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Do Economic Crises Lead Tourists to Closer Destinations? An Analysis of Italy's Regional Data

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Abstract

This article investigates whether the distance between origin and destination has played an increased role in shaping Italy's domestic tourism flows during the recent years of economic recession. Indeed, the occurrence of closer tourism destinations, as a consequence of the economic crisis, has been recently suggested by a number of authors who obtain their results from micro-data and, more specifically, from surveys. Differently, we study this issue through aggregate official data. Our dataset is made of inter-regional tourism flows among Italian regions over the 2000-12 period; across this period, 2008 to 2012 are years of economic recession. The analytical tool employed is a gravity model. Our results document that distance played a more and more relevant role during the recession.

JEL-Code: L830, R120, C290.

Keywords: tourism, gravity mode, regions, distance, great recession.

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Do economic crises lead tourists to closer destinations?
An analysis of Italy's regional data.

1. Introduction

Some research works suggest that tourists have reacted to the recent economic crisis by reducing the distance of their holiday journeys. Eugenio-Martin and Compos-Sorias (2014) make this point very clear: they analyze the answers delivered by a large sample of European tourists, and the people who affirm that they made budget reduction on holidays emerge to be characterized by the choice of closer tourism destinations. Bronner and De Hoog (2012) make the same point with reference to Dutch families. The choice for shorter-distance holidays as a consequence of the economic crisis is reported, more or less explicitly, in other scientific papers, research reports and official documents on recent trends in tourism (e.g., Papatherou et al., 2010; Demunter and Dimitrakopoulos, 2010; Alegre and Sard, 2015; Olive Research, 2009; EC, 2013). In all these, the conclusion about closer destinations is achieved through surveys.

In this study, we aim to evaluate whether such evidence emerges from official data as well. To this end, we use official aggregate data on regional tourism flows within Italy, in order to study whether distance –with its expected negative impact– has gained weight in shaping tourism flows over the years of the so-called Great recession, that is, the years following the 2007-08 financial and economic shock. The analytical tool used is a gravity model. The present study streams into that branch of the tourism economics literature, which analyzes the effects of recessionary shocks on tourism, and more specifically on tourism demand. It also inscribes into the literature dealing with the effect of distance in shaping tourists' choice.

Based on bilateral domestic tourist arrivals in Italian regions over the 2000-2012 period, we do find evidence supporting a deeper effect of distance over the years of the Great recession (2008-12). Thus, even on the basis of official aggregate data, tourists (at least, domestic Italian tourists) seem to have chosen closer holiday destinations in front of the recent severe economic crisis. We will discuss whether such behavior is linked to travel cost only, or alternative explanations are possible as well.

2. The role of distance and the effect of the economic crisis on inter-regional tourism flows

The distance of destination is a relevant feature in tourism. Distance has a psychological, social and cultural dimension, beyond the spatial dimension. In principle, distance can be perceived as a positive or negative attribute of holiday, depending on consumer preferences and specific circumstances. Distance entails of course costs of monetary, physical and time nature, but can provide consumers with benefits. All this said, distance between origin and destination is generally expected to have a negative sign on the size of tourism flow: this has emerged in previous analyses (with different objectives) concerning different periods of time and different geographical areas. This point is the objective of our analysis; in particular, we aims to assess whether or not the negative impact of distance has increased during the years of economic recession. Our analysis is developed using bilateral tourism flows between the twenty Italian regions (Nuts 2), and specifically yearly data on arrivals over the (13 year) 2000-2012 period.

If distance has gained weight in the decision concerning the tourist destination, one can conclude that tourists reacted to the crisis by shortening the distance of their tourism journeys. Then, a further point of discussion regards the reason why tourists choose closer destinations in a time of crisis. As for this, it has been suggested that closer destinations mean lower travel cost in monetary, physical and temporal terms. At the same time, closer destinations imply also a smaller effort to acquire information on the destination and, in general, less stress for the holiday organization –which could be a meaningful motivation in times of economic crisis.

In order to fully understand the findings, it is worth mentioning the state-of-the-art in three economic research lines that are linked to our points; they concern: a) the effect of economic crisis on tourism; b) the gravity models in tourism; c) the characteristics and the evolution of the Italian tourism industry.

Tourism reaction to recessionary shocks and to the recent Great recession

Interest in the tourism reaction to economic crises has flourished as a consequence of the world's economic recession in 2009. Just that year, the world's per capita GDP decreased by about 3.4%; the GDP contraction was even worse in several Western countries and it has lasted more than one year. As for the tourism industry, tourist arrivals in the world declined by about 3.8% in 2009, while tourism receipts are estimated to have declined by 9.4% (UN WTO, 2011).

The following years made register a recovery at the world level, but the crisis has lasted in a number of countries affected by prolonged recession.

Given these negative figures, it is not surprising that a large attention has been devoted to what happened to the tourism industry as a whole, and in specific case studies. A wide set of recent articles deal with the changes of consumer behavior, and the reaction of countries and specific destinations to the recent economic contraction. Just to list the most relevant ones, Smeral (2010) proposes an analysis at the world level, Richtie et al. (2010) analyze the North-American tourism markets, Song and Lin (2010) and Song et al. (2011) focus on Asia, Browne and Moore (2012) and Page et al. (2012) deal with consumer preference changes in the UK, Barros and Machado (2010) with tourism flows toward specific Spanish destinations, Bronner and De Hoog (2012) provides an analysis on Dutch families.

On the whole, this literature vein suggests that countries were hit in different ways by the economic crisis. In some destination countries, like Mexico, the global economic crisis had limited effect when compared to previous (and of different nature) shocks. Asian countries experimented a contraction of tourism flows for a limited period of time around the most severe peak of economic contraction. Differently, the effect seems to have been deeper in developed countries. When considering developed countries, core European countries represent mature destination where domestic (intra-Europe) tourism plays the largest role.

Among all these contributions, Eugenio-Martin and Campos-Sorias's analysis (2014) has inspired the present study. They analyze the answers of the wide sample of European tourists considered by the survey "Attitudes of Europeans toward Tourism" conducted by the EU in 2009 (Flash Eurobarometer 218). In particular, they are interested in evaluating the decision on tourism expenditure cutback made by European households.[1]

The elasticity of tourism demand to aggregate income seems to be asymmetric in case of an increase or decrease of income. Tourism (international tourism in particular) appears to be a luxury good when income increases (i.e., with demand elasticity to income larger than 1), while the contraction of demand is much less elastic when income shrinks.[2] Consumers appear to

[1] They also offer a review on studies on tourism contractions due to natural, socio-political and economic shocks and develop interesting considerations on the comparative effects.

[2] A very large literature about the nature of tourism goods is available. In front of income variation, one can consider how participation in the tourism market changes (that is, how much income-sensitive tourists' decisions are), or how tourists' expenditures vary, or how arrivals or stays change. Generally speaking, domestic tourism appears to be less income-sensitive than international tourism (Garin-Munez, 2009; Bernini and Cracolici, 2014); income elasticity is decreasing with the income level (Bigano et al. 2006). The point that the income (and price) elasticity of tourism demand can be different under different economic conditions is suggested in some analyses; for instance, the recent study of

select specific ways to cut back on tourism expenditure when income decreases. By applying the labels proposed by Bronner and De Hoog (2012), tourism expenditures can be cut through *pruning strategies,* that is giving up the holiday altogether, or *cheese-slicing strategies,* that is economizing on specific attributes or aspects of a holiday. The latter appears to be the way chosen by the largest part of tourists; see Barros and Machado (2010), Song et al. (2011) and Cellini and Cuccia (2014). Shorter stays, cheaper accommodation, cheaper transportation means, out-of-season holiday, smart time for reservation (with large advance or last-minute) are possible ways to reduce the cost of a holiday. As for closer destinations, Eugenio-Martin and Campos-Sorias (2014) underline that the tourists who state that they made budget cutbacks on tourism are more likely to have spent their holiday closer to home: this suggest that tourists chose closer destinations to reduce their expenditures over the years of Great recession. This point is at the heart of our present research: we aim to check whether such structural change in the consumers/tourists' behavior emerges also from official aggregate data, rather than just from tourists' self-statements in survey interviews. We will test the hypothesis by resorting to a gravity model.

Gravity models in tourism economics

Gravity models were first employed in trade economics to study how distance between countries affects bilateral trade flows. Tinbergen (1962) is usually regarded as the first contribution where a gravity model is used for economic analysis.[3] The name comes from the idea that the amount of bilateral flows (of trade, migration, tourism, etc.) depends directly upon the size of the two entities involved (source and destination of the flow), and inversely upon their geographical distance. To wit, the bilateral flow between countries (or regions, or cities) i and j, X_{ij} , obeys to a basic law such as:

$$X_{ij} = h \frac{S_i^{\alpha} S_j^{\beta}}{D_{ij}^{\delta}}$$

Smeral and Song (2013). Moreover, it goes without saying that different tourism types are characterized by different income elasticity. For instance, cultural tourism is deemed to be less income elastic than sea-tourism; with regard to Italy's outbound tourism demand, Cortes-Jimenes (2009) finds that different income elasticity coefficients apply to different European countries as tourism destinations. See also Candela and Figini (2012).

[3] In his review on gravity models, Anderson (2011) proposes Ravenstein (1885) as the first analysis employing gravity equation for the study of migration flows. Wider critical reviews can be found in Haynes and Fortherhingham (1984), and Sen and Smith (1995).

where h is a constant, S_i and S_j account for the dimensional characteristics of country/region i and j (like their population or GDP), and D_{ij} is the distance between i and j. For a review on gravity models used in trade economics, see Cafiso (2007).

In more structured models, S_i and S_j may be vectors and contain push- and pull- factors, so that some variables have a positive impact on bilateral flows while others may have a negative impact. If the time dimension is available in the analysis (so that the dataset is a panel), some variables may vary not only across countries/regions, but also over time. Also spatial dependence has been taken into account by more recent analyses: the characteristics of neighboring countries/regions (for both the origin and the destination) are considered to explain the bilateral flows and the neighbors' influence. These gravity models may include an explicit consideration of spatial autoregressive components: in such a case, they are sometimes labeled as '*origin-destination*' models (La Sage and Pace, 2008).

The use of gravity models in tourism economics is well-established as well. Indeed, tourism can be seen as a form of trade, and tourism flows correspond to traded services. From a different perspective, tourism can also be considered as a peculiar form of migration. Thus, it is not surprising that gravity models have been largely used to study tourism flows. Among the many studies which employ gravity models in tourism, Armstrong (1972), Gordon and Edwards (1973), Crampon and Tan (1973), Malamud (1973), Durden and Silberman (1975), McAllister and Klett (1976), Swart et al. (1978) are pioneer analyses.

Arrivals, overnight stays or receipts from tourism are the most commonly-used variables for the analysis (Fotheringham, 1983; Eilat and Einav, 2004). Reviews on gravity models in tourism are in Uysal and Crompton (1985) and, more recently, in Khadaroo and Seetanah (2008), Patuelli et al. (2013, 2014), and Morley et al. (2014), who also provide a theoretical microeconomic background to gravity equation for tourism demand. As for the control variables, the list is remarkably long. Indeed, along with country/region size and distance, it includes: economic variables (like aggregate or per-capita consumption, employment, investment, relative prices, exchange rates, labor-factor endowments, transport infrastructures and other material and immaterial facilities); natural and environmental endowments (like natural resources or climate); cultural variables (like heritage, supply of live performances and temporary events); social, political and institutional variables (like crime rates and public safety, or variables linked to individual freedom); etc.

These are the same variables used also in *destination choice* models; these models study the choice concerning possible destinations by part of tourists starting from a given place, or the choice of tourists arriving at a given place from different origins. In this branch of literature, distance matters along with individual characteristics, and physical, social and economic variables. However, there is no unanimous consensus on the sign of distance in destination choice models: distance can be a deterrent or an attraction factor, depending on the specific destination under scrutiny (see, e.g., the short review provided by Nicolau and Mas, 2006, p. 986). Differently, when gravity models are used to analyze the bilateral tourism flows within a set of geographical areas, distance always emerges as a significant, negative factor for tourism flows; this result is robust to the consideration of different areas and different periods of time.

As above mentioned, the most recent contributions in tourism economics consider spill-over spatial effects as well: not only the characteristics of the origin and destination, but also the characteristics of neighboring areas matter.[4] The development in spatial econometrics (see La Sage and Pace, 2008) has helped this research line to grow up. We have to mention here some contributions related to our present case study. First, Patuelli et al. (2013, 2014) employ gravity model to study inter-regional flows of tourism in Italy, with a focus on the effect of regional heritage endowment upon tourism flows. They achieve the conclusion that the cultural endowment of the origin and destination regions matter, as well as the endowment of neighboring regions; distance is also significant, with its usual negative sign. Second, Marrocu and Paci (2013) analyze the combined effect of demand and supply factors in shaping inter-province tourism flows in Italy. They also find that spill-over effects from other provinces are relevant; consequently, they conclude that "traditional" gravity models (not including such spill-over effects) might be mis-specified because the characteristics of neighboring areas are disregarded. Lorenzini et al. (2014) achieve similar conclusions. However, all these mentioned analyses do not study the effects of the recent economic recession – which is the point of our present work.

[4] In some cases, only the areas sharing a common border are considered, while in others, all spatial units are considered, with a larger weight attached to the closer ones.

The tourism industry in Italy and its reaction to the Great recession

As far as the consequences of economic crisis on tourism is concerned, Italy is a relevant case to investigate for several reasons. *First*, the tourism sector in Italy is particularly large since it accounts for a share above 10% of the Italian GDP, and a share above 11% of employment (ISTAT, 2014); these figures are larger than the world and European average. Even if this study focuses on domestic tourism, it is appropriate to recall that Italy is the fifth largest tourism destination in the world. Recent analyses on the tourism industry in Italy include Accardo (2012), Massidda and Mattana (2013), Borowiecki and Castiglione (2014), Cuccia et al. (2014), Cellini and Cuccia (2014), just to mention a few.

Second, the recession in Italy has been particularly harsh and prolonged: the whole 2008-12 period can be considered as a long recession (which continued also in 2013 and 14). Italy's real aggregate GDP decreased by around 8% between 2008 and 2012; investments dropped by around 15%, employment rate decreased by 2 percentage points.

In front of these impressive pattern of macroeconomic variables, one can observe that the Italian tourist sector has been hit at a limited extent with respect to other economic sectors. For instance, Cellini and Cuccia (2014) provide a point estimation of -2.5% concerning the percentage variation of the (nominal) annual receipts of the hotel sector in 2012 with respect to 2008. A possible explanation may rest on the fact that domestic tourism has been in large part replaced by international tourism. With reference to overnight stays, foreign tourists covered a share of 43% in 2008; during the Great recession, the share of international tourists has been enlarging, up to 48% in 2012.

Just to provide some figures, in Italy the number of domestic arrivals sharply increased over the period 2000 to 2008 (namely, from 44.9 to 53.5 million); this is well-known and it is consistent with the growth of tourism over this period. Such growth stopped in 2008-09, and the number of arrivals remained quite stable (with a slight increase, indeed) over the crisis period 2008-12, when the datum moved from 53.5 to 54.9 million. The overnight stays of domestic Italian tourists have increased from 2000 to 2008 (198.5 to 211.8 million), while they have been decreasing afterwards (to 200.1 million in 2012), though in the presence of (slightly) increasing number of arrivals; of course, this corresponds to a decrease in the average length of stay of domestic tourists.

In fact, shorter stays are observed both in domestic and international tourism, and this tendency has started at the beginning of the 1990s in several countries, including Italy (see, e.g., Barros and Machado, 2010, and Wang et al., 2012, among many others). Then, this is a long-run trend, rather than a consequence of the crisis, and it is global rather than country- specific. All this said, the contraction of the average stay by domestic tourists is relevant over the years of the Great recession, and it regards all destinations within Italy and all accommodation types (see Cellini and Cuccia, 2014, for further details).

As last point, we report that data on Italians going abroad (i.e., outbound tourism from Italy) show that the Italians' demand of international tourism has not been decreasing significantly over the crisis years. Nevertheless, it is true that the large increase in outbound tourism (which has characterized Italians over the 2000-2008 period) stopped in 2008. Italian travelers abroad were estimated to be 43.3 million in 2004 (they were less that 40 million in 2000), 57.3 million in 2008 and 57.9 million in 2012 (in all years between 2008 and 2012, the number has remained stable between 57 and 58 million). Correspondingly, overnights moved from 225.1 million in 2004 to 245.3 in 2008 and 253 in 2012. Receipts were estimated to have increased from € 16.5 million in 2004, to € 20.9 million in 2008, and quite stable over the subsequent years (the estimate for 2012 is equal to 20.5 million).[5] Therefore, we can safely exclude that Italians have significantly substituted international tourism with domestic tourism, during the Great recession years. Domestic and outbound tourism demand do not appear to be closely related, and they have been following rather different patterns during the crisis.

3. An analysis of inter-regional tourism flows in Italy

In this section we study bilateral tourism flows across the twenty (Nuts 2) Italian regions over the 2000-2012 period. The analysis is based on the estimation of gravity models.

Data

We employ yearly data on (domestic) tourist arrivals in each of the 20 Italian regions, from each of the 20 regions. The full origin-destination matrix is used, including all cases of intra-regional flows (when the origin region i is equal to the destination region j). Thus, 400

[5] All these data are provided by ONT (*Osservatorio Nazionale del Turismo*), a government agency that conducts regular surveys on tourism in Italy, jointly with ISTAT (see ONT, 2014). Other sources give different data. For instance, Beccheri and Nuccio (2014) provide a quite different picture, but they consider only leisure and business travels, and combine Italian national data with data from foreign sources. See also Cortes et al. (2009) for an analysis on the outbound Italian tourism demand.

observations per year are available.[6] Tourism flows across regions are obviously affected by the regions' characteristics. Recall that the Italian regions are very different in size: in terms of population they vary from about 300,000 in Valdaosta, to over 9 million in Lombardy. Similar differences regard the regional territory (Sicily, the largest region, is more than 8.3 times larger than Valdaosta), not to say the amount of sea costs (5 regions have no access to the sea, while the others have access ranging from less than 100 to over 1,600 Km). Obviously, these demographic and physical characteristics matter in shaping tourism flows.

The time span available is for the 2000 to 2012 period; thus, the whole sample is formed by $400 \times 13 = 5{,}200$ observations. We have already provide some comments as far as the dimension of (total) domestic arrivals and stays is concerned.

As for the geographical distance between regions, we consider the distance between the region geo-centroids. As for intra-region distance, we consider the squared roots of the regional area divided by π. The matrix of geographic distances is borrowed by Patuelli et al. (2013, 2014). Thus, the smallest distance is associated to intra-regional tourism in Valdaosta, while the longest distance pertains to the pair Friuli VG-Sicily.

The average distance of domestic trips has been increasing in 2000-02, slightly decreasing over the period 2003-08, and sharply decreasing over 2009-12. We checked this through the following MD_y statistics:

$$MD_t = \sum_{i=1}^{N} \left(\frac{A_{ij,t}}{\sum_{j=1}^{N} A_{ij,t}} \times D_{ij} \right)_{i,t} \Big/ N$$

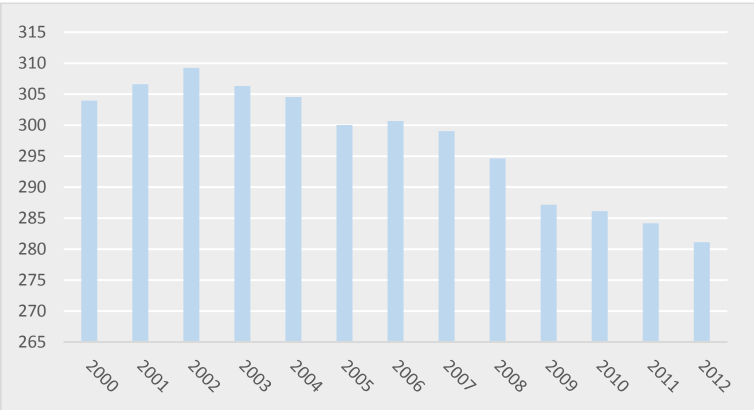
where $A_{ij,t}$ denotes the arrivals of tourists from region i going to region j in year t, D_{ij} is the distance between region i and j, and N=20 is the number of regions available. The values of MD_y are reported in Table 1 and plotted in Figure 1.

[6] The detailed dataset with inter-regional tourism flows in each year under scrutiny is available upon request.

Table 1 – Mean values of travel distance in domestic tourism flows(MD_y)

Year	N	Mean	Sd
2000	20	303.953	73.212
2001	20	306.624	71.848
2002	20	309.239	69.710
2003	20	306.329	69.855
2004	20	304.546	69.076
2005	20	300.024	66.411
2006	20	300.684	69.785
2007	20	299.055	68.705
2008	20	294.634	67.251
2009	20	287.160	71.400
2010	20	286.144	75.022
2011	20	284.163	74.662
2012	20	281.123	73.500
Total	260	297.206	69.801

Figure 1 – Mean values of travel distance in domestic tourism flows (MD_y)



Statistical tests on the equality of such means provide clear-cut results (see Table 2): on the basis of Hotelling's *t*-squared test, the null hypothesis "H0: all mean values equal across the 13 years" is rejected; the test provides t^2=349.28 (with $F_{12,8}$=12.26, and p=.0007). Furthermore, the null that the average is the same as in the first year of the sample (2000) is not rejected until 2007, but it is rejected for each subsequent year (2008 to 2012); see Table 2. In other words, these simple tests on descriptive statistics suggest that the average distance of domestic tourism trips remains the same between 2000 and 2007, while a significant change occurs starting in 2008.

Table 2 – Tests of equality across mean values of travel distance

	Test: mean value in year *y* equal l to the mean value in 2000
2012	t=3.020 (p=0.0070)***
2011	t=2.589 (p=0.0180)**
2010	t=2.382 (p=0.0279)**
2009	t=2.732 (p=0.0132)**
2008	t=2.281 (p=0.0342)**
2007	t=1.265 (p=0.2214)
2006	t=0.781 (p=0.4447)
2005	t=0.897 (p=0.3810)
2004	t=-0.197 (p=0.8462)
2003	t=-0.874 (p=0.8034)
2002	t=-1.799 (p=0.0880)
2001	t=-1.574 (p=0.1321)

Note: tests evaluate the equality of mean values in each year with the mean value in 2000.

Evidence from the gravity model

As already mentioned, the objective of our analysis is to model yearly bilateral tourism flows ($A_{ij,t}$). These can be generally described as $A_{ij,t} = f(\vec{\alpha}, \vec{Y}_{i,t}, \vec{Y}_{j,t}, \vec{D}_{ij,t})$, where $\vec{\alpha}$ is a vector of fixed-effects terms, $\vec{Y}_i$ a vector of origin-specific variables, $\vec{Y}_j$ a vector of destination-specific variables, and $\vec{D}_{ij}$ a vector of pair-specific variables.[7] The previous function gets as follows when a gravity formulation is chosen for *f*:

$$A_{ij,t} = \alpha \frac{\vec{Y}_{i,t}^{\beta} \times \vec{Y}_{j,t}^{\gamma}}{\vec{D}_{ij,t}^{\delta}} . \qquad [1]$$

Gravity models as [1] are commonly log-linearized for the estimation. However, as discussed by Santos Silva and Tenreyro (2006), the OLS estimation of the log-linear form may lead to biased results in case of heteroskedasticity. Santos Silva and Tenreyro (2006) suggest a Poisson-based estimator; for a comparison of results when different estimators are applied, see Cafiso (2011). Most recently, Burger et al. (2009) argue that the solution proposed by Silva and Tenreyro (2006) is vulnerable for problems of over-dispersion and/or excess zero flows. They

[7] Vectors reduce to single variables when only one country/pair-specific characteristic is considered.

propose a modified Poisson fixed-effects estimations (negative binomial). In our analysis, we apply such estimator; thus, the gravity model [1], in accordance to the negative binomial model, formally rewrites as: $A_{ij,t} = \exp(\vec{\alpha} + \beta \cdot \vec{Y}_{i,t} + \gamma \cdot \vec{Y}_{j,t} + \delta \cdot \vec{D}_{ij,t}) + \epsilon_{ij,t}$. [8]

Our interest falls upon the coefficient of bilateral distance –which is, of course, time-invariant ($\vec{D}_{ij,t} \equiv d_{ij}$). We need to check its effect year-by-year in accordance with the scope of our research, then we interact d_{ij} with year dummies and therefore replace d_{ij} with $\sum_{p=2000}^{2012} \varphi_p \cdot d_{ij}$ where $\varphi_p = 1$ if p=t and zero otherwise (t=2000,…,2012). Given the objective, which is to obtain an estimate of the coefficient of distance, the vector of fixed effects $\vec{\alpha}$ is defined as $\vec{\alpha} = \alpha_i + \alpha_j + \alpha_t$ in order to avoid collinearity with d_{ij}. To wit, we include origin-specific, destination-specific and time-specific fixed-effects *à la* Anderson and Van Wincoop (2003); for an intuition behind the inclusion of such fixed effects, see Cafiso (2010).

As for the specification to estimate, the first point is to define the group of variables in $\vec{Y}_{i,t}$ and $\vec{Y}_{j,t}$ which provide the best fit for

$$A_{ij,t} = \exp(\alpha_i + \alpha_j + \alpha_t + \beta \cdot \vec{Y}_{i,t} + \gamma \cdot \vec{Y}_{j,t} + \delta \cdot d_{ij}) + \epsilon_{ij,t} . \qquad [2]$$

We consider both regional population and alternative income measures. As a first investigation, we test different combinations: (A1) regional population and regional GDP at current-prices; (A2) regional population and regional GDP at constant-prices; (A3) regional population and per-capita GDP at current-prices; (A4) only regional GDP at current-prices; (A5) only regional population; (A6) regional population and per-capita GDP at constant-prices. The estimation output is in Table 3.

[8] We have run all the estimations discussed in this paper also by applying OLS and the Poisson Pseudo Maximum Likelihood estimator (Silva and Tenreyro, 2006), we obtain remarkably similar results.

Table 3 – Gravity estimations: unique distance effect

	A1	A2	A3	A4	A5	A6
Origin GDP	-0.535	-0.691	-0.535	-0.816*		-0.691
Destin GDP	-1.206**	-1.010*	-1.206**	-0.623		-1.010
Origin POP	-0.507	-0.267	-1.042*		-0.818	-0.958*
Origin POP	1.166***	1.300**	-0.040		0.504	0.290
Ldist	-0.935***	-0.935***	-0.935***	-0.935***	-0.935***	-0.935***
constant	51.068**	44.587**	51.068**	53.490***	21.860*	44.587**
r2_pseudo	0.114	0.114	0.114	0.114	0.114	0.113
AIC	116436.7	116438.1	116436.7	116441.5	116443.2	116438.1
BIC	116810.4	116811.8	116810.4	116802.1	116803.8	116811.8
N	5,200	5,200	5,200	5,200	5,200	5,200

Note: In all specifications, dummy variables for each year, origin and destination are included.. A1) regional population and regional GDP at current-prices; A2) regional population and regional GDP at constant-prices; A3) regional population and per-capita GDP at current-prices; A4) only regional GDP at current-prices; A5) only regional population; A6) regional population and per-capita GDP at constant-prices. One (two, three) star denotes statistical significance at the 10% (5%, 1%) level.

Regardless of the specific income and population variables considered, distance has a negative and significant effect on bilateral tourism flows in all cases. This outcome is fully consistent with previous, already known evidence. As for income and/or population, their coefficients turn out not significant (or even with a negative sign) in many estimations. This is likely to depend upon the inclusion of the origin and destination fixed-effects. In other words, the size effect is captured by the regional fixed-effect, rather than by income or population variables.[9] Based on Information Criteria (specifically, the BIC) as well as on theoretical reasons, we select A6 as our baseline specification (population along with per capita GDP at constant-prices).

We can now proceed with the estimation of the yearly effect of distance. We therefore replace d_{ij} with $\sum_{p=2000}^{2012} \varphi_p \cdot d_{ij}$ in [2] and estimate the following specification:

$$A_{ij,t} = \exp\left(\alpha_i + \alpha_j + \alpha_t + \beta \cdot \vec{Y}_{i,t} + \gamma \cdot \vec{Y}_{j,t} + \delta_p \cdot \sum_{p=2000}^{2012} \varphi_p \times d_{ij} \right) + e_{ij,t} \,. \qquad [3]$$

Clearly, specification [2] represents the constrained version of [3], under the hypothesis that distance exerts the same effect each year. Also for model [3], we consider different alternatives for the $\vec{Y}_{i,t}$ and $\vec{Y}_{j,t}$ vectors to show that the core results (about the yearly distance effect) are

[9] It goes without saying that income or population would gain statistical significance if individual fixed effects were excluded from the specification.

robust with respect to such alternatives. Table 4 reports the estimation output: regional population and per-capita GDP at constant-prices are included in the estimation B1 (baseline specification, see above); regional population and regional GDP at current-prices are in the estimation B2; regional population and per-capita GDP at current-prices are in the estimation B3.

Table 4 – Gravity estimations: yearly distance effect

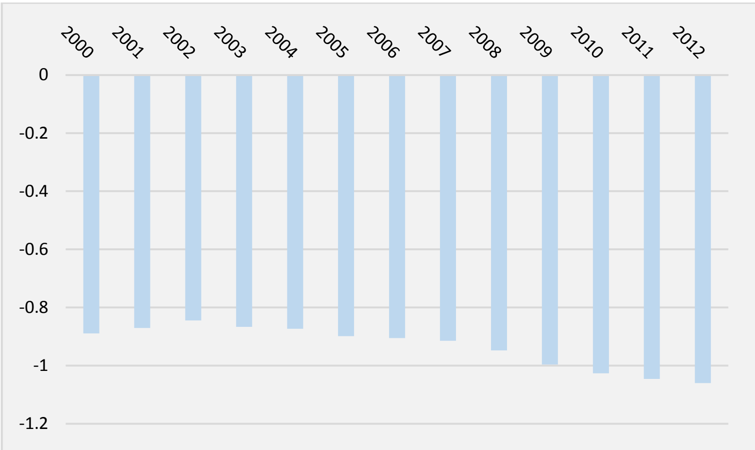
	B1	B2	B3
Orig GDP	-0.407	-0.252	-0.252
Dest GDP	-0.826	-1.055**	-1.055**
Orig POP	-1.016**	-0.780	-1.032*
Dest POP	0.205	0.960**	-0.094
constant	41.730**	47.13**	47.130**
Yearly distance coefficients			
2000	-0.889***	-0.889***	-0.889***
2001	-0.870***	-0.871***	-0.871***
2002	-0.844***	-0.845***	-0.845***
2003	-0.866***	-0.866***	-0.866***
2004	-0.873***	-0.872***	-0.872***
2005	-0.898***	-0.897***	-0.897***
2006	-0.905***	-0.904***	-0.904***
2007	-0.914***	-0.915***	-0.915***
2008	-0.947***	-0.947***	-0.947***
2009	-0.996***	-0.996***	-0.996***
2010	-1.026***	-1.027***	-1.027***
2011	-1.045***	-1.046***	-1.046***
2012	-1.059***	-1.059***	-1.059***
r2_pseudo	0.115	0.115	0.114
AIC	116367.8	116365.8	116365.8
BIC	116820.2	116818.2	116818.2
N	5,200	5,200	5,200

Note: In all specifications, dummy variables for each year, origin and destination are included. As for the income variable, per capita GDP at constant prices is used in B1,regional GDP at current-prices is in B2; per-capita GDP at current-prices is in B3. One (two, three) star denotes statistical significance at the 10% (5%, 1%) level.

The δ_t coefficients signal how distance impacts on interregional flows in each year under consideration. As it emerges from the estimation output, such coefficients are almost the same across the three specifications tested. We therefore consider only the baseline specification in what follows (column B1 in Table 4).

The δ_t coefficients turn out to be negative and significant in any year. This confirms, once again, that distance exerts a negative effect on bilateral regional flows. Furthermore, the size of the estimated coefficients δ_t changes over the years in the sample: they become larger (in absolute value) during the last years of the sample, in correspondence with the Great recession. For a visual display, these are plotted in Figure 2 (corresponding to the estimation in column B1).

Figure 2 – Yearly distance effect (Table 4, Column B1)



Note: this is the graphical representation of the coefficient estimates of distance effect, in each single year, as reported in Column B1 of Table 4.

Table 4 (and Figure 2) provide the core results of our analysis. A rough look at these results about the yearly distance effect leads to the conclusion that distance has been gaining weight over the years of the Great recession. This is supported by formal tests. Indeed, we have executed both Wald and Likelihood Ratio tests of equality regarding the δ_t coefficients; we report and discuss only the output of the LR tests (restricted *vs.* unrestricted model) since these are more reliable in case of Likelihood-based estimations as ours.

The first test checks equality across the thirteen δ_t coefficients, "H0: $\delta_{2000} = ... = \delta_{2012}$". The test yields $\chi^2_{12} = 94.35$ (*p*=.000), leading to reject the null hypothesis that the coefficients are all equal to one another. After that, we run a series of LR tests to check equality across pairs of contiguous years, "H0: $\delta_t = \delta_{t-1}$". The output of these tests is in Column C1 of Table 5. Admittedly, the null of equality cannot be rejected in any case: *p*-values are always larger than 0.38 (interestingly, the lowest value *p*=0.38 occurs for the equality $\delta_{2008} = \delta_{2009}$). The second series of LR tests checks equality across pairs by keeping the year 2000 as reference (starting year), "H0: $\delta_{2000} = \delta_t$" for t=2001-2012. The output leads to no rejection of the equality hypothesis until 2008, but rejection is for any subsequent year (Column C2 of Table 5).

Table 5 –LR Tests of equality across the yearly coefficients of distance

Time t	C1-Test on $\delta_{t-1} = \delta_t$	C2-Test on $\delta_{2000} = \delta_t$
2001	0,617	0,617
2002	0,479	0,226
2003	0,545	0,543
2004	0,480	0,666
2005	0,492	0,798
2006	0,860	0,666
2007	0,800	0,490
2008	0,379	0,116
2009	0,190	0,004***
2010	0,417	0,002***
2011	0,605	0,000***
2012	0,697	0,000***

Note: the p-value of LR tests on coefficient equality is reported. One (two, three) star denotes significance at the 10% (5%, 1%) level.

On the whole, graphical inspection (Figure 2) and the tests discussed suggest that the effect of distance is stable over the sub-sample 2000 to 2008, but it gains more and more negative weight in the period afterwards. Support to this reading is provided also by further LR tests: the test on "H0: $\delta_{2000} = \cdots = \delta_{2008}$" yields $\chi^2_8 = 10.53$ (p=.206), so that one cannot reject the null hypothesis that the effect of distance was constant over the years in the sub-period 2000-2008. The same null is rejected if the sub-period under evaluation runs from 2000 to 2009 (or 2010, 11, 12). Moreover, the test on "H0: $\delta_{2009} = \cdots = \delta_{2012}$" yields $\chi^2_3 = 11.51$ (p=.021) and therefore rejects the null. As a conclusion, distance appears to exert a stable influence effect over the years from 2000 to 2008, but it matters more and more in the period of the Great recession.

Robustness checks

As it emerges from Table 3 and 4, the estimates of the distance effect are robust with respect to alternative specifications of the $\vec{Y}_{i,t}$ and $\vec{Y}_{j,t}$ vectors (that is, nominal *vs*. real, aggregate *vs*. per-capita, exclusion of population). In this section, we aim to check their robustness with respect to the inclusion of further control variables.

The control variables that we are going to consider account for economic, social and institutional conditions, as well as for infrastructural, natural and cultural endowment both in the origin and in the destination. The list of variables is in Table 6; this is a sub-set of the (large) group of variables employed in recent analyses, namely, Cellini and Torrisi (2013), Cuccia et al. (2013, 2014) and Patuelli et al. (2014).[10] Some of these control variables do not vary over time (like the km of coast), while others vary across regions and over time. However, the over-time variation is very limited as compared to the cross-region variation. For simplicity, we therefore include all the control variables available at their value in 2007 (in most cases, the value is equal to the values registered at the beginning and at the end of the period under consideration, 2000 and 2012, respectively; in any case, all results are robust to the consideration of the initial or final values).

Table 7 reports the estimation output of two regressions where the origin and destination control variables listed in Table 6 are included instead of origin and destination fixed-effects. Column D1 reports the estimation for the overall effect of distance, Column D2 reports the estimation for the year-by-year distance effect. Our objective is to check the robustness of the distance coefficients previously estimated, with respect to this alternative.[11]

[10] The main objectives of these research papers (and the methodology employed) are different. Cellini and Torrisi (2013) evaluate the effect of public spending on tourism flows, by resorting to regression analysis. Cuccia et al. (2013, 2014) evaluate the efficiency of regional tourist systems, by using the semi-parametric DEA approach. Patuelli et al. (2013) examine the effect of the cultural endowment in any given region and its neighborhoods, through gravity equations. However, these three works evaluate tourism flows across Italian regions and, to this end, consider a long list of control variables, most of them in common.

[11] Generally speaking, and not surprisingly, the additional control variables are not significant if the fixed effects are included in the specification; otherwise, in the absence of fixed effects, the additional control variables are significant, but sign and significance of their coefficients do change, according to the considered specification. However, the omission of the regional fixed effects, in front of the inclusion of the variables listed in Table 6, is a questionable choice, since relevant fixed effects (not included in the considered variables) can be relevant.

Table 6 – List of the control variables used in the reported robustness checks.

AIRP: number of airports
CINEMA: number of operative cinema
COAST: Number of km of sea beaches in the region
HIGHW: km of highways
KGTURSUM: Cumulated public spending for tourism in capital account (1996 to 2007)
NATPARKS: Hectare of protected natural areas per 100 hectares in the region
PORT: number of ports
PUTN: Putnam index for social capital
RAIL: Km of (electrified) railways
RAIL: km of railways
ROAD: Km of roads
THEATER: number of operative theatre
THEFT: Thefts and robberies per 1,000 inhabitants in the region
UNESCODU: dummy for the presence of UNESCO WHL properties

With reference to the output in Table 7, it is to note that the cumulated public spending for tourism in capital account (KGTURSUM) seems not to be a significant positive factor. Indeed (and surprisingly), it exerts a negative influence in the destination region, as already noted by Cellini and Torrisi (2013). Differently from what found in Patuelli et al. (2013), cultural activities and the heritage endowment (as captured by the variables CINEMA, THEATER and UNESCODU) in the origin favors outward tourism flows. Although, the same have mixed effects for the destination: the UNESCO sites, as well as the presence of theatres, appear to be significant attractors, while the presence of cinemas has a negative effect. The naturalistic endowment (NATPARKS) of the origin hampers flows toward other regions, while it is an attractor for destination regions. Quite surprisingly, the amount of sea coast (COAST) in the destination has a negative sign.

Most importantly, the output in Table 7 and 7.bis confirms the previous estimates of the distance effect, both across the years and year-by-year (Table 4 and 5 *vs.* Table 7). Then, even with respect to structurally different estimations (to wit, fixed-effects *vs.* control variables), the negative effect of distance gets larger and larger during the years of the Great recession (Table 7.bis).[13]

A final remark is due with reference to spatial spillover effects. The analyses by Patuelli et al. (2013, 2014) and Marrocu and Paci (2014) find significant spill-over effects, both for the

[13] LR tests of equality for the coefficients in Table 7.bis replicate the same substantial results of the tests in Table 5.

origin and the destination, captured by the characteristics of the neighboring regions. However, compared to ours, those studies do not consider individual fixed-effects in regression design. In our analysis, spillover effects are caught by individual fixed-effects. In other words, the presence of fixed effects, for both the origin and the destination, overcomes the need to consider explicitly spill-over terms in our estimations. Since our main objective is the check of the weight of the distance effect over time, the choice for individual fixed-effect (rather than a more complex matrix of spatial spill-over effects) appears to be parsimonious and appropriate.

Table 7 – Gravity estimations including control variables

	D1	D2		
Origin GDP	1.349***	1.373***		
Destin GDP	0.264	0.309*		
Origin POP	-0.009	-0.025		
Origin POP	0.001	-0.013		
Ldist	-0.920***	*See Table 7.bis*		
constant	-9.148***	-10.083***		
	for ORIGIN		for DESTINATION	
	D1	D2	D1	D2
RAIL	0.879***	0.892***	-0.350***	-0.347***
ROAD	-0.107	-0.107	0.418***	0.433***
HIGHWAY	0.106***	0.107***	-0.023**	-0.022**
PORT	0.083***	0.083***	0.425***	0.424***
AIRPORT	-0.128***	-0.128***	0.187***	0.190***
THEATER	0.231***	0.229***	1.447***	1.432***
CINEMA	0.142**	0.152***	-0.897***	-0.880***
PUTN	-0.551***	-0.558**	-0.038	-0.047
UNESCODU	0.334***	0.340***	0.303***	0.308***
KGTURSUM	-0.162***	-0.165***	-0.039*	-0.041**
THETF	0.125**	0.118*	0.800***	0.788***
NATPARK	-0.153***	-0.152***	0.359***	0.353***
COAST	-0.119***	-0.119***	-0.200***	-0.201***
r2_pseudo	0.101	0.102		
AIC	118072.6	118021.4		
BIC	118367.6	118395.1		
N	5,200	5,200		

Note: One (two, three) star denotes significance at the 10% (5%, 1%) level.

Table 7.bis - Coefficients of the year-by-year distance effect (from Table 7, column D2)

2000	-0.862***	2007	-0.900***
2001	-0.850***	2008	-0.934***
2002	-0.823***	2009	-0.979***
2003	-0.852***	2010	-1.014***
2004	-0.859***	2011	-1.034***
2005	-0.889***	2012	-1.050***
2006	-0.893***		

Distance and travel cost

We have already mentioned that further travel destinations entail a higher physical and time cost, likely, they could also entail a higher monetary cost. For this reason, closer destinations are thought as a means for reducing holiday costs. However, closer destinations not necessarily mean lower monetary costs, while other considerations could explain the choice for closer destinations. In this regard, Nicolau and Mas (2006) identify a set of factors able to mitigate the negative effect of distance in tourism destination choice. Analyzing the answers from a wide sample of Spanish households, they find a mitigated (negative) effect of distance when the main motivation of tourists is "search for good climate", or "visiting family and friends". Differently, when the main motivation for holiday is "search for tranquility" or "search for culture", no mitigating effect emerges. These results tell a rather simple truth: distance may play a different role according to the motivation of tourists.

With reference to the scope of our analysis, we aim to gain information on whether the deeper negative effect of distance found in the years of the Great recession is linked to travel cost. To this end, we consider the price index of fuel; more specifically, the unit price of fuel, p^{fuel}, in Italy, as provided by ISTAT.[14] Of course, this price varies over time, but virtually not across Italian regions. We multiply bilateral distance (d_{ij}) for the unit price of fuel in order to obtain a variable which more closely represents the travel cost for pairs of regions: $cost\_trav_{ij,t}=d_{ij}\times p^{fuel}_t$. The output of the regression including this variable is in Table 8.

[14] In an exploratory analysis, we have considered two different indices: the price index of fuel and the price index for travel services, as provided by Istat. Even though these two indices are clearly different (cost of fuel is a component of the cost for travel service), they are correlated and the results do not change substantially in front of using either of them. In any case, we prefer to report here the results based on the fuel price, since the index for travel services includes a set of services that have nothing to do with tourism, but are linked with transport of goods.

The estimation results do not change much with respect to our baseline specification (compare Column E1 in Table 8 with Column A6 in Table 3). Furthermore, when the unit price of fuel is included in the gravity equation as a separate regressor, it does not alter the effect of distance, but –rather surprisingly– has a positive coefficient (see Table 8, Column E2). Said differently, no negative effect of the fuel price on regional tourism flows emerges in the case at hand, while distance maintains its negative and significant effect. This leads us to conclude that the negative effect exerted by distance does not seem to be linked to considerations concerning travel cost, at least when such cost is viewed from a strictly-monetary perspective.[15]

This is in line with the considerations of different authors, including Nicholau and Mas (2006, specifically p. 990). They underline that distance does not entail only monetary travel costs, but also organization costs, information collection costs, and it can be perceived as an obstacle when someone is looking for stress-less holidays; a commonly-shared desire in times of deep economic crisis.

As a conclusion, the adverse weight of distance has increased during the years of the recent economic crisis: less likely because the cost of traveling has been increasing, more likely because of the "psychological costs" associated to distance, which are related to consumer preferences and social framework. This result emerges here from macroeconomic data.

Table 8 – The effect of fuel price

	E1	E2
Origin GDP	-0.691	-0.690
Destin GDP	-1.001*	-1.010**
Origin POP	-0.958*	-0.958*
Destin POP	0.290	0.290*
Ldist		-0.934***
Lpfuel		0.185**
L(cost _trav)=L(dist× pfuel)	-0,935***	
constant	44.949***	43.760**
r2_pseudo	0.114	0.114
AIC	116438.1	116438.1
BIC	116811.8	116811.8
N	5,200	5,200

Note: One (two, three) star denotes significance at the 10% (5%, 1%) level.

[15] More technically, if the true relevant variable were *cost_trav=dist*× p_{fuel}, then the coefficient of *dist* and p_{fuel} should be equal when considered as separate regressors in log terms (like in the Column E2 of Table 8); a test on the equality of these two coefficients leads to reject this null, chì-sq(1)=255.90, *p*=.000.

4. Conclusions

By applying a gravity model to study inter-regional flows of domestic tourism in Italy, this study has documented that distance got a more and more relevant (negative) role in shaping tourism flows during the years of the so-called Great recession. This result is in line with similar conclusions –i.e., economic crises lead consumers to closer tourism destinations– obtained by means of survey analyses, especially with reference to international tourism (namely, the recent analyses by Eugenio-Martin and Campos-Soria, 2014, and Bronner and De Hoog, 2012).

However, we have provided evidence which calls for a cautious interpretation of such result. Indeed, the increased negative weight of distance is likely not to depend uniquely on tighter budget constraints and consequent tourists' expenditure cutbacks. We have pointed out that closer destinations do not necessarily mean less expensive holidays: the cost of travel is not the only component of the holiday cost, and distance entails non-monetary costs which can be relevant in the crisis years. To wit, longer distances imply larger uncertainty and higher levels of stress; the search for tranquility may explain the choice of closer tourism destinations in times of economic crisis. Furthermore, we have to recall that the choice of closer destinations is only one element among several changes that have occurred in the tourism sector over the recession years.

From a methodological perspective, we believe that our study contributes to the development of analyses of tourism flows through gravity models. In this regard, when the interest falls on studying the effect of distance and its evolution over time, using gravity models with individual fixed-effects for the origin and destination is a viable and straight option. This can be even preferable than specifications including a wide set of structural variables and/or complex spatial autoregressive structures.

References

Accardo F.M. (2012). Observations on the state of tourism in Italy. *International Business Research*, 5: 67-70.

Alegre J. & M. Sard (2015). When demand drops and prices rise. Tourist packages in the Balearic Islands during the economic crisis. Tourism Management, 46: 375-85.

Anderson J.& E. Van Wincoop (2003). Gravity with Gravitas: A Solution to the Border Puzzle. *The American Economic Review*, 93(1): 170-192.

Anderson J. (2011). The Gravity Model. *Annual Review in Economics*, 3: 133-160.

Armstrong G.W.G. (1972). International tourism: coming or going: the methodological problems of forecasting. *Futures*, 4:115–125.

Barros C. P. & L. P. Machado (2010). The length of stay in tourism. *Annals of Tourism Research*, 37: 692-706.

Beccheri E. & I. Nuccio (2014). *Italiani all'estero: come cambiano le preferenze*. Roma: il Sole 24 ore.

Bernini C. & F. Cracolici (2014). Is participation in tourism market an opportunity for everyone? Some evidence from Italy. *FEEM working paper*, 17.2014.

Borowiecki K.J. & C. Castiglione (2014). Cultural participation and tourism flows: An empirical investigation of Italian provinces. *Tourism Economics*, 20: 241-62.

Bronner F. & R. De Hoog (2012). Economizing strategies during an economic crisis. *Annals of Tourism Research*, 39: 1048-69.

Browne R. & W. Moore (2012). How quickly do Caribbean tourists arrivals rebound after exogenous shocks. *CBB Central Bank of Barbados*, WP 2012.

Burger M., F. van Oort & G.L. Linders G-J (2009). On the specification of the gravity model of trade: zeros, excess zeros and zero-inflated estimation. *Spatial Economic Analysis*, 4: 167-190.

Cafiso G. (2007). The Geographic Space in International Trade: from Gravity to New Economic Geography. Munich Personal RePEc Archive, No. 20269.

Cafiso G. (2010). Rose Effect versus Border Effect: the Euro's impact on Trade. *AppliedEconomics,*Vol 43(13): 1691-1702

Cafiso G. (2011). Sectoral Border Effects and the Geographic Concentration of Production.*Review of World Economics*, Vol 147(3): 543-566.

Candela G. & P. Figini (2012). *The Economics of Tourism Destinations*. Berlin: Springer Verlag.

Cellini R. & T. Cuccia (2014). The economic resilience of tourism industry in Italy: What the 'Grear recession' data show. MPRA w.p. 60999

Cellini R. & G. Torrisi (2013). Regional public spending for tourism in Italy: An empirical analysis. *Tourism Economics*, 19: 1361-1384.

Chun Y. & D.A. Griffith (2011). Modeling network autocorrelation in space–time migration flow data: an eigenvector spatial filtering approach. *Annals of the Association of American Geographers* 101: 523-536.

Cortes-Jumenez I., R. Durbarry & M. Pulina (2009). Estimation of outbound Italian tourism demand: a monthly dynamic EC-LAIDS model. *Tourism Economics*, 15: 547-65.

Crampon L.J., Tan K.T. (1973) A model of tourism flow into the Pacific. *Tourism Review*, 28(3): 98–104

Cuccia T., C. Guccio C. & I. Rizzo (2013). Does Unesco inscription affect the performance of tourism destinations? A regional perspective. *ACEI WP*, No. 2013/4.

Cuccia T., C. Guccio & I. Rizzo (2014). Italian UNESCO Sites and the Performance of Tourist Destinations at the Regional Level. In: F. Mazzola, D. Musolino, V. Provenzano (Eds.), *Reti, nuovi settori e sostenibilità - Prospettive per l'analisi e le politiche regionali*, Milan: Franco Angeli, pp. 153-70.

Demunter C. & C. Dimitrakopoulos (2010). Tourism in Europe. First results for 2010. Eurostat, http://epp.eurostat.ec.europa.eu

EC - EuropeanCommission (2013). Attitudes of Europeans toward tourism - Report. Bruxelles: European Commission.

Eilat Y&L. Einav (2004). Determinants of international tourism: a three-dimensional panel data analysis. *Applied Economics*, 36: 1315-1327

Eugenio-Martin J.L. & J.A. Campos-Sorias (2014). Economic crisis and tourism expenditure cutback decision. *Annals of Tourism Research*, 44(1): 53-73.

Foster L., C. Grim & J. Haltiwanger (2013). Reallocation in the Great Recession: Cleansing or Not?. U.S. Census Bureau - Center for Economic Studies WP.

Fotheringham A.S. (1983). A new set of spatial-interaction models: the theory of competing destinations. *Environmental Planning A*, 15: 15-36

Haynes K.E. & A.S. Fotheringham (1984). *Gravity and spatial interaction models*. Sage Publications, Beverly Hills Ca US.

Khadaroo J. & B. Seetanah (2008). The role of transport infrastructure in international tourism development: A gravity model approach. *Tourism Management* 29: 831-840.

ISTAT (2014). *Annuario Statistico Italiano 2013*, Roma: Istat.

ISTAT (2014). *Dati*. http://dati.istat.it/ (as accessed on January 20, 2015).

Lorenzini E., M. Pisati & T. Pompili (2014). Determinants of international tourist choices in Italian provinces: a joint demand-supply approach with spatial effects. Mimeo, University of Pavia.

Malamud B. (1973). Gravity model calibration of tourist travel to Las Vegas. *Journal of Leisure Research*, 5:13-33.

Marrocu E. & R. Paci (2013). Different tourists to different destinations. Evidence from spatial interaction models. *Tourism Management*, 39: 71-83.

McAllister D.M., Klett F.R. (1976). A modified gravity model of regional recreation activity with an application to ski trips. *Journal of Leisure Research*, 8: 21-34

Morley C., J. Rossellò & M. Santana-Gallego (2014). Gravity models for tourism demand: theory and use. *Annals of Tourism Research*, 48: 1-10.

Nicolau J.L. & Mas F.J. (2006). The influence of distance and price on the choice of tourist destinations: The moderating role of motivations. *Tourism Management*, 27: 1077-1092,

Olive Research (2009). Impact of economic downturn on attitudes and behaviour of international tourists to Britain. London: VisitBritain.

ONT – Osservatorio Nazionale del Turismo (2014). *Statistiche.* http://www.ontit.it/ont/ (as accessed on January 20, 2015)

Page S., H. Song & D.Wu (2012). Assessing the impacts of the global economic crisis and swine flu on inbound tourism demand in the United Kingdom. *Journal of Travel Research*, 51: 142–153.

Papatheodorou A., J. Rossello & H. Xiao (2010). Global economic crisis and tourism: consequences and perspectives. *Journal of Travel Research*, 49: 39–45.

Patuelli R., M. Mussoni & G. Candela (2013). The effects of World Heritage Sites on domestic tourism: a spatial interaction model for Italy. *Journal of Geographic Systems*, 15: 396-402

Patuelli R., M. Mussoni & G. Candela (2014). Cultural offer and distance in a spatial interaction model for tourism. *Economics and Business Letters*, 3: 96-108.

Ravenstein E.G. (1985). The Laws of Migration. *Journal of the Statistical Society*, 48: 167-235.

Richtie J.R.B., C.M.A. Molinar & D. Frechtling (2010). Impacts of the world recession and economic crisis on tourism: North America. *Journal of Travel Research*, 49: 5-15.

Santos Silva J.M.C. & S. Tenreyro (2006). The log of gravity. *Review of Economics and Statistics*, 88: 641-658.

Smeral E. (2010). Impacts of the world recession and economic crisis on tourism: Forecasts and potential risks. *Journal of Travel Research*, 49: 31-38.

Smeral E. & H. Song (2013). Varying elasticities and forecasting performance. *International Journal of Tourism Research*, doi 10.1002/jtr.1972.

Sen A. & T.E. Smith (1995). *Gravity models of spatial interaction behavior*. Springer, Heidelberg.

Song H. & S. Lin (2010). Impacts of the Financial and Economic Crisis on Tourism in Asia. *Journal of Travel Research,* 49: 16-30.

Song H., S. Lin, S. F. Witt &X. Zhang. (2011). Impact of financial/economic crisis on demand for hotel rooms in Hong Kong. *Tourism Management*, 32: 172-186.

Swart W.W., T. Var & C.E. Gearing (1978). Operations research applications to tourism. *Annals of Tourism Research*, 5: 414-428.

Tinbergen J. (1962). *Shaping the World Economy: Suggestions for an International Economic Policy*. New York: The Twentieth Century Fund.

Uysal M. & J.L. Crompton (1985). An overview of approaches used to forecast tourism demand. *Journal of Travel Research*, 23:7-15.

Wang E., B.B. Little, & A. Del Homme-Little (2012). Factors contributing to tourists' length of stay in Dalian northeastern China: A survival model analysis. *Tourism Management Perspectives*, 4: 67-72.