (1982), with very recent applications in studying human capital spillovers in cities (Ciccone and Hall, 1996; Ciccone and Peri, 2002) and the economic impact of cultural diversity in cities (Ottaviano and Peri, 2004).

The model considers the location decision of firms and workers across different cities endowed with different quantities of amenity (which is assumed to be exogenously given, that is local community cannot change it). While labour and capital are completely mobile across cities, land is fixed (and so is the quantity of amenity). The residents of each city consume and produce a composite consumption commodity, whose price is fixed by world markets. Issues of commuting are ignored. The spatial equilibrium is shown in

Figure 1.

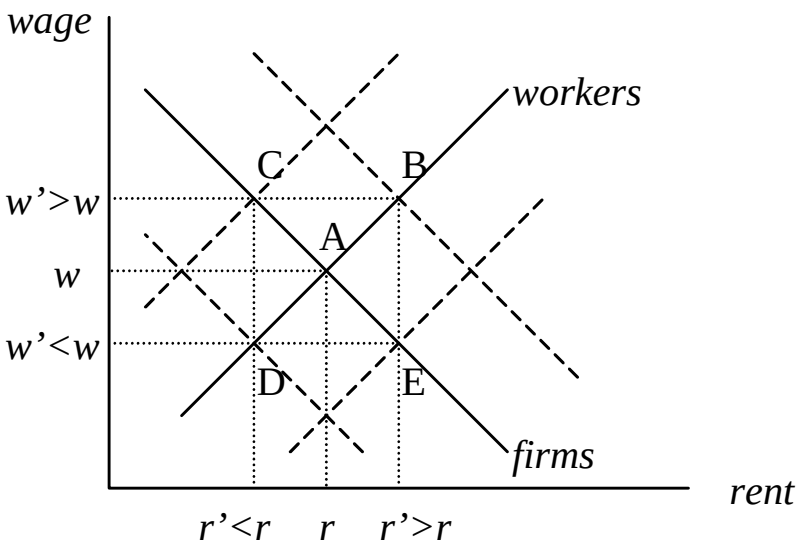


Figure 1: the spatial equilibrium

For the sake of argument, we assume that the only non-traded good is land, which is used by workers and firms for residential and production purposes respectively. Since land is the only non-traded good, regional price differentials are entirely driven by rent differentials. Accordingly, the figure measures regional nominal wages (w) along the vertical axis and regional land rents (r) along the horizontal one. There are many regions, so average real wages and average normal profits are independent from what happens in any specific region.

Downward sloping lines depict the combinations of wages and rents that make firms indifferent about regions. Their downward slope reflects the fact that firms can make the average normal profits in different regions provided that higher wages correspond to lower rents and vice versa.

Upward sloping lines depict the combinations of wages and rents that make workers indifferent about regions. Their upward slope reflects the fact that workers can achieve the average real wage in different regions provided that higher rents correspond to higher wages and vice versa.

The exact positions of the two lines depend on region-specific characteristics. For example, solid lines correspond to the average region. Then their intersection identifies the combination of nominal wages (w) and land rents (r) that make local workers and firms achieve the average real wages and average normal profits respectively (point A).

Figure 1 can be used for two important reasons.

Firstly, it allows us to identify whether the amenity *s* has a prevailing effect on productivity or on 'quality of life'. Suppose that we observe a region different from the previous one where nominal wages are higher ($w'>w$). Figure 1 shows that in principle this could be associated either with an upward shift of the firm indifference line (point B) or an upward shift of the worker indifference line (point C). In both cases the nominal wage is higher than the average but for very different reasons. The upward shift of the firm line implies that firms are able to earn the average normal profits even though they face higher nominal wages and land rents. This is possible only if they are more productive in that region than in the average region. The upward shift of the worker line implies, instead, that for workers to be as 'happy' as in the average region higher nominal wages have to be associated with lower land rents. This reveals the presence of a real wage premium that compensates for poorer than average 'quality of life'. To distinguish whether higher nominal wages signal higher productivity or worse 'quality of life', additional information is needed. In Figure 1 that is provided by rents: whereas higher productivity is associated with higher nominal wages and higher land rents (point B), worse 'quality of life' is associated with higher wages but lower land rents (point C).

Secondly, it allows us to input a price on local attributes. At the margin, the value to consumers is given by the amount of income required to compensate for a small change in the amenity, measured by the sum of the changes in wages and the value of the land they must forgo. From that, the aggregate willingness to pay can be derived. Roback (1982) shows that the incremental value of local willingness to pay for a change in the amenity is given by the incremental value of land (as the effect on wages cancels out because any gain to firms is exactly matched by the loss to consumers).

2.1.2.1 Empirical findings

Roback (1982) estimates the effect of natural amenities on wage and price differential across US cities. She finds that the climate variable performs well in the wage regressions. *Heating degree days* (derived from daily temperature excursions), total snowfall and the number of cloudy days have strong positive coefficients in the wage regressions (and are not significant in the rent regressions), which suggests that these are (consumption) disamenities. On the contrary, the number of clear days has a negative coefficient in the wage regression and positive coefficients in the rents regressions, suggesting that clear days are a (consumption) amenity. She then derives the implicit value of clear days (nearly 70$), and cloudy days (nearly -80$).

2.2 The dynamic analysis

Section 2.1 has analysed the impact of tourism in a static setting. A model is said to be static when the number of employees and total amount of available capital do not respond to economic incentives. This is thought to be the case in the short-run, perhaps a year or so. By allowing labour and capital to respond to economic incentives over time, the analysis becomes dynamic. The responses of capital are investment and depreciation. The responses of labour are migration, labour-force participation, and more hours worked. The simplest way in which a model is made dynamic is by solving it for more than one year. In each succeeding year, the capital stock and labour variables are

adjusted, iteratively, using updated values for the amount of investments, number of workers and worked hours.

This section analyses the impact of tourism on the perspective development pattern of the economy. The question is whether and to what extent a specialization in tourism increases (or decreases) the growth potential of a local economy (e.g., in comparison with regions specialized in knowledge-intensive industries).

2.2.1 Tourism impacts in endogenous growth models

Lanza and Pigliaru (1994), Lanza (1997) and Brau *et al* (2003) consider the question in the context of a Lucas (1988) model of endogenous growth.

They consider a two-sector economy: the manufacturing (relatively more knowledge-intensive) and the tourist sector (relatively more resource-intensive). Countries specialise in manufacturing or tourist sector depending on comparative advantages: countries relatively more endowed with natural resources (which is often the case for small countries) specialise relatively more in the tourist sector. The relative output growth in the two sectors depends on three factors: the relative rate of technological changes, the relative growth of prices and the rate of exploitation of natural resources by the tourism sector.

By assumption, technological change is faster in the knowledge-intensive manufacturing sector. However, with Cobb-Douglas (or CES) international preferences, the rate of change of relative prices moves in favour of the slow-growing economy, thereby completely offsetting the slower rate of technological change. Given a constant rate of exploitation of natural resources, tourism specialization is neutral to growth. Faster growth in tourism-specialized countries, relative to manufacturing-specialized countries, occurs only if:

- the rate of exploitation of natural resource increases. In this case, the long-term sustainability of growth is difficult, as exploitation of natural resources approaches its limits;
- international preferences are such that tourist goods are increasingly valued in international markets to more than offset the gap in the rate of technological change[5]. In this case, long-term sustainability of growth is easier, as it does not depend on increasing exploitation of natural resources.

From a policy point of view, these conclusions favour the development of tourism models based on quality (with tourist goods increasingly valued by consumers in international markets) with respect to development models based on increasing exploitation of natural resources (e.g., mass tourism). The latter may temporarily hide the gap in the technological pace, but it is not sustainable in the long run.

2.2.2 Empirical results

Brau *et al* (2003) investigate the observed relative growth performance of 14 ‘tourism-specialized countries’ - within a set of 143 countries, during the period 1980-1995. It was

[5] This result holds with non-homothetic preferences with tourism as a luxury good, see Brau *et al*, 2003, p. 15.

found that tourism-specialized countries grew significantly faster than the '*non-tourism specialized*'-counterparts. Besides, they show that this positive differential is not explained by other variables used traditionally in the growth literature, such as the initial level of income per capita, the rate of investment or the openness of the economy. The specialisation in tourism seems to provide an additional independent explanation of growth with respect to the types of endogenous growth models such as in Mankiw *et al* (1992). Martin *et al* (2004) analyse growth performance of Latin American countries over the period 1985-1998 and provide additional evidence that tourism-specialized countries tend to grow faster. However, their results hold true only for low- and medium-income countries implying that tourism expansion is a suitable option for growth only before a certain threshold of income per capita is reached. Even in this case, we must consider that these results do not imply *per se* that tourism specialisation is beneficial for long-run growth. As discussed in Section 3.3.1, faster growth in a period could simply be explained in terms of an increasing exploitation of natural resources, and therefore be not sustainable in the longer period.

3 The database

This section describes the database used in the econometric analysis. The database currently contains 1048 observations for over 40 variables (and more than 50 variables derived, such as shares or other indicators).

The database covers 11 countries out of the EU15: Austria, Belgium, Denmark, France, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

Data are collected at NUTS 3 level (equivalent to *counties* in the UK, *province* in Italy, *départements* in France). When not available, we use data at the NUTS 2 level (regions).

Data refer to two different points in time: the first one refers to data for the year 1991 (1990 for some countries); the second period refers to the year 2001 (2000 for some countries). Growth rates are averages per annum (in the log specification).

3.1.1 Economic data

Two main sources are used: Eurostat REGIO database and, in case variables or data were missing, Cambridge Econometrics. Economic data include:

- data used for constructing the dependent variables
  - GDP (Regio, 1991-2001, NUTS 3)
  - Hotel prices (Michelin Red Guides, 1991 and 2001, NUTS 3)
  - Restaurant prices (Michelin Red Guides, 1991 and 2001, NUTS 3);
- data used for constructing the explanatory variables
  - % of gross value added at factor cost in agriculture on total (Regio, NUTS 3 and NUTS 2)
  - unemployment rate (Regio, NUTS 3)

- number of active population (Regio, NUTS 3)
- number of patents applications (Regio, NUTS 3)
- number of patents applications in high technology sectors (Regio, NUTS 3)
- compensation per employee (Cambridge Econometrics, NUTS 2)
- % of working population on total (Cambridge Econometrics, NUTS 2).

Market potential has been calculated as weighted average of the GDP in the region and GDP in surrounding regions, with weights inversely related to the travel time (by car) between the regions. Travel time matrix has been kindly provided by DG REGIO.

3.1.2 Demographic data

These data are from the National Statistical Institutes of each country (mostly from national Census Surveys or Registry data). Demographic data include:

- Number of inhabitants
  - by gender
  - by age (four trances: 0-14; 15-39; 40-64; 65 or more)
  - by marital status (four trances: unmarried, married, divorced, widow)
  - by level of education (three trances: basic or not educated, secondary school, degree or higher education)
  - by citizenship (in the cases of United Kingdom and Ireland, only Country of birth is available and used as proxy. The values are grouped by main area of provenience: autochthonous; other EU15 member; other Europe, Africa, America, Asia, Oceania country; unknown).

These data are used to calculate the indicators employed in the regressions (such as the shares of kid, young, adult, old; shares of male and females; shares of unmarried, married, widow and divorced; shares of low-educated, medium-educated and high-educated; shares of autochthonous, foreign; shares of Europeans, Africans, Americans, Asians, Oceanics).

Density of population has been calculated, using the data of NUTS 3 areas (in square kilometres), from the Eurostat REGIO database.

3.1.3 Tourism data

These data are from the Eurostat REGIO database. Tourism data include:

- Number of hotels (NUTS 3)
- Number of campsites (NUTS 3)
- Number of holiday dwellings (NUTS 3)
- Number of other collective accommodations (NUTS 3)
- Number of beds in hotel rooms (NUTS 3)
- Number of beds in campsites (NUTS 3)

- Number of beds in holiday dwellings (NUTS 3)
- Number of beds in other collective accommodations (NUTS 3)
- Number of rooms in hotels (NUTS 3)
- Number of passengers in the main European airports (kindly provided by Airport Council International).

The quality of data varies and in some cases the number of missing values prevented us from using some variables in the regressions.

A variable measuring the 'passengers potential' has been calculated as the weighted average of the total number of passengers of the airport in the region and surrounding regions with weights inversely related to the travel time (by car) between the regions (NUTS 3).

3.1.4 Dummy variables

The following dummy variables have been created:

- Country dummies: one dummy for each country, taking value 1 for all NUTS 3 belonging to the country, and 0 otherwise;
- Regional dummies: one dummy for each NUTS 2, taking value 1 for all NUTS 3 belonging to the NUTS 2, and 0 otherwise;
- City dummies: one dummy for each NUTS 3, taking value 1 for all observations related to the NUTS 3, and 0 otherwise;
- Rural dummy: taking value 1 for NUTS3 having a density lower than 150 inhabitants per square kilometre, and 0 otherwise;
- WHC dummy: taking value 1 for NUTS3 which includes a World Heritage City, and 0 otherwise;
- Coastal dummy: taking value 1 for NUTS 3 on the coast, and 0 otherwise.

Table 5 synthesizes the content of the database.

Variable	Detail level	Source
Number of inhabitants	NUTS3	Central Statistical Office of each Country
Inhabitants by gender	NUTS3	Central Statistical Office of each Country
Inhabitants by age	NUTS2/3	Central Statistical Office of each Country
Inhabitants by marital status	NUTS2/3	Central Statistical Office of each Country
Inhabitants by education level	NUTS2/3	Central Statistical Office of each Country
Inhabitants by citizenship or Country of birth	NUTS2/3	Central Statistical Office of each Country
Population density	NUTS3	Central Statistical Office of each Country and Regio

GDP	NUTS3	Regio, Eurostat
% of gross value added at factor cost in agriculture on total	NUTS3	Regio, Eurostat
Unemployment rate	NUTS3	Regio, Eurostat
Active population	NUTS3	Regio, Eurostat
Number of patents applications	NUTS3	Regio, Eurostat
Number of patents applications in high technology sectors	NUTS3	Regio, Eurostat
Compensation per employee	NUTS2	Cambridge Econometrics
% of working population on total	NUTS2	Cambridge Econometrics
Hotel prices	NUTS3	Michelin Red Guides
Restaurant prices	NUTS3	Michelin Red Guides
Market potential	NUTS3	Regio and Travel-time matrix
Number of hotels	NUTS3	Regio, Eurostat
Number of campsites	NUTS3	Regio, Eurostat
Number of holiday dwellings	NUTS3	Regio, Eurostat
Number of other collective accommodations	NUTS3	Regio, Eurostat
Number of beds in hotel rooms	NUTS3	Regio, Eurostat
Number of beds in campsites	NUTS3	Regio, Eurostat
Number of beds in holiday dwellings	NUTS3	Regio, Eurostat
Number of beds in other collective accommodations	NUTS3	Regio, Eurostat
Number of rooms in hotels	NUTS3	Regio, Eurostat
Number of passengers in the main European airports	NUTS3	Airport Council International
Passenger potential	NUTS3	Airport Council International, Regio and Travel-time matrix

Table 5: synthetic database information

3.2 Maps of European tourism

The data collected in the database used in the econometric analysis, have also been used to generate geographic representations of European tourism impacts. In this section a set of maps is presented, for few selected ‘tourism indicators’.

The maps use a comparable template, schematically explained in Figure 2.

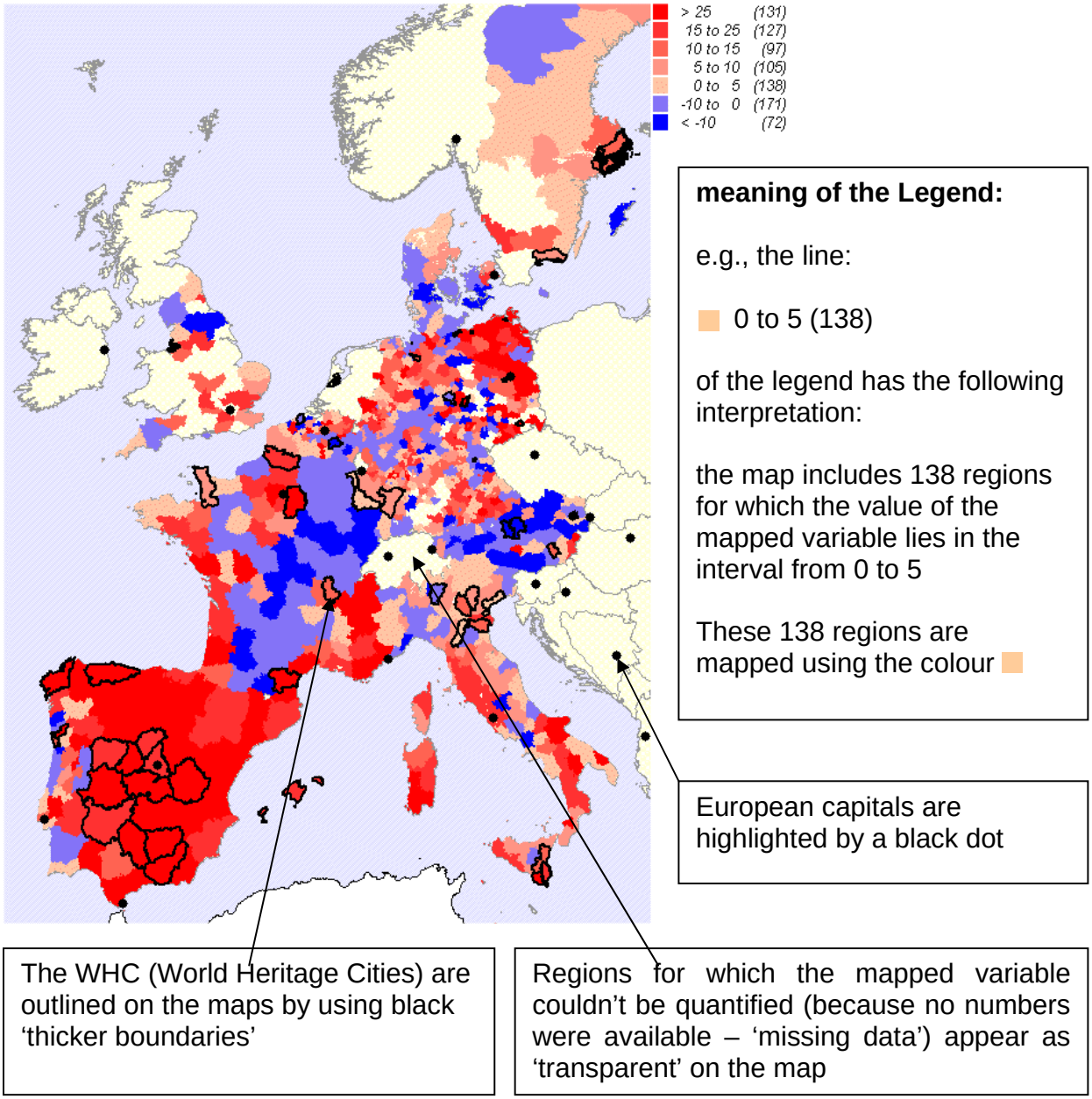


Figure 2: schematic explanation of the meaning of the template used in the creation of the 'maps of European tourism'

In particular, a geographical representation of different indicators will be presented, as follows:

- Map 1a: GDP/capita [€] – reference year 2001
- Map 1b: percentage variation (from 1991 to 2001) in GDP/capita [€]

- Map 2a: average price for a night in hotel [€/night] – (estimated from the 'Michelin Guide', *outliers* excluded) – reference year 2001
- Map 2b: percentage variation (from 1991 to 2001) in average price for a night in hotel [€/night] – (estimated from the 'Michelin Guide', *outliers* excluded)

- Map 3a: density of beds in hotel [bed/km^2] – reference year 2001
- Map 3b: percentage variation (from 1991 to 2001) in density of beds in hotel [bed/km^2]

- Map 4a: density of beds in hotel [bed/capita] – reference year 2001
- Map 4b: percentage variation (from 1991 to 2001) in density of beds in hotel [bed/capita].

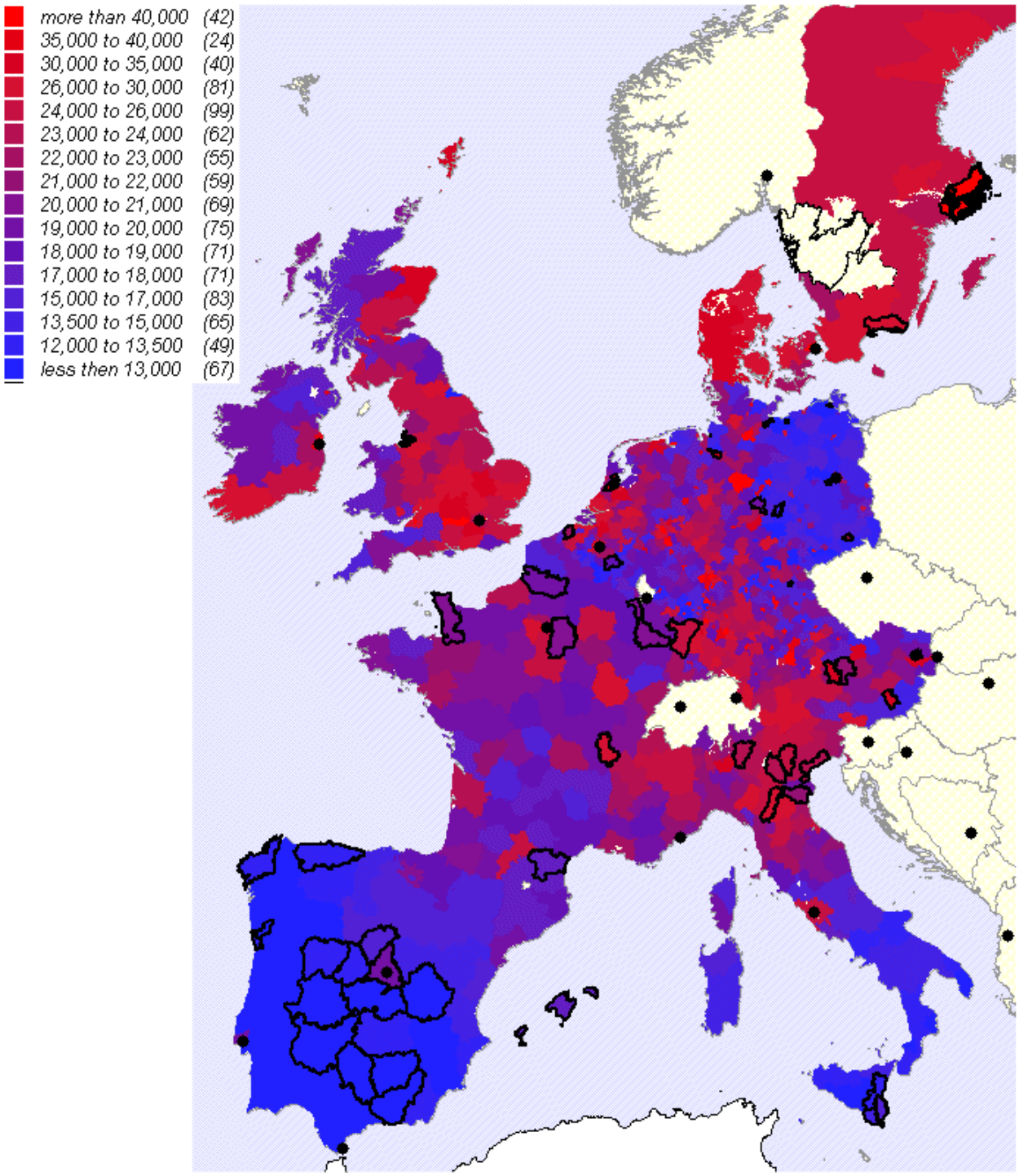
The following definition has been used to evaluate the percentage variation (from 1991 to 2001):

$$\Delta y = \frac{(y_{2001} - y_{1991})}{1/2 \cdot (y_{2001} + y_{1991)})}$$

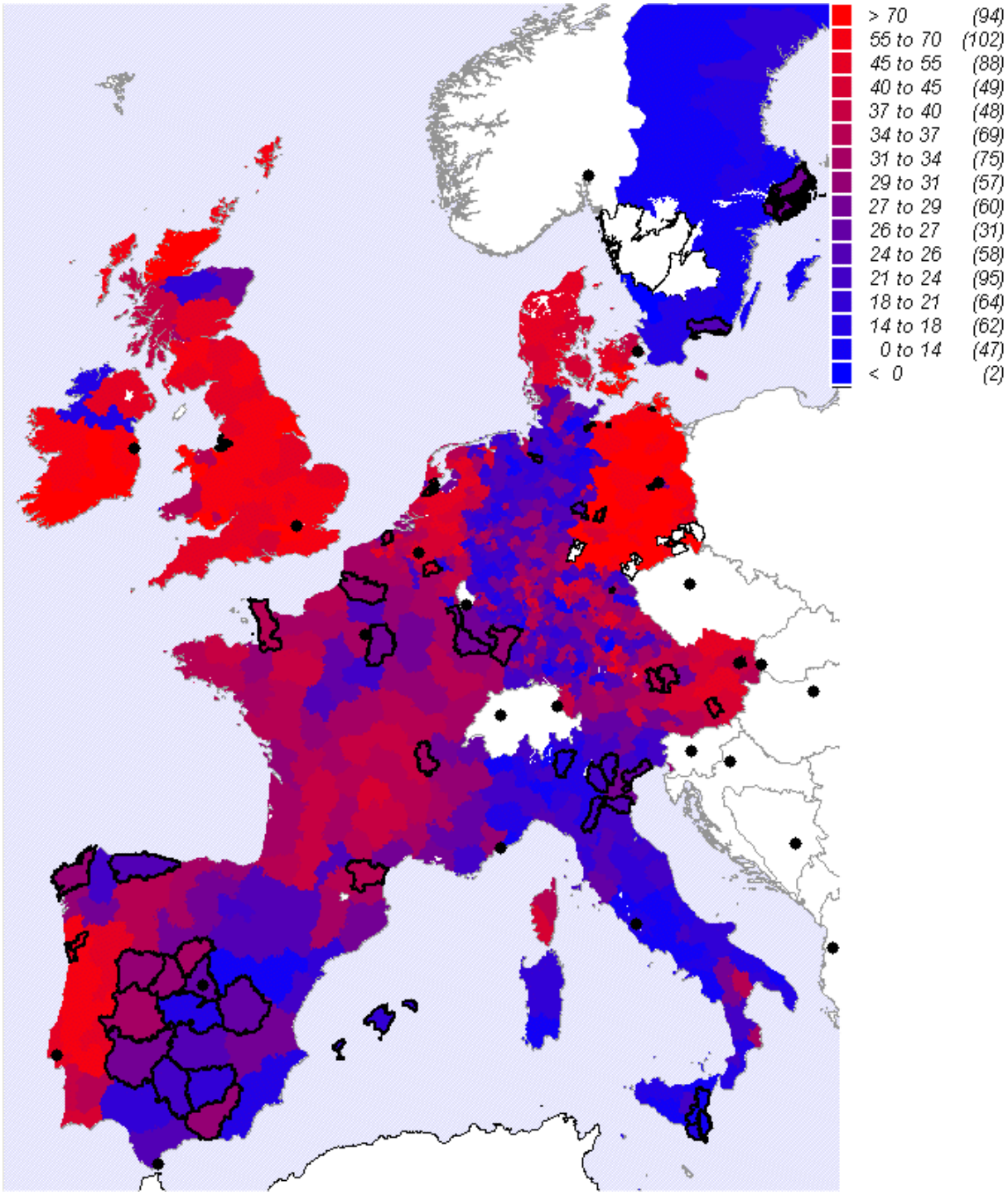
Map 1 is a proxy for the "economic well-being" of the region. Any pan-European statistical analysis (as the one done in the framework of the econometric exercise) has to take into account in a consistent way and balance these historic and basic differences in local economical conditions. Map1b (development in the decade 1991-2001) highlights faster- and slower-growing regions.

Map 2 has been used, in the econometric exercise, as one of the proxies for the tourism-driven impact on local prices. One has to remember that the regressions used in the framework of the econometric analysis include all standard economic variables so that basic differences in local economies are already taken into account and balanced in a consistent way.

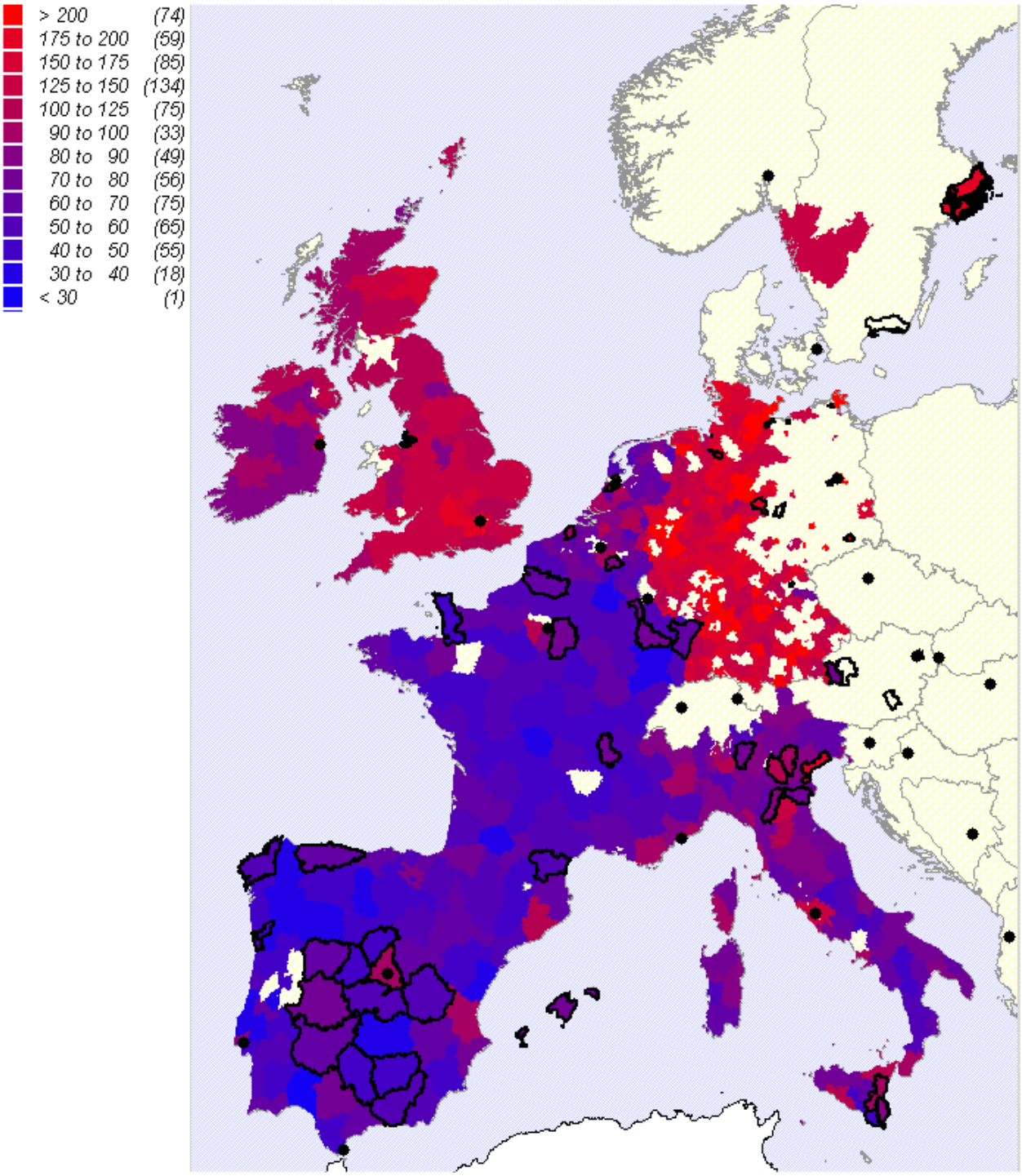
The variables used in **Map 3 and Map 4** can be seen as proxies for tourism-specialization, while the belonging to the WHC (World Heritage Cities, also highlighted in the maps) was selected as proxy for *cultural tourism specialization* in the econometric exercise). A normalization of the number of beds in hotels to the surface of the region ([bed/km^2]), is considered more relevant, for considerations on *cultural urban tourism*, than a normalization on population ([bed/capita]), as urban areas tend to be characterized by high population densities. In particular, from Map 3b and 4b, it visually emerges that WHC regions, in the decade 1991-2001, had faster growing rates than average (i.e., WHC regions tend to be highlighted in red on those maps).



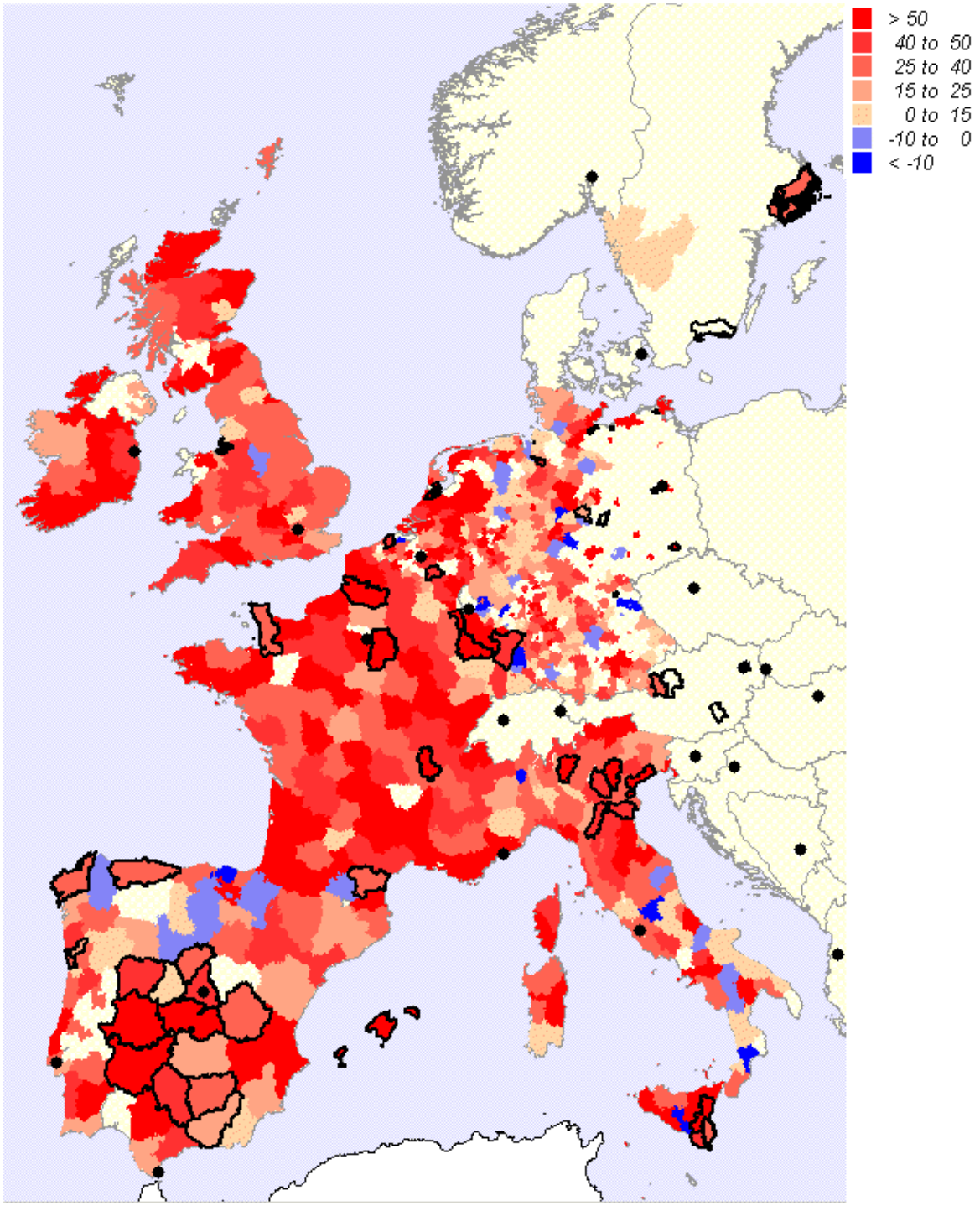
Map 1a: GDP/capita [€] – reference year 2001



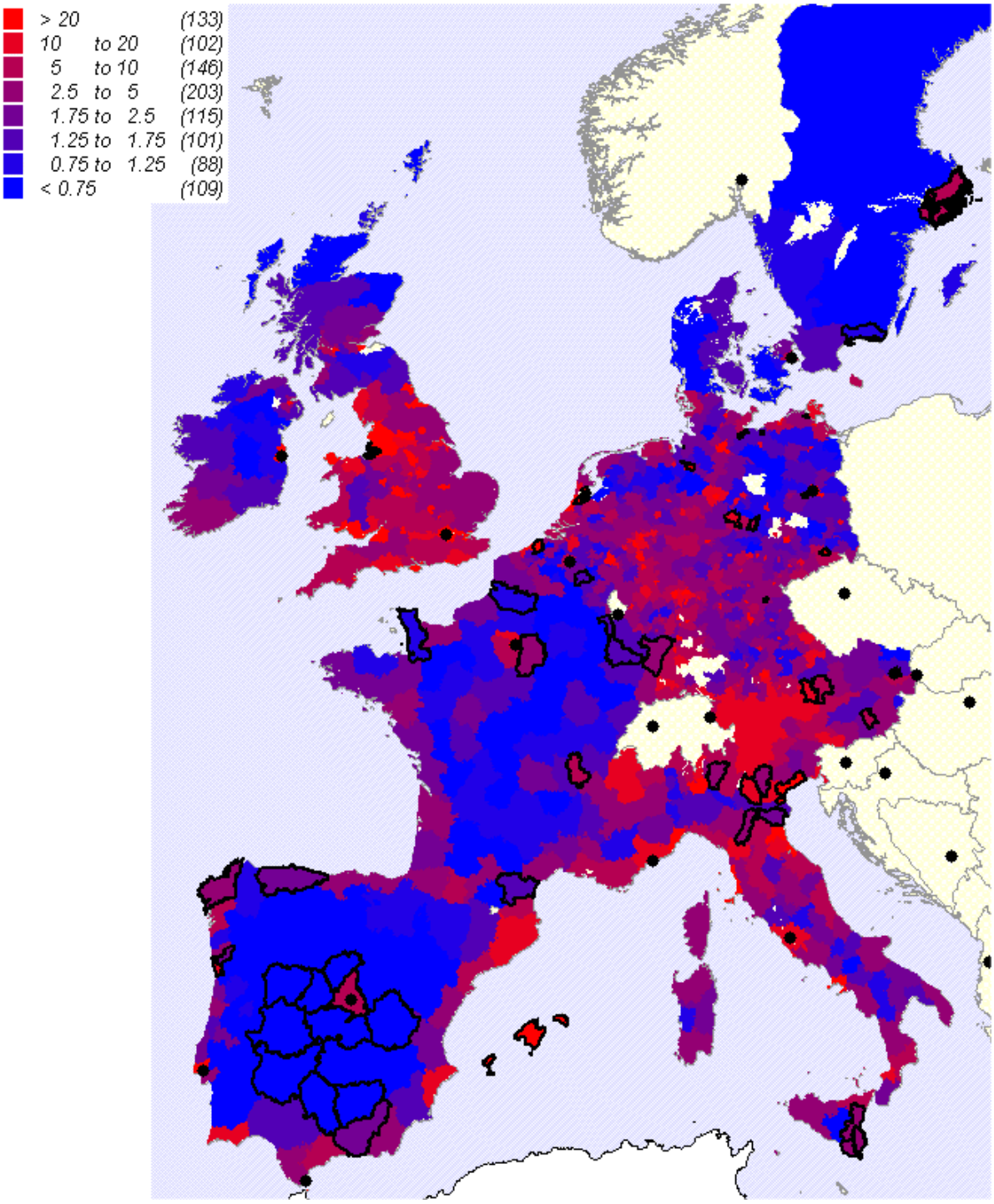
Map 1b: percentage variation (from 1991 to 2001) in GDP/capita [€]



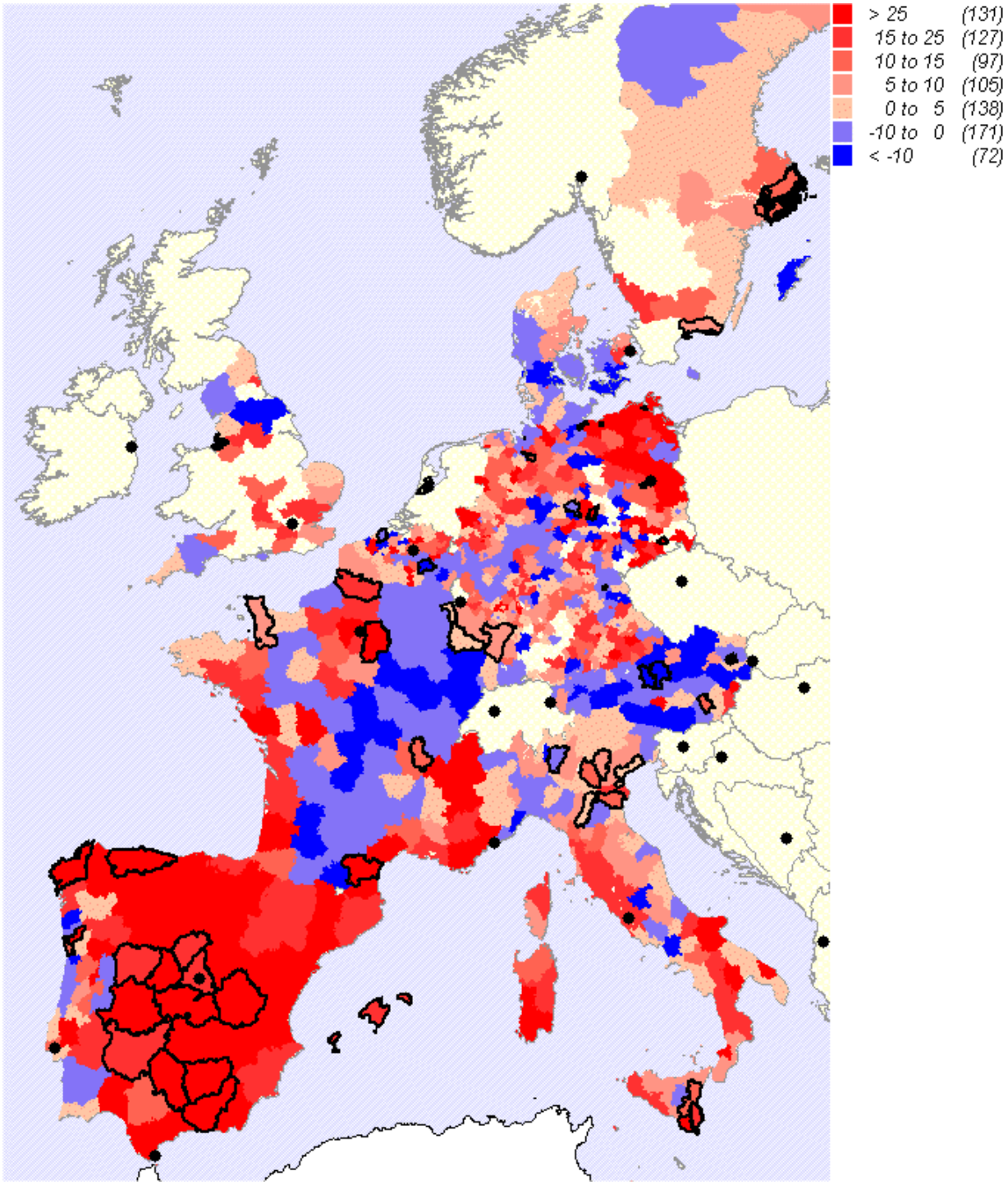
Map 2a: average price for a night in hotel [€/night]– (estimated from the 'Michelin Guide', *outliers* excluded) – reference year 2001



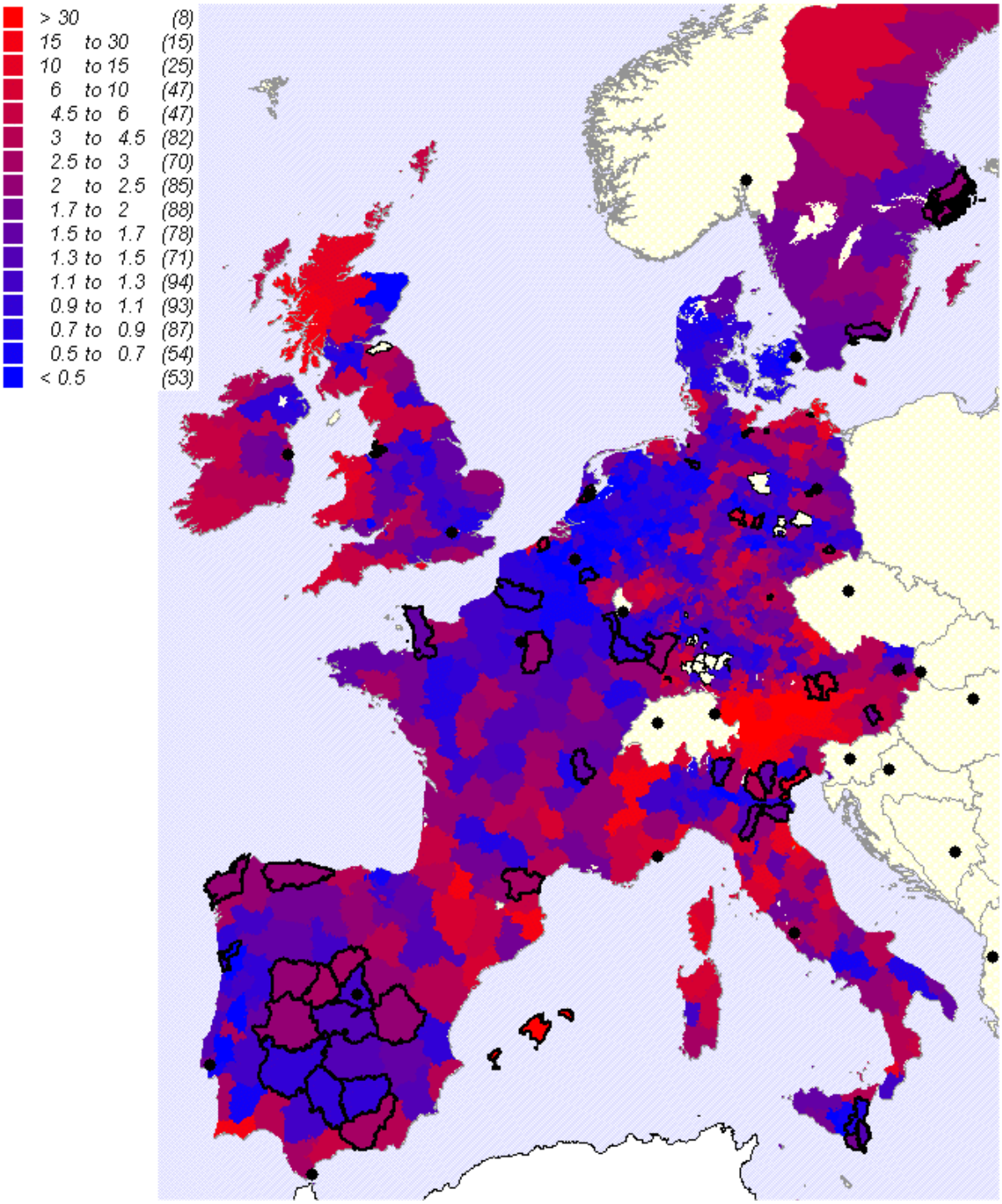
Map 2b: percentage variation (from 1991 to 2001) in average price for a night in hotel [€/night] – (estimated from the 'Michelin Guide', *outliers* excluded)



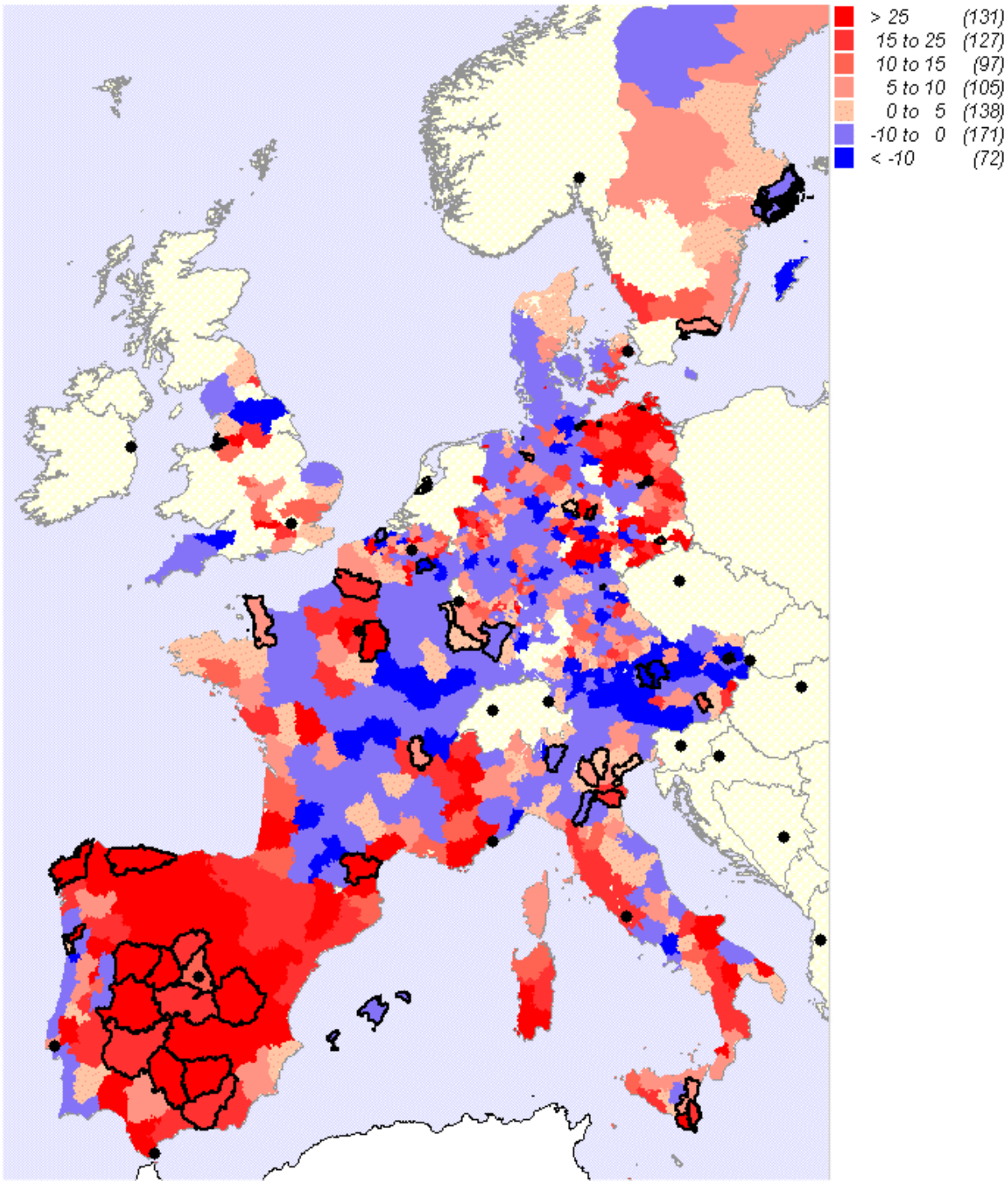
Map 3a: density of beds in hotel [bed/km^2] – reference year 2001



Map 3b: percentage variation (from 1991 to 2001) in density of beds in hotel [bed/km^2]



Map 4a: density of beds in hotel [bed/capita] – reference year 2001



Map 4b: percentage variation (from 1991 to 2001) in density of beds in hotel [bed/capita]

4 The econometric exercise

4.1 Introduction

A pan-European econometric exercise has been carried out to allow the empirical assessment of the theoretically expected dynamic effects of tourism specialisation on local income and prices (see previous Chapter). This section discusses the main findings.

The exercise is carried out in two steps.

In a first step, panel data techniques are used to explain regional *level* differentials in income and local prices in terms of local (cultural) amenities and the relative tourism specialisation of the regions (plus the standard set of control variables normally used in literature). Results are interpreted in terms of the Roback (1982) identification procedure. Differences in *levels* of income and price tend to reflect structural differences in a very long-term perspective and the assumption of perfect labour mobility is not unrealistic.

In a second step, growth regressions are estimated to explain regional *growth* differentials in income and prices. Results are interpreted in terms of the Copeland (1991) and Lanza and Pigliaru (2000) models. Differences in *growth* of income and price tend to reflect structural differences in a shorter term perspective; the assumption of no labour mobility seems more realistic (particularly in the European setting).

Equations are estimated across NUTS 3 regions in 11 EU countries (Austria, Belgium, Denmark, France, Ireland, Italy, the Netherlands, Portugal, Spain, Sweden and the United Kingdom) using two time periods: 1991 (or alternatively 1990) and 2001 (or alternatively 2000).

GDP and population data are from the Eurostat REGIO database. Restaurant prices have been extracted from the Michelin Guide for 1991 and 2001 using the average prices across the quoted restaurants. Local (cultural) amenities are proxied by a variable taking value 1 if the city is a World Heritage City (WHC henceforth) and 0 otherwise; tourism specialisation is measured by the number of beds in hotel per capita. The specialisation in cultural tourism is captured with a term interacting the WHC dummy with the tourism specialisation variable. This is the result of a selection procedure involving all variables described in Section 3.1.

A complete description of the database is provided in Section 3.

4.2 The results

Table 6 and Table 7 report the results of the **level regressions** respectively for income and local prices.

In order to clear the results for time-specific and region-specific effects not accounted for by control variables, NUTS 2 regional and a time fixed effects are introduced. With respect to the introduction of NUTS 3 fixed effects, the use of NUTS 2 dummy variables

allows to maintain some of the spatial dimension of the variation of variables. Because of the relatively low quality of the data concerning human capital, we report the results of all regressions with and without the share of population with University degree or more.

*Regression 1 and 2*report the results of the regressions using only the control variables. The results are consistent with most of findings in literature. Agriculture specialisation has a negative impact on income and prices. Following Roback (1982) this can be interpreted as a negative productivity effect of agricultural specialisation. Higher density regions show both higher income and prices (positive productivity effect). Unemployment has a negative effect on income and not significant impact on prices. As expected, the innovative capacity of the region (patents application per head) and the quality of human capital (share of population with at least a University degree) have a positive impact on income. The surprisingly negative (but weak and not always significant) effects on prices need further investigation.

Regression 3 and 4 assess the consequences on local income and prices of being a WHC. To this end, a dummy variable taking value 1 for WHC and 0 otherwise was included. Results indicate that being a WHC has no impact on income and a positive impact on prices. In the context of the Roback (1982) model, it can be interpreted as a positive effect on the quality of life.

	Reg1[(1)]	**Reg2[(1)]**	**Reg3[(1)]**	**Reg4[(1)]**	**Reg5[(1)]**	**Reg6[(1)]**	**Reg7[(1)]**	**Reg8[(1)]**
Explanatory variables	Coeff.[(2)]	Coeff.[(2)]	Coeff.[(2)]	Coeff.[(2)]	Coeff.[(2)]	Coeff.[(2)]	Coeff.[(2)]	Coeff.[(2)]
Share of people aged 40-64	-1.560*** (0.366)	-1.581*** (0.449)	-1.602*** (0.366)	-1.575*** (0.450)	-1.639*** (0.352)	-1.930*** (0.428)	-1.683*** (0.350)	-1.940*** (0.426)
Share of agriculture in GVA	-0.859*** (0.158)	-0.711*** (0.187)	-0.856*** (0.158)	-0.710*** (0.187)	-0.733*** (0.154)	-0.524*** (0.179)	-0.732*** (0.153)	-.0537*** (0.178)
Density of population	0.082*** (0.009)	0.075*** (0.011)	0.080*** (0.009)	0.075*** (0.011)	0.087*** (0.008)	0.084*** (0.010)	0.085*** (0.008)	0.082*** (0.010)
Unemployment rate	-0.021*** (0.002)	-0.024*** (0.002)	-0.020*** (0.002)	-0.024*** (0.002)	-0.019*** (0.002)	-0.021*** (0.002)	-0.018*** (0.002)	-0.021*** (0.002)
Market potential	-0.042 (0.059)	0.040 (0.070)	-0.036 (0.059)	0.042 (0.071)	-0.032 (0.056)	0.071 (0.068)	-0.021 (0.056)	0.080 (0.068)
Patents applications per head	0.531*** (0.094)	0.301** (0.130)	0.531*** (0.094)	0.305** (0.130)	0.619*** (0.099)	0.246** (0.122)	0.609*** (0.099)	0.262** (0.122)
Share of people with University degree or more		0.011*** (0.002)		0.011*** (0.002)		0.013*** (0.002)		0.012*** (0.002)
World Heritage City (WHC) dummy			0.029 (0.019)	0.007 (0.022)				
Number of beds in hotel rooms per head					0.411*** (0.147)	0.700*** (0.266)	0.367*** (0.147)	0.600** (0.268)
Number of beds in hotel rooms per head WHC*							1.429*** (0.470)	1.506** (0.665)
Constant	10.461*** (0.549)	12.153*** (0.620)	10.415*** (0.549)	12.125*** (0.626)	10.329*** (0.527)	9.293*** (0.712)	10.257*** (0.524)	9.262*** (0.709)
Observations	820	582	820	582	776	573	776	573
R^2	0.9977	0.9973	0.9977	0.9973	0.9980	0.9976	0.9980	0.9976

Table 6: level regressions - GPD per head

Notes:
*** = significant at 1%; ** = significant at 5%; * =significant at 10%;
(1): robust regressions with region fixed effects;
(2): standard errors in parenthesis.

Regression 5 and 6 deal with the consequences of tourism specialisation. To this end we include a variable for tourism specialisation (number of beds in hotel rooms per head)

and in *Regression 7 and 8* we interact it with the WHC dummy (measuring the effect of being both WHC and specialised in tourism). Results indicate that tourism specialisation has a positive impact on income and prices and that these effects are stronger in World Heritage Cities. In the context of the Roback (1982) model, it can be interpreted as a positive effect of tourism specialisation (and particularly of cultural tourism) on the average productivity level of the region.

	Reg1[(1)]	**Reg2[(1)]**	**Reg3[(1)]**	**Reg4[(1)]**	**Reg5[(1)]**	**Reg6[(1)]**	**Reg7[(1)]**	**Reg8[(1)]**
Explanatory variables	Coeff.[(2)]	Coeff.[(2)]	Coeff.[(2)]	Coeff.[(2)]	Coeff.[(2)]	Coeff.[(2)]	Coeff.[(2)]	Coeff.[(2)]
Share of people aged 40-64	-1.392*** (0.477)	1.026* (0.618)	-1.373*** (0.476)	1.065* (0.617)	-1.548*** (0.504)	0.981 (0.645)	-1.565*** (0.500)	0.975 (0.639)
Share of agriculture in GVA	-0.140 (0.186)	0.054 (0.213)	-0.156*** (0.186)	0.041 (0.212)	-0.132 (0.198)	0.065 (0.222)	-0.166 (0.196)	0.017 (0.221)
Total Population	0.016 (0.015)	0.027 (0.019)	0.011 (0.015)	0.022 (0.019)	0.020 (0.016)	0.027 (0.020)	0.013 (0.016)	0.022 (0.019)
Density of population	0.032*** (0.012)	0.039*** (0.015)	0.031*** (0.012)	0.039*** (0.015)	0.034*** (0.012)	0.042*** (0.016)	0.032*** (0.012)	0.042*** (0.015)
Unemployment rate	-0.000 (0 .002)	-0.001 (0.003)	-0.000 (0.002)	-0.000 (0.003)	0.000 (0.002)	-0.001 (0.003)	0.001 (0.002)	-0.000 (0.003)
Market potential	-0.005 (0.071)	0.139 (0.086)	0.002 (0.071)	0.153* (0.086)	-0.004 (0.074)	0.140 (0.089)	0.009 (0.073)	0.160* (0.089)
Patents applications per head	-0.219* (0.120)	-0.120 (0.184)	-0.214* (0.119)	-0.086 (0.184)	-0.266* (0.142)	-0.144 (0.188)	-0.269** (0.141)	-0.088 (0.188)
Share of people with University degree or more		-0.005* (0 .003)		-0.006* (0.003)		-0.005 (0.003)		-0.007** (0.003)
World Heritage City (WHC) dummy			0.041* (0.022)	0.045* (0.025)				
Number of beds in hotel rooms per head					0.138 (0.222)	0.171 (0.329)	0.002 (0.224)	-0.009 (0.332)
Number of beds in hotel rooms per head WHC*							1.985*** (0.602)	2.248*** (0.788)
Constant	6.577*** (0.662)	1.397 (0.933)	6.573*** (0.661)	1.341 (0.931)	6.552*** (0.693)	1.340 (0.976)	6.539*** (0.687)	1.317 (0.967)
Observations	710	514	710	514	668	506	668	506
R^2	0.9977	0.9974	0.9977	0.9975	0.9976	0.9974	0.9976	0.9974

Table 7: level regressions - prices in restaurants

Notes:
*** = significant at 1%; ** = significant at 5%; * =significant at 10%;
(1): robust regressions with region fixed effects;
(2): standard errors in parenthesis.

Table 8 and Table 9 report the results from the **growth regressions**.

In order to clear the results for country-specific effects not accounted for by control variables, country fixed effects are introduced. With respect to the previous exercise, the endogeny problems are reduced, but regressions capture only shorter term dynamics.

Regression 1 and 2 report the results of the regressions using only the control variables. The results are consistent with findings in literature. There is a strong convergence effect in both income and prices (the coefficient on the value of the dependent variable at the beginning of the period has a significant negative effect). The share of agriculture has a negative impact and the density of population a positive impact on both income and price growth (as in the level regressions). Market potential variable and the human capital variable have a positive effect on income (consistent with theoretical expectations and previous empirical findings). The negative impact of human capital on prices is consistent

with the level regressions but needs further investigation (the quality of data is relatively low and this may hamper the reliability of results).

Regression 3 and 4 introduce the tourism specialisation dummy and *Regression 5 and 6* also include the interaction term. The results are consistent with Copeland (1991): tourism specialisation has a positive impact on local prices and a much smaller impact on income growth.

	Reg1[3]	**Reg2**[3]	**Reg3**[3]	**Reg4**[3]	**Reg5**[3]	**Reg6**[3]	**Reg7**[3]	**Reg8**[3]
Explanatory variables	Coeff.[2]	Coeff.[2]	Coeff.[2]	Coeff.[2]	Coeff.[2]	Coeff.[2]	Coeff.[2]	Coeff.[2]
Starting level	-0.021*** (0.004)	-0.026*** (0.005)	-0.022*** (0.004)	-0.026*** (0.005)	-0.009*** (0.002)	-0.012*** (0.002)	-0.009*** (0.002)	-0.012*** (0.002)
Share of people aged 40-64 at time a	0.094*** (0.030)	0.097*** (0.032)	0.095*** (0.030)	0.097*** (0.032)	0.058** (0.029)	0.057** (0.029)	0.058** (0.029)	0.056** (0.029)
Density of population at time a	0.002*** (0.000)	0.001*** (0.000)	0.002*** (0.000)	0.001** (0.000)	0.000** (0.000)	0.000 (0.000)	0.000* (0.000)	0.000 (0.000)
Market potential at time a	0.005*** (0.002)	0.006*** (0.002)	0.005*** (0.002)	0.006*** (0.002)	0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.001)	0.005*** (0.001)
Share of people with University degree or more		0.001*** (0.000)		0.001*** (0.000)		0.000*** (0.000)		0.000*** (0.000)
World Heritage City (WHC) dummy			0.000 (0.001)	0.000 (0.001)				
Number of beds in hotel rooms per head					-0.004 (0.005)	-0.003 (0.005)	-0.005 (0.005)	-0.004 (0.005)
Number of beds in hotel rooms per head WHC*							0.015 (0.013)	0.015 (0.011)
Constant	0.208*** (0.033)	0.400*** (0.076)	0.209*** (0.033)	0.400*** (0.076)	0.071*** (0.018)	0.088*** (0.005)	0.071*** (0.018)	0.089*** (0.018)
Observations	516	470	516	470	412	412	412	412
R^2	0.6165	0.6367	0.6167	0.6367	0.7446	0.7496	0.7451	0.7501

Table 8: growth regressions - GDP per head

Notes:
*** = significant at 1%; ** = significant at 5%; * =significant at 10%;
(3): robust regressions with country fixed effects;
(2): standard errors in parenthesis.

	Reg1[3]	**Reg2**[3]	**Reg3**[3]	**Reg4**[3]	**Reg5**[3]	**Reg6**[3]	**Reg7**[3]	**Reg8**[3]
Explanatory variables	Coeff.[2]	Coeff.[2]	Coeff.[2]	Coeff.[2]	Coeff.[2]	Coeff.[2]	Coeff.[2]	Coeff.[2]
Starting level	-0.073*** (0.004)	-0.072*** (0.004)	-0.074*** (0.004)	-0.072*** (0.004)	-0.077*** (0.004)	-0.075*** (0.004)	-0.077*** (0.004)	-0.075*** (0.004)
Share of people aged 40-64 at time a	0.145*** (0.048)	0.148*** (0.048)	0.147*** (0.048)	0.151*** (0.049)	0.154*** (0.047)	0.180*** (0.048)	0.155*** (0.047)	0.181*** (0.047)
Share of agriculture in GVA at time a	-0.032*** (0.018)	-0.034*** (0.011)	-0.032*** (0.010)	-0.033*** (0.011)	-0.023* (0.012)	-0.025** (0.012)	-0.023* (0.012)	-0.024** (0.012)
Density of population at time a	0.001 (0.000)	0.001** (0.000)	0.001 (0.000)	0.001** (0.000)	0.001 (0.001)	0.003*** (0.001)	0.001 (0.001)	0.003*** (0.001)
Market potential at time a	-0.000 (0.002)	0.000 (0.003)	-0.000 (0.002)	0.000 (0.002)	0.002 (0.003)	0.002 (0.003)	0.002 (0.003)	0.003 (0.003)
Share of people with University degree or more		-0.000*** (0.000)		-0.001** (0.000)		-0.001*** (0.000)		-0.001*** (0.000)
World Heritage City (WHC) dummy			0.001 (0.001)	0.002 (0.001)				
Number of beds in hotel rooms per head					0.027** (0.013)	0.029** (0.014)	0.024* (0.014)	0.025* (0.014)
Number of beds in hotel rooms per head WHC*							0.014 (0.046)	0.019 (0.052)
Constant	0.226*** (0.029)	0.776*** (0.055)	0.225*** (0.029)	0.776*** (0.054)	0.175*** (0.036)	0.162*** (0.034)	0.174*** (0.036)	0.161*** (0.034)
Observations	414	378	414	378	330	330	330	330
R^2	0.6494	0.6428	0.6499	0.6438	0.6520	0.6704	0.6521	0.6707

Table 9: growth regressions - prices in restaurants

Notes:
*** = significant at 1%; ** = significant at 5%; * =significant at 10%;
(3): robust regressions with country fixed effects;
(2): standard errors in parenthesis.

5 Conclusions

Theory tends to show that, finally, the benefits of tourism are capitalised in higher prices of non-tradable sectors (hotels, restaurants, houses, prices of locally produced goods) and that they finally accrue to the immobile factors (e.g., land) employed in the non-tradable sector (which is able to charge higher prices).

Consequently, the above effects imply that there is a distributional issue, as tourism would lead to a contraction of the traded sector (e.g., manufacturing) and to a decrease of real returns to all the other factors.

This structural change induced in the economy may eventually affect its capability to grow in the long run. The crucial question is whether a region relatively specialised in tourism will grow slower or faster than, for example, regions specialised in knowledge-intensive industries. Theoretically, the answer depends on the long-run dynamics of prices of tourist goods compared to, for example, knowledge-intensive goods.

A series of regressions have been evaluated with the objective of explaining both regional levels and growth differentials in prices and income (see Section 4.1). The results tend to indicate that:

- being a World Heritage City implies a higher quality of life, which is reflected in higher *level* of local prices;
- tourism specialisation has a positive impact on the *level* of both income and prices, suggesting a positive effect of tourism on productivity;
- this effect is stronger in World Heritage Cities suggesting that cultural tourism has a stronger impact on local economies than other types of tourism;
- in the shorter term, tourism specialisation seems to have a positive effect on the *growth* of prices, but not on income growth.

Although we consider these results quite suggestive and interesting, they need to be taken with caution. Future work is still needed in order to:

- further test the robustness of results, particularly with respect to different specifications of the basic equation;
- test for the direction of causality (in particular for regressions specified in levels);
- improve our understanding of the interpretation of results, with a stronger link between theory and empirical applications.

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(lxxxi) This paper was presented at the EAERE-FEEM-VIU Summer School on "Computable General Equilibrium Modeling in Environmental and Resource Economics", held in Venice from June 25th to July 1st, 2006 and supported by the Marie Curie Series of Conferences "European Summer School in Resource and Environmental Economics".
(lxxxii) This paper was presented at the Workshop on “Climate Mitigation Measures in the Agro-Forestry Sector and Biodiversity Futures”, Trieste, 16-17 October 2006 and jointly organised by The Ecological and Environmental Economics - EEE Programme, The Abdus Salam International Centre for Theoretical Physics - ICTP, UNESCO Man and the Biosphere Programme - MAB, and The International Institute for Applied Systems Analysis - IIASA.
(lxxxiii) This paper was presented at the 12th Coalition Theory Network Workshop organised by the Center for Operation Research and Econometrics (CORE) of the Université Catholique de Louvain, held in Louvain-la-Neuve, Belgium on 18-20 January 2007.

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