משרד החקלאות - דו"ח לתוכניות מחקר
לקרן המדען הראשי

קוד זיהוי	א. נושא המחקר (בעברית)
118 - 0044 - 10	כפרי תיירות ו/או תיירות בכפרים: מדיניות ותכנון כלכליים בענף התיירות הכפרית

ב. צוות החוקרים

	שם משפחה	שם פרטי	
חוקר ראשי	פליישר	עליזה	
חוקרים משניים			
1	פינקלשטיין	ישראל	
2	צ'צ'יק	ענת	
3			
4			
5			
6			
7			

ג. כללי

מוסד מחקר של החוקר הראשי
האוניברסיטה העברית

סוג הדו"ח	תאריכים					
	תקופת המחקר עבורה מוגש הדו"ח				תאריך משלוח הדו"ח למקורות המימון	
	התחלה		סיום			
מסכם	חודש	שנה	חודש	שנה	חודש	שנה
	03	2009	03	2011	/	

ד. מקורות מימון עבורם מיועד הדו"ח

שם מקור המימון	קוד מקור מימון	סכום שאושר למחקר בשנת תיקצוב הדו"ח
		בשקלים
קרן המדען הראשי משרד החקלאות		80000

ה. תקציר שים לב - על התקציר להיכתב בעברית לפי סעיף ה' שבהנחיות לכתיבת דיווחים

הירידה של ענף החקלאות כמחולל הכנסה ותעסוקה עיקרי באזורים כפריים במדינות המפותחות הובילה את האוכלוסיות שלהן לחפש חלופות אחרות, בנות קיימא מבחינה כלכלית. אירוח כפרי נחשב לעתים קרובות לחלופה מתאימה, ומהווה מקור הכנסה משלים עבור חקלאים ומסייע לשמור על מרחב כפרי בר-קיימא. לפיכך הוא נהנה מתמיכה ציבורית במדינות רבות, ביניהן ישראל. במקביל קיימת רגולציה בענף המייצרת חסמי כניסה ומשפיעה על מאפיינים פיזיים של הענף. באירוח הכפרי, כמו כל צורה של תיירות, הייצור והצמיחה אינם מופרדים מבחינה גיאוגרפית- שניהם מתרחשים במקום של הפירמה, לפיכך spatial clustering בענף מאופיין בשני כוחות מנוגדים-בעוד הפירמות נהנות מיתרונות לאגלומרציה עקב קירבתן הפיזית זו לזו, המבקר, התר אחרי חוויה כפרית אותנטית, עלול לסבול מירידה בתועלת עקב צפיפות רבה של מבקרים וכמות מופרזת של מתקנים תיירותיים. מצב זה עלול להוביל לכך שללא רגולציה מתאימה הענף יצמח יתר על המידה תוך גרימת אובדן רווחה. מטרתו של מחקר זה היא מציאת מסגרת כלכלית מושגית מתאימה לניתוח השפעות חיצוניות אלו המאפשרת לזהות את גודל הענף האופטימלי, ברמת היישוב הבודד, אשר משיא את עודפי הצרכן והיצרן. לשם כך מיושם מודל שוו"מ של משוואות ביקוש ותמחור הלוקח בחשבון תחרות אוליגופוליסטית ברמה האזורית ובידול מוצרים. המודל מורחב כך שיכלול השפעות של צפיפות ו- agglomeration על העדפות הצרכנים וטכנולוגיית הפירמות בהתאמה. מודל זה מיושם על נתונים שנאספו בגליל העליון ונאמד בשיטת המומנטים הכלליים המאפשרת אמידה של משוואות סימולטניות לא לינאריות עם משתני עזר. תוצאות האמידה מלמדות שקיומם במקביל של החצנות של צפיפות ויתרונות לאגלומרציה יכול להוביל לאופטימום של מספר יחידות אירוח ברמת היישוב. עובדה שזכתה להתעלמות הן במחקרים קודמים והן בעיצוב כלי המדיניות השונים. אומדני הפרמטרים שהתקבלו משמשים לדמות תרחישים תחת כלי מדיניות שונים. הממצאים מלמדים כי תחת הרגולציה הקיימת בישראל, מספר יחידות האירוח ביישובים השונים צפוי להיות גדול מזה האופטימלי לענף ולהוביל לאובדן רווחה. לפיכך על תמיכה ציבורית בענף להיות משולבת במדיניות פיתוח רחבה ולהיות מלווה ברגולציה של סך יחידות האירוח ברמה המקומית.

ו. אישורים

הנני מאשר שקראתי את ההנחיות להגשת דיווחים לקרן המדען הראשי והדו"ח המצ"ב מוגש לפיהן

חוקר ראשי	מנהל המחלקה	מנהל המכון (פקולטה)	אמרכלות (רשות המחקר)	רשות המחקר	תאריך (שנה) (חודש) (יום)

דוח לתכנית מחקר מספר 118-0044-10

כפרי תיירות ו/או תיירות בכפרים, מדיניות ותכנון כלכליים בענף התיירות הכפרית

Regulation and Support Policies in the Rural Tourism Industry in Israel

מוגש לקרן המדען הראשי במשרד החקלאות

ע"י

עליזה פליישר המחלקה לכלכלה חקלאית ומנהל הפקולטה לחקלאות רחובות, האוניברסיטה העברית בירושלים
ישראל פינקלשטיין המחלקה לכלכלה חקלאית ומנהל הפקולטה לחקלאות רחובות, האוניברסיטה העברית בירושלים
ענת צ'צ'יק המחלקה לניהול מלונאות ותיירות, הפקולטה לניהול, אוניברסיטת בן גוריון בנגב.

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תקציר: הירידה של ענף החקלאות כמחולל הכנסה ותעסוקה עיקרי באזורים כפריים במדינות המפותחות הובילה את האוכלוסיות שלהן לחפש חלופות אחרות, בנות קיימא מבחינה כלכלית. אירוח כפרי נחשב לעתים קרובות לחלופה מתאימה, ומהווה מקור הכנסה משלים עבור חקלאים ומסייע לשמור על מרחב כפרי בר-קיימא. לפיכך הוא נהנה מתמיכה ציבורית במדינות רבות, ביניהן ישראל. במקביל קיימת רגולציה בענף המייצרת חסמי כניסה ומשפיעה על מאפיינים פיזיים של הענף. באירוח הכפרי, כמו כל צורה של תיירות, הייצור והצמיחה אינם מופרדים מבחינה גיאוגרפית- שניהם מתרחשים במקום של הפירמה, לפיכך spatial clustering בענף מאופיין בשני כוחות מנוגדים-בעוד הפירמות נהנות מיתרונות לאגלומרציה עקב קירבתן הפיזית זו לזו, המבקר, התר אחרי חוויה כפרית אותנטית, עלול לסבול מירידה בתועלת עקב צפיפות רבה של מבקרים וכמות מופרזת של מתקנים תיירותיים. מצב זה עלול להוביל לכך שללא רגולציה מתאימה הענף יצמח יתר על המידה תוך גרימת אובדן רווחה. מטרתו של מחקר זה היא מציאת מסגרת כלכלית מושגית מתאימה לניתוח השפעות חיצוניות אלו המאפשרת לזהות את גודל הענף האופטימלי, ברמת היישוב הבודד, אשר משיא את עודפי הצרכן והיצרן. לשם כך מיושם מודל שוו"מ של משוואות ביקוש ותמחור הלוקח בחשבון תחרות אוליגופוליסטית ברמה האזורית ובידול מוצרים. המודל מורחב כך שיכלול השפעות של צפיפות ו- agglomeration על העדפות הצרכנים וטכנולוגיית הפירמות בהתאמה. מודל זה מיושם על נתונים שנאספו בגליל העליון ונאמד בשיטת המומנטים הכלליים המאפשרת אמידה של משוואות סימולטניות לא לינאריות עם משתני עזר. תוצאות האמידה מלמדות שקיומם במקביל של החצנות של צפיפות ויתרונות לאגלומרציה יכול להוביל לאופטימום של מספר יחידות אירוח ברמת היישוב. עובדה שזכתה להתעלמות הן במחקרים קודמים והן בעיצוב כלי המדיניות השונים. אומדני הפרמטרים שהתקבלו משמשים לדמות תרחישים תחת כלי מדיניות שונים. הממצאים מלמדים כי תחת הרגולציה הקיימת בישראל, מספר יחידות האירוח ביישובים השונים צפוי להיות גדול מזה האופטימלי לענף ולהוביל לאובדן רווחה. לפיכך על תמיכה ציבורית בענף להיות משולבת במדיניות פיתוח רחבה ולהיות מלווה ברגולציה של סך יחידות האירוח ברמה המקומית.

הניסויים מהווים המלצות לחקלאים: לא

* חתימת החוקר __עליזה פליישר_____

רשימת פרסומים והרצאות בכנסים בינ"ל שנבעו מהמחקר:

1. Tchetchik, A., Fleischer, A., and I. Finkelshtain (2011) "An Optimal Size for Rural Tourism Villages with Agglomeration and Congestion Effects" *European Review of Agricultural Economics*. (2011 Forthcoming)

2. Tchetchik**,** A., Fleischer A. and Israel I. Finkelshtain, (2010) An Optimal Size for Rural Tourism Villages with Agglomeration and Club-Good Effects, the Center for Agricultural Economic Research, the Department of Agricultural Economics and Management, The Hebrew University of Jerusalem.

3. Leisure Studies Association (**LSA**) Conference, 2009, Tchetchik A., Fleischer A. and I. Finkelshtain: "Agglomeration and Spatial Density in the Rural Accommodations Industry", Canterbury Christ Church University, Department of Sport Science, Tourism and Leisure, Canterbury, UK.

4. Tourism Destination Development and Branding, international conference, 2009, Tchetchik A., Fleischer A. & . Finkelshtain: An Optimal Size for Rural Tourism Villages, Ben-Gurion University of the Negev, Eilat Campus of the Ben-Gurion University of the Negev.

5. The Israeli branch of the International Regional Science Association (**RSAI**), 2010, Tchetchik, A., Fleischer, A. and I. Finkelshtain: "An Optimal Size for Rural Tourism Villages with Agglomeration and Club Good Effects", Tel Aviv University.

6. International Geographical Union, the Israeli National Committee for Geography, the **IGU** Regional Conference 2010, *Bridging Diversity in a Globalizing World***,** Tchetchik, A., Fleischer, A. and I. Finkelshtain: "Agglomeration and Club Good in the Rural Accommodations Industry", Tel-Aviv, July 2010.

7. The 50th European Congress of the European Regional Science Association, ERSA, 2010, *Sustainable Regional Development in the Creative Knowledge Economy*, Tchetchik, A., Fleischer, A. and I. Finkelshtain: "Agglomeration and Club-Good Effects in the Rural Accommodations Industry", Jonkoping, Sweden.

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Introduction

The decline of agriculture as an income and employment generator in rural areas in developed economies has led their populations to search for other, more economically viable alternatives. Rural tourism is often considered an appropriate alternative due to its contribution to the local economic welfare, thus it is supported by different policy instruments (Jenkins et al., 1998; Fleischer and Felsenstein, 2000). The justification for this public intervention in the rural tourism market lies in the prevailing conditions in rural regions, such as market failure in providing public goods and the existence of externalities or information asymmetries (OECD, 1993). In some cases, rural tourism receives public support without proper regulation, resulting in farmers diversifying to rural tourism as long as they consider it profitable.

In rural tourism, as in all forms of tourism, production and consumption are not geographically distinct. They are both conducted at the location of the firm. Thus, a spatial clustering of rural tourism firms in a village is characterized by agglomeration and congestion. While each firm enjoys agglomeration economies due to the spatial proximity of other firms, the visitors looking for an 'authentic environment' might suffer disutility due to crowded conditions and excessive tourism facilities.

Two distinct bodies of literature motivate this research. One deals with agglomeration, usually of industrial firms in urban areas, and the other deals with congestion of visitors in wilderness areas. Agglomeration effects are discussed at length in studies dealing with clustering of firms in industrial districts and with growth of regions. According to Fujita et al. (1999) the causes of spatial clustering in economic activity are knowledge spillovers, linkages between suppliers and producers and labor-market interactions. More recent literature focuses more on non-market interaction between firms such as common use of facilities, common negotiation with local governments and innovative behavior facilitated by social interaction (e.g. Callois, 2008). According to Duranton and Puga (2004), the clustering of firms allows knowledge spillover and informal networking ('cafeteria effect') for the exchange of ideas and expertise among close neighbors.

The agglomeration effect in the tourism industry has received less attention in the literature. Baum and Mezias's (1992) study on the Manhattan hotel industry describes two opposing forces behind the location decisions of these hotels. The benefit of spillover of guests from adjacent hotels pulls similar hotels to locate close to each other. However, the possibility of local competition pushes hotels away from their similar competitors. Other researchers, such

as Cravens and Piercy (1994), Saxena (2005) and Novelli et al. (2006), addressed issues of clusters and networking of tourism small and medium enterprises. Their major finding is that this collaboration increases the innovative capacity of local businesses. There is some reference in the literature to the advantage of forming clusters of complimentary tourism firms in non-metropolitan areas (e.g. Michael, 2003), but there has not been a specific analysis of agglomeration in rural tourism.

Knowledge spillover and the 'cafeteria effect' have been critical to the success of the rural accommodation industry in Israel. Most of the farmers who established rural accommodations had been looking for a means to augment their income, but had no prior experience in managing a hospitality business. 'Learning from your neighbor' was an important source of information (Fleischer and Pizam, 1997) for the firms that enhanced their productivity and lowered their costs. Co-locating also enabled the sharing of fixed costs such as advertising and signage. As these costs are being shared among an increasing number of firms, the per-firm costs decrease.

The second body of literature we followed is the studies of congestion effects in low-density recreational sites. Visitors to wilderness areas derive utility from the site's amenities and services and disutility from the number of individuals with whom they share the services. This phenomenon is described as 'club good' in Buchanan's (1965) seminal paper. The role of congestion costs has been discussed at the theoretical and empirical levels in models of recreational site selection and site valuation (e.g. Fisher and Krutilla, 1972; Cicchetti and Smith,1973 ; Anderson and Bonsor, 1974; McConnel, 1977).

Timmins and Murdock (2007) test empirically the impact of congestion on the choice of fishing sites in Wisconsin by treating congestion as an endogenous variable. In their model the probability of a site to be chosen is a function of the site's attributes, and congestion is one of them. The negative coefficient of the congestion variable found in their study indicates that as a site becomes more congested the probability of that site being chosen diminishes. Similarly to visitors in wilderness areas, visitors in rural areas wish to escape the crowded urban areas to enjoy the rural ambiance and landscape (Fleischer and Pizam, 1997). An unbalanced development of accommodation units can result in congestion, noise and environmental pollution, thereby causing disutility to the visitors – up to the point that it can threaten the very same rural amenities that attracted them there in the first place. Other possible negative externalities occur when an excessive number of rural households enter the rural tourism industry while abandoning their agricultural activity. In such a case the agricultural landscape, along with its positive impact, might gradually vanish (Fleischer and

Tsur, 2000). In this special case an increase in the number of rural accommodations operators not only leads to congestion as more visitors share the club good but also to a decline in the size of the club good amenities.

As far as we know no analysis of the special case where agglomeration and congestion effects are present exists.

The development of rural tourism in Israel started in the mid-1980s, later than in other countries. However, while its development was induced by similar economic forces (Fleischer and Pizam, 1997), it has demonstrated an outstanding growth rate of 16 % a year over the course of 25 years. In Israel, as in other countries, rural tourism is supported and regulated by various public agencies using a variety of policy measures. The support policy in Israel was the impetus for the rapid development of the rural accommodations; since 1993 the Israeli government has intervened in the rural accommodations market, mainly via the ministries of Tourism and Agriculture. This intervention includes support measures for existing and new firms which encourage the growth of the industry. With regard to restrictions, the rural accommodations industry is regulated mostly by the government through the Israel Lands Authority (ILA). One way the ILA regulates the rural accommodation is by limiting the number of units per firm. This limit is determined individually for each village, based on historical planning regulations. It does not, however, limit the number of operators in the village. New operators can enter the market with the set quota of units. The industry's response to these two intervention forces – financial support and regulation – has been a rapid growth in the number of small-scale operators in peripheral areas. In a study of the rural tourism market in Israel by Tchetchik et al. (2008), a microeconomic model was developed without taking into consideration these two externalities. Accordingly, the different growth simulations indicated large growth potential in both the number of units and welfare. However to the extent that the negative congestion effects offset the positive agglomeration effects, these results may have overestimated the growth potential of the industry. Furthermore, the existence of an optimal size of a rural tourism village is ignored by many public support measures.

2. Research Objectives

The aim of our study is to provide policy makers with knowledge and tools that can be implemented when designing a sustainable rural accommodations policy, especially with respect to spatial aspects. Specifically we aim at establishing the notion of **optimal size of a rural tourism village** conceptually and empirically by taking into consideration agglomeration and congestion. For this end we intend to develop a model that expands the model in Tchetchik *et al*. (2008) by implicitly taking into consideration these two effects and applying it to a regional market. Other than accounting for regional competition, the model will also integrate price competition within rural accommodation firms in the same village and its possible interplay with agglomeration and congestion forces.

3. Description of the research

3.1 The model

We model equilibrium in the rural accommodations market at the regional level, expanding the model in Tchetchik *et al*. (2008) by explicitly incorporating agglomeration and congestion effects. In the present study, the density of firms in a village, as a measurement of agglomeration and congestion, is considered as an attribute of the firm. We used **density of firms in a village as a measure of agglomeration** following various theoretical and empirical studies of agglomeration (e.g. Callois, 2008; Melo *et al*., 2009).
As for a measurement of congestion, we chose to use density of firms in the village. It is a good proxy to the number of visitors, also, the more accommodation units that exist in the village the more interference there is with the authentic rural environment and open space. The advantages of this measurement are that it is not subjective and that it is also used as the measurement of agglomeration. Using the same variable as measurement of agglomeration and congestion enables us to find its optimal level.

We specify a discrete-choice equilibrium model with product differentiation, in which a nested-logit framework is used to describe consumer preferences. The different villages in the region naturally form the different nests. The regional market is modeled as a differentiated-product, oligopolistic market, with N single product firms. The model is set in a ′characteristic space′ (Lancaster, 1971; McFadden, 1978) and allows for both vertical and horizontal differentiations. We adopt the definitions of horizontal and vertical differentiation from the theoretical and empirical IO literature (e.g. Tirole, 1988; Schmalensee and Willig 1989). The accommodation units are vertically differentiated by the observed quality characteristics, such as the size of the unit, its luxury elements and special amenities offered. They are horizontally

differentiated by their geographical location, as well as by the existence of an active farm on the premises.

Consumers' utility depends on the chosen product's characteristics, on random idiosyncratic preferences, and on a small set of parameters to be estimated. Market demand is then determined by aggregating a discrete-choice model of consumer behavior. Prices are endogenous and are determined through competition among the firms.

3.1.1 Demand

Consider a regional rural accommodations industry with N lodging firms, dispersed in V distinct villages and serving M potential consumers. The utility of consumer $i \in \{1,..., M\}$ from staying at accommodation firm $j \in \{1,..., N\}$ is denoted U_{ij} and depends on the attributes of the private good, i.e. the accommodation unit including its price, and the level of congestion in the village. Congestion is captured in the density variables d_v and d_v^2. Including a non-linear congestion term allows for the possibility of increasing utility at low levels of congestion and then decreasing in utility as the village gets more crowded (similar to Buchanan's [1965] model of club good) . The utility function receives the following form:

$$(1)\ u_{ij} = x_j\beta - \alpha p_j + \mu d_v + \mu' d_v^2 + \zeta_j + \xi_{iv} + (1-\sigma)\varepsilon_{ij},$$

where x_j is a vector of observed product characteristics of the j^{th} firm, p_j is the jth firm price per unit night, α, σ, μ, μ' and β are the model's parameters, and ζ_j, ξ_{iv}, and ε_{ij} represent utility components that are attached by the consumer to the unobservable characteristics of the unit. In particular, ζ_j is a firm-specific component that is common to all consumers, and ξ_{iv} represents the i^{th} tourist's preference for a specific village $v \in \{1,..., V\}$. Finally, ε_{ij} represents the i^{th} tourist's preferences for a specific firm.

An individual i prefers alternative j^* over all other k alternatives if $u_{ij^*} \geq u_{ik}\ \forall k \in \{1,.., N\},\ k \neq j$. This inequality sets the basis for the derivation of the various firms' market shares. For this end a few more assumptions about the population distribution of the idiosyncratic utility components, attached by the consumers to the unobserved characteristics, $\zeta_{ir} + (1-\sigma)\varepsilon_{ij}$, are required. In particular, the latter term is assumed to be an i.i.d variable with a population mean of zero. In addition, assuming that ε is an extreme value

variable implies that $\zeta_{ir} + (1-\sigma)\varepsilon_{ij}$ is also an extreme value random variable (Cardell, 1997).

With these assumptions, a closed-form expression for firm *j*'s market share, S_j, can be derived as follows:

$$(2)\ \mathrm{S}_j(\delta,\sigma) = \frac{e^{\delta_j/(1-\sigma)}}{\left(\sum_{j\in Nv} e^{\delta_j/(1-\sigma)}\right)^{\sigma}\left[\sum_{v=1..V}\left(\sum_{j\in Nv} e^{\delta_j/(1-\sigma)}\right)^{(1-\sigma)}\right]}$$

where δ_j is firm's *j* mean utility level, $\delta_j = x_j\beta - \alpha p_j + \mu d_v + \mu' d_v^2 + \zeta_j$

3.1.2. Pricing

It is assumed that the single firm chooses its price to maximize short-run profit. In other words, for a given (exogenous) firms' attributes the price is chosen to maximize profit. At the regional-industry level, we assume that the observed prices reflect a Nash equilibrium in a price game. That is, each firm engages in an oligopolistic competition and sets its price to maximize profits given the prices of the other firms. The necessary condition that characterizes firm *j*'s best response to the pricing of the other firms is given by:

$$(3)\ s_j + \left(p_j - \frac{\partial c(z, d_v, Ms_j)}{\partial s_j}\right)\frac{\partial s_j}{\partial p_j} = 0\ ,$$

where $c(z_j, d_v, s_j N)$ is the variable cost as a function of the accommodation units' attributes and the operator's characteristics, z_j, agglomeration is measured as the density level of accommodations units in the village, d_v, and annual occupancy (*M* is the number of potential consumers, $s_j M = q_j$ is the annual quantity of sold nights for firm j). Due to agglomeration economies, we expect *c'(.)* to decrease in d_v. Note that the characteristics that affect cost are not necessarily those that affect consumer preferences ($z \neq x$).

Equation (3) sets the basis for the estimation of the pricing behavior and the effects of the village and accommodation characteristics on marginal costs.

3.1.3. Welfare measurement

The consumer surplus per person up to a constant (Choi and Moon, 1997) is given by:

$$(4) \qquad W = \frac{\ln\left(\sum_v \left(\sum_{j \in Nv} e^{\frac{\delta_j}{1-\sigma}}\right)^{1-\sigma}\right)}{\alpha}$$

This formula is utilized in the simulations below that examine the impact of industry agglomeration and congestion on consumer surplus.

3.2 Estimation procedure

3.2.1 Empirical specification

The inversion of equation (2) and (3) to the empirical ones (5) and (6), respectively, is shown in detail in Berry (1994). The outside good in our case is represented by rural accommodations in all other regions in the country. As the dependent variables we chose to use occupancy rate instead of a market share, since hospitality firms have a set number of rooms. This was done by dividing the natural logs of the analytical market shares by the outside-good's market share and transforming the dependent variable to be expressed in occupancy rates rather than market shares. The transformation yields the following equation:

$$(5) \quad \ln(\frac{o_j}{o_0}) = x_j\beta - \beta^n \ln(n_j) + \mu d_v + \mu' d_v^2 - \alpha p_j + \sigma \ln(s_{j/v}) + \zeta_j \ ,$$

where o_j and o_0 are firm's j and the outside good's occupancy rate, respectively, $s_{j/v}$ is the market share of accommodation firm *j* within the village and β, β^n, α, σ, μ and μ' are parameters to be estimated. Treating ζ_j as an error component, equation (5) can be used for the estimation of the model parameters. Rewriting equation (5) in terms of occupancy rates rather than market shares is done by using the basic identity: $o_j = \frac{q_j}{365 n_j}$, where n_j is the number of accommodation units offered by firm *j* .

In order to derive an empirical pricing equation we assume that the marginal cost is constant in the output level, linear in the accommodation units' characteristics and has logarithmic relation with the industry density in the village. Incorporating these assumptions, rearranging (3), and substituting for $\frac{\partial s_j}{\partial p_j}$ from the theoretical demand equation yields:

$$(6) \qquad p_j = w_j\gamma + \gamma^d \ln(d_v) + \frac{(1-\sigma)}{\alpha} / \left[1 - \sigma s_{j/v} - (1-\sigma)s_j\right] + \omega_j \quad ,$$

where $w_j\gamma$ is the marginal cost and $\gamma^d \ln(d_v)$ represents the agglomeration economies and the term on the right-hand side of equation (6) represents the oligopolistic price-cost markup. The error term ω_j represents the marginal costs associated with the unobserved characteristics of the accommodation unit and the operator's unobserved managerial skills**.**

3.2.2. Estimation procedure and instruments

Equations (5) and (6) were estimated as a system of equations using the general method of moments (GMM). The control variables chosen for the empirical specification are the different attributes affecting the demand and pricing of rural accommodations. These attributes include the physical attributes of the accommodations units (*e.g.* luxury facilities and equipment such as Jacuzzi tub, LCD TV) and as well as attributes of the surrounding environment and of the operator. (see Table 1 for a description). The variance of these attributes is high in our dataset, reflecting vast product differentiation in the industry. The variables *owner agriculture view* and *active farm* are chosen in the light of evidence of a demand side benefits of a working farm on the tourism activities (Busby and Rendle, 2000; Fleischer and Tchetchik, 2005, among others). The variable Rosh-Pina, was chosen since it is assumed that its' endowments (museums, galleries, cafes etc.) contribute to the attractiveness of firms located in the village. Finally, the variable village density is introduced to examine the existence of congestion effects in the rural accommodations. This variable is measured as the number of accommodation units per village residents. Since the size of the plot for each household in the village is more or less the same, this measure provides a good approximation of the proportion of land used for tourism purposes.

As for the pricing equation, the following control variables are assumed to affect the rural accommodations firm's marginal cost: breakfast, unit size, firm size, special amenities, and luxury elements. The variable farm's cultivated area is included based on cost advantages for farmers in the operation of rural accommodations, demonstrated in Tchetchik et al. (2008).

To carry out the GMM procedure we utilize the NLOGIT3 NLSUR procedure. This procedure requires instruments for the endogenous variables price and market share. For the market share we chose the attributes of the accommodation unit that do not affect cost, such as the number of other accommodation units operated by other rural accommodations operators in the village. For the price variable we chose the operator's

area of cultivated land and village type (specifically, whether the village is a nonagricultural community).

Table 1. Descriptive statistics of regression variables and instruments

Variable	Description	Mean	S.D.
Firm's total market share	Total nights divided by the entire market size (%)	0.57	0.51%
Firm's regional market share	Total nights divided by the region's market size	0.93%	0.84%
Within-village share	Equals firm's share within the village	5.61%	5.87%
Occupancy rate	Annual average occupancy rate	0.28	0.12
Price	Average price per unit night in NIS	296.4	77.4
Breakfast*	=1 if breakfast is included in the hospitality price	0.34	
Luxury (a)	Value of non-durable luxury facilities and equipment such as Jacuzzi tubs, LCD TVs and saunas, based on their cost	4.95	4.15
Amenities	# of durable goods offered to the guests during their stay as 'extras'; such as bath oils, wines, chocolates homemade jam and fruits.	2.7	2.19
Number of units	# of accommodations units per firm	4.07	2.66
Unit size	Average size of each firm's units in m^2	33.73	12.52
Business age	# of years the firm has operated in the market	7. 71	6.26
Village density (b)	Number of accommodations in the village per 1000 residents	104.95	56.04
Owners Agriculture*	=1 if the owner's agric. land is on sight from the units	0.45	
Rosh-Pina*	=1 if the firm is located in Rosh-Pina village	0.22	
Active farm*	=1 if the operator is also an active farm operator	0.58	
Cultivated land	Total cultivated land in dunams (0.1 Hectare)	8.20	2.5
Instruments			
Surveyor rating(c)	The surveyor's impression from the accommodations on a 1-5 scale	2.9	0.62
Nonagricultural community	=1 if the firm is located at a nonagricultural community	0.18	
Cultivated Land	Total area of cultivated land in dunams (0.1 hectare) for active farmers	9.45	

OTHBRKST	Number of other rural accommodations operators in the village who serve breakfast	12.6	8.4
OTHLUXSE(a)	The sum of luxury features *(*as defined by the variable luxury*)* of the other accommodation units in the village	97.95	38.8
OTHLCSET	The share of 'log cabin' type accommodation out of the total units of the other operators in the village	4.52	3.53
OTHARTRS	The sum of activities and attractions offered by the other rural accommodations' operators in the village	13.5	8.6
OTHAMENST	The sum of amenities offered by the other operators in the village	53.8	17.2

Notes: One asterisk indicates a dummy variable (a) Each point represents NIS 1000 of investment in luxury elements per unit; (b) The number of residents in each village was adjusted to fit sample size; (c) One of the authors solely ran the questionnaires as part of her PhD dissertation, hence the problem of subjectivity is avoided to a great extent.

3.2.3 Econometric estimates

Table 2. GMM estimates for the demand equation

Variable	Coefficients	Standard Errors	Marginal Effects [b]	Elasticities [c]
Constant	-1.086*	0.19		
Owner agriculture view	0.18*	0.05	49.17*	0.21*
Luxury elements	0.024*	0.01	6.43 *	0.31*
Rosh-Pina	1.34*	0.14		
ln (No. of units)	0.43*	0.09	28.2	0.27*
Village density	0.026*	0.0049	1.23*	1.19*
Village density sq.	-0.0001034*	0.000020		
Active farm	-0.01	0.03		
Special amenities	0.05*	0.01	13.8*	0.36*
Breakfast included	0.03**	0.03	8.25	0.03
Unit size	0.05**	0.02	12.33*	0.40*
Price (NIS per night)[a]	-0.0026*	0.0005	-0.71*	-2.03*
σ [a]	0.64*	0.05		

*,** Significant at 5% and 10% respectively
(a) These variables are shared with the pricing equation in Table 3.
(b) Calculated by using bootstrapping
(c) Elasticities were calculated only for continuous variables at the mean value.

The demand elasticity is elastic and equals -2.03. This high level of elasticity indicates that despite the differentiation among the units there is still a high level of substitution between them. The 'nested-logit' parameter σ=0.64 is statistically significant, indicating a strong within village dependency between the stochastic parts of the utility. The significance of σ provides justification to the employment of nested-logit to describe the demand of the rural

accommodation market at the regional level. Finally, and most important, we assess the existence of a congestion effect in consumer preferences for rural accommodations and quantify it. Both coefficients for density and density squared are significant and demonstrate an inverse U shaped relation between the firms' average occupancy rate and the density of rural accommodations units in the village (Similar results were received by Cicchetti and Smith (1973), where number of encounters in a wilderness recreation area positively affected the WTP and negatively as congestion grew).

A possible explanation for these relations is that at the earlier stage of tourism development when the number of accommodation units in a village was low, visitors might have enjoyed the feeling and ambience of a rural village where they see only a few other tourists. However, as the density of the units grows, congestion sets in and the average occupancy rate starts to decline. The average optimal density level of accommodation units within a village is calculated to be 124 units for each 1000 residents. At this level the average occupancy rate per firm is the highest. This result can be translated from the aggregate market level to the individual level as the highest probability to choose the firms in the village with the optimal density (all other things being equal).

Pricing equation

Table 3. GMM estimates for the pricing equation

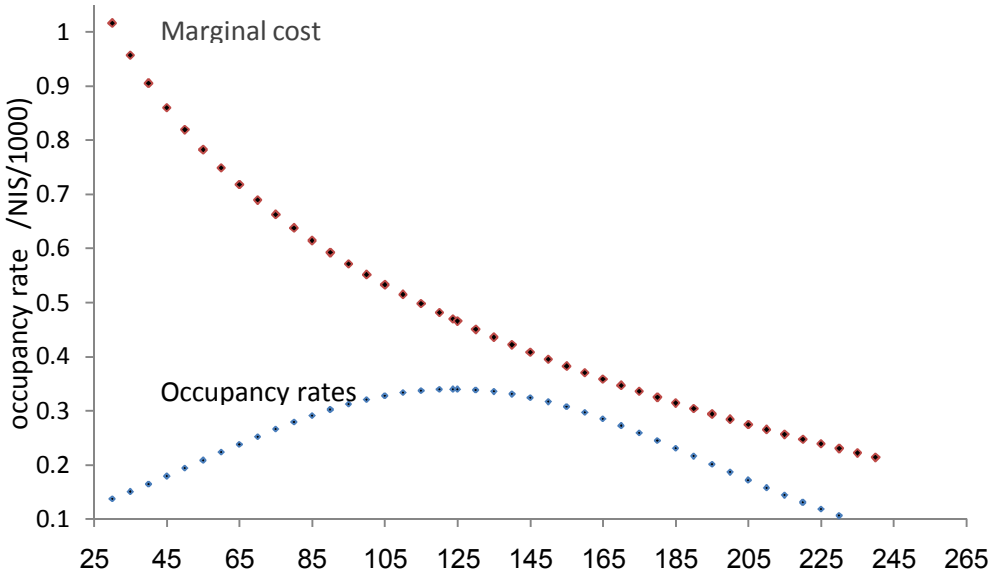
Variable	Coefficients	Standard Errors	P[|Z|>z]	Marginal Effects [a]	Elasticities [b]
Constant	246.50*	64.69	0.01		
Special amenities	14.72*	2.51	0.00		0.13
Breakfast included	-3.39	8.60	0.71		
Luxury elements*	8.03*	1.12	0.00		0.13
Unit size	5.87	5.12	0.32		
Farm's cultivated area	-0.92	1.69	0.65		
Number of years since establishment of firm	1.61	0.78	0.26		
Number of units	-0.17	1.69	0.92		
Village density (ln)	-38.61*	8.35	0.00	-0.34	-0.13

* Significant at 5%
(a) Calculated by using bootstrapping.
(b) Elasticities were calculated only for continuous variables at the mean value.

The negative and significant coefficient of the variable *Village Density* confirms the existence of agglomeration economies in the production of rural accommodations services[1]. Elasticity is found to be -0.13 which indicates that an increase of 1% in the village density lowers costs by 0.13 percent. These relations are depicted graphically in Figure 1.

Figure 1. Marginal cost and occupancy levels as functions of density level

3.2.4. Goodness of fit



Since our estimation procedure is based on instrumental variables, the usual R^2 statistics is inappropriate, neither as a selection criterion nor as a measure of goodness of fit (Pesaran and Smith, 1994). In order to assess the goodness of fit we compare the predicted versus the actual distributions of the dependent variables. Predicted values for the estimated system were obtained by designing a computer program. In particular, *Gauss* non-linear simultaneous-equations subroutine was employed. Solving demand and pricing equations for each of the firms in the market yields equilibrium predicted market shares, and hence equilibrium prices can be calculated immediately. This program was used to conduct the simulations in the next section. The calculated goodness of fit figures for the demand and pricing equations are 0.63 and 0.36, respectively, demonstrating a good fit of the model to the data.

[1] Callois (2008) also demonstrates a cost decrease in firms with anincrease in agglomeration.

3.3 Simulations

Using the estimated parameters we were able to simulate different equilibrium scenarios in the Upper Galilee rural accommodations market. The purpose of the first simulation was to demonstrate that ignoring agglomeration and congestion can lead to over estimation of the growth potential of the regional market. To do so, we have created a scenario in which the number of accommodation units in each village doubles (by doubling the number of operators in each village[2]), and we then ran two simulations. In the first we applied the model's parameters of Tchetchik et al (2008), which did not account for agglomeration and congestion, whereas in the second simulation we applied the current study parameters. The first simulation, based on the previous model, predicts growth of 47% and 41% in the size of the market and in total welfare, respectively. However, when agglomeration and congestion are accounted for, the same scenario leads to an 8% and a 4% decrease in the size of the market and total welfare, respectively. This comparison shows that ignoring these externalities could result in excess development of the market leading to negative economic impact.

In the second simulation we evaluated the effectiveness of the existing regulation. We increased the number of units for each operating firm up to the limit set by the existing regulation, assuming no new firms would enter the market. As mentioned previously, the limit for the maximum number of units per operator differs between villages, thus we increased the number of units for each firm according to its village limit. Many of the firms operated below the regulation, thus for them the number of units was increased in the simulation. The simulation results in Table 5 show that although the number of units increases, the regional market share for some of the villages decreases, while in other villages it increases (original and simulated density levels appear in Table 4). Specifically, in two out of the three villages where the original densities are already above 124 (Amirim and Bet-Hillel), market shares decreased, while the market share of the third village (Shar-Yeshuv) increased by 5%. Note that for high density villages, as the number of accommodation units increases, two opposite forces come to action. On the one hand, the increase in the number of units lowers the production costs and thus the price, which leads to an increase in the market share. On the other hand, the increased density lowers the guests' utility from the accommodation, which leads to a decrease in the market share. Market shares in the other three villages (Korazim,

[2] For each village the new operators we have introduced were endowed with the village's average levels of attributes, including the number of accommodation units.

Metula, and Rosh-Pina) increased, since their original densities were lower than 124 and remained so under the simulation.

Table 4. Present and simulated density levels

Village Density	Present Density	Simulation
Shar-Yeshuv	186	192
Amirim	136	191
Bet-Hillel	165	302
Korazim	33	52
Metula	77	95
Rosh-Pina	30	39

Table 5. Simulation 1 – Increase in number of units up to the limit set by regulation for presently operating firms

	Actual Change	Percentage Change
Village Market Share		
Shar-Yeshuv	0.6%	5%
Amirim	-3.4%	-21%
Bet-Hillel	-17.3%	-94%
Korazim	3.3%	80%
Metula	4.8%	23%
Rosh-Pina	12.1%	44%
Other Indicators		
Consumer welfare (NIS)	13	3%
Average firm profits (NIS)	-2,424	-3%
Aggregate firms' profits (000' NIS)	-259.3	-3%
Total welfare (000' NIS)	-297.3	-1%
Average price (NIS)	-2.0	-1%
Average markup	-0.3%	-0.7%
Size of the market (000' rooms nights)	-1.6	-3%
Average occupancy rate	-11.5%	-28%

In general, the second simulation results in a decrease in the average price, mark-up and firm's profit. Whereas average consumer surplus increases by 3%, total market size decreases

by 3%, and as a result total welfare decreases by 1%. That is to say, if all the incumbent firms exhaust their village regulated limit, some villages will benefit while other will incur losses, and total welfare will marginally shrink. However, it should be noted that in this simulation we assumed that no new firms would enter. In another simulation (not reported here), where all the households in each village entered the market with an existing average number of units, total welfare level suffered a decline of 50 percent. These results show that in the present situation, congestion effect in the demand overpowers the agglomeration economies in the supply. When the number of units surpasses the optimum level, the market faces a drop in its welfare level. This means that if the government continues to support the entrance of new firms into the market, it actually might cause a loss of welfare in the regional economy.

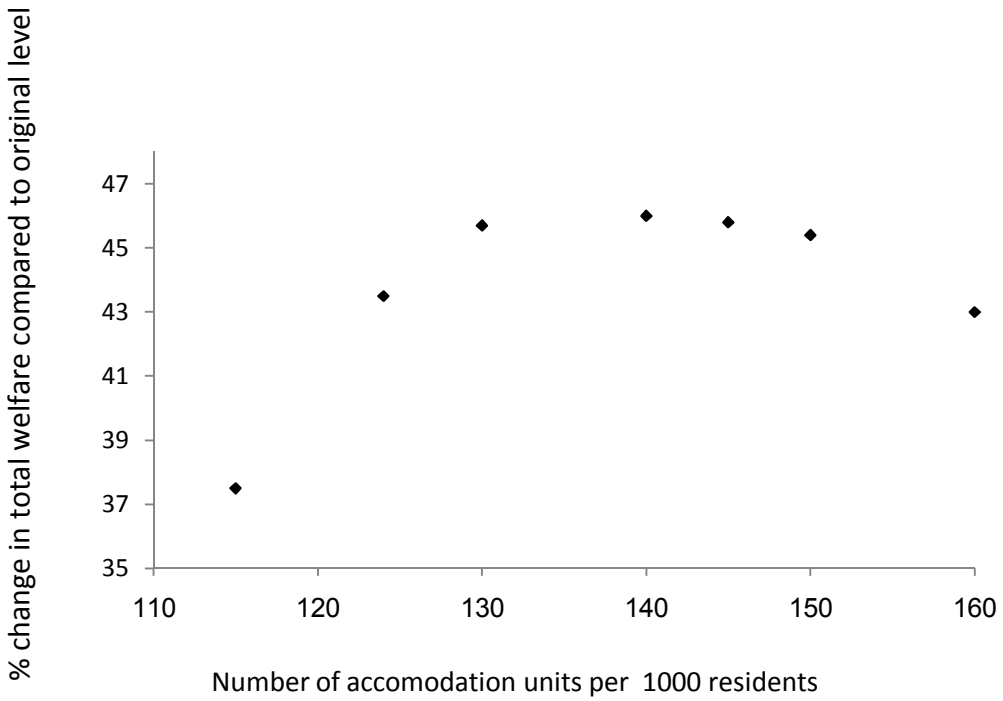
The third simulation is comprised of six simulations for six different density levels below and above the demand side's optimal density level of 124. The purpose of this simulation is to identify the market optimal density of accommodation units (note that the density level of 124 accounts only for consumers' utility). The simulation results are presented in Table 6, and the changes in the welfare levels are shown graphically in Figure 2.

Table 6. Percent change in market share and other market indicators in six simulations according to density level

	Density level – Number of Units per 1000 residents					
	110	115	124	130	140	145
Village Market Share	% change	% change	% change	% change	% change	% change
Shar-Yeshuv	-3	-42	-42	-18	-6	1
Amirim	4	-55	-55	-48	-48	-46
Bet-Hillel	-21	-49	-51	-51	-52	-54
Korazim	-88	90	93	96	97	94
Metula	18	-39	-41	-29	-26	-26
Rosh-Pina	13	102	105	80	73	70
Other Indicators						
Consumer welfare	30	39	40	36	35	34
Average firm profits	-41	-43	-42	-39	-43	-44
Aggregate firm profits	-7	-31	8	18	20	21
Total welfare	18.9	37.5	43.5	45.7	45.9	45.8

Average price	-0.7	-0.7	-2	-2	-3	-3
Average markup	-0.2	-3	-0.1	2	3	3
Market size	-4	7	11	13	14	15
Average occupancy rate	-52	-32	-32	-46	-51	-54

Figure 2. Simulated welfare level as a function of density



We can see that at an average density level of 140 the total welfare level reaches a maximum. Moreover, the difference in the slope up to the optimum level and after it is due to the different impacts of agglomeration and congestion. In up to 124 units, both forces act in the same direction; an increase in the number of units lowers the costs of the operators and increases consumer utility. Between 124 and 140 units, although both forces act in opposite directions, total welfare still increases, however at a higher density level, consumer disutility from its negative externalities takes over and causes a drop in the market share and hence in total welfare. Since agglomeration economies are still pushing for an increase in the market share, the slope is not as sharp as up to the optimum. These results confirm the finding of the first simulation that the demand's congestion effect of an increase in the density level overpowers the technological agglomeration economies. If all the households in the villages will enter the market with their regulated number of units, the density level will vary between 600 to 900, which is far from the optimum level of 140. This means that the current regulation

is based on considerations that are irrelevant to the welfare level of the rural accommodations market.

4. Discussion

We utilized a regional market equilibrium model in the rural accommodations industry to analyze externalities and their impacts on the market. The model is comprised of demand and pricing equations that account for product differentiation and oligopolistic competition, and more importantly, for agglomeration and congestion effects. The empirical model was estimated using data on rural accommodations in the Upper Galilee region in Israel. The results obtained suggest that both congestion and agglomeration effects exist in this regional market. Specifically, an inverse U-shaped relationship was found between consumer's preferences for rural accommodations and the density level of the accommodation units in the village. This implies that an optimum level of rural accommodations development at the village level exists. On the supply side, evidence was found for agglomeration economies

The importance of regulation in the regional accommodation market is presented in the simulations showing that public support of rural tourism has to be integrated into a broader locality-level development planning, and should be accompanied by specific means of regulation, otherwise it may achieve inefficient results. With the existing regulations and the current support policy, the regional rural accommodations market in the Upper Galilee can reach excessive growth and face loss of welfare.

The model employed in this study introduces for the first time a structural economic framework that addresses both congestion and agglomeration in the same economic region, as well as product differentiation and oligopolistic competition. Application of this framework to the rural tourism industry, which is subject to these distinctive market failures, provides important policy implications.

Our study is concerned with the impact of overdevelopment of rural accommodations units on the market welfare. However, this is only one facet of the overall picture. Another group whose welfare may be affected by an overcrowded village is the local community that is not involved in the tourism activity, but lives in the village. Further research dealing with the carrying capacity of tourism destinations, to avoid negative externalities felt by the host community, is warranted.

Publication lists including lectures at conferences

1. Tchetchik, A., Fleischer, A., & I. Finkelshtain (2011) "An Optimal Size for Rural Tourism Villages with Agglomeration and Congestion Effects" *European Review of Agricultural Economics* (Forthcoming)

2. Tchetchik, A., Fleischer, A., & I. Finkelshtain (2010) "An Optimal Size for Rural Tourism Villages with Agglomeration and Club-Good Effects" the Center for Agricultural Economic Research, the Department of Agricultural Economics and Management, The Hebrew University of Jerusalem.

3. Tchetchik, A., Fleischer, A., & I. Finkelshtain (2009). "Agglomeration and Spatial Density in the Rural Accommodations Industry", Leisure Studies Association Conference. Canterbury Christ Church University, Department of Sport Science, Tourism and Leisure, Canterbury, UK.

4. Tchetchik, A., Fleischer, A., & I. Finkelshtain (2009). "An Optimal Size for Rural Tourism Villages" Tourism Destination Development and Branding, international conference, Ben-Gurion University of the Negev.

5. Tchetchik, A., Fleischer, A., & I. Finkelshtain (2010). "An Optimal Size for Rural Tourism Villages with Agglomeration and Club Good Effects", The Israeli branch of the International Regional Science Association, Tel Aviv University.

6. Tchetchik, A., Fleischer, A., & I. Finkelshtain (2010). "Agglomeration and Club Good in the Rural Accommodations Industry", International Geographical Union, the Israeli National Committee for Geography, Bridging Diversity in a Globalizing World, Tel-Aviv.

7. Tchetchik, A., Fleischer, A. & I. Finkelshtain (2010). "Agglomeration and Club-Good Effects in the Rural Accommodations Industry" The 50th European Congress of the European Regional Science Association, Jonkoping, Sweden.

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טופס סיכום עם שאלות מנחות:

מטרות המחקר תוך התייחסות לתוכנית העבודה.
1. מציאת מסגרת כלכלית מושגית שתיקח בחשבון את המאפיינים המיוחדים של הענף ואת ההשפעות החיצוניות,
בפרט צפיפות מצד הביקוש ואגלומרציה מצד הטכנולוגיה 2. מציאת מסגרת אקונומטרית מתאימה לאמידת
משוואת האמידה של המודל הכלכלי 3. תכנון מודל סימולציה ממוחשב שיאפשר לענות על השאלה מהי
הצפיפות האופטימלית מבחינה חברתית של יח' אירוח ביישוב כפרי 4. גיבוש המלצות למקבלי החלטות רלוונטיים
עיקרי הניסויים והתוצאות.
פותח מודל שוו"מ אזורי של משוואות ביקוש ותמחור בענף האירוח הכפרי. זהו מודל בחירה בדידה עם בידול
מוצרים ותחרות אוליגופוליסטית בין הפירמות בתוך היישוב ובין יישובים שונים באזור. המודל לוקח בחשבון גם
החצנות של צפיפות מצד הביקוש ואגלומרציה מצד הטכנולוגיה ונאמד על ידי פרוצדורת GMM המאפשרת אמידה של משוואות סימולטניות לא ליניאריות ושימוש במשתני עזר עבור המשתנים האנדוגניים.
תוצאות המחקר מאשרות את קיומן של החצנות אלו בענף האירוח הכפרי ברמת היישוב הבודד. הסימולציות שבוצעו בתוכנת GAUSS מציעות כי תחת הרגולציה הקיימת בענף צפוי אובדן רווחה.
מסקנות מדעיות וההשלכות לגבי יישום המחקר והמשכו. האם הושגו מטרות המחקר לתקופת הדוח?
תוצאות המחקר מציעות לראשונה מסגרת מושגית לניתוח ענף האירוח הכפרי המעוגנת בתיאוריה כלכלית
מתחום ה- industrial organization ו – economic geography וכן שיטה אקונומטרית מתקדמת לכיול המודל
ולביצוע סימולציות המלמדות על השפעות של מדיניות ממשלתית והשפעות רלוונטיות אחרות על שיווי המשקל
בענף. מסגרת זו מאפשרת בין היתר לזהות את נוכחותם של externalities של צפיפות ואגלומרציה מצד הביקוש והטכנולוגיה בהתאמה בענף ולכמתם תוך שימוש בנתוני שוק אגרגטיביים והנחות על העדפות הצרכנים.
בעיות שנותרו לפתרון ו/או שינויים (טכנולוגיים, שיווקיים ואחרים) שחלו במהלך העבודה; התייחסות המשך המחקר לגביהן, האם יושגו מטרות המחקר בתקופה שנותרה לביצוע תוכנית המחקר?
המחקר הסתיים ומטרותיו העיקריות הושגו.
הפצת הידע שנוצר בתקופת הדו"ח: **פרסומים בכתב** - <u>ציטט</u> ביבליוגרפי כמקובל בפרסום מאמר מדעי; **פטנטים** - יש לציין שם ומס' פטנט; **הרצאות וימי עיון** - יש לפרט מקום, תאריך, ציטוט ביבליוגרפי של התקציר כמקובל בפרסום מאמר מדעי.
1.Tchetchik, A., Fleischer, A., & I. Finkelshtain (2011) "An Optimal Size for Rural Tourism Villages with Agglomeration & Congestion Effects" *European Review of Agricultural Economics* (Forthcoming) 2. Tchetchik, A., Fleischer, A., & I. Finkelshtain (2010) "An Optimal Size for Rural Tourism Villages with Agglomeration and Club-Good Effects" the Center for Agricultural Economic Research, the Department of Agricultural Economics and Management, אhe Hebrew University of Jerusalem.
(ראה בדוח השנתי מידע לגבי הרצאות שניתנו בנושא המחקר)
פרסום הדוח: אני ממליץ לפרסם את הדוח: (סמן אחת מהאופציות)
➢ **<u>ללא הגבלה (בספריות ובאינטרנט)</u>**
האם בכוונתך להגיש תוכנית המשך בתום תקופת המחקר הנוכחי?