

BEMPS –
Bozen Economics & Management
Paper Series

NO 35/ 2016

Tourism farms: a demand-supply
framework

Maria Giovanna Brandano, Linda Osti,
Manuela Pulina

Tourism farms: a demand-supply framework

Maria Giovanna Brandano, Linda Osti# and Manuela Pulina**

Abstract

The aim of this paper is to set a demand and supply framework within the farming sector engaged in agritourism activity. The study is based on data collected at twenty different agritourism located in South Tyrol (Italy) during December 2013 and December 2014. As a first step of the empirical research, through a cluster analysis, the sample of tourism farms is classified into two homogenous groups, that is: “tourism enthusiast” and “tourism opportunist” farms. As a second step of the investigation, a principal component analysis is run to gather orthogonal latent variables related to general and specific motivations (i.e. push and pull factors), and positive and negative perceived externalities. In this manner, though a probabilistic modeling, it is possible to investigate the determinants that are likely to influence the likelihood to choose one of the two types of agritourism. The results show that general push motivations, as well as the specific motivations related to nature and authenticity, are the most relevant determinants in positively influencing customers’ choice of a farm that engages in the tourism industry because of a genuine interest to get in contact with people and to integrate the income of the farm. However, perceived negative externalities, such as a neglected environment, the presence of polluting factories and congestion, will negatively influence the choice of this type of farms.

Keywords: Agritourism, Supply, Demand, probabilistic modelling.

Jel Classification: C38, L83, Z32.

* Department of Economics and Business, University of Sassari and CRENoS, Via Muroni 25, 07100 Sassari, Italy, Email: mbrandano@uniss.it.

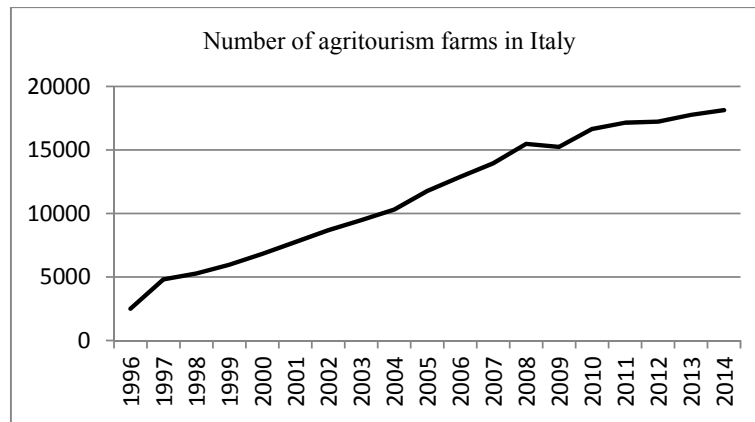
School of Economics and Management, Free University of Bozen/Bolzano, Piazza Università 1, I-39100 Bozen/Bolzano, Italy, E-mail: Linda.Osti@unibz.it

• Department of Political Sciences (POLCOMING) & CRENoS, University of Sassari, Piazza Università, 11, 07100 Sassari, Italy, E-mail: mpulina@uniss.it

1. Introduction

The number of agritourism farms in Italy has constantly increased in the last years (Figure 1). This fact confirms the Italian trend observed in recent time regarding the diversification in the accommodation supply. Indeed, it is recorded on the one hand the decrease in the number of traditional hotels, on the other hand the increase in the number of alternative forms of accommodation, in particular Bed & Breakfast and agritourism infrastructures (Candela and Figini, 2010). Moreover, the *Travel & Tourism Competitiveness Report* (WEF, 2015) shows that Italy represents one of the most competitive countries in the world (ranked 2nd) for natural tourism. With the growing demand of rural living for relaxation and recreational purposes, the potential market for agritourism is increasing.

Figure 1. Increase of agritourism farms in Italy



Agritourism can be described as a combination of tourist activities that combine rural living, passive or active involvement of guests in farming activities, local culture, and genuine food. Italy represents the first tourist destination for “*food and wine vacations*” proposed by international tour operators. Moreover, in the last years this type of tourism is rising at a rate of 12% per year (ISNART, 2013) and can be considered more resilient to the economic crisis than other forms of *tourism*. The link between food and wine and vacations includes agritourism. Amongst the Italian regions, the autonomous province of South Tyrol ranks second for the number of agritourism in 2014 (Istat, 2015), after Tuscany.

According to Santeramo and Barbieri (2015) further research is needed to show the characteristics of the demand while controlling for different types of settings, motivations, as well as tourism flows (e.g.,

local and international tourists). The present paper goes a step further within this thread of literature by analyzing supply and demand of agritourism within a joint framework in order to link motivations, satisfaction, perception on several externalities as well as different types of services offered by farmers.

This paper is organized in six sections. Section 2 describes the literature review on the agritourism topic. Section 3 introduces the methodological framework used to analyze data on supply and demand side. Specific subsections are included to describe the cluster analysis, the principal component analysis (PCA) and the probabilistic model. Section 4 focuses on the case study of South Tyrol and on the survey. Section 5 provides the results of the cluster, the PCA and the probabilistic modeling. Finally, conclusions are provided in the last section.

2. Literature review

In the literature, several studies have investigated consumers' motivations that are likely to influence destination and accommodation choice. Motivations can be distinguished into two types. On the one hand, push motivations, that relate to items such as escapism, relaxation, freedom from the daily routine, experiencing genuine food, personal enhancement, education. On the other hand, pull motivations relate to the degree of attractiveness of a destination, such as natural amenities, cultural attractions, recreational activities (Crompton, 1979; Jansen-Verbeke and van Rekom, 1996; Formica and Murrmann, 1998; Prentice *et al.*, 1998; Jansen-Verbeke and Lievois, 1999; Lee *et al.*, 2004; Yoon and Uysal, 2005; Slater, 2007; Meng *et al.*, 2008; Gil and Ritchie, 2009; Meleddu *et al.*, 2015).

Nevertheless, according to Barbieri and Mshenga (2008), which analyse the performance of agritourism farms in US, the existing literature on this topic *is fragmented and scarce* (p.167). On the one hand, the supply side is analyzed by Nickerson and Mccool (2001) for the Montana (US) case; by Barbieri *et al.* (2008) and Barbieri (2013) for the case of North American agritourism farms; by Barbieri (2010) for the case of Canada; Tew and Barbieri (2012) and LaPan and Barbieri (2013) for the case of Missouri. On the other hand, the demand side is studied by Gao *et al.* (2014) in a sample of residents in Missouri, Pennsylvania, and Texas by analyzing perceptions of agricultural landscapes in terms of awareness of the benefits delivered to society and preferences of specific features. If US case studies are excluded, there is not much literature on motivations in the selection of agritourism infrastructures.

As regards studies related to general agritourism in Italy (the geographical focus of the present paper), Ciani and Ohe (2012) stated that, despite a high number of supply-side studies, on the demand side there exists a gap in the literature. In their paper, the authors analyze the demand characteristics of agritourism in Italy along with the trend of supply and demand. According to a survey conducted by Baloglu and McCleary (1999) on US travellers, Italy was rated significantly higher on its appealing local cuisine and beautiful scenery and natural attractions. This result is in line with the Brown and Getz (2005) study on wine destinations. The authors found that Italy and France are considered as wine destinations “*because both possess an abundance of cultural, landscape, and wine-related attractiveness*” (p. 273). In particular, Ammirato and Felicetti (2013, 2014), analyzed the case of a specific Italian Region – Calabria – by using the Alternative AgriFood Networks (AAFNs) to discover the presence of agritourism rural network and study the potentials of agritourism as a means of sustainable development for rural areas. The supply side and the link between the life cycle of agritourism and the legislation in Sardinian region are analyzed by Pulina *et al.* (2006). More recently, Mastronardi *et al.* (2015) study the environmental performances of Italian farms with agritourism compared with farms without agritourism, using a logit model. Santeramo (2015) employs a gravity model to study the international demand on agritourism in Italy for the timespan 1998-2004. The author found that the Italian supply of agritourism is a major determinant of the demand and, in particular, that Italian supply is not saturated by international demand.

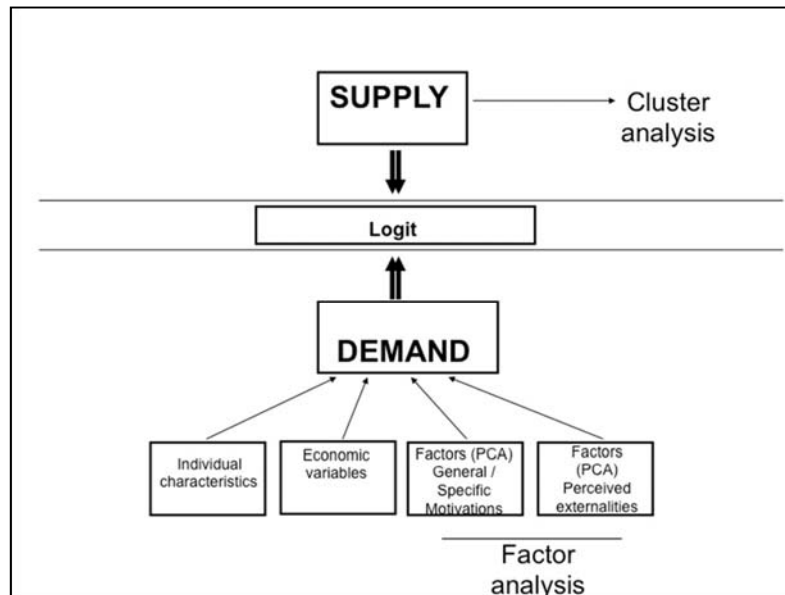
As far as we are aware, there is not in the economic literature any study that focus at the same time on the demand and supply side of agritourism (see also Manrique *et al.* 2015 for the case of Emilia Romagna region using the Bayesian Belief Network - BBN). The present paper represents the first attempt to investigate this topic by using data on both sides of the agritourism market.

3. Methodological framework

Figure 2 frames the methodological demand-supply setting of the present investigation. On the supply side, the first step of the research consists of a classification of the sample of tourism farms, through a cluster analysis. In this manner, it is possible to find distinct groups of agritourism farms characterized by homogenous features. On the demand side, one considers the standard customers’ socio-demographic and economic characteristics as well as other economic variables (e.g. pro capita expenditure), their general and specific motivations and perceived positive and negative externalities. The latter are identified as

factor variables obtained through a principal components analysis that allows one to parsimoniously reduce the initial set of items into a more manageable set. The last step of the analysis links agritourism demand and supply through a probabilistic modelling. In this manner, it is possible to investigate the determinants that are likely to influence the likelihood to choose a given type of tourism farm.

Figure 2. Methodological framework



3.1 The supply side: cluster analysis

Following the previous methodological framework, the sample of tourism farms are clustered based on the number of beds, number of employees, months of activity, and percentage of profit through the tourism activity on the total profit of the farm. A non-hierarchical analysis is employed as this clustering technique is designed specifically to group cases rather than variables. Hence, the k-mean cluster analysis is adopted in order to assign agritourism activities into clusters according to the smallest distance between cases and cluster centroid. As a parsimonious procedure, it is desirable to exclude from the sample possible outliers that may produce clusters with dispersed items. A further characteristic of the k-means cluster analysis is the need to specify the number of clusters desired. Hence, following the technique used by Aguiló and Roselló (2005), a stepwise methodology from four to two clusters is adopted.

3.2 *The demand side: principal components analysis*

From the demand side, a principal components analysis - also called correspondence factor analysis - is run based on a set of variables measured within a 5-point Likert scale from one (not at all) to five (very much), according to respondents' level of agreement. This approach allows one to parsimoniously reduce the number of categorical variables to a more manageable group and to eliminate the irrelevant items that incorporate the noise (Anderson and Gerbing, 1988; Kim *et al.*, 2010).

A set of categorical items expresses respondents' general motivations about their holidays choice as well as specific motivations that drive the choice of a particular type of tourism farm. Furthermore, a set of items relates to customers' perceived environmental positive and negative externalities. The items reduction is pursued via an orthonagonal *Varimax* rotation. According to the Kaiser criterion, only factors with eigenvalues greater than one are retained. Following Hatcher (1994), the items with a loading score (i.e. variable contribution) less than a critical value (in this case 0.50) are excluded from the analysis. The Cronbach's alpha is calculated to test the reliability of the extracted factors; a value greater than 0.7 suggests for reliability. The relative weight of each factor in the total variance is also calculated, that takes into account how much each factor explains of the total variance. Cumulative inertia shows the amount of variance explained by $n+(n+1)$ factors (Escofier and Pages, 1988). Besides, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) test with a value between 0.50 and 1.00 implies that the analysis is satisfactory; as a further adequacy measure, the Bartlett's Test of Sphericity requires that the null hypothesis of a correlation identity matrix fails to be accepted.

3.3 *Linking demand and supply: probabilistic modelling*

A probabilistic modeling can be employed as a useful approach to understand the factors that influence customers' agritourism choice. Within a two clusters setting, the dependent variable is defined as $Y_i = (Y_1, Y_2)$, where Y_1 takes the value zero if the agrotourism farm belongs to the "tourism opportunistic" group; likewise, Y_2 takes the value one if the agrotourism farm belongs to the "tourism enthusiast" group. Since the dependent variable in the present study is dichotomous, a logit model is employed. In this manner, it is possible to investigate the determinants that are likely to influence consumers' choice of the farm typology.

4. The case study

4.1. South Tyrol

The present paper focuses on South Tyrol province as a case study, located in the Trentino-South-Tyrol region. Administratively, this region is divided into two autonomous provinces: Trentino (Trento) and South Tyrol (Bolzano). The region, located in the North-East of Italy, is one of the most popular tourism destinations in Europe especially for mountain tourism. Historically two regions was part of the Austria-Hungary, as a consequence nowadays the most part of people speaks both German and Italian. In particular, German is the most spoken language in South Tyrol. In addition, a constitutional law approved a special status of autonomy in 1948, which allows the region to introduce its own laws on a wide variety of subjects.

Tourism represents a significant driver for the regional economy. The accommodation supply is one of the largest in Italy; indeed, the region ranks second after Emilia Romagna for number of hotels. In terms of demand, in 2013 it ranked second for nights of stay with respect to other Italian regions, and in the last decade, tourist arrivals have recorded a high rate of growth. On average, statistics indicate that in this region tourist length of stay (approximately five days) is higher than in the other Italian regions, suggesting that this area is characterized by a high appeal as a tourist destination.

South Tyrol has an area of 7,400 Km², the total population in 2014 was approximately 518,000 inhabitants. The presence of Dolomites is a strong attraction for international and domestic tourists. According to Brida *et al.* (2009) the majority of the tourists in South Tyrol comes from Germany and has constantly increased in the last 20 years (p. 306). Because tourists travel to South Tyrol mainly for the mountains, the landscape, the nature and the *food and wine vacation*, agritourisms play a key role in this sector. Agritourism activities in South Tyrol are more than 2,800 (Istat, 2015) and they represent 15% of the total Italian supply. In the last ten years the total number of agritourism activities recorded a growth of, on average, 3% per year.

4.2. The survey

The survey was divided into two parts. The first part interviewed sampled agritourism infrastructures located on the downs and the hilly areas of South Tyrol (located up to 450 meters above the sea level) and collected information about the characteristics of the farms. During the telephone interview, agritourism

infrastructures were asked for their cooperation in collecting self-administered questionnaires among their visitors. Interviewed visitors had to be tourists staying at the infrastructure for at least one night.

Altogether, 26 infrastructures were interviewed and of these, 20 agreed upon cooperation to the second part of the survey for the collection of data among visitors.

The sampled agritourism infrastructures are fairly small and count from 6 to 21 beds, with an average of 12.72 and a median of 12 beds. In their breakfast/restaurant room they count between 6 and 25 seats, with an average of 16.78 and a median of 15. Six infrastructures do not offer a restaurant room. Also in terms of employs, the farms are fairly small employing from a minimum of 2 to a maximum of 16 employees, with an average of 5.68 and a median of 6 employees. Almost half (44%) of the infrastructures are open to tourists 8 months a year, with 1 infrastructure being open only 5 months and 3 being open all year around. The decision by the owner of the farms to engage into agritourism, is mainly taken to get in contact with people, to value estate assets, and to integrate profits. The profit from the agritourism activity over the entire profit of the business varies from 15% to 80% with an average of 40.40% and a median of 40%. The most important products of the farms are orchards, vineyards, vegetables and herbs.

The infrastructures offer to their visitors: playgrounds (88%), bicycles (72%), and swimming pools (44%). For their visitors, they also organize active participation to the farm (79.2%), trekking (54.2%), wine tasting (4.8%), and cooking, botany, or other courses (33.3%). They mainly try to differentiate their offerings from the competitors through comfort, activities offered, detailed information of the area, quality, an integrated offer, and personal contact with the guests. They mainly promote themselves through the World Wide Web, the local tourism board and through word of mouth.

Their main guests are families followed by couple of all ages, who travel for leisure purposes.

The second part of the survey involved the collection of data among the guests of the sampled agritourism infrastructures. Altogether, 375 questionnaires were collected among the 20 infrastructures, who cooperated in the data collection.

Tables 1 and 2 present the descriptive statistics of the sampled guests. Visitors are mainly from Germany (81%); 42% are over 50 years old and 40% have a bachelor or postgraduate degree.

Table 1. Descriptive statistics of the demand sample

| % | | | % | | |
|---------------|--------|-------|--------------------|------------------------------|-------|
| Gender | Male | 62.60 | Nationality | German | 80.97 |
| | Female | 37.40 | | Italian | 3.75 |
| Age | 18-30 | 6.09 | | Other | 15.28 |
| | 31-40 | 18.55 | Education | Primary and secondary school | 15.84 |
| | 41-50 | 33.33 | | Professional and college | 44.10 |
| | 51-60 | 23.48 | | Graduate and Post graduate | 40.07 |
| | > 60 | 18.55 | | | |

Source: Authors' elaboration on sample data

Table 2. Descriptive statistics of the per capita expenditures

| <i>Type of expenditure</i> | <i>Obs.</i> | <i>Mean</i> | <i>S.D.</i> | <i>Min</i> | <i>Max</i> |
|----------------------------|-------------|-------------|-------------|------------|------------|
| Accommodation | 338 | 168.63 | 197.60 | 0.00 | 2,500.00 |
| Food | 338 | 115.10 | 160.53 | 0.00 | 2,000.00 |
| Products | 338 | 22.71 | 40.71 | 0.00 | 300.00 |
| Other | 338 | 19.68 | 44.89 | 0.00 | 333.33 |
| Total | 338 | 326.12 | 372.83 | 0.00 | 4,500.00 |

Source: Authors' elaboration on sample data

5. Results

5.1 The cluster analysis

As the aim of the paper is to link guest motivations to agritourism type of offer, to analyse the supply side, a non-hierarchical cluster analysis was conducted on the 20 agritourism farms who participated in the data collection among their visitors. To determine the number of clusters, a combination of techniques were adopted. Firstly, a hierarchical cluster analysis (through the “between linkage” method and the “Squared Euclidean Distance” measure) was performed and the resulting dendrogram showed the largest distance to be in the two final clusters, determining the suitability of dividing the sample into two homogeneous groups. Secondly, due to the small size of the sample, in order to select a cluster analysis with representative clusters, it was decided to use a 20% threshold (i.e. at least 4 cases in each group). Therefore, a stepwise methodology (as suggested by Aguiló and Roselló, 2005), from 4 to 2. As Table 3 highlights, if three or more groups are selected, minority groups accounting for less than 20% of the sample are obtained. Therefore, taking into account the dendrogram of the hierarchical analysis, the complexity of the results' interpretation and the representation of each cluster, the two-cluster solution was examined.

Table 3. Cluster analysis

| | 2-cluster solution | 3-cluster solution | 4-cluster solution |
|-----------|--------------------|--------------------|--------------------|
| Cluster 1 | 10 | 7 | 7 |
| Cluster 2 | 10 | 11 | 5 |
| Cluster 3 | | 2 | 2 |
| Cluster 4 | | | 6 |

Consequently, the farm tourism activities involved in the data collection can be divided into two groups (see table 4). Group 1, the so called “tourism enthusiasts” are farms which offer a higher number of beds (14), have a longer seasonality being open 9 months a year, having a high percentage of profit (about 50%) coming from the tourism activity, but having a smaller number of employees (4). On the other side, the second group, the so called “tourism opportunists” are those farms who engaged in the tourism activity only as a side business to produce a small percentage of the total profit of the farm (less than 30%), are offering less number of beds (12), have a slightly shorter seasonality (opened 8 months a year) and need more personnel (7) to ran their core business, which is farming.

Table 4. Final Cluster Centers

| | Cluster | |
|---|---------|----|
| | 1 | 2 |
| Maximum number of beds | 14 | 12 |
| Total number of employees | 4 | 7 |
| Opening months of the infrastrucutre | 9 | 8 |
| Profit from tourism over total profit (%) | 49 | 27 |

First of all, some slight differences between the two clusters can be seen in the initial decision to engage in the tourism activities. The two most important factors for “tourism enthusiasts” are the opportunity to get in contact with people and to value the estate assets followed by the opportunity to integrate the income of the farm. Tourism “opportunists” also consider the contact with people as the most important reasons to engage in the tourism activity, however they assigned to this item a lower importance. The second and third most important factors are the creation of job opportunities for family members and the value enhancement of the estate assets.

Furthermore, “tourism enthusiasts” are equally divided into farm activities with a focus on wine and fruit production; “tourism opportunists” are mainly fruit producers. In terms of facilities available to tourists, the two groups do not differ much. “Tourism enthusiasts” are slightly more prone in offering swimming

pools and playgrounds for children; “tourism opportunists” are slightly more prone in offering bicycle rentals.

5.2 The principal components analysis

As a first step of the analysis, a PCA is carried out for each of the latent variables, that is: *general motivations*, comprising push and pull factors to choose agritourism accommodation with respect to other types of hospitality infrastructures; *externalities*, including positive and negative perceptions; *specific motivations*, including push and pull factors to choose that specific agritourism accommodation with respect to others.

With respect to general motivations, the initial ten items are parsimoniously reduced to nine items, having set the sampling adequacy at the threshold of 0.50. Full results are reported in Tables 5-7. Two statistically congruent factors are identified which present an eigenvalue greater than one. The first factor (**Factor 1: Push Factor**) includes push items that relate to respondents’ attitude towards this typology of holidays, that is *living in contact with nature, to experience a familiar environment, to experience relaxing places, sharing an experience with local people, having more freedom, to experience genuine food*. The second factor (**Factor 2: Pull Factor1**), which explains approximately 12% of the total variance, includes a set of exogenous items, that is *not finding other place to stay, experience something new, to live according to nature rhythm*. Overall, these two factors take into account just more than 50% of the total variance. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy presents a value of 0.77 and implies that the analysis is satisfactory and the Bartlett's Test of Sphericity indicates that the null hypothesis (i.e. correlation matrix is an identity matrix) can not be accepted. Although, an acceptable Cronbach’s alpha levels greater than 0.7 is found for the first factor, the second factor presents a rather low value of 0.65.

Table 5. General motivations; variables with higher contribution

| | Variable Contribution | % Variance Explained | % Cumulative Variance | Cronbach’s alpha |
|--------------------------------------|------------------------------|-----------------------------|------------------------------|-------------------------|
| Factor 1: Push factor | | 29.52 | 29.52 | 0.74 |
| Living in contact with nature | 0.81 | | | |
| Experience a familiar environment | 0.70 | | | |
| Experience relaxing places | 0.65 | | | |
| Sharing experience with local people | 0.65 | | | |
| Having more freedom | 0.60 | | | |

| | | | | |
|------------------------------------|-------------|--------------|--------------|-------------|
| Experience genuine food | 0.51 | | | |
| Factor 2: Pull factor | | 20.83 | 50.35 | 0.65 |
| No other place to stay | 0.82 | | | |
| Experiencing something new | 0.81 | | | |
| To live according to nature rhythm | 0.60 | | | |

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.77; Bartlett's Test of Sphericity (45)= 621.96

A further PCA is carried out for the ten initial items related to respondents' perceived externalities. Also in this case, two factors are obtained. The first factor (**Factor 1: Negative externalities**) includes *neglected environment* (e.g. rubbish, unkept road verges), *presence of polluting factories*, *congested roads*, *high voltage trellis*, *view on urban centre*, *tourism congestion*. This factor presents a rather high value of Cronbach's alpha equal to 0.90. The second factor (**Factor 2: Positive externalities**) includes the following items: *orchards*, *forests*, *vineyards*, *meadows*. Overall, these two factors take into account approximately 50% of the total variance. A Cronbach's alpha level greater than 0.7 is found for the first factor, while the second factor presents a rather low value of 0.65. Overall, the Kaiser-Meyer-Olkin Measure of Sampling Adequacy presents a value of 0.83 implying that the analysis is satisfactory; also, the Bartlett's Test of Sphericity indicates that the null hypothesis can not be accepted.

Table 6. Respondents' perceived positive and negative externalities; variables with higher contribution

| | Variable Contribution | % Variance Explained | % Cumulative Variance | Cronbach's alpha |
|---|------------------------------|-----------------------------|------------------------------|-------------------------|
| Factor 1: negative externalities | | 37.35 | 37.35 | 0.90 |
| Neglected environment | 0.92 | | | |
| Presence of polluting factories | 0.90 | | | |
| Congested roads | 0.87 | | | |
| High voltage trellis | 0.83 | | | |
| View on urban centre | 0.70 | | | |
| Tourism congestion | 0.70 | | | |
| Factor 2: positive externalities | | 20.67 | 50.03 | 0.69 |
| Orchards | 0.77 | | | |
| Forests | 0.76 | | | |
| Vineyards | 0.70 | | | |
| Meadows | 0.68 | | | |

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.83; Bartlett's Test of Sphericity (55)= 1582.00

A final set of items relates to motivations respondents have to spend their holidays in that specific accommodation. In this case, all the thirteen items are retained and three orthogonal factors are identified as follows: **Factor 1= food and culture** includes the following variables: *experience traditional food, purchase own made products, experience genuine food, experience local culture*, and for the presence of *professional and skilled staff*. **Factor 2= activities** includes *to take part into farming activities, to observe farming activities, presence of children activities*. **Factor 3= price-quality** includes *good prices, nice view, services quality, easy mobility, excursions*. Overall, these three factors take into account almost 60% of the total variance. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy presents a value of 0.83 implies that the analysis is satisfactory and the Bartlett's Test of Sphericity indicates that the null hypothesis (i.e. correlation matrix is an identity matrix) can not be accepted. An acceptable Cronbach's alpha level greater than 0.7 is found for the first two factors, while the third presents the lowest value (0.69).

Table 7. Specific motivations; variables with higher contribution

| | Variable Contribution | % Variance Explained | % Cumulative Variance | Cronbach's alpha |
|--------------------------------------|------------------------------|-----------------------------|------------------------------|-------------------------|
| Factor 1: food | | 25.97 | 25.97 | 0.84 |
| Traditional food | 0.79 | | | |
| Purchase own made products | 0.77 | | | |
| Genuine food | 0.70 | | | |
| Local culture | 0.69 | | | |
| Professional staff | 0.68 | | | |
| Factor 2: activities | | 17.19 | 43.16 | 0.74 |
| To take part into farming activities | 0.80 | | | |
| To observe farming activities | 0.79 | | | |
| Children activities | 0.68 | | | |
| Factor 3: price-quality | | 16.58 | 59.75 | 0.69 |
| Good price quality | 0.73 | | | |
| Nice view | 0.67 | | | |
| Services quality | 0.65 | | | |
| Mobility | 0.53 | | | |
| Excursions | 0.52 | | | |

Kaiser-Meyer-Olkin Measure of Sampling Adequacy = 0.83; Bartlett's Test of Sphericity (78)= 1268.81***

5.3 Probabilistic modelling

To evaluate the determinants that are likely to influence customers' choice on the type of agritourism farm, a probabilistic modelling is employed. In Table 8 the odds ratio are reported, defined as $OR = e^{\beta_i}$. An odds ratio less than one is associated with a coefficient with a negative sign, and in this case, the probability to choose a type of agritourism farm is less likely than the probability to choose the other. Alternatively, an odds ratio greater than one is associated with a coefficient with a positive sign and, in this case, the probability to choose a type of agritourism farm is more likely than the probability to choose the other. When the odds ratio is exactly one, this implies that the odds are even. *Ceteris paribus*, for continuous variables, an odds ratio greater than one implies that the probability of a successful event increases as the value of the continuous variable increases. For dichotomous variables, an odds ratio greater than one implies that the probability of success is higher than for the reference group. For each of the models, marginal effects are also calculated to take into account the amount of change in the dependent variable which is due to a one-unit change in the explanatory variable, *ceteris paribus*.

On this basis, the logit model is constructed on the dependent variable, obtained from the cluster analysis, as discussed previously, and defined as $Y_i = (Y_1, Y_2)$. Specifically, Y_1 takes the value one if customer i chooses a "tourism enthusiast" farm; whereas, Y_2 takes the value zero, if customer i chooses a "tourism opportunist" farm. To run this probabilistic framework the STATA 13 software is employed.

A general to specific approach is used, starting with an unrestricted specification that is then parsimoniously reduced to a final restricted model. In Table 6 main results are reported. Model 1_A is the best unrestricted model obtained when including the control variables, the economic variables and the factors where the coefficients are expressed as odds ratio. In Model 1_B presents the same model with the coefficients expressed as marginal effects. Model 2_A is the best final restricted model obtained when including only the statistically significant coefficients, in this case expressed as odds ratio. Model 2_B reports the same model with the coefficients expressed as marginal effects. From all the variables that reflect respondents' individual characteristics, only the coefficient of *gender* is statistically significant, although only in the unrestricted specification. The positive sign of the coefficient indicates that male are more likely to choose "tourism enthusiast" farms than female.

As a further outcome, it is less likely that customers choose an apartment, with respect to a room, when spending their holidays in "tourism enthusiast" farms. This finding is also confirmed by the

restricted specification. Interestingly, the factors that influence the most the choice of agritourism are the ones that in the PCA presented the highest loading value as well as the highest Cronbach's alpha level being the most reliable latent variables. Specifically, *Factor 1: push factor* presents a positive and statistically significant coefficient at the as 1% level in both the unrestricted and restricted models. Hence, determinants such as *living in contact with nature, to experience a familiar environment, to experience relaxing places, sharing an experience with local people, having more freedom, to experience genuine food*, on the whole are likely to positively influence the probability to choose a “tourism enthusiast” farm, rather than a “tourism opportunist” farm.

A negative sign coefficient is found for the coefficient of *Factor 1: negative externalities*, both in the unrestricted and restricted specification. This finding implies that perceptions on items such as *neglected environment* (e.g. rubbish, unkept road verges), *presence of polluting factories, congested roads, high voltage trellis, view on urban centre, tourism congestion*, on the whole, are likely to negatively influence the probability to choose a “tourism enthusiast” farm with respect to the other type.

Finally, only the coefficient of *Factor 1: food and culture* presents a positive sign and a statistically significant coefficient only in the restricted model. As a reminder, this determinant includes a set of items related to *experience traditional food, purchase own made products, experience genuine food, experience local culture*, and presence of *professional and skilled staff*. Hence, the finding implies that an overall authenticity of the products and services supplied is more likely to positively influence the likelihood to choose a “tourism enthusiast” farm rather than a “tourism opportunist” farm.

Table 8. Probabilistic modeling results

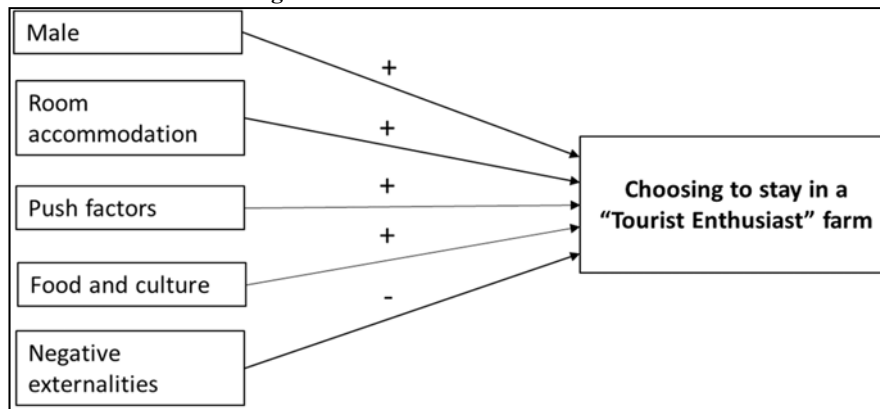
| | Model 1_A <i>Odds ratio</i> | Model 1_B <i>Marginal Effects</i> | Model_2_A <i>Odds ratio</i> | Model_2_B <i>Marginal Effects</i> |
|---|---------------------------------------|---|---------------------------------------|---|
| Nationality: German (ref. other nationality) | 1.128 | 0.120 | | |
| | -0.612 | -0.543 | | |
| Gender (ref. female) | 2.977** | 1.091** | | |
| | -1.296 | -0.435 | | |
| Age | 0.969 | -0.031 | | |
| | -0.104 | -0.107 | | |
| Age_squared | 1.000 | 0.000 | | |
| | -0.001 | -0.001 | | |
| Education | 1.048 | 0.047 | | |
| | -0.156 | -0.149 | | |

| | | | | |
|---|---------------|-----------|--------------|-----------|
| Accommodation (ref. room) | 0.263*** | -1.335*** | 0.306*** | -1.184*** |
| | -0.126 | -0.480 | -0.127 | -0.415 |
| Pro-capita_expenditure | 1.000 | 0.000 | | |
| | -0.001 | -0.001 | | |
| Factor 1: push factor | 2.654*** | 0.976*** | 2.138*** | 0.760*** |
| | -0.712 | -0.268 | -0.454 | -0.212 |
| Factor 2: pull factor | 1.194 | 0.178 | | |
| | -0.331 | -0.278 | | |
| Factor 1: positive externalities | 0.692 | -0.368 | | |
| | -0.153 | -0.222 | | |
| Factor 2: negative externalities | 0.550** | -0.597** | 0.602** | -0.508** |
| | -0.130 | -0.237 | -0.123 | -0.205 |
| Factor 1: food and culture | 1.463 | 0.380 | 1.712*** | 0.538*** |
| | -0.368 | -0.251 | -0.337 | -0.197 |
| Factor 2: activities | 0.754 | -0.282 | | |
| | -0.179 | -0.238 | | |
| Factor 3: price-quality | 0.909 | -0.095 | | |
| | -0.192 | -0.212 | | |
| Constant | 3.598 | 1.280 | 1.417 | 0.349 |
| | -9.316 | -2.589 | -0.620 | -0.438 |
| Number of observations | 153 | 153 | 179 | 179 |
| LogLikelihood ratio test | LR chi2(14) = | | LR chi2(4) = | |
| | 45.02 *** | | 38.78 *** | |
| Akaike information criterion | 195 | 195 | 215 | 215 |
| Bayesian information criterion | 241 | 241 | 234 | 234 |

Notes: For each of the variables, standard errors in the second line; level of statistical significance:
 * p<0.10, ** p<0.05, *** p<0.01

Figure 3 represents a summary of the results the probabilistic models and show the determinants of choosing a “tourism enthusiast” farm over a “tourism opportunist” one.

Figure 3. Determinants in farm’s choice



6. Discussion and conclusions

This paper provided a more comprehensive framework to jointly analyse demand and supply for agritourism farms. The first step of the investigation involved a hierarchical clustering analysis to group tourism farms into homogenous clusters. From the analysis two distinct groups were identified that is “tourism enthusiast” farms and “tourism opportunist” farms. The two clusters were then defined as a dichotomous dependent variable in the probabilistic modelling. The objective was to investigate the main determinants that influence customers’ likelihood to choose a given type of agritourism with respect to the other. To this aim, a set of variables was included into the demand equation, that is: respondents’ individual characteristics, as control variables; a set of economic variables (e.g. pro-capita expenditure); a set of factors, that included general and specific motivations, as well as a set of perceived positive and negative externalities, as obtained by a principal components analysis. A general to specific approach was employed to further test the robustness of the empirical results.

On the whole, the general push motivations, as well as the specific motivations related to nature and authenticity, were found to be the most relevant determinants that are likely to positively influence customers’ choice of a “tourism enthusiast” farm. However, perceived negative externalities negatively impact on the probability to choose this type of accommodation.

Although the empirical data and findings can be regarded as rather narrow from a sample and territorial view point, the demand and supply framework offered a novel more comprehensive approach that can be tested in other settings as well as in other economic sectors.

References

- Aguiló, E. and J. Roselló (2005). Host Community perceptions. A cluster analysis. *Annals of Tourism Research* 32(4): 925-941.
- Ammirato S. and AM. Felicetti (2013). The Potential of Agritourism in Revitalizing Rural Communities: Some Empirical Results. Conference paper in *IFIP Advances in Information and Communication Technology*, DOI: 10.1007/978-3-642-40543-3_52.
- Ammirato S. and AM. Felicetti (2014). The Agritourism as a means of sustainable development for rural communities: a research from the field. *The International Journal Of Interdisciplinary Environmental Studies*, 11/2014; 8(1): 17-29.
- Anderson JC. and DW. Gerbing (1988), Structural equation modeling in practice: a review and recommended two-step approach, *Psychological Bulletin* 103(3): 411–423.

- Baloglu S. and KW. McCleary (1999). U.S. International Pleasure Travelers' Images of Four Mediterranean Destinations: A Comparison of Visitors and Nonvisitors. *Journal of Travel Research*, Vol. 38, November 1999, 144-152.
- Barbieri C. and PM. Mshenga (2008). The Role of the Firm and Owner Characteristics on the Performance of Agritourism Farms. *Sociologia Ruralis*, Vol 48, Number 2.
- Barbieri C., Mahoney E. and L. Butler (2008). Understanding the Nature and Extent of Farm and Ranch Diversification in North America. *Rural Sociology* 73(2), 2008, pp. 205–229.
- Barbieri C. (2010). An Importance-Performance Analysis of the Motivations Behind Agritourism and Other Farm Enterprise Developments in Canada. *Journal of Rural and Community Development* 5, 1/2 (2010) 1–20.
- Barbieri C. (2013). Assessing the sustainability of agritourism in the US: a comparison between agritourism and other farm entrepreneurial ventures. *Journal of Sustainable Tourism* iFirst 2012, 1–19.
- Brida JG., Barquet A. and WA. Risso (2009). Causality between Economic Growth and Tourism Expansion: Empirical Evidence from Trentino - Alto Adige. *Tourismos: an international multidisciplinary journal of tourism* Volume 5, Number 2, Autumn 2010, pp. 87-98.
- Brown G. and D. Getz (2005), Linking Wine Preferences to the Choice of Wine Tourism Destinations, *Journal of Travel Research* 43(3): 266-276.
- Candela G. and P. Figini (2010), *Economia del turismo e delle destinazioni*, McGraw-Hill, Milano.
- Ciani A. and Y. Ohe (2012). Accessing demand characteristics of agritourism in Italy. *Tourism and Hospitality Management*, Vol. 18 No. 2, pp. 281-296.
- Crompton JL. (1979), Motivations of pleasure vacation, *Annals of Tourism Research*, 6(4): 408–424.
- Escofier B. and J. Pages (1988), *Analyses factorielles simples et multiples*. Paris: Dunod.
- Formica S. and S. Murrmann (1998), The effects of group membership and motivation on attendance: an international festival case, *Tourism Analysis* 3 (3/4): 197–207.
- Gil SM. and BRB. Ritchie (2009), Understanding the museum image formation process a comparison of residents and tourists, *Journal of Travel Research*, 47(4): 480–493.
- Hatcher L. (1994), *A step-by-step approach to using the SAS system for factor analysis and structural equation modelling*. USA: SAS Institute Inc.
- ISNART (2010), *Indagine sul turismo organizzato internazionale*, Unioncamere.
- ISTAT (2015), *Capacità e movimento degli esercizi ricettivi*.
- Gao J., Barbieri C. and C. Valdivia (2014). Agricultural Landscape Preferences: Implications for Agritourism Development. *Journal of Travel Research*, Vol. 53(3) 366–379.
- Jansen-Verbeke M. and J. van Rekom (1996), Scanning museum visitors: Urban tourism marketing, *Annals of Tourism Research* 23(2) 364– 375.
- Jansen-Verbeke M. and E. Lievois (1999), Analysing heritage resources for urban tourism in European cities. In D. Pearce & R. Butler (Eds.), *Contemporary issues in tourism development* (pp. 81–107). London: Routledge.
- Kim YG., Suh BW. and A. Eves (2010), The relationships between food-related personality traits, satisfaction, and loyalty among visitors attending food events and festivals, *International Journal of Hospitality Management* 29: 216–226.
- LaPan C. and C. Barbieri (2013). The role of agritourism in heritage preservation. *Current Issues in Tourism*, DOI: 10.1080/13683500.2013.849667.
- Lee CK., Lee YK. and BE. Wicks (2004), Segmentation of festival motivation by nationality and satisfaction, *Tourism Management* 25(1): 61–70.

- Manrique R., Viaggi D. and M. Raggi (2015). A Bayesian network highlighting the linkages between landscape structure and the local economy: the case of agritourism in lowland areas of Northern Italy. *Journal of Environmental Planning and Management*, <http://dx.doi.org/10.1080/09640568.2015.1059738>
- Mastronardi L., Giaccio V, Giannelli A. and A. Scardera (2015). Is agritourism eco-friendly? A comparison between agritourisms and other farms in Italy using farm accountancy data network dataset. *SpringerPlus* (2015) 4:590.
- Meleddu M., Paci R. and M. Pulina (2015), Repeated behaviour and destination loyalty, *Tourism Management* 50: 159-171.
- Meng F., Tepanon Y. and M. Uysal (2008), Measuring tourist satisfaction by attribute and motivation: the case of a nature-based resort, *Journal of Vacation Marketing* 14(1): 41–56.
- Nickerson NP. and SF. Mccool (2001). Agritourism: Motivations behind Farm/Ranch Business Diversification. *Journal of Travel Research*, Vol. 40, August 2001, 19-26.
- Prentice RC., Guerin S. and S. McGugan (1998), Visitor learning at a heritage attraction: A case study of Discovery as a media product, *Tourism Management*, 19(1): 5–23.
- Pulina M., DG. Dettori and A. Paba (2006). Life cycle of agrotouristic firms in Sardinia. *Tourism Management* 27 (2006) 1006–1016.
- Santeramo FG. (2015). Research note: Promoting the international demand for agritourism: Empirical evidence from a dynamic panel data model. *Tourism Economics*, DOI: 10.5367/te.2014.0397.
- Santeramo FG. and C. Barbieri (2015). On the demand for agritourism: a cursory review of methodologies and practice. *Tourism Planning and Development*, DOI: 10.1080/21568316.2015.1137968.
- Slater A. (2007), Escaping to the gallery: Understanding the motivations of visitors to galleries, *International Journal of Nonprofit and Voluntary Sector Marketing* 12(2): 149 –162.
- Tew C. and C. Barbieri (2012). The perceived benefits of agritourism: The provider’s perspective. *Tourism Management* 33 (2012) 215-224.
- World Economic Forum, WEF (2015), The Travel & Tourism Competitiveness Report 2015, Ginevra
- Yoon Y. and M. Uysal (2005), An examination of the effects of motivation and satisfaction on destination loyalty: A structural model, *Tourism Management* 26(1): 45 –56.

APPENDIX A

Table A.1 Variables description

| Variable | Definition | Reduced sample | | | | |
|-------------------------------------|--|-----------------------------|--------|--------|-------|----------|
| | | Obs | Mean | St.D. | Min | Max |
| Dependent variables | | | | | | |
| Cluster | dummy = 1 if respondent spends his/her holidays in a “tourism enthusiastic” farm; dummy = 0 if respondent spends his/her holidays in a “tourism opportunistic” farm. | Tot=375 (1=197 0=178) | 0.52 | 0.50 | 0.00 | 1.00 |
| Explanatory Variables | | | | | | |
| Nationality | dummy = 1 if the respondent is from Germany/Austria, and zero otherwise | Tot=373 (1=302 0=71) | 0.81 | 0.39 | 0.00 | 1.00 |
| Gender | dummy = 1 if male dummy = 0 if female | Tot=353 (1=221 0=132) | 0.63 | 0.50 | 0.00 | 1.00 |
| Age | | Tot=345 | 49.19 | 12.49 | 18.00 | 86.00 |
| Education | 2= primary; 3= secondary; 4=professional school; 5=high school; 6=bachelor; 7=post graduate | Tot=322 | 5.22 | 1.47 | 2.00 | 7.00 |
| Accommodation | dummy = 1 if apartment dummy = 0 if room | Tot=374 (1=281 0=93) | 0.75 | 0.43 | 0.00 | 1.00 |
| Pro capita expenditure | | Tot=338 | 326.12 | 372.83 | 15.00 | 4,500.00 |
| Factor 1: push factor | General motivations: <i>living in contact with nature, to experience a familiar environment, to experience relaxing places, sharing an experience with local people, having more freedom, to experience genuine food</i> | Tot=244 | 0.00 | 1.00 | -4.36 | 1.84 |
| Factor 2: pull factor | General motivations: <i>not finding other place to stay, experience something new, to live according to nature rhythm.</i> | Tot=244 | 0.00 | 1.00 | -1.51 | 3.03 |
| Factor 1: negative externalities | <i>Externalities: neglected environment (e.g. rubbish, unkept road verges), presence of polluting factories, congested roads, high voltage trellis, view on urban centre, tourism congestion</i> | Tot=303 | 0.00 | 1.00 | -6.11 | 0.93 |
| Factor 2: positive externalities | <i>Externalities: orchards, forests, vineyards, meadows</i> | Tot=303 | 0.00 | 1.00 | -1.76 | 1.50 |
| Factor 1: food and culture | Specific motivation: <i>experience traditional food, purchase own made products, experience genuine food, experience local culture, and for the presence of professional and skilled staff.</i> | Tot=257 | 0.00 | 1.00 | -3.73 | 4.06 |
| Factor 2: activities | Specific motivation: <i>to take part into farming activities, to observe farming activities, presence of children activities</i> | Tot=257 | 0.00 | 1.00 | -3.15 | 2.53 |
| Factor 3: price-quality | Specific motivation: <i>good prices, nice view, services quality, easy mobility, excursions</i> | Tot=257 | 0.00 | 1.00 | -3.15 | 2.81 |