

# Does rural tourism benefit from agriculture?

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## Abstract

Rural tourism enterprises have been developed in rural areas as an alternative to agriculture. The inter-relationships between tourism and agriculture have been discussed at the macrolevel in the relevant literature but not at the firm level. The objective of this paper is to investigate if and how rural tourism enterprises on working farms differ from such enterprises without agricultural activity. The analysis is based on in-person surveys of 197 operators of rural accommodations in Israel. It was found that the farm activities on a working farm are of no value to the visitors. However, on the production side, farmers seem to benefit from the existence of farm activities by using labor more efficiently. In addition, we found that a concentration of firms and attractions creates positive externalities that benefit the single firm.

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## 1. Introduction

In many rural regions, tourism is accepted as a natural part of the socio-economic fabric juxtaposed with agriculture. It is clear that rural tourism is based on rural amenities; however, it is not clear how it relates to agriculture. Are these inter-relationships of mutual benefit? That is, while rural tourism provides farmers with auxiliary funding to continue their agricultural activity, is the latter an important or even necessary component of rural tourism? Do working farms with rural tourism enjoy economies of scope and run their businesses more efficiently than firms with only a single activity? The purpose of this paper is to analyze the effect of a working farm on the tourism activities within the same firm. The effect can accrue from three possible sources: consumer preference, the production process of the firm and the whole rural ambience, making it necessary to analyze them all.

The demarcation between farm tourism and rural tourism is somewhat hazy. Nilsson (2002), in his work on farm tourism, defines it as a subset of rural tourism. According to Nilsson, rural tourism is based on the rural environment in general whereas farm tourism is based

on the farm and farmer. This means that within the framework of rural tourism, farm tourism enterprises are more closely related to agriculture than other rural tourism operations. Clarke (1996) elaborates further and claims that there is a difference between tourism on farms and farm tourism. When accommodations are divorced from the farm environment then it is 'farm tourism', while in 'tourism on the farm', the farm environment and its essence are incorporated into the product (e.g., participation in the farm work, a tractor ride, picking your own produce).

These links not only differ, they also change over time. Busby and Rendle (2000) claim that the link between farm tourism and agriculture is getting weaker. They describe the transition from tourism on the farm-to-farm tourism. This transition occurs as farmers who became engaged in tourism on their farms as an alternative source of income to agriculture, slowly divorced themselves from agricultural activities. According to Busby and Rendle (2000), with this transition the farm activities are no longer a necessary component. Clough (1997) extends this argument further by claiming that most of the visitors would be happy not seeing the working farm. It seems that many researchers agree that the role of the farm and farmer is to supply the background that provides farm tourism with its unique features (Pearce, 1990; Nilsson, 2002). This is strengthened by Walford's (2001) finding that successful farm

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accommodations are located in an aesthetically pleasing, tranquil countryside environment; there is no reference to farm activities. These observations lead to the conclusion that there is a range of links between agriculture and tourism and that these links are getting weaker, especially from the visitor's point of view.

If benefits do not accrue to the farmer from the demand side, then they may accrue from the supply side. That is, farmers involved in tourism and agricultural production might do the former more efficiently and thus have an incentive to continue the farm's activity. Farming problems have given a big push to farmers and policy-makers to seek alternative activities, among them, tourism (Ilbery, Bowler, Clark, Crockett, & Shaw, 1998). The diversification of farm activities to tourism has, in some cases, fulfilled expectations, whereas in other regions it has not: this issue has been the predicate of many works. Fleischer and Pizam (1997) depicted different cases and elaborated on the causes of their success or failure. However, the topic at issue here is not the success of tourism as an auxiliary activity but the level of symbiosis between tourism and agriculture. Only a few papers have referred to this relationship, mostly contending that the coexistence is mutually beneficial. For example, reallocating farm labor results in more efficient use of this resource as tourism employs idle farm manpower, and visitors' exposure to the farm products helps market those products (Hjalager, 1996).

This work contributes to enhancing the conceptual framework of the relationship between rural tourism and agriculture at the firm level. Most previous studies have examined the mutual impacts of tourism and agriculture at the sector level. Unlike our study, the two sectors are treated as two separate entities and not as two activities at the same firm. In the studies of de Kadt (1979) and Belisle (1983) in the Caribbean Islands and of Gooding (1977) in Barbados and Jamaica, it was found that most of the farmers failed to adjust their agricultural production in response to the special needs of the growing tourism industry and thus did not benefit from it. A different case is the Himalayas, where Belisle (1983) has found that the farmers had adjusted to the needs of the tourism industry by diversifying into high-value agricultural products. A more contentious issue in the literature is whether tourism and agriculture share or compete for resources and infrastructure. A study in the Middle East (Hermans, 1981) and in Finland and the Caribbean Islands (Report of The Symposium on Agriculture and Tourism) provided evidence that the two sectors compete over labor and land. However, Fox and Cox (1992) noted that the development of tourism enhanced infrastructure development, consequently benefiting the agricultural sector.

Although mentioned in the relevant literature, the level and extent of the links between tourism and agriculture at the firm level have not been rigorously examined.

This paper delves into these specific links, at the firm level, in rural tourism accommodations in Israel, by analyzing in depth about 197 rural accommodation enterprises. Rural tourism in Israel is a relatively new phenomenon in which, similar to other rural regions, farmers and rural residents were searching for an alternative source of income (Fleischer & Pizam, 1997). Rural accommodations have been established in different types of rural residences: some on working farms (a few of these ceased to farm while operating the tourism business), others on non-working farms, and some in small, non-agricultural rural settlements. Unlike in some countries, a working farm was not a prerequisite for receiving public support (Fleischer & Felsenstein, 2000). The existence of these two types of accommodations, one located on working farms and one located on non-working farms in rural settlements, provided us with an excellent opportunity to examine the impact of agriculture on tourism by comparing them.

Another issue suffering from a dearth of rigorous analysis in the pertinent literature is the externalities in the rural accommodations market. The tourism industry is not a footloose industry, i.e., independent of its surroundings. The existence of attractions and other tourism enterprises in the surrounding area might be part of the experience and thus can benefit the entrepreneur. Reference to the rural tourism firms' environment is seen in research by Walford (2001) on patterns of development of rural accommodations enterprises in England and Wales. Using descriptive data he showed that such firms tend to concentrate around scenic areas which might indicate the existence of what he called the 'neighborhood effect'.

We claim that benefits to the single accommodation in an attractive ambience accrue from the higher price they can charge and from the higher occupancy rate than a similar business in a less attractive location. Visitors will be willing to pay more for accommodations located in an attractive area with beautiful landscape and a plethora of tourism activities.

By analyzing the rural accommodations using hedonic price analysis and Cobb–Douglas production estimation, we discovered that the working farm is not a necessary attribute of rural accommodations for the visitors. However, farmers enjoy a higher productivity level in their tourism enterprise than non-farmers. We also found that attractions and a concentration of tourism firms create positive externalities.

## 2. Evaluating the impact of agriculture on the rural tourism market

Prices and sales in the rural tourism market are determined simultaneously by supply and demand. The supply side reflects the cost structure of the firm and its

level of efficiency. The more efficient the production process is, the less it will cost the entrepreneur to produce the rural tourism services than other less efficient firm. The demand side reflects the value visitors attach to a stay in rural accommodations. Since rural accommodations vary in their attributes, we expect visitors to attach different values to different attributes, one of them being the existence of a working farm. Profits can increase if visitors are willing to pay a higher price for an attribute or if the business is operated more efficiently, i.e., at a lower cost for the same level of production. We wanted to evaluate the contribution of a working farm to the rural accommodations owner and thus we had to evaluate both sides of the market, supply and demand.

Just how much visitors value the existence of a working farm can be examined by using hedonic price analysis. Rural tourism accommodations vary widely in their attributes. Some of these attributes are similar to those of a hotel, e.g., the level of luxury of the unit or a special view, but some are unique to rural tourism. Among the latter is the existence of a working farm with all of its implications. The importance of this attribute has been hypothesized and discussed in the aforementioned literature but has not yet been checked using market transactions. Assuming that the rural accommodations market is in equilibrium during the tourist season, the visitors' willingness to pay depends on the attributes of the unit. Thus, use of actual transaction prices shows the revealed, not stated, preferences for a working farm on the rural accommodations' premises. The prices in the rural accommodations market can be considered hedonic prices. The price that a unit is rented for depends on its characteristics, including the existence of a working farm. Hedonic prices of housing (Ridker & Henning, 1967), grapes (Golan & Shalit, 1993), and fish (McConnell & Strand, 2000) all depend on the characteristics of the good and its value as revealed by its marginal contribution to the price.

In the long run in the hedonic model, an incremental change in price due to the existence of one of the characteristics equals the buyers' marginal willingness to pay for that characteristic as well as the marginal cost of producing that characteristic. In the short run, equality is more likely to hold only for the willingness to pay and not for the marginal cost due to adjustment problems (Rosen, 1974).

On the supply side, we expect entrepreneurs with a working farm to be more efficient or more productive tourism producers. This is due to the following intrinsic characteristics of the farm: (1) Most farmers have cheap hired labor available on the farm. Thus, we would expect them to use more hired labor and less self-labor than non-farmers. (2) A large portion of the entrepreneurs' time is spent on phone calls, making reservations and other arrangements. The farmers take the mobile

phone with them and while working on the farm, they can take care of their tourist business. (3) For the most part, the visitors need the owner in the morning before they leave for their activities and in the evening when they come back. Farmers are flexible with their time and can adjust their work schedule to meet the needs of their visitors.

An analysis of both sides of the rural tourism market is necessary to ascertain the overall impact of agriculture. Analysis of one side of the market, supply or demand, is not sufficient and can lead to erroneous conclusions.

### 3. Description of data and variables

The data used for our analysis originate from a cross-sectional survey of rural accommodations operators in Israel during 2000. The survey included an interview, in which the respondents were asked to answer a questionnaire, and a tour of the hospitality units and all other related facilities.

The questionnaire included a wide range of questions concerning the elements of the hospitality. These included a description of the hospitality units, the garden, the view from the units, the tourist activities related to the hospitality, and the service orientation of the owner. Other kinds of questions referred to the capital and labor inputs of the owners and the annual performance of the business for the year 1999. Owners with a working farm were also asked about the agricultural elements relevant to the accommodations. Finally, owners were asked about their demographic and personal characteristics.

#### 3.1. Sample construction

The sources of information on rural tourism businesses in Israel are decentralized. Entrepreneurs tend to operate independently and advertise their business via one or more channels (e.g., special guidebooks for rural tourism, regional tourism associations, the yellow pages, and several Internet portals for local rural tourism). By integrating all information sources, we found that there are 886 rural tourism operators in about 120 rural settlements in different regions in Israel. They operate about 3150 hospitality units, as many as half of which are in the Galilee region.

Sample size was set at 200 operators (22.6% of the population). The sample construction was based on a cluster-sampling model. First, the country was divided into eight regions, only five of which were relevant for sampling (Northern Galilee, Western Galilee, The Golan Heights, the Sea of Galilee and its vicinity, and the Arava region in the south). The selected regions included 817 rural tourism operators in 100 rural

settlements; the other three had very little rural tourism activity. Based on knowledge of the variability between and within rural communities, we decided to sample 20 communities. The distribution of rural communities among the five regions was proportional to the number of rural communities with tourism operations. The distribution of selected operators within each community was proportional to the number of operators. Operators in each community were selected randomly.

The rural communities include three types: Moshav, Moshava, and community settlement. The first two types combine working-farm owners with residents that are either former farm operators or new residents who do not practice agriculture. The third type includes residents who do not practice agriculture at all. Eventually, 197 interviews were completed successfully, i.e., there were no missing observations for the main variables.

### 3.2. Measurement of variables

Table 1 presents descriptive statistics of the variables relevant to the current study for the whole sample, for the group of operators with working farms (82 owners), and for the group of operators without working farms (115 owners).

The key variable for the production function estimation is the rural tourism annual revenue for 1999 in NIS currency units (1 NIS = \$0.25). To calculate the revenue, the respondents were asked about their occupancy rate in 1999 during different periods of the year, mainly the holidays and summer vacation (high season), weekends and weekdays during the off-season. In general, hospitality prices are highest in the high season, lowest in the mid-week off-season, and between these levels on weekends during the off-season. By multiplying occupancy by prices obtained from the operators, we estimated annual revenue for each operator. Prices are composite prices for the different units throughout the year. Among other important variables were primary capital investment, labor in terms of annual working hours (both self and hired), and managerial skills.

Significant differences between rural accommodations with a working farm and without were found in the following variables (Table 1). (1) Experience: farmers had engaged in rural tourism longer than non-farmers, 7.16 years compared to 5.65 years. (2) Agritourism activities: farmers naturally offer more agriculture-related activities. (3) Tourism village: more agricultural-based settlements were declared tourism villages and, accordingly, enjoyed government support for planning and infrastructure. (4) Attraction2: non-farmers enjoy the presence of more attractions in the vicinity of their settlements than do farmers, 25.75 attractions compared to 21.9 attractions. (5) Labor: farmers invest less

working hours (self- and hired-labor) than non-farmers, 16.66 h/m<sup>2</sup> compared with 19.86 h/m<sup>2</sup> for non-farmers.

### 4. Hedonic prices for rural accommodations

Following Freeman's (1993) presentation of the hedonic price analytical framework, let  $P_i$  represent the price of an  $i$ th rural accommodations unit in a given season. Let  $Z_i = (Z_{i1}, Z_{i2}, \dots, Z_{ik})$  be the  $K$  attributes that determine the price of the rural accommodations. The hedonic price equation receives the following form:

$$P_i = F(Z_i), \quad (1)$$

where  $F$  is the function that relates price  $P_i$  to the attributes of accommodations unit  $i$ . The incremental contribution of the  $k$ th attribute to the price is given by the following partial derivative:

$$\partial P_i / \partial Z_{ik} = \partial F(Z_i) / \partial Z_{ik}. \quad (2)$$

The functional form we chose for the estimation of the hedonic price function is linear. Cropper, Leland, and McConnell (1988), in their comparison between different functional forms of hedonic prices, found that when some attributes are replaced by proxies, the linear form performs best. Proxies were used since some of the attributes of rural accommodations are difficult to quantify, e.g., quality of service was measured by the number of aspects of good service (see Table 1 for full description of variables) measures. Thus, a linear functional form seems to be the best choice. Accordingly, the functional form of the hedonic price function is

$$P_i = \beta Z_i + \varepsilon_i, \quad (3)$$

where  $\beta$  is a vector of  $K$  coefficients and  $\varepsilon_i$  is a random error.

In the hedonic price model, it is assumed that consumers are familiar with the product's characteristics and accordingly, attach values to the different characteristics (Rosen, 1974). Estimation of the model reveals the marginal value of each characteristic. In our study, we can assume that the characteristics are known to the visitors at the time they make their reservation. It is not a strong assumption since returning visitors have the necessary information while new visitors receive theirs mostly from word of mouth (Fleischer, 1996). Information is also available on the Internet and while making the reservation, potential visitors tend to inquire at length about the different characteristics of the unit.

Attributes of rural accommodations are divided into four groups. These are attributes of the unit itself, attributes of the owner, the level of touristic activity, and the agricultural activities. The unit is characterized by the luxury level of the unit, its size, whether it is a log

Table 1  
Variable descriptions and summary statistics by working farm group

Variable	Description	Rural accommodations enterprises		
		Total sample	Working farm	Non-working
<i>Farm</i>				
Revenue	Annual revenue per square meter in NIS	1500 (959.6)	1422.6 (675.4)	1554.6 (1117.5)
Price	Annual average price for one hospitality night in NIS	299.8 (69.2)	295.1 (68.6)	303.1 (69.7)
Breakfast*	= 1 if breakfast is included in the hospitality price	0.29	0.29	0.28
Log cabins	Percent of wooden-made cabins per operator	0.22	0.22	0.22
Luxury	Scale of luxury level based on luxury elements cost, see note (a)	5.56 (4.52)	5.38 (4.95)	5.69 (4.21)
Amenities	Number of amenities, e.g., bath oils, homemade jam, fruits, etc.	2.68 (2.27)	2.72 (2.45)	2.65 (2.15)
Uniqueness	Ranking of the uniqueness of units' interior design (b)	0.22 (0.57)	0.27 (0.61)	0.19 (0.54)
Size	Average unit size per operator in square meters	33.71 (11.18)	33.24 (7.96)	34.04 (13.0)
Service	Service orientation of the hospitality operators, see note (c)	7.03 (0.95)	7.043 (0.98)	7.021 (0.92)
Firm size	Number of units per operator	3.64 (2.8)	4.09 (2.53)	3.32 (2.96)
Experience	Number of years in the rural hospitality business	6.27 (5.35)	7.16** (5.33)	5.65 (5.31)
AgriTourism	Number of agritourism activities offered to the visitors by the operator	0.22 (0.55)	0.48** (0.74)	0.04 (0.24)
TourActivities	Number of tourist activities offered to the visitors by the operator	0.66 (0.9)	0.66 (0.83)	0.66 (0.95)
Tourism village*	= 1 if government supports the planning and construction of tourism infrastructure	0.36 (0.48)	0.44** (0.5)	0.3 (0.46)
Attraction1	Number of tourist attractions at the operators' settlement	5.83 (5.14)	5.7 (4.6)	6.01 (5.51)
Attraction2	Number of special tourist attractions in the settlements' vicinity, see note (d)	24.16 (9.04)	21.9** (7.62)	25.75 (9.64)
Landscape1*	= 1 if visible landscape from the units is open and rural in nature	0.85	0.84	0.86
Landscape2*	= 1 if outstanding landscape is visible from the units, see note (e)	0.47	0.46	0.46
CowshedView*	= 1 if units are located near a cowshed or a henhouse	0.05	0.09**	0.02
ManProf*	= 1 if owner has a managerial education and/or experience as a manager	0.17	0.15	0.19
Capital	Capital investment in rural hospitality per square meter	2861.5 (1541.6)	2732 (1418.7)	2953 (1622.6)
Labor	Total annual labor hours per square meter (self + hired)	18.54 (9.76)	16.66** (7.8)	19.86 (10.8)
Marketing	Annual marketing and advertising costs in thousands NIS	3.29 (2.62)	3.32 (2.47)	3.28 (2.72)
Farming*	= 1 if the operator is also a working farm operator	0.41 (0.49)		

Notes: Standard deviations are in parentheses below the mean. \* The variable is a dummy variable accordingly the mean is the proportion of cases with this characteristic. \*\* The difference between means is significant at a 0.05 level of confidence. (a) Each point of this variable represents 1000 NIS of luxury elements per unit (e.g., Jacuzzi, Bath, Sauna, VCR, etc.). (b) This is a category variable ranking from 0 to 3 reflecting the uniqueness of the accommodations' design' e.g., ethnic furniture, arts objects, etc. (c) The values for the Service variable are the number of aspects of good service towards the visitors, e.g., initiating acquaintance conversation, making sure that the visitors' needs throughout the vacation are satisfied, etc. (d) As classified by the Israeli Karta Guide for Rural Tourism 2000. (e) Landscape is defined as outstanding if a scenic view is in full sight of e.g., sea, mountains, forests, etc. with no presence of man-made structures.



cabin, and the serving of breakfast. The owners' orientation to serving visitors is an important characteristic of rural accommodations because of the personal touch in this type of hospitality. The level of tourism orientation is reflected in the number of accommodations units, the number of tourism activities being offered on the premises, the existence of tourism village infrastructure and number of tourist attractions in the same rural habitation and surrounding area. The latter also reflects the regional characteristics. Agriculture is reflected as an attribute of the unit if the visitors are exposed to a working farm and/or open green rural landscape.

We expect that for each unit improvement in the attribute (in the case of a continuous variable) or the existence of an attribute (in the case of a dichotomous variable), visitors will be willing to pay for it and thus the hedonic price will increase. If visitors do not value the attribute then the coefficient of its variable will not be significantly different from zero. An ordinary least-squares model of the hedonic price function is presented in Table 2. Multicollinearity is not a problem since most of the coefficients are significant. Of the four variables that reflect the attribute of the unit, three have a positive and significant coefficient. For each increase in 1000 NIS in the luxury component, the hedonic price increases by 4.84 NIS. Visitors are willing to pay 28 NIS more for log cabins and 0.84 NIS for every additional square meter. The serving of breakfast is not valuable enough for the visitors. It should be noted that in Israel, most B&B are actually B& no B, i.e., they

do not include breakfast and visitors do not expect it. Similarly, the service orientation was not found to be valuable. Although we expected them to be an important attribute for rural hospitality, these characteristics do not seem to have a significant impact on the hedonic price. This might be due to the difficulty in measuring personality or behavior of the operator. The third group of variables, tourism orientation of the accommodations, has the highest impact on the hedonic price. This is true at the unit level (TourActivities), at the settlement level (Attraction1 and Tourism Village) and at the regional level (Attraction2). The incremental contribution of activities and attractions to the price fades with increases in distance. For each increase in activity or number of attractions at the unit location, the price increases by 9.7 NIS, at the settlement level by 5.4 NIS and in the surrounding area by 2.2 NIS. The public investment in the planning and infrastructure of a tourism village pays off and visitors will pay 20 NIS more for this attribute. In the last group of variables, the existence of an outstanding landscape adds 16.9 NIS to the hedonic price. This result is in accordance with the findings of Fleischer and Tsur (2000) that people are willing to pay for maintaining agricultural landscape. However, the existence of a working farm does not carry any value for the visitors.

These results support the impression of some researchers that the existence of a working farm at the accommodations site is not important for visitors. It actually means that a farmer does not have any advantage from the visitors' point of view over a non-farmer operating a rural accommodations business. On the other hand, a business with intensive tourist activities in and around the premises is valued at a higher price. The activities in the rural settlement and its surrounding area are mostly run by different entrepreneurs, and thus their contribution to the hedonic price can be interpreted as a positive externality. That is, an additional tourist business or attraction will contribute to all the existing businesses. Although visitors are exposed to the rural ambience during their recreational activities, comfortable accommodations and a plethora of tourist activities are the attributes they value.

Table 2  
Hedonic prices for different characteristic of rural hospitality

Group	Variable	Coefficient	Standard error
Unit	Breakfast	8.23	9.32
	Luxury*	4.84	1.1
	Log cabins*	27.82	13.45
	Size*	0.84	0.38
Farmer	Service	−0.05	4.44
Tourism	Firm Size	2.57	1.69
	TourActivities*	9.96	4.79
	Tourism village*	20.14	9.95
	Attraction1*	5.43	1.09
	Attraction2*	2.25	0.64
Agriculture	Landscape2*	16.89	8.15
	CowshedView	7.9	20.01
	Farming	−0.28	8.63
	Constant*	119.4	41.86
	R <sup>2</sup>	0.385	
	Number of observations	197	

Notes: The dependant variable is the annual average price for night hospitality for each operator in NIS in 1999. Variable definitions are in Table 1. \* Significance at 5%.

## 5. Cobb–Douglas production function of rural accommodations

Assuming constant returns to scale, the production function per square meter of rural accommodations output in firm  $i$  can be approximated and estimated by the following Cobb–Douglas production function:

$$\log y_i = A_i + \alpha \log L_i + \beta \log K_i + \varepsilon_i, \quad (4)$$

where the efficiency factor  $A_i$  consists of the four groups of factors: luxury, managerial skills, firm size, and

agriculture,  $L$  and  $K$  are labor and capital, respectively, and  $\varepsilon$  is random error.

### 5.1. Production factors

Rural accommodations firms differ in their production factors such as labor and capital, advertising efforts, and a variety of qualitative and quantitative shift factors. The following factors were hypothesized to affect the level of output in the rural accommodations, besides labor and capital.

#### 5.1.1. Pull effects

Entrepreneurs spending more money on marketing will enjoy more visitors and thus higher output. Another important factor that acts in the same direction is the availability of tourism attractions and infrastructure in the area. They attract visitors to the area and thus create positive externalities for the producers.

#### 5.1.2. Extras

This group includes different amenities offered to the guests and special interior design. These factors play an important role in differentiating the units from the other accommodations and thus give them some market power.

#### 5.1.3. Firm size

The average firm contains 3.7 accommodations units. This firm size is still small enough, being characterized by relatively large constant costs and small variable costs, to suggest higher productivity.

#### 5.1.4. Managerial skills

We approximated managerial skill of the firm owner with managerial profession and the number of years they have run the tourism accommodation business. We hypothesized that the more time the entrepreneurs have been in the business and the higher their managerial skills, the more efficient they will be in their production process.

#### 5.1.5. Agriculture

The existence of a working farm is expected to increase the productivity of the labor for the aforementioned reasons. Open and rural landscape have been found to create externalities (Fleischer & Tsur, 2000), thus units enjoying such views will demonstrate a higher productivity level. We also assumed that the agricultural-related tourism activities would contribute to the productivity level.

### 5.2. Estimation of production function

Regression estimates for Eq. (4) are reported in Table 3. Multicollinearity is not a problem since most of the

Table 3  
Cobb–Douglas production function estimation for rural hospitality

Group	Variable	Coefficient	Standard error
Inputs	Log capital*	0.145	0.056
	Log labor*	0.593	0.070
Pull effects	Marketing*	0.01	0.004
	Tourism village*	0.099	0.027
	TourActivities*	0.036	0.014
	Attraction1*	0.012	0.003
	Attraction2*	0.007	0.002
Extras	Uniqueness	0.036	0.021
	Amenities*	0.017	0.006
Size	Firm size*	0.022	0.005
Managerial skills	Experience	−0.002	0.002
	ManProf*	0.064	0.031
Agriculture	Farming*	0.054	0.025
	Landscape1	−0.021	0.033
	AgriTourism	−0.043	0.023
	Constant*	1.444	0.174
	$R^2$	0.603	
	Number of observations	197	

Notes: The dependant variable is the annual revenue per square meter of hospitality units in NIS in 1999. Variable definitions are in Table 1.

\* Significance at 5%.

coefficients are significant. Coefficients of labor and capital are both positive and significant, as expected. All variables in the pull effects group are positive and significant. It should be noted that the attractions variables and tourism village are external to the firm and thus, here again we see that a firm located near tourist attractions or in a tourism village enjoys positive externalities. This is reflected in the higher productivity that a firm enjoying these attributes demonstrates.

In the extras group, the amenities and uniqueness variables have a positive significant coefficients. This means that the firm owner gets more than just returns to capital from his/her investment in amenities.

Firm size receives a positive and significant coefficient, which means that at this level of production, the bigger the firm is the more efficient it is. Obtaining a managerial profession seems to increase the efficiency level of the firm.

In the last group of variables reflecting the agricultural activities, the coefficient of the dummy variable of farming is positive and significant. Our original hypothesis about the rural accommodations with the working farm being more efficient was proven correct. A firm with a working farm will have a higher output for the

same levels of labor and capital than a firm without a working farm. The rest of the variables in this group, however, do not have a significant impact on the production function.

## 6. Conclusions

The key contribution of this work is in conceptual terms. Previous work on the relationship between tourism and agriculture simply treated it as the impact of the tourism sector on the agricultural sector. We delineated the more complicated relationship within the firm itself, as expressed in the production process and the consumers' preferences and between the rural environment and the single firm. We empirically showed that the working farms' impact is embodied in two aspects of the enterprise: in the visitors' valuation of the accommodations and in the enterprises' production efficiency. Accordingly, potential benefits can accrue to a farmer running a tourism business from the visitors' willingness to pay more for accommodations on working farms and from more efficient use of labor and capital.

In the case researched here, we found that the working farm does not have any value for the visitors. However, on the production side, farmers seem to benefit from the existence of a working farm. A firm producing agricultural goods and tourism services appears to use its production factors more efficiently in producing tourism than firms managed by non-farmers. Thus, although it seems that rural accommodations are divorced from agriculture, a farmer will still benefit from a working farm.

Another important finding is the effect that a concentration of tourist activities in the region and the infrastructure of a tourism village have on the firm. In this case, visitors are willing to pay a higher price for a firm located in a region that is rich in tourist attractions. Additionally, a firm located in such a region demonstrates a higher productivity level. Since this attribute is external to the firm, it means that a concentration of tourism firms creates a synergetic effect. This provides justification for public spending on tourism attractions and infrastructure. It can also be seen that support for one tourist firm has an echo effect on the others nearby and thus its impact is amplified.

The findings in this study have important policy implications. The conceptual framework depicts the possible relationships, which are usually ignored in different policy measures, regardless of the region or country. We show that in some cases, agriculture production benefits tourism production. Thus, it can be that support for agricultural production is indirectly channeled into support for tourist activities. In this case, reducing support for agriculture while

increasing support for non-agricultural activities, such as tourism, might not have the desired impact on firms with these two activities. The support funds for agriculture indirectly help tourism production: reducing them, on the one hand, and increasing direct support for tourism, on the other, might actually counteract each other.

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