Domestic tourism demand in Italy: a Fixed Effect Vector Decomposition estimation

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Domestic tourism demand in Italy: a Fixed Effect Vector Decomposition estimation

by

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Abstract

This study investigates the main determinants of the Italian domestic tourism demand measured in terms of regional bilateral tourism flows. We consider a large panel of explanatory variables meant to capture not only the role of traditional economic demand-driven forces, but also qualitative supply-side factors that can be crucial in determining the comparative advantage of the exporting regions. The empirical analysis, performed in the context of an *extended* gravity model, builds on the Fixed Effect Vector Decomposition estimator (*FEVD*) developed by Plümper and Troeger (2007). The investigation is conducted for the country as a whole and separately for the two macro-areas, namely the Centre-North and the South. According to our results, at aggregate level, the main determinants of Italian tourism flows appear to be the lagged dependent variable, which control for reputation and habit formation, and relative prices. Also the per capita *GDP* plays a significant role, but its coefficient suggests that in Italy domestic tourism does not behave as a luxury good, as frequently found in the international tourism context. Another interesting result is that for Italian tourists, domestic destinations and international destinations act as substitutable goods. At sub-sample level two main findings are worth noting. On the one hand, the main outcomes of the full sample analysis are confirmed, on the other hand some interesting differences arise with respect to the impact of the relevant variables. In particular, tourists coming from the southern regions appear to be more concerned than northern ones about variations in their per capita *GDP* and in price differences.

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1. Introduction

Recent empirical literature has pointed out that, in the world, domestic tourism accounts for the greater part of total tourism flows (Bigano *et al*. 2006). This evidence implies that tourism demanded by people in their own country is greater than international tourism in terms of both size and economic indicators. Nevertheless, since international arrivals and nights exhibit higher rates of growth, the relative weight of domestic tourism is decreasing over time.

The same structure of the world tourism industry is reflected in all European countries such as Italy where, in 2007, domestic tourism weights 55 and 57 per cent for arrivals and nights respectively. This configuration of the Italian tourism market has not changed significantly during the last eighteen years, even though international flows have shown faster rates of growth. As a results, from 1990 to now, domestic tourism weight has decreased by about 5 per cent with respect of total tourism.

Despite of that, in Italy the economic impact of domestic tourism still remains greatly dominant especially if we consider its contribution in terms of tourism consumptions, value added and employment. In such a perspective, a continuous decreasing trend in domestic flows turns out in a big loss of economic resources for our country. This is the reason why we believe that Italian domestic tourism should draw greater attention to researchers that have substantially overlooked the phenomenon until now. Empirical literature on domestic tourism determinants, in fact, is quite scant and mainly refers to specific regions or areas of the country.

In the light of these considerations, this study builds on a regional data set for Italian domestic tourism and develops an empirical analysis aimed to estimate its main determinants. We employ a large panel of explanatory variables aimed to capture the role of traditional economic demand-driven variables, such as prices and income. In addition we consider qualitative supply-side factors that can be crucial in determining the comparative advantage of the exporting region. The dependent variable of this study is given by the number of arrivals in region *i* (*destination*) from region *j* (*origin*).

The analysis is firstly performed at aggregate level. Here we consider bilateral tourism flows across the twenty Italian regions, treated both as origin and destination. Accordingly, the observation unit in our framework consists in the number of arrivals at destination *i* from the specific origin *j*, with the different regions competing with each other in order to attract more tourists. Then the full sample is split into two sub-samples focusing on the two traditional macro-areas of the country, namely the North-Centre and South. The main scope of the disaggregated analysis is to capture differences in tourists preferences according to the area of the country they come from. Accordingly, our strategy has been to build these subsamples only with respect to the region of origin. Thus, one subsample includes the arrivals from the Centre-North tourists to the twenty Italian regions and, conversely, the other subsample comprises the arrivals registered in all regions but originated only from southern regions residents.

As suggested by previous literature (cfr., *inter al*., Khadaroo-Seetanah, 2008), the empirical analysis is performed in the context of an *extended* gravity model. The gravity model has many applications in different fields of empirical research, specifically in migration and international trade (Lowry, 1966; Poyhonen, 1963). The basic essence of this model is that the flows of the considered good between two different regions or countries depend positively on the size of them and negatively on the distance.

The panel structure of our data allows us to estimate the model using the standard panel data techniques. In light of this, we first test the fixed effects model (*FEM*) versus the random effects

model (*REM*). As it is well known, the latter is more efficient but its estimates are inconsistent if the unobserved effects are correlated with the regressors (J. Wooldridge, 2002). In order to verify the consistency of the *REM* it is recommended to apply the Hausman specification test which tests the null hypothesis that the differences in coefficients estimate between the *FEM* and the *REM* are not systematic. In our case, the Hausman test rejects the null, so that we should apply the *FEM*. However, the within estimator employed by the *FEM* has a drawback, that is, the demeaning transformation sweeps away all time invariant variables (Hsiao, 2003). In our analysis many covariates present such characteristic. A solution to this problem is offered by the Fixed Effect Vector Decomposition estimator (*FEVD*) developed by Plümper and Troeger (2007), which also corrects for the inefficiency of the estimates arising when variables have a very small within variance. In light of this, we have decided to employ the *FEVD* estimator to perform the analysis both at national and sub-sample level.

Given all that, our study can potentially contribute to definitely ameliorating the state of knowledge along several lines.

First of all, to our knowledge, this is the only panel data analysis on domestic tourism developed in terms of regional bilateral tourism flows for both Italy and the rest of the touristy countries. In such a disaggregated context, not only we have the possibility to gather information on the competition across exporting regions, but more robust empirical results are granted too.

Secondly, our choice of the determinants gives attention not only to the variables suggested by the basic gravity model (*population, distance and income*), but also to items related to the region of destination in terms of supply factors, marketing strategies and public policy interventions.

Third, the application of the *FEVD* model is certainly a novelty in this strand of literature. Moreover, it is the use of this estimator that has made possible the choice of a large set of determinants.

Finally, since our estimated coefficients can be read in terms of elasticities, our results may be very useful for public authorities and destination management organizations often called to take decisions aimed at improving the competitive position of one country or region.

The paper is organised as follows. After this introduction, the next section presents the background of our study giving a general overview of the world tourism industry and describing the recent trend in domestic and international components of the Italian tourism demand. In Section 3 we discuss the role of the main determinants of tourism flows and summarize the main empirical literature for the case of Italy. In Section 4 we present our empirical model and research strategy. In Section 5 we give some details on our dataset and provide some descriptive statistics of the variables considered in the study. Then, in Section 6, we present the results. Finally, in Section 7, we draw some conclusions.

2. Background

2.1 *General overview*

Tourism industry is one of the most rapidly growing and largest industry in the world. In 2009, according to the World Tourism and Travel Council (*WTTC*) simulation, it contributed, on average, by about 9.5% and 7.5% to Gross Domestic Product (*GDP*) and employment respectively and it is expected to grow by about 4% annually over the coming 10 years.

Within this panorama, Italy is one of the top tourist destinations in the world and its contribution to the world tourism economy is a well-known phenomenon. As we can see from Table 1, in absolute terms, out of 181 world countries, Italy is recorded in the seventh position with respect to *GDP* (it is fourth out of the 27 European countries) and it is eighteenth for employment. However, when attention is turned to the contribution of tourism to the national economy, Italy falls in the 77th position for *GDP* and 65th position for employment. Things get even worse in terms of growth rates: in such a case Italy is ranked 109th and 100th for GDP and employment respectively (-4.4% in 2009 and to average 1.9% per annum over the coming 10 years). Taking into account data spanned over the last decades, this numbers highlight a general decline that the Italian tourism seems to be facing in these last years. Unfortunately, according to the *WTTC* forecasting, things are not expected to better off: in 2019, Italy is expected to fall down along the ranking of growth rates of about 50 positions (*cfr*. Table 1, last column).

Table 1. *WTTC* ranking for Italy

	2009			2019		
	Absolute Size	**Relative Size**	**Growth**	**Absolute Size**	**Relative Size**	**Growth**
T&T Economy GDP	7	77	109	9	75	169
T&T Economy Employment	18	65	100	19	64	154

Source: World Travel and Tourism Council

These dynamics deserve the right consideration by central and local authorities aiming at exploiting the potential of the tourism industry in generating economic development and in reducing regional disparities. This is the reason why a big effort is required to understand the determinants of the Italian tourism demand and to discern the way in which different destinations attract tourists.

In order to describe the Italian tourism market with some details, next sections report various statistical data regarding domestic, inbound and outbound tourism flows at both aggregate and regional levels.

2.2 *Domestic and international components of the Italian tourism demand*

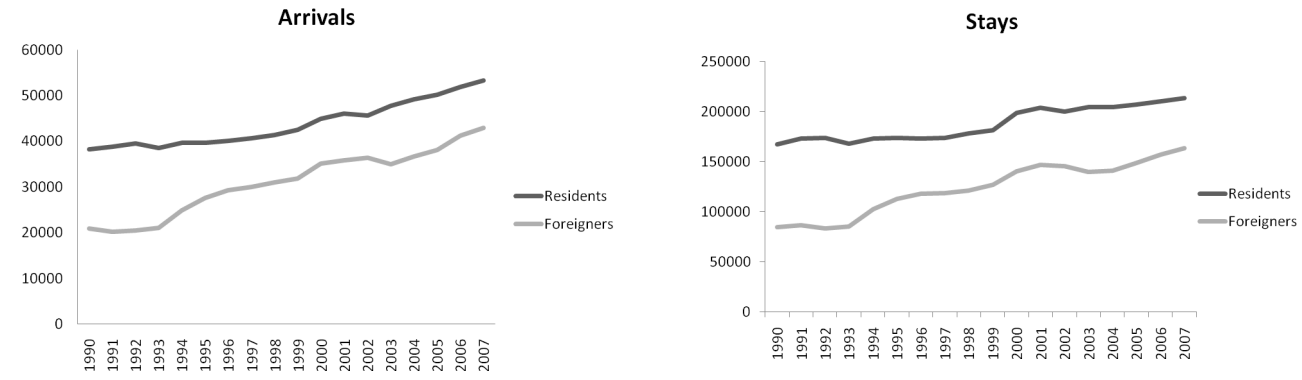
In Italy domestic tourism represents since ever the major part of the entire related industry and produces a remarkable macroeconomic impact in terms of value added and labour force. With respect to total demand for Italian destinations, during the period 1990-2007, domestic tourism weights, on average, 59% and 61% for arrivals and nights respectively (*cfr*. Table 2).

Figure 1 shows the main dynamics of arrivals and overnight stays over the period 1990-2007 for both the domestic[3] and inbound[4] components.

Figure 1. Domestic-inbound arrivals and overnight stays

[3] The ratio of domestic tourists over population is less than one (0.90) meaning that residents were domestic tourists less than once per year.

[4] In terms of numbers of nights spent on holiday, residents give rise to a higher average duration (4 nights) than foreigners (3.8 nights).



Source: ISTAT

As we can see, the two variables (*arrivals and overnight stays*) exhibit an upward sloping trend over the sample period, with the inbound demand being more volatile because of a larger sensitivity to the economic conjuncture and to changes in international competitiveness. Across the two series, interesting differences also emerge in terms of growth rates.

Table 2. Growth rates and weights

	Domestic		**Inbound**	
	Arrivals	**Nights**	**Arrivals**	**Nights**
Change 1990-2007	40%	30%	105%	90%
Change 1998-2007	30%	20%	40%	35%
Weight 1990	0.65	0.66	0.35	0.34
Weight 1998	0.57	0.60	0.43	0.40
Weight 2007	0.55	0.57	0.45	0.43
Weight (average1990-2007)	0.59	0.61	0.41	0.39
Weight (average1998-2007)	0.57	0.58	0.43	0.42

Source: ISTAT

As we can see from Table 2, in eighteen years, we can calculate an increase of about 40% and 100% for domestic and foreign arrivals and an increase of about 30% and 90% for domestic and foreign stays, respectively. Focusing on the last ten years, even though relatively minor changes have occurred, the increasing trends are still confirmed with the inbound component exhibiting higher growth rates (*cfr*. Table 2).

It follows that, with respect to total flows, in eighteen years the domestic component has lost some weight, from 0.65 to 0.55 for arrivals and from 0.66 to 0.57 for overnight stays, while in ten years the loss is of 2% and 3% for arrivals and nights respectively.[5]

Despite of that, the economic impact of domestic tourism still remains relevant especially if we consider its contribution in terms of tourism consumptions, value added and employment.

[5] These dynamics are the result of two contemporaneous phenomena: on the one hand, for various reasons, industrialized countries can encounter a generalized increase of international tourism flows; on the other, Italian tourists are today more willing to go abroad than in the past.

Table 3 reports tourism consumptions in the range of the last ten years. As we can see, in 2007 the domestic demand accounts for 67% of internal tourist consumptions and for 7% of total final consumptions. These numbers highlight the increased weight of the domestic component: in 10 years it has grown of about 6%.

Table 3. Tourism consumption

	Domestic (1)	**Inbound (2)**	**Internal (3)=(1)+(2)**	**Total (4)**	**(1)/(3)%**	**(1)/(4)%**	**(3)/(4)%**
1998[a]	83683	52695	136378	1231385	61.4	6.8	11.1
2007[b]	63959	31506	95465	916171	67.0	7.0	10.4

Sourse: ISTAT

[a]Bn current lires; [b]Mln current euros

The valued added exhibits a similar dynamics. As we can see from Table 4, taking into account direct and indirect effects, in 2007 tourism value added amounts to EUR 73.5 bn. The last column of the same Table highlights that, in the last ten years, the contribution of the domestic demand to total tourist value added has raised of about 6%. Finally, let us turn our attention to employment. Here again the contribution of the domestic component of the Italian tourist demand is relevant, raising in ten years from 60.4% to 64.5% (*cfr*. Table 4).

Table 4. Tourism value added and employment

	Domestic (1)	Inbound (2)	Total (3)	Domestic (4)	Inbound (5)	Total (6)	(4)/(6)%
Value added							
1998[a]	42908	26141	69049	68256	44558	112814	60.5
2007[b]	31774	15933	47707	48838	24709	73547	66.4
Employment							
1998[c]	924	589	1513	1213	794	2007	60.4
2007[d]	1046	585	1630	1577	867	2444	64.5

Source: ISTAT

[a]Bn current lires; [b]Mln current euros ; [c]Old serie; [d]New serie.

2.3 *Recent trends in Italian domestic tourism*

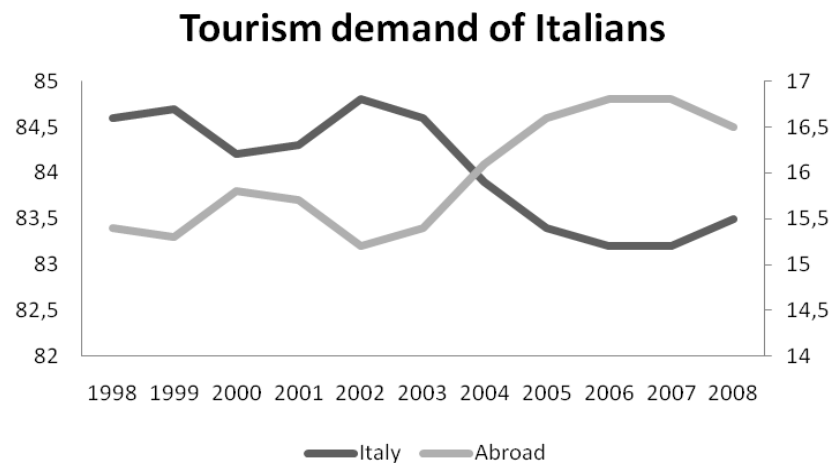
The previous section has focused on the relation between domestic and inbound tourism demand in Italy. In particular, it compares the contribution of the two components in terms of value added, tourism consumptions and employment over the last decades. In order to complete the picture, this section provides some statistics describing the relation between domestic and outbound components of Italian tourism demand. A regional disaggregated picture is also provided.

Firstly, it is worth pointing out that in Italy, the continuous increase of residents tourism demand is a phenomenon that has been widely documented by official statistical data. This demand is characterized by a very large domestic component whose weight, however, is decreasing with respect to total demand. Survey data[6] show that in 2007,[7] 83.2% of total travels is given by trips

[6] In Italy a long tradition of surveys on tourism demand implemented by the major statistical institute (ISTAT) starts in 1959. Since 1997, the survey "Viaggi e vacanze" registers each three months residents tourist flows directed to national and foreign destinations.

within national borders, while the rest 16.8% represents the percentage of residents that choose to travel abroad. As we can see from Figure 2, domestic tourism accounted for 84.6% in 1998.

Figure 2. Domestic vs. outbound flows



Source: Istat, survey "Viaggi e vacanze".

Among other things, this dynamics is the result of the increasing preferences of Italians for foreign destinations. It could be a signal for the presence of a substitution effect which is reallocating national resources in favour of other countries. In the long term, this trend can produce serious consequences since, as highlighted in the previous section, in Italy domestic tourism gives a meaningful contribution to the development of the relative economic sector and to the national economy as a whole.

To control for this substitution effect, policy interventions and marketing strategies have a fundamental role. Accordingly, great attention has to be given to policies and strategies of the main international competitors and to the recent dynamics characterizing domestic tourism flows across the different areas of the country.

In this respect, it is worth pointing out that in one year the propensity to travel[8] is increased for residents of southern and northern regions and that the number of travels per capita has slightly increased in North and Centre, while has remained fairly constant in the South (*cfr*. Table 5).

Table 5. Propensity to travel and travel per capita

	Propensity to travel		Travels per capita	
	2006	**2007**	**2006**	**2007**
North	33.3	34.2	2.2	2.3
Centre	32.3	31.4	2.0	2.1
South	21.4	21.7	1.3	1.3
Italy	28.9	29.2	1.8	1.9

Source: Istat, survey "Viaggi e vacanze".

[7] Data on 2008 are also available.
[8] Number of travellers each 100 residents.

Furthermore, with respect to all destinations (domestic and foreign), residents prefer the North of Italy for their travels: as shown in Table 6, 38.7% choose northern destinations, 20.4% choose to go to central regions and 24.2% choose the South. The same Table shows that 11.6% choose European Union Countries, 2.2% other European Countries and 2.9% the rest of the world (*France, Spain, Greece and Germany represent the main destinations*).

Table 6 – Total travels (2007)

Destination	Travels (%)
Italy	83.3
- North	38.7
- Centre	20.4
- South	24.2
Abroad	16.7
- European Union	11.6
- Other European Countries	2.2
- Extra-European Countries	2.9
World	**100.0**
North	46.3
Centre	24.5
South	29.2
Italy	**100**

Source: Istat, survey "Viaggi e vacanze". (Tab.1.1.8; 1.1.12

With respect to national destinations, again the North registers the highest number of visits (46%), followed by the South (29%) and the Centre (25%) (*cfr*. Table 6).

Slightly different is the picture on regional tourism flows emerging from data on nights and arrivals registered in hotels.[9] In such a case accommodations in private houses and non-official data are totally disregarded so that market shares may result changed with respect to previous survey data. As a matter of fact, in Table 7 we can see that, while the North is confirmed as the favourite macro-area, the South moves now in the last position in terms of arrivals.[10]

In order to complete the picture, it is also interesting to analyse the dynamics of regional market shares over the last ten years. Table 7 ranks domestic arrivals and nights both in 1998 and 2007. As we can see, regional market shares do not seem significantly changed during the period considered. However, some details are worth noting. As for arrivals, there are eight regions that maintain the same position in the rank (*Emr, Lom, Tos, Ven, Cal, VdA, Bas, Mol*), four regions that register a well-offs (*TAA, Sic, Pug, Umb*) and, again, eight regions that go down in the rank (*Laz, Cam, Lig, Pie, Mar, Sar, Abr, FVG*). When considering the nights we can see that there are eight regions that maintain the same position (*Emr, TAA, Lom, Laz, Pie, FVG, Bas, Mol*), six regions that register a well-offs (*Ven, Cam, Mar, Pug, Cal, Umb*) and, again, six regions that go down in the rank (*Tos, Lig, Sic, Sar, Abr, VdA*).

[9] Accomations extrahotel are included.

[10] Italian tourists seem to like better destinations that supply sea tourism (72.5%), but are also willing to visit mountains (24.7%), metropolitan areas (19.8%). Among all, countryside (7.3%) and lakes (3.0%) result the least desiderated destinations (Source: Doxa survey data).

Table 7. Domestic flows

Arrivals				Nights				Arrivals		Nights	
	1998		**2007**		**1998**		**2007**		%		%
Emr	12.34	*Emr*	12.34	*Emr*	14.25	*Emr*	13.69	*Umb*	91.87	*Umb*	68.25
Lom	10.33	*Lom*	10.68	*Tos*	10.11	*Ven*	11.92	*Pug*	65.80	*Pug*	61.95
Tos	10.28	*Tos*	10.40	*Ven*	9.77	*Tos*	10.19	*Cal*	58.78	*Bas*	61.17
Ven	9.32	*Ven*	10.18	*Taa*	9.62	*Taa*	9.14	*Bas*	57.30	*Cal*	48.69
Laz	8.54	*Taa*	7.34	*Lom*	7.06	*Lom*	6.51	*Pie*	44.66	*Ven*	45.95
Taa	7.39	*Laz*	7.26	*Lig*	6.62	*Cam*	5.35	*Ven*	40.69	*Pie*	23.75
Cam	6.48	*Sic*	5.34	*Cam*	6.13	*Mar*	5.33	*Abr*	37.53	*Fvg*	22.13
Lig	5.61	*Cam*	5.21	*Laz*	5.52	*Laz*	5.09	*Lom*	33.04	*Sic*	21.93
Sic	5.32	*Lig*	4.53	*Mar*	5.41	*Lig*	4.77	*Tos*	30.33	*Sar*	21.85
Pie	3.57	*Pug*	4.27	*Sic*	3.99	*Pug*	4.63	*Fvg*	29.93	*Abr*	21.67
Mar	3.50	*Pie*	4.01	*Sar*	3.68	*Sic*	4.07	*Sic*	29.26	*Tos*	20.54
Pug	3.32	*Mar*	3.42	*Pug*	3.42	*Sar*	3.75	*Emr*	28.81	*Mar*	17.88
Sar	3.02	*Umb*	2.92	*Abr*	2.94	*Cal*	3.37	*Taa*	27.89	*Mol*	17.67
Abr	2.41	*Sar*	2.80	*Cal*	2.71	*Abr*	3.00	*Mar*	25.81	*Emr*	14.84
Fvg	2.10	*Abr*	2.57	*Pie*	2.71	*Pie*	2.80	*Sar*	19.16	*Taa*	13.61
Cal	2.02	*Cal*	2.49	*Fvg*	2.37	*Fvg*	2.42	*Mol*	14.27	*Laz*	10.16
Umb	1.96	*Fvg*	2.11	*VdA*	1.45	*Umb*	1.92	*Laz*	9.40	*Lom*	10.13
VdA	1.52	*VdA*	1.06	*Umb*	1.37	*VdA*	0.99	*Lig*	3.89	*Cam*	4.31
Bas	0.61	*Bas*	0.74	*Bas*	0.58	*Bas*	0.78	*Cam*	3.66	*Lig*	-13.80
Mol	0.36	*Mol*	0.32	*Mol*	0.28	*Mol*	0.27	*VdA*	-10.66	*VdA*	-18.45
North	**52.18**	**North**	**52.24**	**North**	**53.86**	**North**	**52.24**	**North**	**28.93**	**North**	**16.00**
Centre	**24.28**	**Centre**	**24.00**	**Centre**	**22.41**	**Centre**	**22.53**	**Centre**	**27.28**	**Centre**	**20.25**
South	**23.54**	**South**	**23.76**	**South**	**23.74**	**South**	**25.22**	**South**	**29.94**	**South**	**27.07**
Italy	**100**	**Italy**	**100**	**Italy**	**100**	**Italy**	**100**	**Italy**	**28.77**	**Italy**	**19.58**

If we look, now, at the growth rates the same table shows that *Umb*, *Pug*, *Cal* and *Bas* register better performances, both in terms of arrivals and nights. Conversely, *Laz, Lig, Cam, VdA, Mol* and *Lom* stand out among the regions that have experienced a worse-off. The case of *Lom* deserves a comment. As we can see from the Table, this region ranks in the 8th position for arrivals, while moves at the 17th for number of nights. One of the explanation of this evidence is to be found in the motivations behind the tourists choice. Probably, short visits, mainly due to business activity, characterize the tourism market of this region.

In terms of macro-areas, the South shows the highest growth rate for both arrivals and nights (*even higher than the national average*), followed by the North for arrivals and the Centre for overnight stays.

Finally, let us turn our attention to tourism consumptions. When this variable is considered, *Pug*, *Sar*, *Sic*, and *Cal* stand in the highest position of the list if we consider the ratio between consumption and arrivals, while *VdA*, *Taa*, *EmR* and *Lig* rank the highest positions when consumption per capita is taken into account (Cfr. Table 8). *Sic* and *Pug*, together with *Laz*, report the highest values also in terms of consumption per-die. It turns out that the South results the most expensive macro-area of the country.

Summing up, as already highlighted by previous literature[11], our data confirm, on the one hand, a quite stable behaviour of inter-regional tourism flows over the last ten years and, on the other, the

[11] Cortès-Jimènes (2008)

increased interest of Italian tourists for the unusual and less touristy areas of the country (*cfr. Bas, Cal, Pug*).

Table 8. Ranking of the Italian regions (2007)

Tourism consumption on arrivals		**Tourism consumption per-die**		**Tourist consumption per-capita**	
Pug	1725	*Sic*	524.12	*VdA*	4991
Sar	1655	*Pug*	397.39	*Taa*	4325
Sic	1597	*Laz*	387.02	*EmR*	1991
Cal	1520	*Lom*	362.23	*Lig*	1915
Abr	1390	*Pie*	338.28	*Tos*	1724
FVG	1348	*Mol*	321.08	*Mar*	1505
Cam	1289	*Cam*	314.03	*Sar*	1484
EmRom	1287	*Sar*	308.72	*Abr*	1448
Lig	1277	*Lig*	302.78	*Ven*	1353
Mar	1277	*Abr*	298.50	*FVG*	1248
Ven	1198	*VdA*	297.61	*Cal*	1006
Tos	1137	*FVG*	294.27	*Pug*	964
VdA	1112	*Tos*	290.10	*Sic*	905
Taa	1107	*EmR*	289.99	*Umb*	778
Laz	1085	*Cal*	280.25	*Laz*	759
Mol	1075	*Ven*	255.71	*Cam*	617
Pie	947	*Taa*	222.11	*Mol*	579
Lom	883	*Mar*	204.60	*Lom*	524
Bas	660	*Umb*	166.91	*Pie*	462
Umb	439	*Bas*	156.17	*Bas*	441
North	**1134**	**North**	**283.38**	**North**	**1170**
Centre	**1056**	**Centre**	**281.24**	**Centre**	**1164**
South	**1493**	**South**	**351.28**	**South**	**909**
Italy	**1200**	**Italy**	**300.03**	**Italy**	**1077**

3. Determinants of domestic tourist flows

There are relatively few researches that analyse domestic tourism demand. These studies, the most of the time, concentrate on international flows or in tourism in general so that the domestic component results overlooked. As a consequence, literature on domestic tourism determinants is quite scant and moves along the lines suggested by international tourist flows studies.

In general terms, it has emerged that factors conditioning the choice of a destination across international borders might also influence the destination choice of a tourist within its own country. In this respect, empirical evidence is quite various. In particular, previous works have shown that demand elasticities are strongly affected by the nationality of the tourist and the chosen destination (Naudé-Saayman, 2005: 369). Furthermore, it has also shown that typical developed country determinants are less significant when developing country aspects of tourism demand are taken into account (Naudé-Saayman, 2005: 388).

In what follows we try to summarize the role of the most often used explanatory variables in the analysis of tourism demand. The premise for this analysis is the emergence of new trends in the discretionary consumption of leisure time. In particular, several studies have shown that tourists in choosing their destinations are often no longer interested to a set of distinct elements composing a holiday experience, but to the entire portfolio of attractions and services offered by a site or region.

It turns out that tourism flows cannot exclusively being explained in terms of economic demand-driven variables such as income and cost of living (Zhang-Jensen, 2007: 224)[12], since several non-economic or qualitative determinants may also affect the behaviour of travellers (Garin-Munoz 2009, p. 761).

These are the reasons why tourism flows have been increasingly explained in terms of qualitative supply-side factors that are crucial in determining the comparative advantage of the "exporting countries". There is a large number of qualitative variables relating the destination country that can influence tourism flows. Among them tourist services, destination attractiveness and destination accessibility seem to play the major role. According to the broader perspective suggested by Cracolici and Nijkamp (2008)[13], tourist supply factors as a whole can be divided into *complementary* elements and *pertinent* factors. For complementary elements are intended information, services, cultural events, quality and variety of products in the shops, hotels and other accommodation, level of prices and living costs and tourist safety. On the other hand, pertinent factors include reception and courtesy of local residents, artistic and cultural cities, landscape, environment and nature.

Besides supply-side factors, qualitative variables that are likely to influence tourism demand may also concern the origin market. They include tourists' attributes (*gender, age, education level, and employment/profession*), household size (*composition of household, and child/children age*), population and trip motive or frequency (Lim 1997: 845).

Summing up, according to the literature, there are both economic and non-economic factors that can affect inbound and domestic tourist demand. These factors can alternatively concern the origin market (*income, prices, tourist age and education*…), the destination region (*prices, income, services, attractiveness, risk, marketing promotion*…) or the relation between origin and destination (*distance, accessibility, bilateral trade flows, common borders*…). Depending on the perspective, destination factors may be further divided into complementary and pertinent elements.

Let us now concentrate our attention on the rationale behind the factors generally proposed by the literature as the appropriate modelling framework to estimate tourism trade between two or several pairs of destinations.

Income in the origin country is certainly at the top of the list. This variable proxies the tourist spending power and therefore it is expected to positively influence the tourist demand both currently and with delay (income variations can take time to influence tourist demand). In general terms, it seems that tourism is a luxury good, with income elasticity roughly between one and two (Eilat-Einav, 2004: 1217).

The size of the population in the origin is another determinant of the tourism demand since it influences the extent of demand for tourism services. Precisely, the greater the population of the origin, the greater the amount of tourism generated, ceteris paribus (Garin-Munoz, 2009). Sometimes studies on tourism determinants also consider population at destination. This variable can work both as a pulling factor for destinations where tourists attract tourists, or, conversely, as a dampening factor.

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[13]A strand of empirical literature has moved towards the analysis and measurement of tourist destination competitiveness based on an analysis of tourists judgements of a tourist destination profile (cfr. inter al. Cracolici-Nijkamp, 2008 and Crouch-Ritchie, 1999)

At origin, tourist choice can also be positively influenced by its own education level. Higher education is expected to give people greater interest in travelling abroad and learning about different cultures (Lim, 1997: 844).

As previously mentioned, the amount of tourism demand is also likely to depend positively on tourism infrastructures (*hotels, restaurants*) and attractiveness (*climate, culture, history, and natural environment*). Complementarily, promotion (*marketing expenditure*), cultural initiatives and public investment on cultural supply turn out to be relevant as well. Moreover, internet plays an increasingly propulsive role on tourism through marketing information, on line booking and electronic commerce (Naudè-Saayman, 2005). Conversely, risk over tourists safety is expected to exert a negative influence. In this perspective, political risk is another variable that has been shown to be important for destination choice for both developed and less developed countries (Eilat-Einav, 2004. 1316).

In terms of variables linking origin and destination regions, relative price is often used to explain tourists behaviour. When expressed in relative terms, prices capture the cost of living in the destination with respect to the origin and are expected to negatively influence a destination choice. To capture differences in purchasing power between currencies, the exchange rate also appears as a determinant of international tourist flows. On this issue, empirical evidence is not conclusive. As reported in Eilat-Einav (2004), estimated prices elasticities vary dramatically both within and across papers. Nevertheless, it seems that tourism to developed countries has a price elasticity of about one, while tourism to less developed countries is unresponsive to price fluctuations (Eilat-Eivav, 2004: 1316).

Another important determinant linking origin and destination is given by transportation costs. They are intended as the costs for travelling between the origin and destination country and are supposed to discourage tourist demand when are high or increasing (negative elasticity). Closely related to transportation costs is the distance between origin and destination, which matters for at least two reasons. On the one hand it can be interpreted as a proxy for travel costs. On the other hand distance can matter simply because tourists may be discouraged from going too far from their own residences. At international level, for instance, it seems that tourists prefer to avoid long distance indeed (Bigano *et al*., 2006).

According to the premises, all these variables can in principle influence both international and domestic tourism flows, even though one can expect that the two components of the total demand exhibit different degrees of responsiveness.

In Garin-Munoz (2009) it seems that domestic tourists are less sensitive to income and prices changes than international ones. This evidence is supported by the works of Taylor-Arigoni Ortiz (2009) and Bigano *et al*. (2006). In particular Bigano *et al*. (2006) find that income elasticity of domestic holidays is positive for countries with low incomes, but falls as income grows and eventually goes negative. As for prices, domestic tourism demand is also likely to depend on prices of alternative destinations stronger than international flows do.

Besides income and prices, others variables can impact differently on domestic tourism demand. Precisely, recent empirical studies have pointed out the relevance of the residents overseas departures. In such a case it might be interesting to investigate whether domestic and international tourism are complementary or substitute. In other words it is worth seeing if there is a kind of substitution effects, a trade-off between holidays in the home country and abroad (Bigano *et al*.

2006). In fact, with a negative elasticity we can say that international tourism grows at the expense of domestic tourism and viceversa.

In the case of developing countries other factors determining domestic tourism are transportation networks, telecommunications, commerce, urban development and public health (Wen, 1997: 566).

3.1 *The case of Italy*

For the case of Italy, studies on tourism have developed along several lines of research. Among them, tourism demand and its determinants represent the most investigated issues. Other topics relate to the economic impact of tourism[14] and its role for growth[15], the destinations competitiveness[16], the relation between tourism activity and business cycle[17] and the life cycle hypothesis[18].

Studies on the determinants of the Italian tourism demand mainly concentrate on international flows[19] or in tourism in general, so that the number of contributions focusing on domestic tourism is quite small and mainly refers to specific regions or areas of the country.

Examples of studies where domestic and international flows are analysed as distinct components of total demand are Mazzocchi-Montini (2001), Brau (2008), De Blasi *et al*. (2008) and Provenzano (2009). Mazzocchi and Montini study the earthquake effects of tourism in central Italy, Brau applies a choice modelling approach for the tourism demand in Sardinia, De Blasi et al. implement a gravity model to study the international demand of farm-hotels in Italy and Provenzano develops a dynamic analysis of tourism demand for Sicily. More precisely, he formalizes three models to define the international, domestic and local tourism demand.

De Blasi *et al*. (2008) estimate elasticities with respect to income, population and the percentage of urban population at origin, the number of beds at destination and, finally, the distance between origin and destination. They find the percentage of urban population at origin highly significant (3.27) and an elasticity around 1 for both income and population at origin. Less significant is the distance with an estimated coefficient of 0.56.

The results found by Provenzano (2009) are mixed and in general reveal that the responsiveness to economic and non-economic variables by agents demanding tourism in Sicily varies according to the origin of the tourist: international, domestic and local.

To the best of our knowledge, the only studies focusing exclusively on domestic tourism determinants are Gardini (1979) and Di Torrice *et al*. (2008). The former considers the interregional tourism flows and determines the Leontieff-Strout gravitational coefficients. The latter, estimates the domestic same-day visits in Italy through different sources.

Summing up, the existing empirical literature on Italian domestic tourism is quite scant and, what is more, lacks of a global overview helping to understand its determinants and their relative elasticities.

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[14] Cfr. *inter al*. Bacci-Ghezzi-Giacomelli (2002a, 2002b), Costa (1984)
[15] Cfr. *inter al*. Cortés-Jimenez (2006).
[16] Cfr. Cracolici-Nijkamp (2008).
[17] Cfr. Guizzardi-Mazzocchi (2009).
[18] Cfr. Formica-Uysal (1996).
[19] Cfr. *inter al*. Giacomelli (2003); De Blasi *et al*. (2008); Carraro *et al*. (1994); Carraro-Manente (1998).

4. The empirical model and research strategy

Our aim is to investigate the main determinants of the domestic tourism in Italy, giving particular emphasis to the role of supply side attributes as driving force of Italian tourists' choice.

In particular, firstly we want to test whether, besides variables typically used to explain international tourism flows, destination attributes also matters for the case of the Italian domestic tourism. Furthermore, we want to investigate if regional differences in terms of economic factors, culture and different life styles may affect the behavior of Italian tourists. The idea is that such differences may generate two geographies of the domestic tourism demand, one expressed by residents in Centre- North regions and the other by tourists resident in southern regions.

For our purpose we consider bilateral tourism flows across the twenty Italian regions. Accordingly, the observation unit in our framework ($arr_{i,j}$) consists in the number of arrivals at destination *i* from the specific origin *j*, with the different regions competing with each other in order to attract more tourists. The explanatory variables are the main determinants of international tourism flows plus other determinants that, according to our view, could be particularly significant for the case of Italian domestic tourism. This kind of analysis brings us to a large panel data set where explanatory variables are spatially differentiated. In details, we consider variables that are closely related with the place of origin, variables that are closely related to the destination and, finally, variables linking each pair of regions.

At origin we analyze the impact of population density, per capita GDP, education and outbound tourism. As explained in the previous section, with population ($densp_j$) and per capita GDP (gdp_j) it is possible to test the extent to which size and wealth can positively affect the amount of tourism generated by a particular region. With education (edu_j) the hypothesis tested is that general education level, increasing the interest for cultural and historical attractiveness, can again positively influence tourism demand at origin. Finally, outbound tourism ($trips_j$) serves us to test whether the two goods, that is, the domestic tourism and the outbound tourism, are somehow competing with each other. A negative elasticity would reveal that the two goods are substitutable, whilst a positive sign would indicate that they are complementary.

At destination we study the impact of population density, culture, the degree the regional touristic vocation, of transport infrastructure and public safety. With population density ($densp_i$), measured at destination, we can control for the role of regional size. This variable is expected to positively influence the tourism demand. However a negative impact is also reasonable for tourists demanding relaxing holidays.

To investigate the role of culture as possible attracting factor for tourism demand we consider on the one hand the number of museums ($museums_i$), on the other hand the public effort in supporting and promoting various initiatives. As supporting activities we consider the volume of public expenditure for culture activities and events ($cultexp_i$), while to capture the role of promotion we consider the percentage of free tickets over the total tickets sold for visiting public museums and historical buildings ($cultprom_i$).

To take account of regional differences in the degree of tourism vocation, we use an index which measures the relative endowment of touristic places ($places_i$)[20] for each region of the country. High values of this index indicates that in the region there is an high number of sites relatively to the total national endowment. We expect the index to be positively related with the number of arrivals.

To control for the role of transport infrastructure we consider the number of highways kilometers ($roads_i$), which expresses the facility for internal mobility, particularly important for those tourists whishing to visit different places in the same region.

To conclude with the determinants of tourism demand measured at destination, we consider a social variable aimed at capturing the role of public safety. At this scope, we use a variable measured as the percentage of minor crimes over the total crimes ($crime_i$). Given this definition, higher values indicate higher safety levels.

Moving to variables defined to control for the relation between origin and destination, we refer to distance ($dist_i$) and relative prices ($price_{i,j}$). Differently from the other determinants which refer to the single region of origin and/or destination, they are measured for each pair of regions. As it is costumary in this literature, the relative price index is measured as the ratio between the *CPI* at destination and the *CPI* at origin. We assume that the tourists consider the purchaising power of their income at destination with respect to the one at origin. As for distance, we have already discussed its role as a proxy for time and transportation costs.

To conclude and to give dynamics to our analysis, we consider the lagged dependent variable ($arr_{i,j,t-1}$). With this variable we aim to capture the tendency of tourists of one region to return to the same place to spend their holidays.

Given the structure of our dataset, we consider the Gravity model, duly augmented, the natural context where conducting the empirical investigation. The gravity model has many applications in different fields of empirical research, in particular in migration and international trade (Lowry, 1966; Poyhonen, 1963). The basic essence of the gravity model is that the flows of the considered good between two different regions or countries depend positively on the size of them and negatively on the distance.

The extended version of the gravity model we propose in our study is represented by the following equation:

$$\textbf{(1)} \quad arr_{i,j,t} = k^{\gamma_0} \times \frac{densp_{i,t}^{\gamma_1} \times densp_{j,t}^{\gamma_2}}{dist_{i,j}^{\gamma_3} \times price_{i,j,t}^{\gamma_4}} \times \prod_{s=1}^{n} X_{s,j,t}^{\alpha_s} \times \prod_{s=1}^{n} X_{s,i,t}^{\beta_s}$$

where, X_j and X_i are the sets of variables which refer to the origin and to the destination place respectively. Taking the logs of both sides of equation (1) we obtain the following linear equation:

[20] See Section 5 for details about the index.

$$\textbf{(2)} \quad arr_{i,j,t} = \gamma_0 k + \gamma_1 densp_{i,t} + \gamma_2 densp_{j,t} - \gamma_3 dist_{i,j} - \gamma_4 price_{i,j,t} + \sum_{s=1}^{n} \alpha_s x_{s,j,t} + \sum_{s=1}^{n} \beta_s x_{s,i,t}$$

with low letter case denoting the log transformation and, therefore, coefficients representing elasticities. Given all variables we decided to include in our analysis, equation (2) turns into the following econometric model:

$$\begin{aligned}\textbf{(3)} \quad arr_{i,j,t} = {} & \alpha_i + \beta_0 arr_{i,j,t-1} + \beta_1 densp_{i,t} + \beta_2 densp_{j,t} + \beta_3 dist_{i,j} + \beta_4 price_{i,j,t} + \beta_5 gdp_{j,t} + \beta_6 places_i \\ & + \beta_7 cult\exp_{i,t} + \beta_8 cultprom_{i,t} + \beta_9 museum_i + \beta_{10} trips_{j,t} + \beta_{11} road_{i,t} \\ & + \beta_{12} edu_{j,t} + \beta_{13} crime_{i,t} + \beta_{14} 2005_t + \beta_{15} 2006_t + \beta_{16} 2007_t + \varepsilon_{i,j,t}\end{aligned}$$

where, time dummies have been added in order to control for possible idiosyncratic temporal effects. According to our scopes, model in equation (3) is firstly tested for the full sample of the twenty Italian regions. Then the data set is disaggregated into two regional-wise sub-panels and the model is re-estimated twice. Our strategy has been to build these subsamples only with respect to the region of origin. Thus, one subsample includes the arrivals from the Centre-North tourists to the twenty Italian regions and, conversely, the other subsample comprises the arrivals registered in all regions but originated only from southern regions residents.

4.1 *Estimation technique*

The panel structure of our data allows to estimate the model using the standard panel data techniques, that is the fixed effects model (*FEM*) or the random effects model (*REM*). The latter is more efficient but its estimates are inconsistent if the unobserved effects are correlated with the regressors (J. Wooldridge, 2002). In order to verify the consistency of the *REM* it is recommended to apply the Hausman specification test which tests the null hypothesis that the differences in coefficients estimate between the *FEM* and the *REM* are not systematic. If the Hausman test rejects the null, the *REM* estimates are not consistent and we should apply the *FEM*.

However, the within estimator of the *FEM* has a drawback which becomes particularly important in studies like ours. As a consequence of the demeaning transformation, it sweeps away from the estimation all the time invariant variables (Hsiao, 2003). In our analysis many covariates present such characteristic since they vary between regions, but not within the same region.[21] Some of them do not vary at all, like distance, others are time invariant only relatively to the time span considered for the analysis, like highway kilometers[22]. It turns out that, for our analysis, it might be a big loss not to be able to explicitly estimate the impact of time invariant variables.

A solution to this problem is offered by the Fixed Effect Vector Decomposition estimator (*FEVD*) developed by Plümper and Troeger (T. Plümper and V. E. Troeger, 2007). Interestingly, in developing their model, these authors point out another weakness of the fixed effect estimator which is less known but extremely important, that is the inefficiency of the estimates for variables that have a very small within variance. For instance, the *GDP* and the population (*variables*

[21] Next section reports the main descriptive statistics of our series.

[22] It varies between regions but for the same region its within variation can be nil for years.

common to many empirical studies) typically exhibit much more between than within variation. Thus, as it was also pointed out by Cornwell and Rupert (1988) the within estimator suffers from two drawbacks: the elimination of all the time invariant variables and the loss of efficiency, both due to the within transformation which ignores the between variation. The *FEVD* estimator, by contrast, has the double advantage of allowing the estimation of the time invariant variables and to improve the efficiency of the estimates for the rarely time varying variables.

The estimator is a three stage procedure: the first stage serves to obtain the unit effects from the standard fixed effect model estimation, the second stage regresses the unit effects on the time invariant and the rarely time invariant variables, the last stage is a pooled *OLS* estimation of the full model, including the error term of the second stage.

5. Data source and description

As explained in the previous section, the dependent variable of our model is given by the number of arrivals in region *i* (*destination*) from region *j* (*origin*). Data on arrivals disaggregated at regional level are taken from the census investigation titled "Movimento dei clienti negli esercizi ricettivi," conducted by the Italian National Institute of Statistics (*ISTAT*). The owners of establishments providing accommodation on the basis of an entrepreneurial activity are asked to collect information about their clients. By filling a form they register the number of arrivals and departures, distinguished by country of origin and Italian region of residency. The advantage of these data is that they allow us to setup a panel dataset with yearly arrivals measured by region of origin and region of destination. The period covered by our analysis is 2004-2007, considering that there are 20 regions of origin and 19 regions of destinations, we have a panel with T = 4 and N = 380.

With only one exception, *ISTAT* also provides data on the explanatory variables we have considered in our analysis. Details on definition and data sources are clearly shown in Table 9. Only for the index *places* some more information is deserved. From the ISTAT investigation titled "Capacità degli esercizi ricettivi" we have taken data on the number of touristic places of which every region is naturally endowed. Data refer to seven groups of touristic places: mountains resorts, hilly resorts, maritime resorts, city of arts, lakes, thermal resorts and religious spots. The index is given, for each region of destination, by the ratio between the regional specific endowment and the total national endowment.

Table 9. Variables description and data sources

Variable	Definition	Source
arr	Number of people arrived each year in each region	ISTAT
densp	Population density	ISTAT
dist	Aerial distance	Google hearth
gdp	Real per capita GDP	ISTAT
price	Ratio between the IPC in the destination and in origin	ISTAT
places	Ratio between the regional endowment of touristic places and the total national endowment.	ISTAT

museum	Number of national museums and monuments	ISTAT
roads	Highway kilometers.	ISTAT
cultexp	Regional expenditure in cultural activities	ISTAT
promcult	Ratio between paying and not paying visitors of national museums	ISTAT
trips	Number of people resident in the region of origin who travelled abroad	ISTAT
edu	Percentage of people in age 25-64 with at least a diploma	ISTAT
crime	Percentage of minor crime over total crime	ISTAT

Table 10 shows the main descriptive statistics of the variables in log format. Given the double dimension of our panel data, we can calculate our statistics along two directions corresponding to the within and the between dynamics of each variable. Specifically, we are interested in decomposing the total variance of each determinants into the *within* variance (*the difference between the individual observation and its mean)* and the *between* variance (*the difference between the individual mean and the total mean computed for all individuals and all periods*). As we discussed in the previous section, this information is particularly useful when dealing with cross sectional time series data, since the ratio between the two components of the total variance gives suggestions on the type of econometric model to be considered for the estimations.

Looking at the last column of Table 10 it is interesting to note that some of the time varying variables are indeed rarely time varying, in that the between variation dominates the within variation. The dependent variable (*arr*) and the per capita *GDP* exhibit a between standard deviation which is 18 times the within one. The other variables with a huge ratio are the *densp* (57.2), *roads* (68.61), *trips* (11.82) and *crime* (6.53). These large b/w ratios warn us that by applying an estimator that uses the sole within variance, like the *FEM* within estimator does, we would lose a big percentage of the total information provided by these variables. Moreover, considering that also the dependent variable has a high b/w ratio, the within estimator may lead to coefficients estimates which can be seriously biased. Therefore, from the descriptive statistics arises that, among the standard panel data models, the *REM*, which exploits both the within and between variance, should be the preferable one, unless we detect strong correlation between the individual terms and the observed covariates that would invalidate the *REM* results. In such a case, the *FEVD* could turn out as our first candidate.

Table 10. Descriptive statistics

Variable		**Mean**	**Std. Dev.**	**Min**	**Max**	**Obs**		**b/w**
arr	overall	10.61	1.5	4.51	14.2	N =	1520	
	between		1.5	4.89	14.14	n =	380	
	Within		0.08	10.23	11.12	T =	4	18.41
densp	overall	-1.91	0.64	-3.29	-0.85	N =	1900	
	between		0.64	-3.27	-0.85	n =	380	
	Within		0.01	-1.94	-1.87	T =	5	57.23

dist	overall	5.94	0.61	4.36	6.98	N =	1900	
	between		0.61	4.36	6.98	n =	380	
	Within		0	5.94	5.94	T =	5	-
gdp	overall	3	0.25	2.61	3.34	N =	1900	
	between		0.25	2.62	3.33	n =	380	
	Within		0.01	2.96	3.04	T =	5	18.41
price	overall	0	0.02	-0.05	0.05	N =	1520	
	between		0.02	-0.05	0.05	n =	380	
	Within		0	-0.02	0.02	T =	4	3.86
places	overall	-1.89	1.7	-5.79	0.07	N =	1900	
	between		1.7	-5.79	0.07	n =	380	
	Within		0	-1.89	-1.89	T =	5	-
museum	overall	2.87	0.69	1.95	4.47	N =	1615	
	between		0.69	1.95	4.47	n =	323	
	Within		0	2.87	2.87	T =	5	-
roads	overall	5.52	0.92	3.37	6.71	N =	1900	
	between		0.92	3.37	6.7	n =	380	
	Within		0.01	5.46	5.62	T =	5	68.61
cultexp	overall	-0.6	0.92	-2.3	0.79	N =	1900	
	between		0.92	-2.3	0.79	n =	380	
	Within		0	-0.6	-0.6	T =	5	-
promcult	overall	4.67	0.53	3.28	5.73	N =	1710	
	between		0.51	3.89	5.66	n =	342	
	Within		0.14	4.06	5.34	T =	5	3.75
trips	overall	6.82	1.42	3.93	10.04	N =	1520	
	between		1.41	4.11	9.9	n =	380	
	Within		0.12	6.43	7.13	T =	4	11.82
edu	overall	3.92	0.12	3.65	4.15	N =	1900	
	between		0.11	3.71	4.11	n =	380	
	Within		0.03	3.85	3.99	T =	5	3.35
crime	overall	3	0.42	1.81	3.7	N =	1900	
	between		0.42	1.85	3.63	n =	380	
	Within		0.06	2.83	3.17	T =	5	6.53

6. Estimation and results

This section reports the main findings of our empirical investigation.
As previously anticipated, the first step of the analysis consists in checking for the consistency of the *REM* estimates by means of the Hausman specification test (Hausman, 1978). Not surprisingly, according to the test, we reject it in favor of the *FEM* ($\chi^2 = 872$). It follows that, given the presence, in our sample, of relevant time invariant explanatory variables, together with variables that exhibits very high ratios of the between-within variance, we are induced to apply the *FEVD*, as strongly recommended by Plümper and Troeger.

6.1 *Results at full-sample level*

The results for the full sample estimation are shown in Table 11. Starting from the gravity variables we find a positive elasticity of 0.0196 for the population density in the region of origin, which means that the higher is the population density the higher are the arrivals from that region. The positive impact is in line with what has been found in other studies but the magnitude of the coefficient is lower than what appeared in previous empirical literature on international tourism flows (*cfr.*, *inter al*. Khadaroo-Seetanah, 2008). By contrast, demand elasticity with respect to population at destination exhibits a negative sign (-0.0076). It is not easy to compare this result with the previous literature since population is rarely measured in the region of destination. One exception is the work of Zhang and Jensen (2007). These authors estimate this elasticity for a large panel of developed and developing countries, finding an elasticity of 1.276 for the full sample. Conversely, at sub-sample level they obtain negative coefficients. In particular, they estimate elasticities of -0.441 and -0.733 for developing Asian countries and European transition countries, respectively.

The third gravity variable of our model, the distance, shows the expected negative sign. It is then confirmed its role as proxy for travel monetary and non monetary costs (e.g., time travel). However, the size of the coefficient (-0.0082) appears much smaller than the one suggested by the existing empirical literature. Khadaroo and Seetanah (2008) find an elasticity of -0.22, on average. It seems, thus, that when domestic tourism is taken into account tourists are less sensitive to distance than international ones.

As expected, per capita *GDP* in the origin affects positively the number of arrivals. However, the estimated elasticity is only 0.1175 resulting lower than the existing evidence for both domestic tourism (e.g., 0.86 in Garin-Mugnoz, 2009) and international tourism (e.g., 1.21 and 1.52 in Garin-Mugnoz, 2009; 0.26 and 0.81 in Khadaroo-Seetanah, 2008; 0.69 in Zhang-Jensen, 2007; 1.23 in De Blasi et al., 2008). However, its size is very close to Provenzano's findings for the case of domestic tourism determinants in Sicily (Provenzano, 2009). In general terms, domestic tourism for Italy does not seem to behave as a luxury good, as frequently found for international tourism (Eilat-Einav, 2004). A negative elasticity of arrivals with respect to income is found in Taylor-Arrigoni Ortiz (2009) with variables expressed in variations and not in levels.

The other important economic variable considered in our study is the relative price. In this case, we estimate an elasticity of -0.2204 which is in line with the range of values suggested by the literature (cfr., inter al., Khadaroo-Seetanah, 2008). This result suggests that tourists are responsive to differences in prices across destination and are discouraged to go to regions where the cost of living is higher than the one in their own region.

The lagged dependent variable is highly significant. Its size (1.0026) reveals the presence of important habit persistence among Italian tourists which tend to return to the same region where they spent the previous year's holidays. In addition, by using bilateral flows the result strength the reputation's role for each region with respect to the region of origin. With respect to previous literature, our estimate compares to Provenzano's findings (Provenzano, 2009), but appears higher than what found by Garin-Mugnoz for the case of domestic tourism in Galicia (0.24) (Garin-Mugnoz, 2009) and by Khadaroo and Seetanah (0.13) for the case of international tourism flows (Khadaroo-Seetanah, 2008).

A positive coefficient is also estimated for the index capturing regional endowments of touristic attractiveness, *places*. Although its size is small (0.0043), this coefficient confirms that pertinent factors act as pulling forces for tourism demand.

As far as the role of culture is concerned, we find a positive, but low, impact for public expenditure in cultural activities, *cultexp* (0.0057). The sign of this coefficient reveals that a rise of public involvement in cultural initiatives determines an increase in tourism arrivals. The number of museums, monuments and archeological sites exhibits a positive elasticity, as well (0.0006). Again the coefficient is very low. Finally, the role of promotion, *cultprom*, is not significant.

A satisfactory inland connection, controlled by the variable *roads*, is also a factor which tourists appear to take into consideration. However the relative elasticity, 0.0058, is very small when compared to other empirical results. Khadaroo and Seetanah (2008), investigating the role of transport infrastructure in international tourism, find an elasticity of 0.13 for a sample of 28 countries. Even higher elasticities are estimated in Provenzano (2009) (2.55 *and* 4,17 *for domestic and international tourism flows respectively*).

Other outcomes of our analysis concern the role of foreign destinations and the *crime* index. As far as the former is concerned, it appears that domestic destinations, besides competing with each other, also compete with destinations outside the national borders. In fact, the coefficient of the number of *trips* (-0.0158) to foreign countries appears with a negative sign. Conversely, the variable *crime* exhibits a coefficient with positive sign, meaning that tourists are attracted by places where the security level is higher (0.0089).

Finally, the education level does not seem to affect the number of domestic arrivals. This result is in contrast with what has been found for international tourism. Year dummies are not significant too.

Summing up, results at aggregate level suggest that the principal determinant of the domestic tourism demand in Italy is the lagged dependent variable which control for the role of reputation and habit formation. Other relevant determinants are relative prices and per capita income measured in the region of origin. Also population density at origin and travel abroad influence Italian domestic tourism, but with low elasticities. Very low, even if statistically significant, is the explanatory power of public cultural expenditure, population density at destination, distance, foreign destinations, roads and crime. Furthermore, our results suggest that domestic tourists do not respond to variations of the index controlling for cultural promotion by the public authority and to education level of tourists. In comparison to international tourism flows, it emerges that domestic tourism demand is less responsive to per capita *GDP*, population density at origin, distance and transport infrastructure.

Table 11. Results at full sample level

Variable	Coefficients	*SE*
$arr_{i,j,t-1}$	1.0026***	0.0003
$densp_{j,t}$	0.0196***	0.0016
$densp_{i,t}$	- 0.0076***	0.0006
$dist_{i,j}$	- 0.0082***	0.0002
$price_{i,j,t}$	- 0.2204***	0.0283
$gdp_{j,t}$	0.1175***	0.0013
$places_i$	0.0043***	0.0003
$cultexp_{i,t}$	0.0057***	0.0001
$cultprom_{i,t}$	0.0039	0.0062

$museum_i$	0.0006***	0.0001
$trips_{i,t}$	- 0.0158***	0.0009
$roads_{i,t}$	0.0058***	0.0003
$Edu_{j,t}$	- 0.185	0.3667
$crime_{i,t}$	0.0089***	0.0018
2005_t	- 0.0103	0.0083
2006_t	- 0.0134	0.0145
2007_t	- 0.0271	0.0218
Const	0.4970***	0.0128

*Panel Fixed Effects Regression with Vector Decomposition (FEVD). The variables arr, odensp, ddensp, dist, gdp, price, places, museum, roads, cultexp, trips and crime are treated as time invariant or rarely changing variables. Standard errors are robust to heteroschedasticity. Stars denote p-values as follows: * p<0.05; ** p<0.01; *** p<0.001*

6.2 *Results at macro-area level*

Let us now turn our attention to the sub-samples analysis. As previously anticipated, we re-estimated the model in equation 3 for the two macroareas previously defined. Results, shown in Table 12, highlights two main outcomes.

On the one hand, in general terms, with the only exceptions of relative prices, *roads* and *museum*, the sub-sample analysis supports the qualitative results obtained at full sample level. The sign of the coefficients is confirmed and among the main determinants again we find the lagged dependent variable and other covariates such as per capita income, population density, distance and travel abroad.

On the other hand, it seems that our estimated elasticities highlight interesting differences in the behavior of tourists coming from the two different areas of the country. In particular, all elasticities, when statistically significant, are systematically higher for southern tourism demand, which refers to the less developed area of the country. These differences appear particularly interesting when economic variables are taken into account. Specifically, it appears that northern tourists do not respond to relative price changes and that traveling from southern regions is comparatively more income sensitive. These evidence supports what highlighted for the case of international tourism flows where it appears that the richer the country, the lower the sensitivity to both economic variables. In particular, for *gdp*, empirical evidence highlights that if income grows elasticity demand falls and eventually goes negative (Bigano et. al., 2006). Given the substitutability between domestic and international tourism, already found for the full sample, a possible explanation is that when income is low its growth determines an increase in domestic tourism rather than international one since people first prefer cheap holidays. The income elasticity for the domestic tourism demand starts to fall when people are rich enough to afford holidays abroad.

Other interesting differences can also be remarked for the rest of the variables.

Trips to foreign destinations, for instance, is another variable that reports the expected negative sign for both macroareas, even though the sensitive of southern tourist demand is higher. To our opinion,

this result can be explained in terms of per capita income divergences across Italian regions. A higher elasticity expressed by southern tourists implies that for low level incomes the degree of competition between domestic and international tourism becomes higher.

As far as the coefficient for population density in the region of origin is concerned, its size may depend on the different weight that the domestic tourism exhibits in the two areas of the country.[23] In other words, the propensity to travel within the country boards is higher for the southern regions than for northern ones, making national destinations more sensitive to population variations in the South. Conversely, at destination, population density represents the only variable with a (only slighter) higher elasticity for northern tourists. It could probably mean that people traveling from the richest area of the country, with a higher population density[24], tend to prefer less crowded destinations.

The distance is observed to have the expected sign, but again the elasticity is higher for southern tourists. This results probably depend on the great regional disparities in transport infrastructure and services. Tourists from southern regions are more concerned with this variable probably because they are costumed to experiment frequent inland connection problems. This interpretation can be supported by the sign of the coefficient reported by the variable *roads* which is positive and negative for south and north respectively. Another possible explanation could be that southern tourists, differently from northern ones, mainly use cars for their trips.

Also for the role of culture, the impact of public expenditure in cultural activities is estimated positive for both macroareas and higher for south, whilst cultural promotion is confirmed insignificant. Surprisingly, at macroarea level, the variable *museum* exhibits an unexpected negative sing.

Some slight macroarea differences also appear for the role of regional endowments of touristic attractiveness, while education is confirmed statistically non significant for both macro-areas.

Finally, the variable *crime* exhibits a statistically significant coefficient only for northern tourists and exhibits the expected sign.

In conclusion, results at sub-sample level confirm for both macroares the strong role of the lagged dependent variable, which suggests the presence of repeated tourism around the country, and the presence of interesting different behaviors across Italian tourists. In particular, among other things, our disaggregated analysis suggests that, while for southern tourists economic variables exhibit a significant explanatory power, the same is not true for northern ones. Moreover, the rest of the determinants we have considered in our study do not seem to exert a relevant role, especially after doing a comparison with the international tourism literature.

Table 12. Results at sub-sample level

	South		Centre-North	
Variable	**Coefficients**	***SE***	**Coefficients**	***SE***
$arr_{i,j,t-1}$	1.0081***	0.0003	1.0060***	0.0003
$densp_{j,t}$	0.0623***	0.007	0.0033***	0.0006
$densp_{i,t}$	- 0.0123***	0.0016	- 0.0143***	0.0001

[23] For 2007, the domestic tourism account for the 88% of the total tourism for the South, the 84% for the Centre and for the 80% for the North (ISTAT).
[24] ISTAT

$dist_{i,j}$	- 0.0157***	0.0003	- 0.0055***	0.0004
$price_{i,j,t}$	- 0.6498***	0.0792	- 0.0087	0.0231
$gdp_{j,t}$	0.4575***	0.012	0.0337***	0.0013
$places_i$	0.0058***	0.0005	0.0041***	0.0002
$cultexp_{i,t}$	0.0089***	0.0002	0.0039***	0.0001
$cultprom_{i,t}$	- 0.006	0.0116	0.008	0.0072
$museum_i$	- 0.0034***	0.0003	- 0.0011***	0.0000
$trips_{i,t}$	- 0.0622***	0.0034	- 0.0055***	0.0007
$roads_{i,t}$	0.0122***	0.0006	- 0.0008***	0.0001
$Edu_{j,t}$	- 0.4191	0.6329	- 0.0889	0.5313
$crime_{i,t}$	0.0011	0.0044	0.0175***	0.0008
2005_t	0.0093	0.017	- 0.0230*	0.0109
2006_t	0.0069	0.024	- 0.0301	0.0219
2007_t	- 0.0065	0.0335	- 0.0476	0.0341
Const	0.7807***	0.0132	0.2177***	0.0141

*Panel Fixed Effects Regression with Vector Decomposition (FEVD). The variables arr, odensp, ddensp, dist, gdp, price, places, museum, roads, cultexp, trips and crime are treated as time invariant or rarely changing variables. Standard errors are robust to heteroschedasticity. Stars denote p-values as follows: * p<0.05; ** p<0.01; *** p<0.001*

7. Conclusions

Italy is one of the top tourism destination in the world with a fast growing tourism industry. Domestic tourism accounts for the largest part of the whole industry in terms of consumption, value added and employment; yet, the empirical literature is quite scant. For these reasons, our analysis attempted to shed some light on the determinants of Italian interregional tourism flows.

We used a panel of 380 individuals (*constructed considering the bilateral flows of arrivals between the twenty Italian regions*), observed during the period 2004-2007. An extended gravity model has been estimated with the *FEVD* estimator, which allows to obtain the estimates for the time invariant variables and, in addition, improves the efficiency for the variables showing a between dominant variability. Besides the gravitational variables (e.g, *distance and population*), we investigated the role of the determinants which are commonly present in the existing empirical literature of international tourism and compared our results with those obtained in other studies. This analysis has been firstly conducted at aggregate level and, then, at sub-sample level capturing the North-South geographical partition of the country.

At aggregate level, the main determinant of Italian tourist flows appear to be the lagged dependent variable, which indicates the presence of strong habit persistence and the importance of reputation. Moreover, Italian tourists seem to be particularly sensitive to differences in relative prices between their region and the possible destinations. The impact estimated for these two variables is in line with elasticities suggested by the existing literature for the international counterpart. On the contrary, even though the per capita *GDP* plays a significant role, its coefficient suggests that domestic tourism does not behave as a luxury good, as frequently found for international tourism. The domestic bilateral flows are also determined by the population density in the region of origin and (*negatively*) by distance, though their impact is not strong. An interesting result is that, for

Italian tourists, domestic destinations and international destinations act as substitutable goods. We have also found that local government can improve the tourist competition by increasing the expenditure in cultural activities. As for the role played by the pertinent factors, the endowment of touristic places as well as a good level of transport infrastructures appear to act as pull factors. By contrast, variables which are often significant in explaining international tourism flows, like safety level and education, seem to affect only a little, or to not affect at all, the domestic ones.

At sub-sample level, we have then investigated the presence of differences in the determinants of tourism with respect to the two macro-areas, namely the Centre-North and the South. While from one hand, in terms of statistical significance, with some exceptions, the full sample evidence is confirmed, on the other hand some interesting differences arise with respect to the impact of the relevant variables. In particular, tourists coming from the southern regions appear to be more concerned, than northern tourists, with per capita *GDP* variations and differences in prices.

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