Promoting the international demand for agritourism – empirical evidence from a dynamic panel data model

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1 February 2014

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Last update: February 2014

Abstract

Tourism is a major economic activity and one of the most important income sources for Italy. In recent years, tourism supply is widely changing and rural tourism is growing fast. Studies on agritourism are increasing in number, but the determinants of the international demand for rural tourism is are still largely under-investigated. We empirically investigate the determinants of the international demand for agritourims in Italy. We show the luxury nature of rural tourism, and demonstrate that international flows are demand driven.

To the extent that entrepreneurs and policymakers want to encourage rural tourisms, subsidies, policy interventions and marketing campaigns may differ substantially according to the targeted foreign countries. We investigate these differences.

KEYWORDS: *Agritourism, Italy, Demand, Tourism flows, PPML, Dynamic gravity*
JEL : L83, Q17, F22

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A revised version of the manuscript will appear in *Tourism Economics*.
Suggested citation: *Santeramo, F. G. (2015 forthcoming). Research note: Promoting the international demand for agritourism–empirical evidence from a dynamic panel data model. Tourism Economics. DOI: http://dx.doi.org/10.5367/te.2014.0397*

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Introduction

Over the past few decades, rural areas have been affected by a rapid evolutionary process that has profoundly changed their traditional socio-economic structure. Agricultural activities have been acknowledged to provide several benefit to the whole ecosystem. In particular, there is an increasing awareness that agricultural activities are multi-functional and that agriculture increases the diversification of economic activities in rural areas (Benton, 2012). The modern rurality contains greater complexity through which it seeks to respond to the new demands of the post-industrial society in terms of food safety, environmental protection, recreational needs and, in general, to improve the quality of life (Debailleul, 2001; Van Huylenbroeck et al., 2007; Van der Ploeg, 2009). Among the main changes that have affected rural areas in recent decades, rural tourism and especially agritourism have rapidly captured the interest of entrepreneurs and policy makers.

The changing scenario of the tourism sector has encouraged the demand for agritourism at national and international level, hence the supply of rural tourism is expanding rapidly. Rural tourism is appealing to a wider range of consumers. Driven by the need to escape from the hustle and bustle of city life, tourists express a high appreciation for the quietness of countryside and small villages, as well as for a more direct contact with the natural environment and the rediscovery of folklore and ancient traditions (Debailleul, 2001). On the other hand, policy makers have recognized to rural tourism a strategic role in fostering the initiation and consolidation of sustainable rural development based primarily on local resources, both material (e.g. the ecosystem services needing protection) and intangible (history, culture, traditions, knowledge, skills) (MEA, 2005; NEA, 2011). Rural tourism is of

crucial importance for several reasons: it helps preserving endangered resources that were likely to disappear (for example, many traditional products) or to be degraded (landscape, rural buildings, etc.) (MEA, 2005; NEA, 2011); it creates opportunities for employment and economic growth in marginal areas; it intensifies the interdependence between rural and urban areas (Benton, 2012).

Agritourism has been studied in various contexts (e.g. Marques, 2006; Carpio et al., 2008; Santeramo et al., 2008; Scarpellini and Polidori, 2009; Ohe and Ciani, 2011). Yet the lack of a unique definition undermines the investigation on this sector. Indeed, scientists are still trying to reach a consensus on the definition of agritourism (Phillip *et al.*, 2010). Our case study presents relevant features: in Italy the agritouristic activities are regulated by a specific Law (LD 96, 20 February 2006) which defines agritourism as "accommodation and hospitality activities carried out by farmers […] through the utilization of their own farm in connection with the activities of cultivation of the land, of silviculture, and of the raising of animals". The presence of a specific regulation is not a minor issue: indeed, it represents an ideal framework to analyze tourism flows to agritourism.

Further aspects make the present analysis of particular interest. The Italian rural areas have an extraordinary potential, not yet valorized: notwithstanding the existence of numerous and valuable business initiatives, Italian agritourism lacks an integrated system for rural tourism. On the other hand, the expectations of tourists, as well as the demand for integrated services, are growing considerably. In this framework, an analysis of the international demand for Italian tourism is one of the key elements for policymakers and entrepreneurs aiming at improving the attractiveness and the competitiveness of Italian rural areas. Our contribution to the specific literature is clear. Ohe and Ciani (2003, 2010, 2011) have analyzed the national demand for Italian agritourism, and characterized the

determinants for price formation. We complement these studies analyzing the international demand for Italian agritourism.

The objectives of this paper are twofold. Firstly, we investigate the factors affecting the international demand for agritourism and evaluate the country-of-origin characteristics that are associated with larger arrivals in the Italian agritourism. Secondly, we evaluate the dynamics in tourism flows over the last several years and investigate the factors that are able to explain how to enhance international demand for agritourism. To this end, we estimate a dynamic gravity model on a panel data that covers more than ninety percent of foreign arrivals in Italian structures.

Our results provide valuable information to entrepreneurs and policymakers in Italy and can be generalized to other countries. A better understanding of the determinants of international demand for agritourism over time and differences across countries of origin is revealed by our results. We conclude our paper with a discussion of the implications of our results for the design and administration of policy interventions and marketing campaigns to promote agritourism.

International demand for Italian agritourism

During the last decade the Italian agritouristic industry has been considerably growing. In five years, the number of foreigner visitors has increased by 121 percent; the supply, in terms of number of beds, has also increased significantly, as it has more than doubled in just five years (Figure 1). Nowadays, the number of foreign visitors exceeds one million. Over one third of tourists hosted by Italian farmhouses are of foreign nationality and their number has considerably grown. The two hundreds thousands visitors registered in 1998 is small considering that the foreign customers of Italian agritourism have been more than four hundreds thousands in 2004.

< FIGURE 1 ABOUT HERE >

The demand for Italian agritourism is very heterogeneous. Visitors come from all over the world (Table 1); however, the main partners (namely Germany, United Kingdom, USA, Netherlands, France, Switzerland) account for eighty percent of total international demand of agritourism in Italy.

< TABLE 1 ABOUT HERE >

German tourists are the most numerous: they accounts for fifty percent of the total international demand. A large number of tourists (8 percent of the total international demand) travels from the USA and Canada. Among the European citizens, English and Dutch visitors account, respectively, for 7 and 6 percent of the total. More modest is the demand from French and Swiss citizens, accounting for 5 percent each.

The arrivals of German tourists showed a decline, while streams of tourists from other countries have increased, in particular from countries that have had little relevance so far. In particular, differently from a general trend (+5.8 percent), arrivals from Germany have declined by 4 percent. Such a decreasing tendency is shared only by Israeli visitors, sensibly

curtailed from 2002. In all other cases, the trend is positive. The expansion of the demand is particularly significant in rich (*e.g.* the United States of America, Switzerland) and close countries (*e.g.* Spain, France, Czech Republic). The determinants of these trends are not a clear cut: why other rich and close countries (e.g. Germany or Netherlands) show different trends is unclear.

Theoretical and empirical framework

The Gravity Model is a workhorse in applied analysis of international trade. The model has been proposed in the sixties by Tinbergen and Pöyhönen, and theoretically investigated by Anderson (1979). It has become widely adopted to assess the effects of trade agreements (e.g Seccia et al., 2009; Rose, 2002; Xiong and Beghin, 2012), foreign direct investment (Brenton et al., 1999), and also migration and tourism flows (Karemera et al., 2000).

The model borrows the idea of the gravity attraction among masses and postulates that the volume of trade among countries is proportional to their "mass", while inversely related to their respective distance. The analytical relation of the basic Gravity Model is expressed as follows :

(1) $X_{ijt} = GY_{it}^{\alpha} Y_{jt}^{\beta} D_{ij}^{\delta}$

where G is a scale factor, X_{ij} represents the trade or migration flow, Y_i and Y_j proxy the economic masses of country of origin (i) and country of destination (j), and D_{ij} is the distance between the two countries. The economic masses are commonly proxied by Gross Domestic Product, Population, Gross Domestic Product per capita, or other combinations of those variables.

After log-linearization the gravity model can be rewritten as follows:

(2) $\ln X_{ij} = \alpha_0 + \alpha \ln Y_i + \beta \ln Y_j - \gamma \ln D_{ij} + \varepsilon_{ij}$

This fundamental model has been expanded to take into account other determinants of international flows. Linnemann (1966) has been the first to augment the basic Gravity Model, and currently empirical estimations are in favour of the expanded model. Deardorff (1995), Head and Mayer (2013) have shown that several candidates should be taken into account: population, income per capita, exchange rates, commercial agreements, and the presence of a common language or colonial links.

Several econometric issues need to be considered for a correct estimation of the gravity equation in that differenr specifications would lead to different goodness to fit the data (Harrigan, 2001). Firstly, Anderson and van Wincoop (2003) and Feenstra (2004) suggest that the standard gravity equation is incorrectly specified as it does not include the multilateral resistance terms. One of the suggested solutions to solve this problem is to include exporter and importer fixed effects in order to account for the multilateral resistance terms (Baier and Bergstrand, 2007; Subramanian and Wei, 2007). Fixed effects, or time-invariant regressors, are able to eliminate problems (Baldwin and Taglioni, 2006)[a]. Secondly, as has become widely recognized in recent years, the presence of zero flows and heteroskedasticity in the error term affect the gravity-type estimations (Silva and Tenreyro, 2006). In particular, least squares estimates tend to be biased by the presence of zero trade flows[b]. Two naïve approaches consist of replacing zero trade flows with small numbers or dropping observations with zero flows. The former neglects the intrinsic information conveyed by zero trade flows; the latter discards an even larger proportion of information contained in the dataset. A further solution consists in estimating a Tobit model. However, there is a consensus on the necessity to model the presence of zero trade flows (Jayasinghe *et al*., 2010; Xiong and Beghin, 2012) to correct for bias: the larger the percentage zeros the larger the bias is likely to be. The Heckman (1979) specification can handle sample selection induced by zero flows. In our setting the limited portion of zero flows and the heteroskedasticity disfavour the adoption of the Heckman estimation. We followed the approach proposed by Silva and Tenreyro (2006) and widely supported in recent studies (Jayasinghe *et al*., 2010; Xiong and Beghin, 2012, among others). It consists of assuming an additive error in specification (1) and estimating the model by a pseudo-Poisson Maximum Likelihood estimator (PPML), with the following set of first-order conditions:

(3) $\sum_{i=1}^{k}(X_k - \exp{(Z_k\hat{\alpha})}) = 0$

where $X_k$represents trade flows, Z_k is the full vector of explanatory covariates, $\exp{(Z_k\hat{\alpha})}$ is the expected value of $X_k$conditional on covariates (i.e. $E[X_k|Z_k]$). Wooldridge (2002, p. 676) argues that PPML Z_k is consistent if the conditional mean is correctly specified, that is if $E[X_k|Z_k] = \exp{(Z_k\hat{\alpha})}$ holds. The property applies regardless of the count data adopted.

Finally, we introduce a relatively novel approach for gravity model of tourist flows: we account for possible endogeneity of the dependent variable by estimating a dynamic gravity model. The intuition is that the number of arrivals may be endogenous in that habit formation or network effects, may induce a positive (or negative) trend in tourist arrivals. Ignoring dynamic effects might lead to omitted variables bias. This is true also in tourism economics (Taylor and Ortiz, 2009). We estimate a dynamic panel data model. The approach has been recently applied in analysis of trade flows (Olivero and Yotov, 2012), although, to the best of our knowledge, this is the first empirical application in tourism economics.

Data and expected results

The data-set span for 7, since 2004 and includes data on 33 countries so as we account for more than 95 percent of the total agritourism flows to Italy. The dependent variable is the number of arrivals of foreigners to Italian agrituristic structure. The data was extracted from the database of the Italian Institute of Statistics (ISTAT). The number of agrituristic structures and the number of beds are accurate proxies of the supply. Data was also obtained from the ISTAT database and expressed in absolute number. The GDP was extracted from the World Economic Outlook Database of International Monetary Fund; it is expressed in current U.S. dollars and deflated using Consumer Price Indexes (CPI) from the U.S. Bureau of Labor Statistics. Data for population, in millions of habitants, was obtained from the FAO database. The geographical distance among capitals, expressed in kilometers, is computed using the Haversine formula and coordinates from the extracted from the CIA's The World Factbook.

< TABLE 2 ABOUT HERE >

A common practice in gravity model estimation to model the supply, is to use GDP to proxy output capacity. Nevertheless, while total GDP is appropriate for aggregated data, it may overestimate the effect of the Italian supply of agritourism. We have proxied Italian supply of agritourism with two specific variables: the number of agritouristic structures, and the total number of beds in agritourism. We expect a positive relationships with the number of arrivals.

On the demand side, the countries of origin's purchasing capacity has been proxied by per capita GDP, while the effect of the economy size is captured by the total population. We expect a positive signs for both determinants. The expected signs of the variables "Rurality" and "Agricultual-Pop" may be ambiguous. We believe as most plausible explanation the following: the higher the urbanization of the country of origin, the higher the demand for agritourism would be; put differently, the higher the percentage of population living in rural

areas, and working in agricultural sector, the lower the demand for agritourism. Therefore, we expect to observe negative coefficients.

Frictions are a major issue in international dynamics. The geographical distance between Italy and the country of origin proxies transport and transaction costs. According to the theory, distance is the main friction to trade, migration, and international flows (Disdier and Head, 2008). We have also introduced dummies that proved to explain international dynamics in gravity models: dummies on international agreements. The variable "Euro" is equal to one if the country of origin has adopted the Euro currency, and zero otherwise. Sharing the same currency should facilitate tourist movements. The variable "Schengen agreement" is one if the county of origin has signed the agreement, zero otherwise[c]. The agreement may have helped touristic movements. While these dummies are relevant for international trade, we cast doubts on their relevance in this niche. If and how effective are these friction for the international demand of agritourims is an empirical question.

Results

The results on the factors that influence the international demand for Italian agritourism are presented in Table 3. We have estimated several specifications (I-VI) to explore the robustness of the estimates.

< TABLE 3 ABOUT HERE >

Results show that the Italian supply is a major determinant. Both variables are statistically significant at 1% level. Estimates from the final specification (VI) show that the increase in arrivals due to an expansion of agritouristic supply is more than proportional: increasing the number of agritourism of 1.0% induce1.14% increase in international demand.

We provide an intuitive explanation of the results. The agritouristic sector represents a small share of Italy's touristic sector; a change in supply causes directly proportional effects on agritouristic flows. As Italian agritouristic sector is likely to be "export-oriented", there are margins for an expansion of its supply; put differently, Italy should increase the proportion of agritourism with respect to the usual touristic structures in order to increase the international demand for tourism in Italy[d].

The results for the demand side are of particular interest. All variables are statistically significant at 1% level, but not all determinants have the same importance. The elasticity of arrivals to "Per-capita GDP" of country of origin is above one: the richer the countries, and the richer the tourists, the higher the demand for Italian agritourism. Our study leads to suggest Italian entrepreneurs of agritourism intending to expand their business to target countries with constant and solid growth in income per-capita. On the other hand, countries facing economic recessions or simply a moderate economic growth appear to be less desirable areas for marketing campaigns. On the contrary, the coefficient for "Population" is less than one. Furthermore, Increases in population size of country of origin raise international

demand for Italian agritourism less than proportionally. The variables "Rurality" and "Agricultual-Pop" have the expected sign: the higher the percentage of population living in rural areas (say 1% increase), and working in agricultural sector, the lower the demand for agritourism (-0.02%)[e].

Modelling the frictions in international movement of tourists is a hard challenge. "Distance" is negative and statistically significant at 1% level. The coefficient (-0.877) is in line with previous literature[f]. Neither "Euro", nor "Schengen agreement" turned out to be statistically significant. It is very plausible that such variables are of minor importance in specific sectors such as the agritouristic one.

< TABLE 4 ABOUT HERE >

Table 4 summarizes the estimation by mean of different econometric methods. Coefficients' significativity and signs are robust to model specification. Coefficients from the PPML model are smaller, as theoretically explained by Silva and Tenreyro (2006).

Results from the dynamic specification deserve particular attention. We have regressed several lagged variables to control for dynamics in touristic flows[g]. All proved not significant except one, the lagged dependent variable. The number of arrivals at time *t-1* is able to explain arrivals at time *t*. More specifically, the larger the number of arrivals in the previous year, the larger the arrivals in the current year. Put differently, the international demand for agritourism shows persistence or inertia. A direct implication follows: entrepreneurs and policy makers should devote their efforts in keeping client's businesses. Tourists who have chosen Italian agritourism are likely to return or to recommend their experience to other potential customers.

Conclusions

The expansion of agritouristic supply and the lack of studies on international demand for agritourism have motivated the present analysis. Our empirical framework is particularly well suited to provide empirical evidence for at least two reasons. Firstly, agritouristic activities – yet not clearly defined in many countries – are precisely regulated by Italian laws. Secondly, Italy is a major destination for international tourisms from all over the world. The latter characteristic ensures to our dataset a high heterogeneity. We have estimated several gravity models to explore the determinants of international demand for Italian agritourism. Tobit, PPML and a dynamic model have also been estimated.

We found that the Italian supply of agritourism is a major determinant. In particular we found that Italian supply is not saturated by international demand. Indeed, entrepreneurs should explore the potential gains in agritourism, while policymakers should assist the sector by promoting the realization of further (and larger) structures. Richer and growing countries are the right target. Moreover, the larger the urbanization, the higher the probability to attract new tourists would be. Obviously, these considerations, and the relative policy or business recommendations, are stronger for closer countries. Finally, we show that international tourists that have visited Italian agritourism are an effective channel for tourism promotion.

The analysis is not exempt from limitations. In primis, the analysis is country-specific and results cannot be directly generalized. Indeed, the peculiarity of the agritouristic sector complicates the feasibility of empirical analysis. The lack of studies is a clear proof. A further limitation is that we cannot directly compare our results with existing literature. Therefore, while our findings should be taken *cum grano salis*, the *pars construens* of this criticism is that the present analysis adds novelty to the current knowledge in tourisms economics. Indeed, analyzing the demand for agritourism is a promising area of research.

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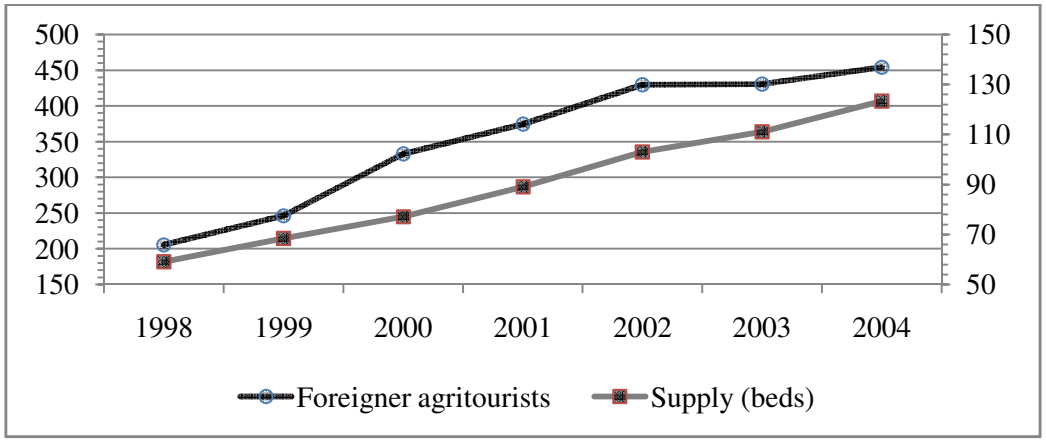
Figure 1 – Arrivals of foreigner tourists (.000) and supply of beds (.000)



Source: ISTAT

Table 1 - Foreigner tourists (per country of residence) spent vacations in Italian agritourisms

Countries	***Arrivals****	***Share****	***AGR*****	***Countries***	***Arrivals ****	***Share****	***AGR*****
Germany	211651	48.3%	-4.6%	Ireland	2152	0.5%	36.2%
United Kingdom	31208	7.1%	16.1%	Japan	1546	0.4%	27.3%
USA	29417	6.7%	41.6%	Czech Republic	1270	0.3%	110.1%
Netherlands	26635	6.1%	5.8%	Hungary	1197	0.3%	81.9%
France	23398	5.3%	40.5%	New Zealand	991	0.2%	14.5%
Switzerland	20764	4.7%	36.4%	Finland	964	0.2%	37.1%
Austria	18356	4.2%	6.4%	Greece	700	0.2%	7.4%
Belgium-Lux	17141	3.9%	10.9%	Russian Federation	629	0.1%	35.2%
Denmark	5228	1.2%	24.5%	Brazil	491	0.1%	64.9%
Sweden	4490	1.0%	27.7%	South Africa	472	0.1%	74.6%
Canada	4476	1.0%	46.8%	Slovak Republic	446	0.1%	41.3%
Spain	3721	0.8%	54.9%	Portugal	428	0.1%	3.3%
Australia	3558	0.8%	37.9%	Argentina	340	0.1%	26.1%
Israel	3100	0.7%	-8.4%	Venezuela	311	0.1%	7.4%
Slovenia	2634	0.6%	28.0%	Mexico	218	0.05%	35.5%
Norway	2448	0.6%	75.2%	China	208	0.05%	130.6%
Poland	2229	0.5%	67.1%	**World**	438294	100.0%	5.8%

(*) 2002-2004 average value; (**) 2002-2004 average growth rate.

Table 2 – Definition of variables and descriptive statistics

Variable name		Mean	Std.dev
$Arrivals_{it}$	Arrivals of from country j in year t (in .000 absolute value).	10.4	32.1
Per-capita GPD_{it}	GDP per capita (current U.S. dollars) of country j, year t	17.3	13.2
$Population_{it}$	Total population (in millions) of country j, year t	49.9	114.7
$Distance_{ij}$	The distance between Italy and country j in .000 kilometers	4.2	4.5
$Agritourisms_{it}$	Number of Italian agrituristic structures (.000) in year t	8.2	2.1
$Beds_{it}$	Total supply (.000) of beds in year t	96.3	26.2
$Euro_{i}$	1if country j has adopted the euro, 0 otherwise	0.2	0.4
Schengen $agreement_{i}$	1if country j has signed Schengen agreement, 0 otherwise	0.2	0.4
$Agricultual\text{-}Pop_{it}$	Agricultural population (in percent) of country j, year t	9.2	11.2
$Rurality_{it}$	Agricultural population (in percent) of country j, year t	26.9	13.8

The statistics are computed from a pooled sample.

Table 3 – Determinants of foreign arrivals to agritourisms

	I	II	III	IV	V	VI
Supply						
# agritourism	0.989		0.987	0.990	1.224	1.143
	(4.12)**		(4.09)**	(4.08)**	(4.36)**	(4.11)**
# beds		0.914				
		(4.13)**				
Demand						
Per-capita GPD	1.456	1.456	1.453	1.454	1.256	1.115
	(19.59)**	(19.59)**	(17.91)**	(17.84)**	(14.67)**	(11.27)**
Population	0.648	0.647	0.647	0.647	0.557	0.562
	(11.93)**	(11.93)**	(11.74)**	(11.71)**	(9.61)**	(9.83)**
Rurality					-0.037	-0.023
					(6.16)**	(2.89)**
Agriculture*Rurality						-0.001
						(2.72)**
Frictions						
Distance	-0.760	-0.760	-0.758	-0.760	-0.916	-0.877
	(11.46)**	(11.46)**	(10.59)**	(10.52)**	(11.98)**	(11.43)**
Schengen agreement			0.013	0.032	-0.178	-0.127
			(0.08)	(0.15)	(0.86)	(0.62)
Euro				-0.031	0.263	0.299
				(0.15)	(1.24)	(1.43)
Constant	-1.256	-2.824	-1.251	-1.270	-0.367	0.324
	(0.57)	(1.10)	(0.57)	(0.57)	(0.14)	(0.13)
R^2	0.70	0.70	0.70	0.70	0.74	0.74
Observations	268	268	268	268	231	231

+ $p<0.1$; * $p<0.05$; ** $p<0.01$

Table 4 – Model specification and dynamic estimation

	OLS	Tobit	PPML	Dynamic
Dynamic				
$Arrivals_{t-1}$				0.136
				(2.76)**
Supply				
Number of agritourism	1.143	1.153	0.155	0.924**
	(4.11)**	(4.21)**	(4.47)**	(2.93)
Demand				
Per-capita GPD	1.115	1.116	0.155	1.469
	(11.27)**	(11.46)**	(16.88)**	(10.83)**
Population	0.562	0.561	0.071	0.694
	(9.83)**	(9.98)**	(10.25)**	(10.66)**
Rurality	-0.023	-0.023	-0.002	-0.002
	(2.89)**	(2.94)**	(3.00)**	(0.26)
Agriculture*Rurality	-0.001	-0.001	-0.001	-0.001
	(2.72)**	(2.75)**	(3.68)**	(2.53)*
Frictions				
Distance	-0.877	-0.879	-0.118	-0.568
	(11.43)**	(11.64)**	(10.45)**	(6.94)**
Schengen agreement	-0.127	-0.127	-0.021	-0.144
	(0.62)	(0.63)	(1.15)	(0.56)
EU accesion	0.299	0.298	0.032	-0.053
	(1.43)	(1.44)	(1.55)	(0.20)
Constant		0.245		
		(0.10)		
Constant	0.324	0.924	1.006	0.000
	(0.13)	(21.42)**	(3.16)**	(2.83)**
R^2	0.74			
Observations	231	231	231	70

+ $p<0.1$; * $p<0.05$; ** $p<0.01$. T-stats in parenthesis

[a] Fixed effects are a main issue for bilateral trade flows. Our specification is unidirectional therefore the time-invariant regressors (e.g. distance) is able to capture the multilateral resistance.

[b] Although our dataset contains a limited number of zero flows, we have taken this issue into account.

[c] EU Accession Negotiations began on 31 March 1998 for Cyprus, Estonia, Hungary, Poland, the Czech Republic and Slovenia. On 15 February 2000 the agreements has been expanded to include Bulgaria, Latvia, Lithuania, Malta, Romania and Slovakia.

[d] Although a direct comparison of the results is not possible due to different methodological framework, our results are consistent with those in Ohe, and Ciani (2011). They find that price elasticity to the supply of beds is positive, suggesting to expand the supply of agritouristic facilities.

[e] For instance, dwellers of low rural countries, such as those from Belgium and Luxembourg, Australia, Israel, Argentina, United Kingdom, Germany, Venezuela, New Zealand, Denmark, Brazil, Sweden, are more likely to be customers of Italian agritourism. *Ceteris paribus*, tourists from South Africa, Slovak Republic, Portugal, Slovenia and China (the most rural countries in our sample) are less likely to choose Italian agritourism for vacation.

[f] See Disdier and Head (2008) for an excellent review of the empirical findings on the effects of distance in gravity models.

[g] Results are omitted for clarity, and available from authors upon request.