

# Hedonic Pricing Evaluation on Agritourism Activity in Italy: Local Culture-based or Facility-based?

Ohe Y. <sup>1</sup>, Ciani A. <sup>2</sup>

<sup>1</sup> Department of Food and Resource Economics, Chiba University, Matsudo, Japan

<sup>2</sup> Department of Economics and Food Sciences, University of Perugia, Perugia, Italy



**PAPER PREPARED FOR THE 116<sup>TH</sup> EAAE SEMINAR "Spatial Dynamics in  
Agri-food Systems: Implications for Sustainability and Consumer Welfare".**

Parma (Italy)  
October 27<sup>th</sup> -30<sup>th</sup>, 2010

*Copyright 2010 Ohe Y. , Ciani A. . All rights reserved. Readers may make verbatim copies  
of this document for non-commercial purposes by any means, provided that this copyright  
notice appears on all such copies.*

# Hedonic Pricing Evaluation on Agritourism Activity in Italy: Local Culture-based or Facility-based?

Ohe Y.<sup>1</sup>, Ciani A.<sup>2</sup>

<sup>1</sup> Department of Food and Resource Economics, Chiba University, Matsudo, Japan

<sup>2</sup> Department of Economics and Food Sciences, University of Perugia, Perugia, Italy

**Abstract**—This paper focused on how and what diversified activities influence the price level of agritourism. A hypothesis that contrasts two directions was examined: facility-based and local culture-based activities. First, from the conceptual consideration, we defined that agritourism based on local cultural resources can internalize positive externalities, which are accompanied by local cultural resources, into income, unlike facility-based activity that has no connection with local cultural resources. Second, the results of estimations from the price determinant ordered logit model clarified that owning a swimming pool was the most common and influential factor in enhancing the price level while regional diversity was observed in terms of local cultural resource-based activities such as restaurants, world heritage sites and DOC wines. These findings indicate that hardware-based evolution is more effective in the short term than evolution based on software aspects. Nevertheless, this hardware-based evolution of agritourism is implicitly based on the assumption of continuously growing demand and sufficient financial capability for the fixed investment. When growth in demand becomes stagnant, facility installation can be a heavy burden on operators. Consequently, for the sustainable development of agritourism it will be necessary to harness locality to create a balance between facility-based services and local culture-based services.

**Keywords**—agritourism, local cultural heritage, hedonic pricing

## I. INTRODUCTION

Agritourism has been recognized as an effective measure toward diversification of farm activity (Sharpley [28]). Due to its soft-tourism character based on endogenous resource utilization, farmers can reflect diverse local characteristics including agriculture in the evolution of their agritourism activities and therefore the evolution of agritourism will result in diversity from one region to another. On the other hand, it has been pointed out by those people

concerned that facility-based evolution has progressed and agritourism is emerging that is almost identical for the tourist as staying in a hotel in a rural area (Ohe and Ciani [21]). Agritourism in Italy has enjoyed steady growth, which, we can say, presents an advanced model of agritourism development. In this context, the evaluation of diversified agritourism activity in Italy can give us important information for the future evolution of agritourism not only in Italy, but also in other parts of the world.

Nevertheless, it has been neither explored conceptually nor empirically how the orientation toward facility-based evolution that has nothing to do with rural cultural heritage exerts influence on the direction of diversification of tourism activity by farmers. To put it differently, it is essential for the endogenous evolution of agritourism, which is local-culture-based, to clarify how agritourism activity is performed in connection with local resources. Studies on this aspect have been rather confined to solely conceptual considerations or descriptive case studies and therefore economic studies on this issue are still at the initial stage.

In consideration of the initial stage of the economic studies above, this paper aims at conceptual and empirical evaluations of the diversification of agritourism in Italy and at clarification of how facility-based or local culture resource-based activity determines the price level of agritourism services by incorporating the concept of cultural capital (Throsby, [30]). The concept of cultural capital has not been applied in economic empirical studies on agritourism. To explore the significance of cultural capital from an economic approach by focusing on agritourism that is based on the local cultural heritage will benefit not only agritourism research, but also economic research in the tourism arena in general, especially on the aspects of how to utilize local cultural resources and to come up with support measures. First, we review

related literature on our topics and the position of our study. Second, we present an economic conceptual framework of types of utilization of local cultural resources from the viewpoint of agritourism diversification that enables us to lead to the following empirical examination. Thirdly, in the latter half of this paper we empirically clarify the regional characteristics of agritourism and evaluate how local cultural resource-based factors and factors without a local cultural resource base determine prices for accommodation. Finally, we summarize our results and suggest policy recommendations.

## II. LITERATURE REVIEW

From the viewpoint of utilization of cultural heritage and resources that are crucial for the diversification of agritourism, Thorsby [30] presented the concept of cultural capital as an asset that embodies, stores or provides cultural value and that added a cultural dimension to economics. Thorsby [31] also pointed out the necessity for advancement of analytical models. In empirical studies, Garrod and Fyall [12] dealt with the pricing strategy of heritage tourism. Nevertheless, empirical studies on this type of capital have not been conducted sufficiently in the arena of tourism economics except for evaluation of the economic impact of festivals and events (Dwyer and Forsyth [10]; Timothy [32]). Cultural tourism has focused on urban areas rather than on rural areas (Bonet [5]).

For the sustainable utilization of cultural heritage, which is often termed as commoditization (Cohen, 1988) or commodification (McKercher and du Cros [16]; George et al. [15]), there have been discussed several points of concern; authenticity issues have been addressed (Cohen [6]; Timothy and Boyd [33] pp.237-256.) and George et al. [15] discussed, in addition to positive aspects, negative aspects of rural tourism such as conflicts and loss of diversity in local communities. Although we should keep in mind these issues, they go beyond the focus of our paper. Thus we assume that these points are given conditions in this paper.

Cultural heritage, typically represented as UNESCO world heritage, (for studies on the connection between UNESCO world heritage and tourism, see Robinson et

al [25]; Di Giovine [9]) has close connection with identities of local people (De Beus [8]). Awareness of local identity is an essential source of the beginning of local resource utilization. Services based on local cultural resources are considered to reflect local identity. In this context, farm and traditional culinary specialties are included in the scope of heritage (Timothy and Boyd [33], pp.33-34). Agritourism enables farmers to attain two goals at once: the preservation of traditional cultural heritage and the utilization of these resources as a business. Although both the tangible and intangible aspects of rural cultural heritage are crucial for agritourism, agritourism cannot be a market segmented from that of hotels unless agritourism operators essentially utilize these local cultural resources. There have been few supply side studies in the arena of rural and agritourism whereas cultural aspects have been attracting growing attention from conceptual and demand aspects (Barbič [3]; Royo-vela [26]).

Garrod et al. [13] presented an interesting concept of countryside capital that explicitly deals with rural resources as stock, including intangible rural cultural heritage. However, an empirical evaluation has not been done, yet.

The local cultural resources that we deal with here are confined to cases whereby they are utilized for agritourism diversification and provided as the flow of goods and services rather than the stock of local cultural heritage, which is included in the cultural or countryside capital.

A flow concept similar to countryside capital is multifunctionality in agriculture that is generated along with farm activity as non-commodity outputs, i.e. a joint product of farming and exerting positive externality to society such as the succession of rural cultural heritage, maintenance of biodiversity, landscape formation, and food security (for the definition of multifunctionality, see OECD [17, 18], and from an European perspective, see van Huylenbroeck and Durand [36]). Multifunctionality includes not only environmental functions, but also socio-cultural functions (Ohe [22]).

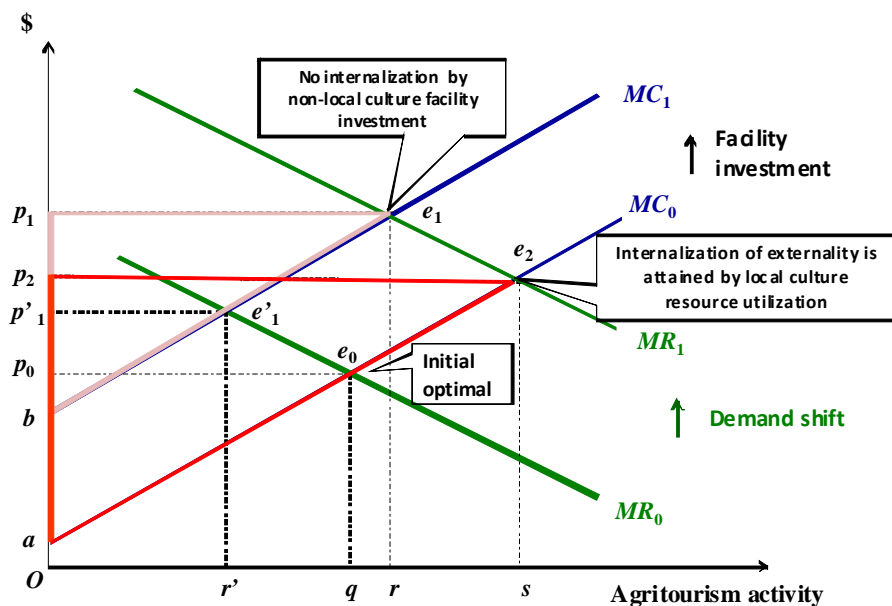
Normally, the generators of multifunctionality are not rewarded from the externalities they generate. How to internalize these externalities matters for optimal rural resource allocations. Therefore, farm

diversification in connection with multifunctionality is attracting growing attention (van der Ploeg et al., [35]). Especially non-governmental approaches are explored for this goal and agritourism is one of these solutions through a market (OECD [19]). In this context, the importance of business management in rural tourism and agritourism has increased (Sharply [27]; Page and Getz [24]; Sharpley [28]; Sharpley and Vass [29]).

Regarding the relationship between agritourism and multifunctionality, Vanslenbroeck et al. [37] conducted hedonic pricing analysis of the rural landscape that is an essential factor for agritourism, while Allali [2] conducted a case study in Morocco on the relationship between landscape and agritourism to explore the possibility of agritourism in developing countries. Ohe [22, 23] mentioned that rural tourism conducted by female and retiree farmers from other occupations enhanced multifunctionality.

While Cracolici et al. [7] conducted evaluations on tourism sustainability and economic efficiency, that study did not focus on agritourism. Studies on Italian agritourism were conducted mainly from the perspectives of farm diversification and multifunctionality (Fanfani and Galizzi [11]; Velázquez [38]) or were regionally focused (Tondini [34]; Ohe and Ciani [20]) while there have been studies on local brand products, such as DOC wines, but these were not in connection with agritourism (Viganò [39]; Belleli et al. [4]; Gatti [14]).

To sum up, the connection between rural tourism and local cultural heritage, however, has not been evaluated conceptually and empirically, so this connection should be more fully explored. We call these both the tangible and intangible cultural heritage, which are 'local cultural resources' and which the local community has traditionally nurtured and are related to the local identity and diversity of local culture. What matters here is not solely to focus on psychological aspects or cultural aspects, but to identify how these local resources are utilized for



**Fig.1 Operator's subjective equilibrium of agritourism diversification**

diversification of agritourism and subsequently to obtain a viewpoint for future utilization and preservation of these resources.

### III. CONCEPTUAL FRAMEWORK

Here, we present an economic framework to explore the relationship between the utilization of local cultural resources and the diversification of agritourism to lead to the following empirical examination. We consider a micro level operator's subjective equilibrium model because we use micro level data for estimation. Market equilibriums at the regional and national levels are assumed to be attained from the aggregation of these micro-level behaviours.

To simplify the discussion here, we focus on the two contrasting types of activities or attractions: local culture-based activities and facility-based activities that have nothing to do with local culture. We define these two types of activities by making different assumptions for each activity. Assumptions for local cultural resources are based on the following. First, these resources exert positive externalities on society, which are often referred to as multifunctionality of agriculture as mentioned above. Of course, although agriculture generates negative externalities as well, we assume that negative externalities are given condition here and we focused on the net positive externalities that negative ones are deducted from positive ones. The second assumption is that the

utilization of local cultural resources means the internalization of externalities to generate income without an increase in the marginal cost of utilization. Put another way, it is assumed that if an installation cost exists, which shifts upward the marginal cost, the facility installation is identical with internalization benefits, which shifts downward the marginal cost. Therefore, the third assumption is that the effect of these local cultural resources on rates is not large, but that the income generating effect will be greater than could be expected from rate increases.

With regard to facility-based activity that has nothing to do with local culture, the following contrasting assumptions are made. First, no externality is generated along with the process of service production. Second, although the demand shift effect can be increased by facility investment, the marginal cost will shift upwardly as well due to the installation cost of facilities. Therefore, third, the rate increase effect will be over-estimated, and operators will not accrue benefit from the facility installation unless there is a sufficiently large demand increase.

These assumptions, that is, those made for local culture-based and facility-based agritourism, are illustrated in Figure 1, which shows these two cases of agritourism diversification and subjective equilibrium points for a typical agritourism farmer engaged in these activities. It measures service prices and costs in value terms vertically and activity levels in value terms horizontally, which means that activity levels are outcome-based, including not only diversification of activity, but also quantitative enlargement of activity. The values of services provided by agritourism farms are assumed to be properly evaluated according to the rates of accommodation as a single market. As mentioned below, data that we use are from a nationwide survey so that it is considered that this assumption of agritourism as a single good is satisfied.

In the figure, right upward curves illustrate the marginal cost curves  $MC$  because the marginal cost will also increase when the activity level increases. Right downward curves illustrate the marginal revenue curves  $MR$  because repeat visitors are not uncommon in agritourism because of consumer loyalty. Under the assumption of the same demand shift in the two cases, first in the facility-based case, facility installation

normally is undertaken under the expectation of a demand upward shift from  $MR_0$  to  $MR_1$  and of higher rates as a consequence while the marginal cost curve will shift upwardly from  $MC_0$  to  $MC_1$  due to the installation cost of the facility. In Italy, the demand for agritourism has been growing steadily, which means that  $MR$  upward shifts have occurred in reality. Subsequently, a new equilibrium point becomes  $e_1$  after the facility installation from the initial equilibrium point  $e_0$ . At the new equilibrium point, both levels of activity and rates increase, and thus farmers gain increases as well. In the facility-based case, however, the portion of rate increase from  $p_0$  to  $p_1$  includes the portion of marginal cost increase (from  $p_2$  to  $p_1$ ) in addition to the portion of demand increase (from  $p_0$  to  $p_2$ ).

In contrast, in the case of local culture resource-based activity or attractions, the new optimal point is  $e_2$  because the positive externalities that these resources have are internalized into income through agritourism.

This is because, if externalities exist,  $MC_1$  becomes the private marginal cost curve while  $MC_0$  becomes the marginal social cost because the vertical gap between the two curves expresses the existence of externality. When those operators internalize the externality into new activities generating income sources, then the  $MC_1$  curve eventually shifts down to  $MC_0$  as mentioned above. Thus,  $MC_0$  will also represent the actual marginal cost after internalization at the new optimal point  $e_2$ . However, this shift downward of the  $MC$  curve will not occur in the case of the non-local culture-based case because of the absence of externality or its internalization process.

Then the farmer's gain in the case based on local cultural resources, depicted as the triangle  $ae_2p_2$ , will be greater than the case based on a non-local cultural facility depicted as another triangle  $be_1p_1$ . This means that a simple increase in the rate does not always guarantee an increase in the farmers' gain because of the marginal cost shift.

Typical examples of the above two contrasting cases are swimming pools for outdoors and restaurants for indoors. Although an accommodation facility is the common minimum requirement from the viewpoint of diversification, we focus on contrasting the two diverse facilities here. A farm restaurant embodies a

diverse local gastronomical culture accompanying externalities while a swimming pool is a facility that has nothing to do with local cultural resources without externalities. Swimming pools were never commonly used by ordinary peasants, whereas the landlord class occasionally had swimming pools for personal use. Although swimming pools provided as part of agritourism are neither in the rural tradition nor connected with local identity, they have recently increased along with the agritourism evolution for the following reasons. Peak demand for agritourism is in summer, so tourists want to escape from heat, especially in Italy. In this respect, swimming pools that provide outdoor recreation as well as escape from the heat are effective in creating a demand increase in the peak season and differentiate an operator's agritourism facilities from those of rivals; however, swimming pools are very seasonally limited facilities.

In contrast, although the demand for farm restaurants has seasonality as well, operators can expect day trippers in addition to lodging tourists, so that a year round operation is possible. Thus, while revenue per capita day tripper will be lower than in the case of lodging tourists, the demand for restaurants is more stable than that for swimming pools. The difference between these two facilities depends on the differences not only between indoor and outdoor facilities, but also because of each demand character. Moreover, restaurants can create a year round demand shift through utilization of local food cultural resources unlike swimming pools, the use of which is accompanied by an unavoidable seasonality in demand.

To summarize, we should be careful in only looking at the rate increase effect and understand that it does not guarantee an increase in farmer's gain as mentioned above. If a farmer makes a decision by only looking at the rate increase without consideration of an increase in  $MC$ , sound management of one's own agritourism would be lost because it is considered that the larger the installation cost of a facility, the larger the gap between a nominal rate increase and the farmer's actual gain. Therefore, when we evaluate

facility-based diversification from the rate increase aspect, unless we consider the upward shift of  $MC$ , we tend to overestimate the demand shift effect. We should pay attention to this gap between the nominal rate and farmers' actual gain.

#### IV. ACTIVITIES AND ATTRACTIONS OF AGRITOURISM

Given the conceptual framework with a dichotomous classification as an ideal theoretical model, Table 1 shows actual activities and attractions that constitute agritourism resources available for tourists by classified whether services are provided on or off -farm and facility or local culture -based.

We focus on three types of local culture-based activities and attractions since we have already mentioned the case of restaurants, the first of which are the off-farm local cultural resources that operators take advantage of that generate externalities as local public goods. Examples are world heritage sites designated by UNESCO. World heritage sites exert positive externalities not only to the surrounding local community but also to the global community. Italy has many such sites, so that their impact on the local economy will extend widely. Although the internalization of externalities was mainly done by those who locally utilize resources in tourism businesses including agritourism, we rather focus on agritourism-related effects for our purpose. Operators take advantage of these heritage sites as simple users of externalities. In the case of local public goods, operators do not pay for the benefit of externalities, so that the  $MC$  curve does not shift, just like in the case of no facility installation. Therefore, the  $MC_0$  curve remains in place because beneficiaries stay at the social marginal cost, which is  $MC_0$  in this figure if externality exists without payment by beneficiaries for that externality, and only the  $MR$  curve shifts upwardly. Thus in this type, an increase in activity level causes an increase in prices and in farmer's gain as well at the new optimal point  $e_2$ .

Connection with local cultural heritage	Necessity of facility installation*: <i>MC</i> upward shift	Type of resources for utilization	Example of goods, services & resources	Internalization: <i>MC</i> downward shift		
None: accompanied by no externality	Yes (Facility based)	On-farm resources	Accommodation facility	None		
			Swimming pool			
			Availability for disabled			
Yes: accompanied by externalities (Local culture based)			None	On/off-farm private goods with traits of local public goods	Restaurant	Yes
					Equitation	
					Educational farm	
	Organic farming					
Off-farm local public goods	World heritage sites					

*Note*: \*facility installation cost for agritourism is considered here other than that for conventional agricultural purposes.

The second local culture-based resource is local brand products that are produced by farmers themselves or by the local food processing industry within a designated area. A typical example is DOC, i.e., controlled designation of origin for wine. Local brand products exercise positive externalities to the radius of designated local areas in the enhancement of the attractiveness of the production area for tourists. Local brand production is privately conducted and locally designated, and at the same time these local brand products generate externalities because they have an aspect of local public goods as well. If operators are simple beneficiaries of externalities, then  $MC$  will not shift upward as mentioned. In contrast, if operators are generators of externality,  $MC_1$  becomes the private marginal cost curve while  $MC_0$  becomes the marginal social cost due to the existence of externality. When those operators internalize the externality into new activities generating income sources, then the  $MC_1$  curve eventually shifts down to  $MC_0$  as mentioned above. Thus, in any case,  $MC_0$  will represent the actual marginal cost after internalization at the new optimal point  $e_2$ . Local restaurants in general can use these products for foodstuff and sell them to tourists. In this respect, it is fair to say that these products are private goods with an aspect of

local public goods or have the intermediate characteristic of on-farm and off-farm resources because some operators are producers of these goods while others are only users of them.

The last type is individual-based activity not accompanied by special facilities, such as organic farming and educational farm (fattoria didattica) activity. These activities basically do not need special facilities for agritourism that differ from those needed for conventional farming. Even

if such facilities are necessary, they will add only trivial installation costs, e.g., additional toilets for visiting children. Educational farm activity provides an opportunity for children to learn about farming and rural life through visits to these farms. This activity is usually conducted by individual farmers or a farmer's family. In these cases farmers internalize on-farm resources that have local cultural identity. Point  $e_2$  is again the new optimal point because no  $MC$  shift occurs from the initial  $MC_0$  even if externalities exist.

Given the considerations above, next we will explore empirically to what extent these types of services influence the prices of agritourism by examining the following question of which will work stronger: local cultural resource-based services or facility-based tourism.

## V. DATA AND METHODOLOGY

Data were obtained from "Agritourist 2005", a catalogue of agritourism farms, edited and issued by the largest national agritourism organization in Italy. This organization promotes agritourism, provides guidance to potential users through issuing information on agritourism and also has a reservation

Items	Region			Result	Test
	North	Central	South		
Average no. beds (farms that offer rooms & apartments)	16.4	22.9	19.9	***	mt
Average no. beds (farms that offer only rooms)	12.8	13.9	14.7	**	t
Average no. beds (farms that offer only apartments)	13.1	20.1	17.8	***	t
Only rooms available	39.6	18.6	47.7	***	chi
Only apartments available	23.9	52.3	26.4		
Rooms and apartments available	25.6	28.6	24.9		
Swimming pool	15.6	65.4	25.3	***	chi
Barrier free	38.2	45.5	44.0	**	chi
Tennis court	3.8	9.0	11.9	***	chi
Camping site	7.3	3.7	14.4	***	chi
Restaurant	55.5	38.2	81.2	***	chi
Equitation service	15.6	16.1	20.2	n.s.	chi
Educational farm	14.5	8.3	16.3	***	chi
Organic farming	17.5	22.8	33.6	***	chi
Low level (fee level for accommodation $\leq$ 20 Euro per night)	38.9	19.0	37.0	***	chi
Higher level (fee level for accommodation $\geq$ 40 Euro)	21.2	36.4	18.8		

Source : Agriturismo 2005 by Agriturismo

Notes : \*\*\*,\*\* implies 1%, 5% significance. t and chi mean t test and chi-square test, respectively.

Items	Region			Results	Test
	North	Central	South		
No. world heritage sites	1.9	3.5	1.6	n.s.	mt
No. DOC wine brands	15.5	20.8	12.6	n.s.	mt
No. DOP wine brands	1.9	2.0	0.6	n.s.	mt
No. IGT wine brands	5.1	4.3	7.8	n.s.	mt
No. PDO and PGI food products	10.5	7.8	8.6	n.s.	mt
No. traditional agri-food products	207.9	236.0	176.1	n.s.	mt
Operating rate for agritourism	43.9	40.2	31	n.s.	mt
Operating rate for hotels	115.3	122.6	94.2	+	mt

Source: Original data were obtained at regional level as of 2004 from Annuario Dell'agricoltura Italiana by INEA for local brand products, Annuario Statistico Italiano by ISTAT and World Heritage List by UNESCO for world heritage sites.

Note : mt means multiple test. n.s. and + mean no significance among regions and 20% significance (as reference).



service (for instance, Agriturismo [1]). This catalogue covers the largest number of agritourism farms across the country and gives information on rates and available services for farms associated with this organization. Pictures of each farm are also provided. The drawback of these data is that we cannot evaluate subtle differences in services because published rates are grouped according to four ordinal levels. Nevertheless, other than this catalogue there are no other publicly available micro-level data on a nationwide basis despite the improvement in government statistics on agritourism. Thus this catalogue provides the most reliable micro-level agritourism data based on the same yardstick regardless of the region within the country.

Data on local brand products were obtained at the regional level as of the year 2004 from the *Annuario Dell'agricoltura Italiana* by INEA and data on world heritage sites were taken from the World Heritage List compiled by UNESCO in 2004.

We conducted statistical tests to clarify the regional characteristics in agritourism and estimated the rate determinant function with the notion of hedonic pricing function to examine the influence of local culture resource-based factors on the rate. However, because of constraints placed by the data on rates as mentioned above, our estimation is actually quasi-hedonic rather than exactly hedonic.

## VI. STATISTICAL COMPARISON OF REGIONAL CHARACTERISTICS

Tables 2 and 3 show comparisons of regional differences in the average bed number, types of accommodation, facility-based and/or local culture-based services, price levels and cultural resources available for tourism.

In comparison with other regions examined, agritourism in the north was operated on a rather small scale in terms of the number of beds in any type of room accommodation and in the number of services other than accommodation services and prices were relatively low.

Conversely, operations in the central region were larger, with more than half providing apartment accommodation; prices were highest among the regions. Also, there was a contrast between the high

portion of facility-based services and lower portion of local culture-based services. Those in the south operated with the highest portion of local culture-based activities such as restaurants, were intermediate between the other two regions in terms of size and in the middle in terms of the number of beds available, and prices were low. In short, agritourism in Italy is characterized as embracing regional diversity. The percent of farms offering facility-based services such as a swimming pool goes along with the number of beds. These facts suggest that quantitative and qualitative enlargement do not go along with each other. Bearing in mind these findings, we look into what services will strongly influence prices below.

## VII. ESTIMATION OF PRICE DETERMINANT FUNCTION

The estimation model assumes that prices are determined by four vectors, which are the combination of local culture-based and facility-based activities as tabulated in Table 1.

$$p = g(fb, fc, lcpr, lcpc)$$

where,

$p$  = prices of accommodation

$fb$  = vector of non-local culture- and facility-based services

$fc$  = vector of local culture- and facility-based services

$lcpr$  = vector of local culture based on farm service activity

$lcpc$  = vector of local cultural factors as local public goods

Prices are not a value term, but are expressed by four groupings, as explained above. Thus we used the explained variable as an ordinal variable; less than 20 Euro=1, from 20 to 30 Euro=2, from 30 to 40 Euro=3, over 40 Euro=4. Although prices with or without meal service should be evaluated, this data constraint does not allow for such detailed and subtle examination. We can, however, investigate the influence on prices by facility-based services and local culture-based

services and deal with the issue of meal service by taking into account restaurant service.

For the explanatory variables, as actual variables of the *fb* vector, non-local culture- and facility-based service, we considered the number of beds, type of accommodation facility (room=1, apartment=2, room and apartment=3), provision of camping site (yes=1, no=0), provision of swimming pool (yes=1, no=0), availability for the disabled (yes=1, no=0), and provision of tennis

court (yes=1, no=0), as based on the above results.

As a variable of the *fc* vector, local culture- and facility-based service, we considered operation of a restaurant (yes=1, no=0). As variables of the *lcpr* vector, personally conducted local culture-based services, we considered the following three activities: organic farming (yes=1, no=0), educational farm (yes=1, no=0), and equitation service (yes=1, no=0). As variables of the *lcpc* vector, indicators of local cultural public goods, we considered the number of designated world heritage sites in each region and also the number of DOC wines as typical local brand products. In comparison with the variable of DOC wines, we used the number of traditional agri-food products and various combinations of local brand products in place of the DOC wine variable. Since these local brand products are private goods with positive externality, we focus on the aspects of local public goods of these products rather than treating them as simple private goods. Ordered logit model estimation was employed for estimation and conducted at national and three regional levels. Sample size was 1634 for the national level.

As variables of the *lcpc* vector, indicators of local cultural public goods, we considered the number of designated world heritage sites in each region and also the number of DOC wines as typical local brand products. In comparison with the variable of DOC wines, we used the number of traditional agri-food products and various combinations of local brand products in place of the DOC wine variable. Since these local brand products are private goods with positive externality, we focus on the aspects of local public goods of these products rather than treating them as simple private goods. Ordered logit model estimation was employed for estimation and conducted at national and three regional levels. Sample size was 1634 for the national level.

## VIII. RESULTS

Estimation results are tabulated in Tables 4 to 6. The provision of a swimming pool was the only commonly significant parameter among the three regions; there are regional differences in all of the

Table 4. Results of estimation of rate determinant function (north)

Region	North			
Variables	Parameter	Odds ratio	Parameter	Odds ratio
No. beds	0.0363 <sup>***</sup> (0.0114)	1.0369	0.0318 <sup>***</sup> (0.0110)	1.0322
Camping site (yes=1, no=0)	-1.0810 <sup>***</sup> (0.3688)	0.3392	-1.1323 <sup>***</sup> (0.3674)	0.3223
Swimming pool (yes=1, no=0)	1.3310 <sup>***</sup> (0.3006)	3.7847	1.3141 <sup>***</sup> (0.2998)	3.7212
Availability for disabled (yes=1, no=0)	0.7478 <sup>***</sup> (0.2062)	2.1124	0.7755 <sup>***</sup> (0.2063)	2.1717
Tennis court (yes=1, no=0)	-0.1448 (0.5758)	0.8652	-0.1522 (0.5726)	0.8588
Restaurant (yes=1, no=0)	-0.1778 (0.2091)	0.8371	-0.1406 (0.2080)	0.8688
Organic farming (yes=1, no=0)	0.3731 <sup>+</sup> (0.2530)	1.4522	0.3748 <sup>+</sup> (0.2519)	1.4545
Educational farm (yes=1, no=0)	0.3012 (0.2948)	1.3515	0.272 (0.2948)	1.3126
Equitation (yes=1, no=0)	0.0288 (0.2824)	1.0292	0.0812 (0.2813)	1.0846
No. world heritage sites	0.1497 <sup>**</sup> (0.07394)	1.1615	0.3651 <sup>***</sup> (0.8459)	1.4407
No. DOC wines	0.0362 <sup>***</sup> (0.0078)	1.0369	-	-
No. traditional agri-food products	-	-	0.0059 <sup>***</sup> (0.0012)	1.0059
LR chi-square	-422.8309 <sup>***</sup>		-421.2638 <sup>***</sup>	
Sample size	377		377	

Source: same as Tables 2 and 3.

Notes: \*\*\*, \*\*, \*, + mean 1%, 5%, 10%, 20%(reference) significance, respectively and figure in the parenthesis shows standard deviation.

other parameters. This fact indicates that the influence of the parameter of a swimming pool on prices is common and represents the effectiveness of facility-based evolution that does not have anything to do with locality. Further, we should carefully interpret this price enhancement effect because this effect is overestimated due to the accompanying upward shift of the marginal cost line. At least, what we can tell here is that facility-based evolution that has nothing to do with local heritage is observed across the country.

In considering the examined variables according to region, in the north the largest odds ratio was for a swimming pool followed by that of availability for the disabled and number of beds with 1% significance (Table 4). The parameter of a camping site was negative, but mildly influenced prices because of the small odd ratio (1% significance). Among local cultural factors, while there was no significant parameter of individually conducted services, those of world heritage sites and DOC wine were positive with

significance (5% or 1% significance).

Region	Central region					
Variables	Parameter	Odds ratio	Parameter	Odds ratio	Parameter	Odds ratio
No. beds	0.0090* (0.0047)	1.0090	0.0090* (0.0047)	1.0090	0.0094* (0.0047)	1.0095
Camping site (yes=1, no=0)	-1.0777*** (0.3643)	0.3404	-1.0653*** (0.3648)	0.3446	-1.1471*** (0.3638)	0.3176
Swimming pool (yes=1, no=0)	1.1240*** (0.1471)	3.0771	1.1087*** (0.1471)	3.0304	1.1535*** (0.1470)	3.1692
Availability for disabled (yes=1, no=0)	0.1228 (0.1357)	1.1307	0.1133 (0.1356)	1.1199	0.1215 (0.1357)	1.1292
Tennis court (yes=1, no=0)	0.4068+ (0.2525)	1.5019	0.4012+ (0.2525)	1.4936	0.3834+ (0.2520)	1.4673
Restaurant (yes=1, no=0)	0.7201*** (0.1500)	2.0546	0.7292*** (0.1502)	2.0735	0.6978*** (0.1496)	2.0094
Organic farming (yes=1, no=0)	-0.0946 (0.1629)	0.9097	-0.0850 (0.1630)	0.9185	-0.0900 (0.1626)	0.9139
Educational farm (yes=1, no=0)	0.15502 (0.2517)	1.1677	0.1465 (0.2517)	1.1578	0.1259 (0.2514)	1.1342
Equitation (yes=1, no=0)	0.1917 0.1877	1.2113	0.1839 (0.1878)	1.2019	0.2088 (0.1877)	1.2321
No. world heritage sites	0.2080*** (0.0237)	1.2312	-	-	-	-
No. DOC wines	-	-	0.0542*** (0.0061)	1.0557	-	-
No. traditional agri-food products	-	-	-	-	0.0036*** (0.0004)	1.0036
LR chi-square	-902.4733***		-900.8289***		-905.7623***	
Sample size	886		886		886	

Source: same as Tables 2 and 3.

Note: Multifunctionality was observed between the world heritage variable and variables of DOC wine or traditional agri-food products, so only one of these variables was used for estimation.

world heritage sites and DOC wine, so we abandoned the use of these two variables together and made estimations using each variable separately (Table 5).

Region	South			
	Variables	Parameter	Odds ratio	Parameter
No. beds	0.0162* (0.0096)	1.0163	0.0147+ (0.0098)	1.0149
Camping site (yes=1, no=0)	-0.8889*** (0.3351)	0.4111	-0.9085*** (0.3342)	0.4031
Swimming pool (yes=1, no=0)	0.7085** (0.2893)	2.0310	0.7517*** (0.2864)	2.1206
Availability for disabled (yes=1, no=0)	0.4171* (0.2344)	1.5175	0.4083* (0.2348)	1.5043
Tennis court (yes=1, no=0)	0.5142+ (0.3969)	1.6723	0.5339+ (0.3983)	1.7056
Restaurant (yes=1, no=0)	0.7454** (0.3323)	2.1073	0.7875** (0.3319)	2.1980
Organic farming (yes=1, no=0)	-0.2393 (0.2502)	0.7872	-0.2434 (0.2499)	0.7840
Educational farm (yes=1, no=0)	0.3258 (0.3202)	1.3852	0.3898 (0.3227)	1.4767
Equitation (yes=1, no=0)	-0.0923 (0.3042)	0.9118	-0.1122 (0.3020)	0.8939
No. world heritage sites	0.1119+ (0.07595)	1.1184	0.1575+ (0.1075)	1.1706
No. DOC wines	-0.0145 (0.0240)	0.9856	- -	-
No. traditional agri-food products	- -	-	-0.0019 (0.0026)	0.9981
LR chi-square	-301.9713***		-301.8750***	
Sample size	271		271	

Source : same as Tables 2 and 3.

In short, the north is characterized as having no connection between individually conducted local culture-based services and prices; thus, it is the least diversified area.

In the central region, multicollinearity was observed because of the high correlation between

The odds ratio for a swimming pool was the largest (1% significance), as in the north, but that of a restaurant followed (1% significance). A camping site was a negative parameter with a low odds ratio (1% significance). With respect to local culture-based services, the parameters of world heritage sites and DOC wine were positive with statistical significance (1% significance). In contrast, there was no parameter of individual local culture-based services with significance.

In the south, having a restaurant had the largest odds ratio (5% significance), meaning that the presence of a restaurant is the most influential factor on prices. This was followed by a swimming pool and availability for the disabled (Table 6). These results indicate the significance of the local food culture in the south. On the other hand, neither local public goods such as world heritage sites and DOC wine nor individually conducted culture-based services, with the exception of a restaurant, were statistically significant.

In summary, non-local culture-based and facility-based services as commonly exemplified by a swimming pool strongly influence prices across the country. Influence from local culture-based activities such as restaurants differs from one region to another due to differences in the provision of boarding services among regions.

One reason that organic farming statistically had no influence on prices in any of the regions is that

there are already farm product markets in which organic products are dealt. Another reason is that the value is reflected in the price of meals prepared in restaurants that use organic foodstuff. That equitation service had no significant influence on prices is because this service is not considered as a necessary service, but as an optional service, which means it has not yet been considered as an independent market. It is considered that the regionally variable influence of educational farm service is due to a newly inaugurated service, so this service has not been evaluated well at the regional level, but only at the wider national level.

## IX. CONCLUSIONS

The estimation results of the price determinant function indicate that the influence of facility-based service on price formation is commonly observed across the country although local culture-based services depend on a diverse local cultural background. Thus we can say that agritourism in Italy evolves with two contrasting vectors: the uniform facility-based vector and the diverse local-based vector. Among local culture-based factors, factors related to local public goods work more influentially than individual-based activity in the north while individual-based restaurant activity does so in the south. The central regions exhibited traits midway between those of the other two regions.

The above results suggest that the agritourism market evolves from a single market to multiple markets with emerging diversified services, which cannot be properly evaluated through examination of a single agritourism market. This suggests the evolution of the agritourism market from a single market to multiple markets.

To strengthen locality it is desirable for the agritourism evolution to utilize local resources. Nevertheless, the most influential factor on prices is the facility without any local cultural resource base. The reason for the facility-based influence is that it is easy for consumers to recognize the difference in quality as visible hardware in terms of amenity improvement with a uniform style despite a non-negligible installation cost. Thus it is quicker for operators to achieve a response from consumers with installation of a facility. Because of that, facility

installation is easily reflected in the prices. In contrast, services based on the local cultural heritage are more optional and are newly emerging services, so that the quality of these services is not easily visible to consumers. Besides that, the creation of new local culture-based services needs more lead time to be fruitful as an economically viable new service. Thus, it is undeniable that agritourism in Italy has diversified with dichotomous vectors although these contrasting vectors can create diversity itself.

On the other hand, the problems of this facility-based evolution is that, firstly, the financial capability of farmers determines the level of facility installation so that small operators with low financial capability eventually will be excluded from this evolution. Secondly, even if an operator has financial capability, unless the demand shift is large enough, facility installation does not always result in a better business outcome due to the upward shift of the *MC* curve, which represents the fixed cost on the business. Stated differently, suppose demand remains constant, the effect of nominal facility installation on price formation will be overestimated. Therefore, when growth in demand becomes stagnant, facility installation can be a heavy burden on the business of agritourism.

Consequently, it will be necessary for the sustainable development of agritourism to harness locality by creating a balance between facility-based services and local culture-based services. In this respect, it is important to develop software for the utilization of local resources and the establishment of markets for newly emerging local culture-based services in combination with facility-based services. At the same time, care should be taken, as a sharp price increase can ironically reduce revenue because agritourism is a price-elastic good. Thus the segmentation of agritourism markets seems to be inevitable in the long term. Policy support should be focused on this point.

## ACKNOWLEDGMENT

This research was funded by the Grants-in-Aid for Scientific Research, no. 20248024, Japan Society for the Promotion of Science.

## REFERENCES

1. Agriturist (1994) *Stato e prospettive dell'Agriturismo in Italia*, Rome: Agriturist.
2. Allali K (2009) Agricultural landscape externalities, agro-tourism and rural poverty reduction in Morocco. In: L Lipper, T Sakuyama, R Stringer, and D Zilberman (eds.) *Payment for environmental services in agricultural landscapes: Economic policies and poverty reduction in developing countries*. Rome, FAO and Springer, pp 189-220.
3. Barbič A (1998) Cultural identity of the Slovenian countryside: territorial integrity and cultural diversity from the perspective of rural communities. *Agriculture and Human Values* 15: 253-265.
4. Belletti G, Burgassi T, et al. (2007) The roles of geographical indications on the internationalization process of agri-food products. In: M Canavari, D Regazzi, and R Spadoni (eds.) *International marketing and international trade of quality food products*. Bologna and Milan, Edizioni Avenue media, pp 517-539.
5. Bonet L (2003) Cultural tourism. In: R Towse (eds.) *A handbook of cultural economics*. Cheltenham, Edward Elgar, pp 187-193.
6. Cohen E (1988) Authenticity and commoditization in tourism. *Annals of Tourism Research* 15: 371-386.
7. Cracolici M F, Cuffaro M, et al. (2009) Tourism sustainability and economic efficiency: a statistical analysis of Italian provinces. In: L F Girard, and P Nijkamp (eds.) *Cultural tourism and sustainable local development*. Surry, Ashgate, pp 167-180.
8. De Beus J (1996) The value of national identity. In: A Klamer (eds.) *The value of culture: On the relationship between economics and arts*. Amsterdam, Amsterdam University Press, pp 166-186.
9. Di Giovine M A (2009) *The heritage-scape: Unesco World Heritage and tourism*. Maryland, Lexington Books.
10. Dwyer L and Forsyth P (2006) *International handbook on the economics of tourism*, Cheltenham, Edward Elgar.
11. Fanfani R and Galizzi G (2000) *La multifunzionalità in agricoltura: L'agriturismo in Emilia-Romagna, il sistema agro-alimentare dell'Emilia-Romagna: Rapporto 1999*, Milan, Franco Angeli, pp 311-328.
12. Garrod B and Fyall A (2000) Managing heritage tourism. *Annals of Tourism Research* 27: 682-708.
13. Garrod B, Wornell R, et al. (2006) Re-conceptualising rural resources as countryside capital: The case of rural tourism. *Journal of Rural Studies* 22: 117-128.
14. Gatti S (2009) Protected designation of origin, sustainable development and international policies: a survey of DOC wines from Emilia-Romagna. In: T d N Vaz, P Nijkamp, and J L Rastoin, (eds.) *Traditional food production and rural sustainable development: A European challenge*. Surry, Ashgate, pp 255-265.
15. George E W, Mair H, et al. (2009) *Rural Tourism Development: Localism and Cultural Change*. Ontario, Channel View Publications.
16. McKercher B and du Cros H (2002) *Cultural tourism: The partnership between tourism and cultural heritage management*. New York, Haworth, pp 115-134.
17. OECD (2001) *Multifunctionality: Towards an analytical framework*. Paris, OECD.
18. OECD (2003) *Multifunctionality: The policy implications*, Paris, OECD.
19. OECD (2005) *Multifunctionality in agriculture: What role for private initiatives?* Paris, OECD.
20. Ohe Y and Ciani A (1998) The activity and characteristics of agri-tourism farms: a study of Umbria, Italy. *The Bulletin of the Chugoku National Agricultural Experiment Station* 19: 1-18.
21. Ohe Y and Ciani A (2003) Evolutionary process of agri-tourism in central Italy, Umbria. *Japanese Journal of Tourism Studies* 2: 11-18.
22. Ohe Y (2007) Multifunctionality and rural tourism: a perspective on farm diversification. *Journal of International Farm Management* 4: 1-23.
23. Ohe Y (2008) Impact of rural tourism operated by retiree farmers on multifunctionality: Evidence from Chiba, Japan. *Asia Pacific Journal of Tourism Research*: 13( 4): 343-356.
24. Page S J and Getz D (1997) *The Business of rural tourism: International perspectives*, International Thompson Business Press, London.
25. Robinson M, Evans N, et al. (2000) *Tourism and heritage relationships: Global, national and local perspectives*. Sunderland, Business Education Publishers.
26. Royo-vela M (2009) Rural-cultural excursion conceptualization: a local tourism marketing management model based on tourist destination image measurement. *Tourism Management* 30: 419-428.
27. Sharpley R (1996) *Tourism & leisure in the countryside* 2nd Edition. Huntingdon, ELM Publications, pp 73-80.
28. Sharpley R (2005) Managing the countryside for tourism: a governance perspective. In: L Pender and R Sharpley (eds.) *The management of tourism*. London, SAGE Publications, pp 175-187.
29. Sharpley R and Vass A (2005) Tourism, farming and diversification: an attitudinal study. *Tourism Management* 27: 1040-1052.
30. Thorsby D (2001) *Economics and culture*. Cambridge, Cambridge University Press.
31. Thorsby D (2009) Tourism, heritage and cultural sustainability: three 'golden rules'. In: L F Girard, and P

- Nijkamp (eds.) Cultural tourism and sustainable local development. Surry, Ashgate, pp 13-29.
32. Timothy, D J (2007) Managing heritage and cultural tourism resources: Critical essays. Volume One, Aldershot, Ashgate.
33. Timothy, D J and Boyd, S W (2003) Heritage tourism. Harlow, Pearson Education, pp 33-34.
34. Tondini E (1995) La valutazione dell' agriturismo. Perugia, Regione Dell' Umbria.
35. Van der Ploeg, J D, Laurent C, et al. (2009) Farm diversity, classification schemes and multifunctionality. *Journal of environmental Management* XXX: 1-8.
36. Van Huylenbroeck G and Durand G (2003) Multifunctional agriculture: A new paradigm for European agriculture and rural development. Aldershot, Ashgate.
37. Vanslebrouck I, Van Huylenbroeck G, et al. (2005) Impact of agriculture on rural tourism: a hedonic pricing approach. *Journal of Agricultural Economics* 56: 17-30.
38. Velázquez B E (2005) Agritourism in Italy. In: OECD (2005) Multifunctionality in agriculture: What role for private initiatives? Paris, OECD, pp 35-40.
39. Viganò L (2005) La qualità dei prodotti agricoli e agro-alimentari. La riforma dello sviluppo rurale: Novità e opportunità, quaderno n. 1. Rome, INEA, pp 63-74.
- (Author's e-mail reference: yohe@faculty.chiba-u.jp)