The relationship between immigration and tourism firms

Carla Massidda, Ivan Etzo, Romano Piras

University of Cagliari, Italy

Abstract

This article investigates whether the presence of immigrants represents an opportunity for Italian tourism firms to increase the number of establishments and their employees. To this scope, we focus on the hotels and restaurants sector where a great amount of revenues comes from the tourist expenditure. The investigation is conducted at both the nationwide level and, separately, for Centre-Northern and Southern provinces. As estimation technique, in order to deal with the potential endogeneity problem, we will proceed with the two-stage least square method. The results strongly support a positive relationship between the provincial share of immigrants and the number of tourism establishments and their employees. This relationship seems to be stronger for southern provinces.

Introduction

Recent studies have demonstrated that in Italy the strong expansion of the number of immigrants has given a positive impetus to the tourism demand by pulling international tourist arrivals, number of nights and total expenditure (Massidda et al. 2015). In particular, it has been demonstrated that foreign communities in Italy have been a major force of attraction for tourism inflows in the three main market segments represented by leisure tourism, business and visiting friends and relatives (VFR). Conversely, up to our knowledge, there are not studies that focus on the relationship between immigration and tourism supply, namely with that part of firms involved in the production of goods and services demanded by tourists for holiday purposes.

The mechanisms that, starting from an increase in the stock of immigrants, can lead to a rise in the Italian tourism supply go through two main channels. The first is the consumption channel that concerns tourism demand. In fact, as mentioned, the presence of immigrants, pulling tourist inflows, stimulates the demand of goods and services and, therefore, the production activities aimed at its fulfilment. The second is the production channel that is powered by the presence of immigrants along two dimensions. On the one hand, foreign population represents workforce, mostly low-skilled, which often allows firms to pay lower wages. Under this perspective, in Italy

foreign workers might create a favourable environment for opening new activities and/or raise the productive scale of existing ones. On the other hand, immigrants can be entrepreneurs whose activity contributes to enlarge the tourism market by raising the number of firms and their employees (natives and foreigners).

This issue has been the matter of a recent investigation proposed by Olney (2013) for the case of USA domestic firms disaggregated by area of economic activity, but without a specific focus on the tourism sector. He finds that firms respond to immigration increasing the number of local units and, consequently, expanding their labor demand. In the footsteps of this research, the present paper aims to investigate whether in Italy the presence of immigrants represents an opportunity for tourism firms to increase the number of local production units (establishments) and their employees.

A possible drawback of this investigation is the identification of the tourism supply. In fact, the plural and heterogeneous nature of the tourism product makes it particularly hard to isolate tourism firms and to fully understand the impact that immigration might exert on them. Tourism, in fact, can be defined as an "industrial sector" consisting of combination of conventional industries that jointly contribute to satisfy the tourism demand (Candela and Figini, 2010).

The literature suggests several approaches to identify the supply side of the tourism market. One of these consists in splitting the economic activities related to tourism

into "basic" and "ancillary" and considering the group of basic services the closest proxy of the tourism supply. As it is well known, a large share of these services is delivered by the Hotels and Restaurants (H&R) sector, whose firms find in the tourism demand the main source of their revenues. As a matter of fact, according to the National Institution of Tourism Research (ISNART, 2013), more than 45 percent of total tourism expenditure in Italy refers to accommodation and restaurant services. Taking these considerations into account, the strategy of the present paper is to focus on this sector in order to capture the response given by the tourism firms to immigration in terms of local units as well as employees. The investigation is conducted both at the nation-wide level and, separately, for the two macro-areas of the Country, namely Centre-North and South. This may be of particular interest since recent data show that the flows of immigrant are growing faster in the South, the less developed area of the country, rather than in the Centre-North.

The analysis considers data on local units and their employees for 103 Italian provinces (NUTS 3) during the period 2004-2010. The empirical model uses the share of immigrants as the main explanatory variable. The other determinants of the model are population density, the unemployment rate and the growth rate of value added per capita. As for the identification strategy, in order to deal with the potential endogeneity problem that might affect ordinary least squares (OLS) estimates, we apply the two stage least squares (2SLS) method. The instrument is built by

exploiting the pulling force exerted by the pre-existing immigrant communities on new immigration flows.

Results strongly support the existence of a positive relationship between the provincial share of immigrants and both the number of tourism establishments and their employees. This relationship appears to be stronger for Southern provinces. Conversely, being unknown the nationality of employees, our analysis is not able to determine whether or not immigrants displace native workers. Neither can it say anything about the impact of the share of immigrants on wages of both natives and foreigners.

The rest of the paper is organized as follows. Next section provides a brief overview of the relevant literature. Afterwards we present the general context and discuss the empirical model and the estimation strategy. Following that, we present the dataset and comment the main empirical findings. Finally, we highlight some concluding remarks.

The relevant literature

There are two strands of literature related to the present contribution. The first regards a great number of studies that focus on the impact of immigration on the economy of receiving countries. Traditionally, this strand of research has been interested in highlighting the influence of immigrants on the main labor market

outcomes, namely wages and employment (cfr. inter al., Borjas et al., 2012). Far from reaching an overall consensus, these studies have recently prompted the idea to extend the analysis beyond the labor market edge, to embrace a more appropriate general equilibrium perspective (Dustmann et al., 2016; Ottaviano and Peri, 2012, 2013). The main issue is that, taking fully into account the skill complementarities between workers, immigrants can be seen as an opportunity for receiving countries (Ottaviano and Peri, 2013). More precisely, immigrants and natives are heterogeneous and can complement each other, giving to firms the opportunity to diversify skills, tasks and products, to cut production costs and, in some cases, to expand their capital stock, both on the intensive as well as the extensive margin by increasing the number of establishments in order to utilize the abundant supply of low-skilled workers. On this point Olney (2013) has focused his recent effort. He finds that firms expand their production activities to respond to immigration, leaving wages almost unaffected. His findings can be considered a demonstration that firms respond to immigration increasing labor demand because they find convenient to open new establishments where there is abundance of labor.

The second strand of literature includes contributions dealing with the relationship between migration and tourism. The works of Jackson (1990), King (1994), Williams and Hall (2002) and Boyne et al. (2002) can be considered the first attempts to provide a theory of the positive nexus between these two phenomena. From this

framework, migration turns out to be one of the main prerequisites for VFR trips, both inbound and outbound. In the footsteps of these initial works, recent studies have argued that the connection between tourism and migration goes beyond the VFR channel. Accordingly, immigrants can increase the attractiveness of a destination for the general class of tourists, simply because they enrich a destination's cultural life by providing a wider array of consumption possibilities. They also motivate compatriots' visits for ethnic reunion and/or they retain business links with their country of origin. Recent contributions worth to be mentioned are those of Prescott et al. (2005), Seetaram and Dwyer (2009), Dwyer et al. (2010), Gheasi et al. (2011), Tadesse and White (2012), Seetaram (2012a, b), Leitão and Shahbaz (2012), Genç (2013), Law et al. (2013), Etzo et al. (2014), Massidda et al. (2015) and Massidda and Piras (2015). Despite these studies differ in many aspects, they show two common characteristics. The first is the finding of a robust and positive relationship between migration and tourism flows that goes well beyond the VFR segment of the tourism demand. The second is that none of them investigate the impact of migration focusing on the other side of the market, namely the tourism supply.

The general context

The purpose of this section is to describe the general context concerning the analysis developed in this study. Therefore, the period considered coincides with the sample of the empirical analysis that has been constrained to the years 2004-2010 by data availability.

During this period, after decades of continuous growth, immigration continues to be a very important phenomenon in Italy. Foreign citizens, reported to be 1.3 million in the 2001 census, more than tripled in the subsequent ten years reaching 4.1 million in 2010. In terms of percentage over Italian population, they rose from the 2.2% in 2001 to the 7% in 2010. As regard the skill level, immigrants are relatively less educated than Italian natives. As shown in Table 1, 10.89% have only primary education, 33.72% lower-secondary education, 44.86% upper-secondary education and 10.52% a university degree or more. Thus, only one out of ten immigrants are high-skilled (i.e. holding a university degree or more).

Table 1 – Immigrants and Italians main characteristics: education level (2010).

	Italians	Immigrants	Italians/Immigrants
Primary education (ISCED 1)	4.65	10.89	0.43
Lower-secondary (ISCED 2)	29.86	33.72	0.88
Upper secondary (ISCED 3, 4)	46.83	44.86	1.04
University degree and more (ISCED 5, 6)	18.66	10.52	1.77
	100.00	100.00	

Source: own computation based on Istat (Data warehouse: http://stra-dati.istat.it/ and http://dati.istat.it/).

More than 2 millions of these immigrants have a job. In this regard, from Table 2, it is interesting to observe that at national level (column 1) the majority of them are employed in three main sectors: about 24.7% in Other personal services, 16.7% in Constructions and, finally, 19.4% in Manufacturing. It is also interesting to note that H&R, with 9.0% of immigrants employed, comes fourth, meaning that firms operating in this sector show a clear preference for foreign workers. This is also confirmed by the share of immigrant workers over total employment (column 2). As we can see, H&R reports the third highest share (15.8), after Other personal services (29.2) and Constructions (18.1). In this respect, it is worth to know that the average national share (not reported in the Table) is much lower (9.1).

In Table 2, we can see also the data on employment, disaggregated by sector and geographic area. As we can notice, the sector distribution of foreign workers is not homogeneous across macro-areas. Manufacturing registers the highest percentage of immigrants employed in the Northern regions (25.15%), while in the Centre and in the South the highest share of foreign workers is in Other personal services. Southern regions are also characterized by a very significant percentage of immigrants employed in Commerce (16.3%). As far as H&R is concerned, while all macro-areas confirm their interest for foreign workers, the highest percentage of immigrants employed in H&R is registered in the South (10.4%).

Table 2 – Immigrants (age >15) employed by sectors and geographical area (2010)

Sectors	Sectors	Italy		North	Centre	South
		%	Share (Foreigners/ Total)	%	%	%
1	Agriculture, forestry, fishing	4.3	10.0	2.55	3.9	13.4
2	Energy, mining and quarrying	0.1	1.5	0.2	0.1	0.1
3	Manufacturing	19.4	9.2	25.15	13.1	8.0
4	Construction	16.7	18.1	15.65	20.5	13.5
5	Commerce	8.2	5.0	7.05	7.1	16.3
6	Hotels and restaurants	9.0	15.8	8.35	10.1	10.4
7	Transportation and communication	4.4	7.3	5.8	2.4	2.1
8	Financial, insurance and real estate	0.8	2.0	0.85	0.8	0.2
9	Professional, scientific and technical activities	7.1	6.0	8.6	5.8	1.5
10	Public administration	0.2	0.2	0.15	0.1	0.2
11	Education; Health and social work activities	5.1	3.3	6.15	3.5	3.3
12	Other personal services	24.7	29.2	19.4	32.5	31.2
		100		100	100	100

Source: Fondazione Leone Moressa based on the LFS data (ISTAT).

As for local units, the data made available by ISTAT derive from the Statistical Register of Active Enterprises (ASIA) and cover the industrial and service activities. During the period under investigation, the total number of firms rose from about 4 million in 2004 to 4.5 million in 2010. To these firms, on average, belong about 4.8 million of local units which employ roughly 17 million workers. On average, as we can see from the last two columns of Table 3, local units and employees have increased by approximately 3% and 5%, respectively. [1]

Table 3 - Local units and employees: growth rates

	Industry				Services						Total	
	Manuf.		Constructions		Commerce		H&R		Other Services			
	L.U.	Empl.	L.U.	Empl.	L.U.	Empl.	L.U.	Empl.	L.U.	Empl.	L.U.	Empl.
2005	-1.33	-1.24	3.83	3.74	-0.86	1.80	3.39	4.31	3.80	4.36	1.74	2.14
2006	-1.05	-0.46	2.62	2.48	-0.25	1.78	1.24	3.17	2.38	3.18	1.16	1.80
2007	-6.26	0.27	5.50	8.11	-1.35	2.47	3.05	7.05	3.65	2.44	1.23	2.75
2008	-2.65	-1.10	0.06	0.96	-1.26	1.03	2.59	5.86	2.35	3.51	0.49	1.64
2009	-5.00	-4.86	-2.63	-5.05	-2.41	-1.26	-0.45	-0.59	0.74	0.27	-1.29	-2.04
2010	-2.01	-3.32	-3.67	-4.57	-0.64	-0.47	1.05	1.26	1.11	0.47	-0.34	-1.17
2005-2010	-17.06	-10.33	5.50	5.13	-6.60	5.42	11.32	22.76	14.83	15.02	3.00	5.13

Source: ASIA

In Table 3, we see also the data on local units and employees disaggregated by sector. In this case, for reason of synthesis, the category Other services re-aggregates all services, but Commerce and H&R. As we can notice, H&R shows the highest growth rates in the number of employees, both yearly and, on average, for the interval 2004-2010, whereas it ranks second after Other services as far as the growth rate of local units is concerned. It is also interesting to observe that H&R reports a negative growth rate in 2009 alone, the year just after the crisis, whereas Manufacturing and Commerce have negative signs throughout the whole period.

Turning to a macro-area perspective, ASIA statistics, reported in Table 4, show that 51% of local units are located in the Northern provinces with 56% of employees (corresponding to 9.7 millions), 21% of local units are in the Centre with 21% of employees (3.6 millions) and 28% are in the South with 23% of employees (4 millions).

Table 4 - Local units and employees by geographic area (2010)

	North	Center	South	
Local Units	51%	21%	28%	100
Employees	56%	21%	23%	100

Source: Becheri and Maggiore (2011)

In terms of growth rates, local units of almost all sectors have grown faster in the Centre and in the South. As shown is Figure 1, this is particularly evident for H&R.
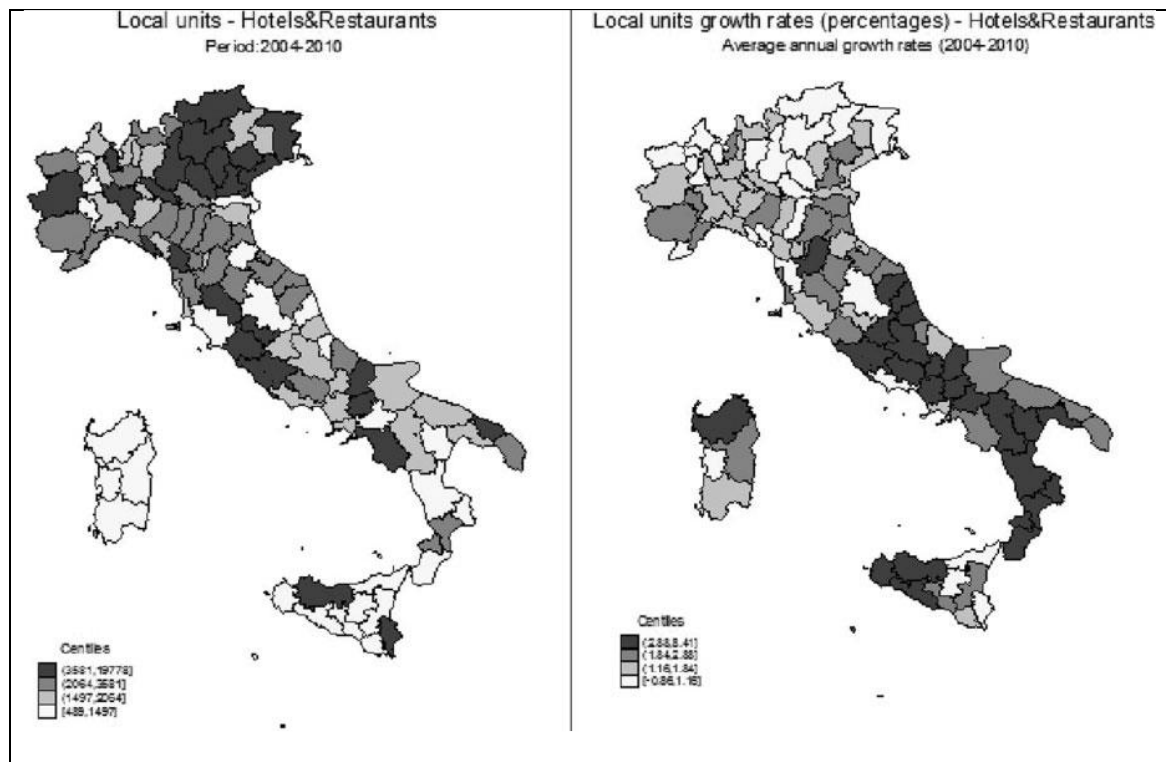

Figure 1. Geographical distribution of Italian H&R local units in levels and growth rates.

To conclude, in Table 5 we report some statistics on H&R firms divided by macro-area. For comparison, data on total firms in tourism and total aggregated firms are also reported. As we can see, with respect to total tourism, H&R firms cover a share slightly above 60% in Italy, and in all the macro-areas (column 4). It is also relevant the percentage of H&R firms over total firms that corresponds to 6.3% at national level, it rises to 6.7% in the North, it is 6.6% in the Centre and, finally, it is 5.6% in the South (column 5). The last two columns of the Table report the rate of change of firms in the H&R sector and in aggregate. As we can notice, the part of the tourism supply measured by H&R is confirmed to be highly dynamics with rates of variation much higher than the rest of the economy.

Table 5 - H&R firms by geographic area

	H&R	Total Tourism	Total	% H&R/ Total Tourism	% H&R/ Total	% Tourism/ Total	Rate of change 2009-2010 H&R	Rate of change 2009-2010 Total
North	185723	304232	2808492	61.2	6.7	10.9	2.7	0.25
Center	85354	142126	1291662	60.1	6.6	11.0	2.5	1.0
South	112472	185280	2009063	60.7	5.6	9.2	2.8	0.2
Italy	383549	631638	6109217	60.7	6.3	10.3	2.7	0.4

Source: Becheri and Maggiore (2011)

To sum up, following the previous discussion, three main aspects characterize the Italian tourism-migration arena. First, the H&R sector shows a clear preference for foreign workers, measured in terms of both percentage of immigrants employed by H&R over total immigrant workers and of the share of immigrants employed by

H&R over the total workers employed by the same sector. Second, this phenomenon is stronger in Southern provinces. Third, H&R local units and their employees have grown faster in the South rather than in the rest of the Country.

Econometric model and estimation method

This paper focuses on the relationship between the phenomenon of immigration and the tourism supply in Italy. In particular, we investigate how an increase in the share of working age foreign-born population affects the number of local units and their employees in the H&R sector, which we deem representative of the tourism activities in Italy. As a term of comparison, the impact of immigration share is estimated for the Aggregate Economy as well, with respect to both the total number of local units and for their employees. The investigation is carried out at nation-wide level and, separately, for Centre-Northern and Southern macro-areas. Data refer to a panel of 103 Italian provinces (NUTS 3) during the 2004-2010 time period.

As for the empirical model, following a standard approach in the migration literature, we consider a static relationship. More in detail, in the footsteps of Olney (2013), the estimated equation is the following:[2]

(1) $\ln y_{i,t} = \beta_0 + \beta_1 \ln Sh\_Imm_{i,t} + \beta_j X_{i,t} + \mu_i + \gamma_t + \varepsilon_{i,t}$

where the dependent variable ln $y_{i,t}$ is, alternatively, the log of the number of establishments and of the number of employees, in province i at year t. The variable of interest (ln $Sh\_Imm_{i,t}$) is the log of the share of working age foreign born population resident in province i at year t, whereas $X_{i,t}$ is a set of three control variables and β_j (j=2, 3, 4) are the corresponding estimated coefficients. The control variables are included to take into account some determinants that might be relevant for firms that are willing to consider the opportunity to open new establishments and/or to hire new employees. Under such a perspective, we first consider ln $Dens_{i,t}$ that stands for the log of population density. This variable is often significant in models analyzing the determinants of new firms creation and serves to capture the positive agglomeration (spill-over) effects (Armington and Zoltan, 2002). The second variable is the log of the unemployment rate (ln $Unemp_{i,t}$) which is included in order to control for provincial-specific, time variant labour demand shocks. Notice that its expected sign is not defined a priori. On the one hand, in fact, an increase in unemployment levels might increase the probability that the unemployed decide to start their own business. On the other hand, high unemployment rates can be the result of an economic downturn, which increases the risk of starting new businesses. Finally, $g\_vapc_{i,t}$ indicates the growth rate of value added per capita that is meant to capture global productivity shocks at provincial level; its effect is expected to be positive. To complete the model, differences in some characteristics that are time

invariant during the period considered, such as the average endowment of infrastructures but also the tourism endowments (natural, climatic, historical etc.), are captured by the fixed effects μ_i. Conversely, the effects of common shocks which affect all provinces are captured by including the temporal dummies γ_t. Finally, $\varepsilon_{i,t}$ is the error term uncorrelated with the covariates.

Our research strategy is to include the three control variables one by one into the analysis. Therefore, the empirical investigation considers four alternative model specifications. This is aimed, on the one hand, at comparing the statistical performance of the different models and, on the other, at performing a robustness check on the significance of our variable of interest, namely ln $Sh\_Imm_{i,t}$. This is a quite standard way of proceeding whenever one explanatory variable is of primary interest and the researcher wants to see whether the estimated coefficient is robust or not to adding other variables (Wooldridge, 2013).

As regard the econometric approach, one of the main concerns when studying the economic impact of migration is that OLS estimates of equations (1) could be potentially not consistent due to the possible endogeneity of the migration variable. The source of endogeneity could be caused by omitted variables which might affect both the increase in the number of establishments in one province and the decision of immigrants to move in that province. For example, provinces that are experiencing an economic expansion could both attract new investments (i.e., the creation of new

establishments) and pull foreign workers, namely immigrants. In such a case OLS results could be seriously biased. In order to overcome this problem and obtain reliable estimates, we employ an instrumental variable approach, namely the two stages least square (2SLS) estimator. Following both Altonji and Card (1991) and Card (2001) the instrument is constructed by exploiting the correlation between the new immigrants inflow from a source country and the historical persistence of communities from the same country in the destination area (province). Thus, the resulting variable predicting the yearly number of immigrants in each Italian province is built as follows:

$$(2) \ \ p\_sh\_imm_{i,t} = \frac{\sum_i (sh\_imm_{j,i,2002} * imm_{j,t})}{pop_{i,t}}$$

where, $sh\_imm_{j,i,2002}$ is the share of immigrants from country j residing in province i in 2002 over the total number of immigrants from country j residing in Italy in 2002[3] and $imm_{j,t}$ is the total number of immigrants from country j residing in Italy in year t. In order to obtain the predicted exogenous component of the share of immigrants the numerator has been divided by the total population resident in each province (i.e., $pop_{i,t}$).

Data sources and description

This study utilizes data on establishments, foreign immigrants and other control variables for 103 Italian provinces (NUTS 3). Data on establishments are taken from the Statistical Archive of Active Enterprises (ASIA) managed by the Italian National Institute of Statistics (ISTAT). Information on local units, that is the number of establishments at provincial level, is available since 2004. However, given that in 2010 there was a change in the methodology of data collection, the present paper restricts the empirical investigation to the 2004-2010 time period. The ASIA data base provides information regarding the total number of employees, self employment included. Furthermore, all the data are also available at sectoral level, which allows focusing the empirical analysis to specific sectors such as H&R which is our main purpose.

Data on immigrants are taken from ISTAT archives and refer to the foreign-born population resident in Italy and not holding the Italian citizenship. Unfortunately, information on their educational attainment is not available at provincial level; hence we cannot differentiate them by skill level. Conversely, having information on their age, we consider only the working age (16-64 years old) immigrants, that represent a better proxy for the labour supply of immigrant. Finally, data on unemployment and population density are taken from ISTAT data-warehouse.

Results of the effect of immigrants on the number of establishments

In this section, we discuss how, according to the four empirical models derived from equation (1), variations in the provincial share of immigrants might affect the number of establishments in the H&R sector. For a complete discussion of the main findings, we compare the results with those obtained for the Aggregate Economy. In both cases, estimates are performed at nation-wide level and for the two macro-areas of the country. Along the diverse phases of the empirical analysis, Wald tests on coefficient restrictions are conducted to control for the statistical significance of macro-area differences. Results are reported in Table 6.[4]

Table 6 - Number of local units

Hotel and Restaurant

Variables	Model 1 Italy	Centre-North	South	Model 2 Italy	Centre-North	South	Model 3 Italy	Centre-North	South	Model 4 Italy	Centre-North	South
ln_Sh_imm	0.157*	0.111*	0.152*	0.158*	0.083*	0.204*	0.154*	0.084*	0.183*	0.154*	0.086*	0.183*
	(0.013)	(0.014)	(0.026)	(0.014)	(0.016)	(0.028)	(0.014)	(0.017)	(0.028)	(0.014)	(0.017)	(0.027)
ln_Dens				0.250**	0.659*	2.095*	0.230**	0.652*	2.136*	0.230**	0.631*	2.116*
				(0.111)	(0.144)	(0.343)	(0.112)	(0.147)	(0.324)	(0.112)	(0.147)	(0.328)
ln_Unemp							-0.009	0.003	-0.029**	-0.009	0.003	-0.029**
							(0.007)	(0.006)	(0.012)	(0.007)	(0.006)	(0.012)
g_vapc										-0.033	-0.059	0.049
										(0.039)	(0.034)	(0.086)
$\chi^2(1)$	2.50			18.79			12.78			12.38		
p-value	[0.114]			[0.000]			[0.000]			[0.000]		
Obs	721	469	252	721	469	252	721	469	252	721	469	252
Centered R^2	0.998	0.999	0.997	0.998	0.999	0.998	0.998	0.999	0.997	0.999	0.999	0.997

Aggregate Economy

Variables	Model 1 Italy	Centre-North	South	Model 2 Italy	Centre-North	South	Model 3 Italy	Centre-North	South	Model 4 Italy	Centre-North	South
ln_Sh_imm	0.088*	0.097*	0.091*	0.086*	0.078*	0.111*	0.083*	0.076*	0.103*	0.083*	0.077*	0.103*
	(0.007)	(0.009)	(0.015)	(0.007)	(0.010)	(0.015)	(0.007)	(0.010)	(0.016)	(0.007)	(0.010)	(0.016)
ln_Dens				0.454*	0.453*	0.827*	0.467*	0.463*	0.841*	0.467*	0.452*	0.815*
				(0.052)	(0.080)	(0.130)	(0.052)	(0.081)	(0.127)	(0.052)	(0.080)	(0.135)
ln_Unemp							-0.005***	-0.004	-0.010***	-0.005***	-0.005	-0.010
							(0.003)	(0.003)	(0.006)	(0.003)	(0.003)	(0.006)
g_vapc										0.005	-0.031	0.066
										(0.021)	(0.018)	(0.061)
$\chi^2(1)$	0.17			4.81			2.88			2.79		
p-value	[0.683]			[0.028]			[0.090]			[0.095]		
Obs	721	469	252	721	469	252	721	469	252	721	469	252
Centered R^2	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999

Notes: constant, provincial and year fixed effects, not shown, are included in all regressions; standard errors in brackets are robust to both heteroschedasticity and autocorrelation. $\chi^2(1)$ is the test for equality of the coefficient of ln_Sh_imm between Centre-North and South.

$*p < 0.01$, $** p < 0.05$, $*** p < 0.10$.

As we can see in the upper part of the table, the estimated elasticities reported by the share of immigrants in the H&R sector are statistically significant and with positive signs at both national and macro-area level in all four models that we have estimated. In addition, it is also worth noticing the notable stability of the estimated elasticity across the four models. In particular, at national level, it remains remarkably stable around 0.15, thus a 10 percent increase in the share of immigrants leads to about 1.5 percent increase in the number of establishments. At macro-area level, the estimated relationship appears to be stronger in the South with respect to the Centre-North. With the exception of Model 1, the differences of the coefficients are statistically robust at 5% significance level (see the Wald test statistics reported in the table). More in detail, depending on the empirical specification, in the South elasticities vary between 0.152 (Model 1) and 0.204 (Model 2), whereas in the Centre-North macro-area the impact is estimated to vary between 0.083 (Model 2) and 0.111 (Model 1). All together, these results represent a quite robust statistical proof of the influence of immigration on the Italian tourism supply represented by the number of local units in the H&R sector. According to the mechanisms previously discussed, this might be explained by the fact that this sector is taking great advantage of the relatively abundant supply of (prevailingly low skilled) foreign workers to create new firms or to re-locate existing ones.

Let us now consider estimates obtained for the Aggregate Economy. Results, shown in the lower part of Table 6, confirm a statistically robust influence of the provincial immigration share on the number of local units. However, as far as the magnitude of the estimated coefficients is concerned, interesting differences emerge with respect to

H&R. In particular, it appears that firms representative of the Aggregate Economy are less sensitive to variations in the share of immigrants than firms in the H&R sector. This outcome holds true at both nation-wide level, for which the estimated elasticities vary across models in the small range of 0.083/0.088, and for the two macro-areas taken separately. In addition, also for the Aggregate Economy the impact of the immigrant workers appears to be stronger in the South (0.103/0.111) than in the Centre-North (0.076/0.078). Again, according to the Wald test statistics, these macro-areas differences are statistically robust at conventional statistical significance level (5% in Model 2 and 10% in Models 3 and 4). It is important to note the remarkable stability of the estimated elasticity across the four models.

As for the effect of the other covariates on H&R local units, in Table 6 we see that population density reports positive and statistically significant estimates across Models 2, 3 and 4, both at nation-wide level and for the two macro-areas. Again, Southern firms appear more responsive than Centre-Northern ones. The main implication that can be derived from these findings is that agglomeration externalities positively affect the number of local units in H&R. Turning the attention to the unemployment rate, it seems that it affects only the number of local units in Southern provinces with an estimated coefficient that reports a negative sign (Models 3 and 4). Finally, the growth rate of value added per capita is always statistically insignificant (Model 4).

As far as the Aggregate Economy is concerned, results are very similar: there are agglomeration externalities (Models 2, 3 and 4); the unemployment rate, when significant, reports a negative sign (Models 3 and 4); the growth rate of value added

per capita is never statistically significant (Model 4) and, finally, in general Southern provinces give stronger responses to variations in the determinants. Having said that, however, the main outcome to be stressed is that firms representative of the Aggregate Economy give, in general, weaker responses than firms belonging to the H&R sector to all the covariates of our empirical models.

Results of the effect of immigrants on employees

Now we estimate the four models derived from equation (1) to study the effect of the provincial share of immigrants in total employment in the H&R sector. As before, estimates are also implemented for the Aggregate Economy and the investigation is conducted at nation-wide level and for the two macro-areas of the country. As we did in the previous section, results are reported in the upper part of Table 7 for H&R and in the lower part for the Aggregate Economy.

Table 7 - Number of employees

	Model 1			Model 2			Model 3			Model 4		
Hotel and Restaurant												
Variables	Italy	Centre-North	South	Italy	Centre-North	South	Italy	Centre-North	South	Italy	Centre-North	South
ln_Sh_imm	0.329*	0.218*	0.398*	0.334*	0.221*	0.470*	0.326*	0.228*	0.419*	0.325*	0.227*	0.420*
	(0.024)	(0.024)	(0.025)	(0.025)	(0.029)	(0.056)	(0.026)	(0.031)	(0.028)	(0.026)	(0.031)	(0.055)
ln_Dens				1.105**	-0.065	2.912*	1.069*	-0.100	3.007*	1.069*	-0.087	2.952*
				(0.192)	(0.305)	(0.657)	(0.195)	(0.311)	(0.596)	(0.195)	(0.311)	(0.604)
ln_Unemp							-0.015	0.015	-0.067*	-0.015	0.015	-0.067*
							(0.012)	(0.013)	(0.023)	(0.012)	(0.013)	(0.023)
g_vapc										0.078	-0.038	0.138
										(0.072)	(0.076)	(0.138)
$\chi^2(1)$		12.04			19.45			11.94			12.13	
p-value		[0.000]			[0.000]			[0.001]			[0.000]	
Obs	721	469	252	721	469	252	721	469	252	721	469	252
R2_adj	0.995	0.997	0.999	0.996	0.997	0.993	0.996	0.997	0.993	0.996	0.997	0.993
Aggregate Economy												
Variables	Italy	Centre-North	South	Italy	Centre-North	South	Italy	Centre-North	South	Italy	Centre-North	South
ln_Sh_imm	0.187*	0.163*	0.213*	0.187*	0.150*	0.230*	0.177*	0.147*	0.199*	0.177*	0.147*	0.199*
	(0.012)	(0.012)	(0.024)	(0.012)	(0.015)	(0.026)	(0.012)	(0.015)	(0.024)	(0.012)	(0.016)	(0.024)
ln_Dens				0.039	0.318**	0.686**	0.005	0.331**	0.745*	0.005	0.325**	0.710**
				(0.087)	(0.147)	(0.326)	(0.086)	(0.147)	(0.291)	(0.086)	(0.146)	(0.293)
ln_Unemp							-0.018*	-0.005	-0.042*	-0.018*	-0.006	-0.041*
							(0.005)	(0.005)	(0.010)	(0.005)	(0.005)	(0.010)
g_vapc										0.019	-0.017	0.088
										(0.034)	(0.036)	(0.067)
$\chi^2(1)$		4.22			9.74			4.58			4.64	
p-value		[0.040]			[0.002]			[0.032]			[0.031]	
Obs	721	469	252	721	469	252	721	469	252	721	469	252
R2_adj	0.999	0.999	0.998	0.999	0.999	0.998	0.999	0.999	0.998	0.999	0.999	0.998

Notes: constant, provincial and year fixed effects, not shown, are included in all regressions; standard errors in brackets are robust to both heteroschedasticity and autocorrelation. $\chi^2(1)$ is the test for equality of the coefficient of ln_Sh_imm between Centre-North and South.
*$p < 0.01$, ** $p < 0.05$, *** $p < 0.10$

As far as the H&R sector is concerned, estimates highlight the positive influence of the provincial share of immigrants on the number of employees at both national level and for the two macro-areas. The estimated elasticities at national level are very stable in all models at 0.33 meaning that a ten percent increase in the share of immigrants leads to a 3.3 percent increase in employment. Here again, Wald test statistics confirm (at 5% significance level in all models) that Southern provinces are more responsive than Centre-Northern ones: in the former the estimated impact ranges between 0.398 (Model 1) and 0.470 (Model 2), while in the latter coefficients vary between 0.218 (Model 1) and 0.228 (Model 3). These results are particularly helpful to interpret the reaction of the Italian tourism firms to the abundance of foreign workers. It seems that, besides opening new establishments and/or re-locating existing ones, Italian tourism firms respond to the relatively abundant supply of (prevailingly low skilled) foreign workers by increasing the labor demand. Therefore, in the tourism labor market, a rightward shift of the labor supply curve due to an increased number of immigrant workers has been probably followed by a rightward shift in the labor demand curve caused by an increase in the number of establishments. Consequently, a new equilibrium has been determined, in which the number of total employees has increased. Unfortunately, the present analysis does not allow us to know the nationality of the new employees and whether the new equilibrium leaves wages unchanged.

When comparing these results with the estimated coefficients for the Aggregate Economy, we notice that the main finding of the positive impact of the immigration share on the number of employees is confirmed at both nation-wide level (0.177/0.187) and for the two macro-areas. In particular, this variable always reports a coefficient that is higher in the South (0.199/0.230) than in the Centre-North (0.147/0.163). Wald test statistics confirm the statistical significance of these differences (at 5% significance level in all models). Moreover, as it was the case of local units, here again it is interesting to observe that the number of employees in the H&R sector is more responsive to variations in the immigrants share than employees representative of the Aggregate Economy.

Finally, as for the other covariates, population density keeps its positive role in the H&R sector as well as in the Aggregate Economy, although not across all Models. The unemployment rate negatively affects employment in the South in both the H&R sector and the Aggregate Economy (Models 3 and 4), now with a statistically significant role also detected at nation-wide level for the Aggregate Economy. Finally, once more, no statistical significant role is detected for the growth rate of the per capita value added.

Conclusions

The present study investigates how immigration affects the Italian tourism supply. In particular, we focus on firms active in the H&R sector to investigate whether the number of establishments and of their employees has increased in Italy in response of the relative abundance of low-skilled foreign workers. We believe that this strategy is appropriate for the scope of the present analysis, since the H&R sector contributes to the supply of goods and services of the total tourism demand in Italy, for more than 45 percent.

Results are particularly meaningful under several points of view. Firstly, the empirical investigation is able to highlight a strong positive relationship between immigration and the performance of the supply-side of the Italian tourism market. In particular, we estimate a positive influence of the share of immigrants on the number of establishments and on their employees. Secondly, we find out that the response of Southern provinces is almost always stronger with respect to Centre-Northern ones. Third, it emerges that the response of the H&R firms is stronger than what seems to be the reaction of the Italian firms at aggregate level.

Therefore, our results give a clear, even though partial, picture of the type of contribution that immigrants are able to give to the Italian tourism supply. This outcome perfectly conforms with the descriptive statistics discussed in an earlier section of this contribution, namely that the H&R sector shows one of the highest share of immigrants employed, that this share is higher in the South and, finally, that,

in the South, the local units of H&R and their employees grow faster than in the rest of the Country. Moreover, if compared with the available empirical evidence given by previous works on the positive impact of immigration on tourism demand, the present study definitely highlights a clear potential of the immigration phenomenon as being able to convey a positive influence on the Italian tourism economy, in particular for Southern provinces.

Under a broader perspective, our results can be interpreted as evidence in favour of a positive impact of foreign workers on the Italian economy as a whole. As a matter of fact, tourism in Italy is one of the main economic sectors. According to official statistics (Osservatorio Nazionale del Turismo, 2010), after Spain Italy is the second European country for tourism value added and it is the first for number of employees. In this scenario, the H&R sector ranks fifth and ninth for value added and employees respectively. Furthermore, Italy is always at the top of the European rank for arrivals and nights and exhibits a continuous expansion in its accommodation capacity greatly due to the H&R component.

Interestingly, these performances have occurred despite the years of the crisis and the appearance of new tourism destinations in emerging countries, especially in Asia and Africa. Besides the unquestionable high attractiveness of Italy as a tourism destination, there are two main facts that we can mention to explain this result. The first is represented by the tariff reduction policy recently adopted by the Italian H&R

sector that has surely contributed to encourage tourists to spend their holidays in Italy. The second is that Italian tourism firms are trying to continue their investment activities in the attempt to win their international competition in terms of quantity and quality of accommodation services.

A suggestion arising from our empirical analysis is that both actions might have been possible also thanks to the abundance of foreign workers that have helped tourism firms to reduce their cost of production. From this point of view, the policy implications of our results become very pervasive and, certainly, regard also areas other than the tourism industry. Indeed, national and local authorities are somehow informed that immigrant workers, thanks to their lower wages, help to sustain the expansion of firms and the labour markets outcomes, possibly for both natives and immigrants. Therefore, immigration policies should be aimed at maintaining flexible labour markets in order to enable firms to take advantage of abundant foreign workforce. Given the importance of these topics, our empirical analysis strongly calls for future research.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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[1] Differently from migration, the data available for local units allows to separate Commerce by H&R.

[2] Notice that, with the exception of $g\_vapc_{i,t}$, all variables are expressed in logs, thus the corresponding estimated coefficients can be easily interpreted in terms of elasticity. As for $g\_vapc_{i,t}$, given that it is a growth rate and in various years it turns out to be negative, we avoid the log transformation otherwise we would lost observations. Thus its estimated coefficient, multiplied by 100, has to be read as the percentage variation of the dependent variable given by a one point variation in $g\_vapc_{i,t}$.

[3] The 2002 is the first year for which data of immigrants by country of origin are available at provincial level.

[4] The first stage regression results, not shown but available upon request, show that the log of the predicted share of immigrants has a positive and statistically significant coefficient at aggregate as well as at macro area level. The F-test on the instruments is very high across all regressions. The reported standard errors in Tables 6 and 7 are robust to both heteroschedasticity and autocorrelation.