

Seasonality and Efficiency of the Italian Tourist Enterprises: some Regional Scenarios

Stagionalità ed efficienza delle imprese turistiche italiane: alcuni scenari regionali

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Riassunto: è stato costruito un database che include dati statistici ufficiali prodotti dall'ISTAT - sia di carattere economico, sia di natura quantitativa - riferiti alle imprese turistico-ricettive (alberghi e strutture complementari). Alcune analisi econometriche hanno verificato la significatività della relazione tra indici di efficienza e di dimensione da un lato ed indici turistici di stagionalità e di utilizzo dei posti letto dall'altro.

Keywords: Bed-places, Efficiency, Nights spent, Seasonality, Tourism, Tourist flows.

1. A database including size, seasonality and efficiency indicators

Up to now, statistics on tourist flows cannot be linked with any economic indicators at the enterprise level, and only regional descriptive analyses at the macro level can be carried out. The only way to merge economic and “physical” data on tourism flows (herein we consider the number of nights spent) referring to statistical units more detailed than Italian regions consists in building up a database as described below. Moreover, the relationships existing among economic and physical data are introduced in paragraph 2, where two econometric models are defined, tested and commented.

In this study two relevant ISTAT statistical sources were considered: 1) the statistical register of the active enterprises “ASIA”, containing for each enterprise relevant economic data as number of persons employed and turnover, both of them referred to 1999. 2) The monthly survey monitoring arrivals and nights spent in the Italian tourist “accommodation establishments”, that can be distinguished between hotels and other collective accommodations (campings, tourist villages, youth hostels, other structures). Concerning the second source, we preferred to take into account the most recent available data – referred to year 2000 – because a preliminary statistical check showed small differences between the statistical indexes – introduced in the next – built up referring to 1999 and 2000. While the first source is detailed at the enterprise level, data from the second one are available at the level of 532 “tourist areas”, that are sub-provincial tourism administrative bodies (called “APT”) including municipalities in charge, according to the statistical law, of picking up monthly data on tourist flows from accommodation establishments and sending them to ISTAT. So, the tourist flows level of detail isn't the single tourist enterprise, but the tourist area, e.g. a cluster of enterprises. The linkage between the two sources represents the first attempt at the moment

carried out on this field and was based on the variable “municipality” where each enterprise in the ASIA register is located. Data in ASIA, concerning about 60,000 tourist enterprises, were gathered at the tourist area level according to the municipality where each enterprise operates and the tourist area to which the municipality is assigned. In this way we built up new macro-enterprises based on clusters of enterprises belonging to the same tourist area, of which both economic and tourist data are available. Finally, we had a database including 532 macro-units for hotels and 458 for other collective accommodations, because in same tourist areas no enterprises of such kind operate, especially in the South. At the regional level, because of the low number of areas Molise and Basilicata were joined with Abruzzo and Calabria respectively.

Then for each tourist area it was possible to calculate both economic and structural indexes, useful for models in paragraph 2. Economic indicators are the ratios between turnover and: a) persons employed (productivity): b) number of enterprises (size). Structural tourist indexes are: a) seasonality¹, given by the percent ratio between nights spent in June, July and August and in 2000; b) bed-places use, given by the percent ratio between nights spent in 2000 and the product between bed-places and the number of opening days (“available bed-days”). In table 1 main indicators are resumed at the regional level for hotels and other collective accommodations (from now on “oca”).

Table 1: Regional indicators by type of accommodation (Million Lire)

Region	Hotels					Other collective tourist accommodations				
	Turnover / Emplo-yees (1999)	Average turnover (1999)	Nights spent (thousand d2000)	Index of seasonality	Bed-places use	Turnover / Emplo-yees (1999)	Average turnover (1999)	Nights spent (thousand d2000)	Index of seasonality	Bed-places use
Piemonte	90	458	5,582	32.7	24.6	66	228	2,511	58.1	12.1
Valled'Aosta	72	393	2,414	45.6	40.5	70	249	786	70.9	11.1
Lombardia	118	1,119	17,969	31.7	45.0	133	531	4,871	67.5	23.4
Trentino A.Adige	94	474	29,173	42.6	33.1	53	101	7,669	57.4	16.3
Veneto	99	859	26,426	42.9	49.2	144	516	28,445	76.3	22.2
Friuli V.Giulia	94	541	3,701	45.7	35.4	63	246	5,510	77.1	28.7
Liguria	87	467	11,749	42.4	49.3	82	244	3,720	66.1	18.1
Emilia Romagna	86	435	30,075	61.5	56.6	67	318	6,328	77.0	27.9
Toscana	96	596	22,137	41.1	41.1	84	242	15,161	65.6	22.6
Umbria	88	485	3,467	34.0	41.7	39	64	2,049	53.9	22.5
Marche	80	410	5,973	56.8	36.3	82	225	6,438	70.6	18.9
Lazio	128	1,268	26,664	28.0	57.8	149	1,097	3,167	70.1	13.9
Abruzzo Molise	89	444	4,933	56.0	30.6	50	114	1,986	86.3	19.7
Campania	94	739	14,880	40.5	50.8	60	156	5,819	71.7	23.8
Puglia	96	635	4,785	51.8	27.9	116	435	3,868	88.7	16.8
Basilicata	84	424	5,630	61.4	28.6	91	325	2,114	87.0	10.1
Calabria										
Sicilia	92	779	11,624	42.0	45.6	68	205	1,786	70.5	15.9
Sardegna	117	767	6,432	62.1	37.6	102	430	3,045	84.6	24.3
North/West	101	772	37,714	36.1	43.0	99	359	11,888	65.3	18.5
North/East	93	578	89,375	49.2	45.9	110	393	47,952	73.5	22.8
Centre	109	878	58,241	36.3	48.3	88	325	26,815	66.4	20.7
South/Islands	95	675	48,284	48.9	40.9	82	278	18,618	80.5	19.7
ITALY	99	640	233,613	42.6	42.7	91	283	105,272	71.3	20.2

On the average, hotels' productivity is higher than “oca” (99 million against 91) and is more steady: for hotels it ranges from 72 million (Valle d'Aosta) to 128 (Lazio), while for the “oca”

¹ In the regressions this index performed better than two other indexes given by: 1) percent ratio between nights spent in August and the overall 2000; 2) coefficient of variation of monthly nights spent in 2000.

the range is from 39 (Umbria) to 149 (Lazio). Some hotels' features stress differences with "oca": a) the average enterprise size is quite higher (640 million against 283). 2) They explain more than two thirds of nights spent in 2000. 3) Seasonality is quite lower (42.6% against 71.3%). 4) Bed-places use is more than double (42.7% against 20.2%). Looking at figures by regions and geographic areas, lower levels of seasonality characterise areas with higher productivity or size: for both hotels and "oca" it happens in North/West and Centre. On the other hand, the link with bed-places use is less clear, as when comparing North/West with North/East: in the former lower bed-places use indexes couple with higher productivity and size indexes, and vice versa.

2. Econometric models' main results

Productivity or size indicators on one hand, seasonality and bed-places use indexes on the other can be used to estimate the model $y_i/x_i = a S_i + b B_i$, where i refers to the generic tourist area, y is turnover, x is the number of persons employed or of enterprises, S is the index of seasonality and B is the bed-places use index, while a and b are parameters to be estimated separately for hotels and the "oca", using in each region tourist areas as micro data. The main aim is to test the significance of the relation between economic productivity (x = persons employed) to indirect productivity (bed-places use) and seasonality – e.g. another indirect physical unproductivity index due to unsteadiness of tourist flows in the year. For each region we estimated an "efficiency model" (EM): since both the explicative variables come from tourism statistics, we want to better qualify their informative content, verifying their explicative power on a raw (but the only computable) efficiency indicator. Moreover, we tested a "size model" (SM) because it's not clear the relation among explicative variables and the market share of each tourist enterprise, even though we expect a weaker statistical significance in comparison with model EM (the average yearly turnover could depend more on other variables). Both EM and SM could sound ambitious, because explain economic output indicators on the basis of physical indicators only, paying the unavailability of other economic indicators at the tourist area level. The main aim was to test a unique general bivariate model, even though in some cases univariate models could perform better.

For what concerns model EM (table 2), results are rather good and better for hotels in each region: on the average the adjusted R^2 is equal to 0.874 for hotels and to 0.760 for the other collective accommodations. For hotels the best fit is in North/West (0.923) and the worst in South/Islands (0.803), and it's worthwhile to note that an opposite result characterises "oca" (0.733 and 0.778 respectively). Particularly good results concern Trentino, Friuli, Umbria and Valle D'Aosta for hotels, the only Liguria for "oca". In all cases the Fisher's F significance is higher than 0.0001, while the parameters estimates' precision varies from region to region. For hotels the bivariate model performs well for Piemonte, Lombardia, Trentino and Toscana; bed-places use is highly significant (without seasonality) for Veneto, Friuli, Liguria, Emilia, Marche and Abruzzo-Molise; in no region seasonality is particularly significant *without bed-places use*; bad results affect Sardegna only. So, the model performs better in the North and bed-places use is more relevant than seasonality, which on the average is less relevant in North/East and South/Islands. On the other hand, for "oca" the bivariate model isn't

appropriate at all and the best model is based on seasonality only: its significance is high in Piemonte, Trentino, Emilia, Toscana, Marche, Abruzzo-Molise and Sicilia and is quite good in Veneto, Umbria, Campania and Puglia, with a wider coverage of whole Italy when compared with hotels. Moreover, seasonality becomes more relevant passing from North/West to South/Islands. Bed-places use is absolutely more relevant than seasonality only in Lombardia and in no region both variables are not significant at all. Model SM results worst than EM: parameters' estimates are not precise for "oca" - with a few exceptions - with seasonality more relevant than bed-places use as for EM, while for hotels only the bed-places use is significant, except for Umbria and Islands.

Table 2: Regressions by Regions and type of tourist accommodation

Region	Dependent variable:Turnover/(persons employed)						Dependent variable:Turnover/enterprises					
	Hotels			Other accommodations			Hotels			Other accommodations		
	Adjust.	Pr> t		Adjust.	Pr> t		Adjust.	Pr> t		Adjust.	Pr> t	
	R ²	Season	Beds	R ²	Season	Beds	R ²	Season	Beds	R ²	Season	Beds
Piemonte	0.916	0.0001	0.0001	0.566	0.0000	0.2666	0.805	0.2155	0.0000	0.427	0.0010	0.2469
Valle d'Aosta	0.946	0.0379	0.0739	0.865	0.0149	0.6236	0.969	0.7570	0.0005	0.462*	0.1877	0.6814
Lombardia	0.920	0.0001	0.0001	0.561	0.8897	0.0000	0.761	0.0694	0.0000	0.423	0.9567	0.0001
Trentino A.A.	0.986	0.0001	0.0001	0.811	0.0000	0.0306	0.905	0.4820	0.0000	0.599	0.0009	0.4240
Veneto	0.897	0.0271	0.0001	0.712	0.0013	0.0173	0.577	0.2085	0.0002	0.348*	0.0472	0.3801
Friuli V.Giulia	0.966	0.4522	0.0001	0.758	0.0880	0.0359	0.921	0.0351	0.0000	0.630*	0.6468	0.0223
Liguria	0.911	0.0168	0.0006	0.940	0.0170	0.0010	0.904	0.7935	0.0000	0.860	0.3607	0.0042
Emilia Rom.	0.719	0.4198	0.0001	0.753	0.0001	0.0202	0.443	0.3499	0.0004	0.517	0.0069	0.2339
Toscana	0.936	0.0001	0.0001	0.700	0.0000	0.0211	0.805	0.2518	0.0000	0.349	0.0226	0.1138
Umbria	0.946	0.0352	0.1311	0.815	0.0033	0.2398	0.855	0.3936	0.1655	0.732*	0.0021	0.0449
Marche	0.881	0.0196	0.0001	0.806	0.0000	0.2960	0.843	0.6354	0.0000	0.684	0.0000	0.4410
Lazio	0.886	0.0019	0.0050	0.731	0.0290	0.0980	0.855	0.2013	0.0000	0.103*	0.7087	0.4315
Abruzzo-Molise	0.822	0.6461	0.0004	0.812	0.0000	0.5561	0.698	0.3356	0.0004	0.622	0.0001	0.2453
Campania	0.868	0.0032	0.0167	0.841	0.0011	0.0226	0.683	0.9402	0.0025	0.633	0.0083	0.5180
Puglia	0.864	0.0096	0.0100	0.730	0.0094	0.2668	0.596	0.9752	0.0138	0.587*	0.0032	0.5069
Basilicata-Cal.	0.729	0.1047	0.0171	0.790	0.0161	0.4498	0.647	0.6708	0.0012	0.451*	0.1131	0.9409
Sicilia	0.759	0.0160	0.1778	0.607	0.0001	0.8322	0.515	0.7061	0.0627	0.408*	0.0028	0.6786
Sardegna	0.778	0.4224	0.2373	0.887	0.0149	0.0011	0.480*	0.3758	0.0739	0.529*	0.5005	0.0485
North/West	0.923	0.0137	0.0187	0.733	0.2304	0.2228	0.860	0.4589	0.0001	0.570	0.3765	0.2332
North/East	0.892	0.2248	0.0001	0.759	0.0224	0.0260	0.712	0.2689	0.0002	0.558	0.1755	0.2651
Centre	0.912	0.0142	0.0341	0.763	0.0081	0.1637	0.840	0.3705	0.0414	0.517	0.1834	0.2578
South/Islands	0.803	0.2003	0.0766	0.778	0.0069	0.3548	0.628	0.6673	0.0258	0.628	0.1047	0.4897
ITALY	0.874	0.1229	0.0373	0.760	0.0603	0.2099	0.737	0.4665	0.0178	0.520	0.1983	0.3312

Figures without * indicate that $F < 0.0001$. Otherwise: V. D'Aosta: 0.0342; Veneto 0.0018; Friuli 0.001; Umbria 0.0006; Lazio 0.1735; Puglia 0.0003; Basilicata 0.02; Sicilia 0.0007; Sardegna 0.0079 and 0.0093. Simple means at the last 5 rows.

Conclusions: 1) the database's usefulness is high and other variables will be added soon. 2) Hotels' behaviour can be modelled better than other collective accommodations. 3) Productivity is more influenced from seasonality and bed-places use than yearly turnover. 4) For hotels, bed-places use is more relevant than seasonality, especially for productivity. 5) The best models concern hotels' productivity in the North.

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