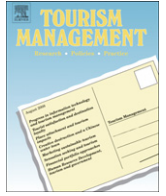




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## The impact of changes in household vacation expenditures on the travel and hospitality industries

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### ABSTRACT

Two large tourism industries, travel and hospitality, are strongly affected by changes in household demand for vacations. In recent years, rising income and declining prices per unit of quality have led to changes in patterns of household vacation consumption. To understand the impact of these changes on the travel and hospitality industries, we develop a theoretical model distinguishing between travel and on-site expenditures and apply it to Israeli data. We find that under certain circumstances, the changes in income and prices are responsible for a shift toward multiple, short vacations. This trend can be a boon to the travel industry but a disadvantage for the hospitality industry. Both industries are expected to face a rise in the demand for high-quality products.

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### 1. Introduction

Changes in households' vacation consumption patterns can affect the two largest tourism industries, travel and hospitality, differently. For example, the recently observed shift from one long vacation to multiple short ones (OECD, 2002) means an increase in the demand for travel, while the hospitality industry faces a drop in length of stay and a rise in guest turnover. Most of the studies analyzing households' vacation expenditures do not distinguish between travel and on-site expenditures, instead analyzing them as a whole. We claim that these two components of vacation spending can, on the one hand, be affected differently by changes in income and prices, and on the other, have different effects on the travel and hospitality industries. To understand the economic motivations behind vacation decision-making and their impact on the different tourism industries, travel and on-site expenditures need to be analyzed separately. In this study, we develop an economic model of vacation consumption which distinguishes between travel and on-site expenses, and apply it to a household expenditure survey of Israel.

Throughout this paper, we loosely adapt Decrop's (2006) definition of vacation, i.e. vacation involves leisure tourism: vacationers can spend their vacation touring or staying in the same spot. Unlike Decrop (2006), however, we exclude the possibility of vacationing at home from our definition.

The different aspects of vacation decision-making are discussed at length in Decrop's (2006) book and in many other papers (for

example: Heung, Qu, & Chu, 2001; Litvin, Xu, & Kang, 2004; Duman & Mattila, 2005; Pan & Fesenmaier, 2006; Hyde & Laesser, 2009). More relevant to the current study are the following studies explaining what determines a tourist's length of stay. Gokovali, Bahar, and Kozak (2007) analyzed determinants of vacation duration for tourists in Bodrum, Turkey. Their analysis was based on direct questioning of the tourists. By employing survival analysis, they found that about 16 variables, among them nationality, education and income, are significantly associated with length of stay. A similar approach was used by Menezes, Moniz, and Vieira (2008) to examine the length-of-stay determinants for tourists in the Azores. Alegre and Pou (2006) took an economic approach to explain the continuous declining trend in vacation duration for tourists visiting the Balearic Islands. Their analysis was based on data collected by a survey of tourists' expenditures on the islands, taking into account their demographic and socioeconomic characteristics. The analysis was limited to the vacation on the islands themselves and thus cannot give a full picture of the household's holiday consumption. Further economic analyses of households as consumers of vacations were conducted by Davies and Mangan (1992) for the UK, Van Soest and Kooreman (1987) and Melenberg and Van Soest (1996) for the Netherlands, and Taplin (1980) for Australia. These economic studies were based on household expenditure surveys in different countries. They had information on the household's vacation expenditure during the survey year and they were mainly concerned with the impact of income change on these expenditures. The major finding repeatedly reported in those studies was that vacation expenditures are expected to increase faster than income. Fleischer and Rivlin (2009a, 2009b), in their studies of the Israeli case, were able to

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obtain price elasticities in addition to income elasticity and distinguish between the quality and quantity of vacations by using additional data on the number of vacation days each household took. This decomposition enabled them to determine that about half of the increase in expenditures goes to improvement of vacation quality. However, they also treated vacation as an aggregate product and did not decompose it into travel and on-site expenses.

We claim that by separating vacation expenditures into travel and on-site expenses, we can explain the trend toward shorter vacations noted by Alegre and Pou (2006) and the switch to higher-quality holidays pointed out by Morgan (1991). Moreover, we can obtain the relationship between these trends and economic variables such as income and prices. This is mainly because the number of vacations is affected by, among other things, economic factors in the travel industry. Each vacation involves traveling and thus, for example, the emergence of low-cost carriers can affect number of vacations taken by a household. On the other hand, total number of vacation days is determined mainly by economic factors affecting the hospitality industry. Furthermore, changes in income do not necessarily have the same impact on the number of vacations as on the total number of vacation days. The length of the vacation is the product of these two decisions. If a household decides to take more vacations but does not change the total number of vacation days during the survey year, the result is more, but shorter vacations. Thus, to understand where changes in the number of vacations and their duration are stemming from, we have to distinguish between travel and on-site expenses. We find that with an increase in income and a decrease in price level, households tend to increase the number of vacations they take but the total number of vacation days during the survey period is not affected. This result provides a possible explanation for the continuous drop in vacation duration.

The next section provides the theoretical model, the derived empirical model and the estimation procedure. The data source and preparation procedure are described in the third section. The results of the estimated models are presented and discussed in the fourth section, followed by a concluding section on the possible implications of increasing income and decreasing price levels for the travel and hospitality industries.

2. Theoretical and empirical models

The theoretical one-commodity model developed by Fleischer and Rivlin (2009a) to depict households' vacation demand was adapted here to a two-commodity model: travel and on-site services. The model enables distinguishing between the quality and quantity of each of these commodities. An observed increase in vacationers' travel expenses can be due to an increase in the quality of the travel, e.g., flying business instead of coach, or to an increase in the number of vacations. Similarly, an observed increase in vacationers' on-site expenditures can be due to two factors: a move to higher-quality accommodations and activities on site, or an increase in the number of vacation days. Income and price elasticities for both quality and quantity of travel and on-site demand are derived from the following model.

The utility maximization problem of a household subject to budget constraints can be defined as follows:

$$\begin{aligned}
 U &= U(d_1, d_2, \dots, d_n, v_1, v_2, \dots, v_k, z) \\
 \text{s.t. } &\sum_{i=1}^n p_i d_i + \sum_{j=1}^k t_j v_j + z = Y
 \end{aligned}
 \tag{1}$$

where  $d_i$  is the number of vacation days in vacation  $i$ ,  $v_j$  is the number of vacations of type  $j$ ,  $z$  is the rest of the goods and services the household consumes with a normalized price of one,  $p_i$  is the on-site price per day for vacation  $i$ ,  $t_j$  is the price of traveling to

vacation  $j$ , and  $Y$  is the household's income. Prices  $p_i$  and  $t_j$  depend on the quality of the service. In particular:

$$p_i = \hat{p}_d q_i^d \quad t_j = \hat{p}_v q_j^v \tag{2}$$

where  $q_i^d$  is the number of quality units consumed during one day of vacation  $i$ ,  $q_j^v$  is the number of quality units of travel to vacation type  $j$ , and  $\hat{p}_d, \hat{p}_v$  are the price of a quality unit of vacation days and travel, respectively. The price of a quality unit can be viewed as a group-specific price-level indicator (Nelson, 1991).

By using the definition of price in eq. (2), the same problem faced by the household in eq. (1) can be rewritten in terms of quality units as follows:

$$\begin{aligned}
 U &= U(D, V, z) \\
 \text{s.t. } &\hat{p}_d D + \hat{p}_v V + z = Y
 \end{aligned}
 \tag{3}$$

where  $D = \sum_{i=1}^n q_i^d d_i$  is the total number of quality units consumed at the destination and  $V = \sum_{j=1}^k q_j^v v_j$  is the total number of quality units consumed while traveling to vacation  $j$ . The number of vacation days cannot be summed up because they differ in quality as well as in travel to the vacation site. However, converting vacation days and travel into quality units enables their summation and the creation of a quantity measure of aggregate commodities  $D$  and  $V$ .

Solving the maximization problem in eq. (3) yields the following demand functions for the aggregate goods:

$$\begin{aligned}
 D &= D(\hat{p}_d, \hat{p}_v, Y) = q_D d_q \\
 V &= V(\hat{p}_v, \hat{p}_d, Y) = q_V v_q
 \end{aligned}
 \tag{4}$$

where  $q_D = \sum_i q_i^d (d_i / \sum_k d_k)$  and  $q_V = \sum_j q_j^v (v_j / \sum_k v_k)$  are the weighted average quality units per day on site and per travel to vacation, respectively,  $d_q = \sum_i d_i$  and  $v_q = \sum_j v_j$  are the number of vacation days and the number of vacations, respectively (for details see Fleischer & Rivlin, 2009a).

The unit values,  $\pi_D, \pi_V$ , are the average expenditure per day of vacation and per travel to vacation, respectively. They are calculated by dividing total on-site expenditure  $E_D$  by the number of vacation days, and by dividing total travel expenses  $E_V$  by number of vacations:

$$\begin{aligned}
 \pi_D &= \frac{E_D}{\sum_i d_i} = \hat{p}_d q_D \\
 \pi_V &= \frac{E_V}{\sum_j v_j} = \hat{p}_v q_V
 \end{aligned}
 \tag{5}$$

Unit values can also be interpreted as the weighted sum of quality units multiplied by the exogenous price  $\hat{p}_d$  or  $\hat{p}_v$ .

The unit value is comprised of two parts: the price of a quality unit which is exogenous to the consumer, and the weighted average level of quality, which is endogenous to the consumer. The endogeneity stems from the households' decision of how many units of quality to consume as a function of their socioeconomic characteristics.

The income and price elasticities of variable  $X$ ,  $\eta_X$  and  $\varepsilon_X$ , respectively, are:

$$\begin{aligned}
 \eta_D &= \eta_{q_D} + \eta_{d_q} \\
 \eta_V &= \eta_{q_V} + \eta_{v_q}
 \end{aligned}
 \tag{6}$$

$$\begin{aligned}
 \varepsilon_D &= \varepsilon_{d_q} + \varepsilon_{q_D} \\
 \varepsilon_V &= \varepsilon_{v_q} + \varepsilon_{q_V}
 \end{aligned}
 \tag{7}$$

2.1. Empirical model and estimation methodology

The empirical functional form is adopted following Fleischer and Rivlin (2009a). This functional form facilitates the estimation of the demand elasticities in eqs. (5) and (6) using the available expenditure share data and unit values from the household expenditure survey. Note that to generate the elasticities from the existing data, we had to assume zero cross-price elasticities. This implies that if travel costs are going up, households will take fewer vacations but will not change the total number of vacation days. This assumption does not affect the estimated own elasticities presented below since they do not depend on the cross elasticity. Moreover, cross elasticities are known to be much smaller than own elasticity in absolute terms in many empirical studies of demand (Deaton, 1987). Thus, we do not expect this assumption to have a strong impact on the results presented here.

The fact that only some of the households have non-zero vacation expenditures is accounted for in the empirical model by adding the following selection equation:

$$I^* = \alpha_0 + \alpha_1 \ln Y + \alpha_2 \ln FS + \alpha'_3 M_1 + \alpha'_4 S + u_1 \quad (8)$$

where  $Y$  is total expenditure (as a proxy for permanent income),  $FS$  is family size,  $M_1$  is a vector of a subset of household characteristics and  $S$  is a vector of variables accounting for seasonality.  $I^*$  is an unobserved variable. The observed variable,  $I$ , equals one when the household decided to take a vacation during the period of the survey and zero otherwise. Accordingly, eq. (9) takes on the following form:

$$I = \alpha_0 + \alpha_1 \ln Y + \alpha_2 \ln FS + \alpha'_3 M_1 + \alpha'_4 S + u_1 \quad (9)$$

The censored empirical demand model for on-site services is described by eqs. (10) and (11) if  $I = 1$ , and for vacation travel by eqs. (12) and (13) if  $I = 1$ .

$$\begin{aligned} \ln \pi_D > 0 \text{ if } I = 1 \\ \ln \pi_D = \beta_0^D + \beta_1^D \ln Y + \beta_2^D \ln FS + \beta_3^D M_2 + \beta_4^D S + u_2 \end{aligned} \quad (10)$$

$$\begin{aligned} w_D > 0 \text{ if } I = 1 \\ w_D = \gamma_0^D + \gamma_1^D \ln Y + \gamma_2^D \ln FS + \gamma_3^D M_3 + \gamma_4^D \ln \hat{\pi}_D + u_3 \end{aligned} \quad (11)$$

$$\begin{aligned} \ln \pi_V > 0 \text{ if } I = 1 \\ \ln \pi_V = \beta_0^V + \beta_1^V \ln Y + \beta_2^V \ln FS + \beta_3^V M_4 + \beta_4^V S + u_4 \end{aligned} \quad (12)$$

$$\begin{aligned} w_V > 0 \text{ if } I = 1 \\ w_V = \gamma_0^V + \gamma_1^V \ln Y + \gamma_2^V \ln FS + \gamma_3^V M_5 + \gamma_4^V \ln \hat{\pi}_V + u_5 \end{aligned} \quad (13)$$

where  $M_i$ ,  $i = 1, 2, 3, 4, 5$  are vectors of not necessarily identical subsets of household characteristic variables,  $\pi_D$  and  $\pi_V$  are the unit value per day of vacation and per vacation, respectively,  $w_D$  and  $w_V$  are the share of on-site and travel expenditures out of all household expenditures, respectively. This functional form for demand systems has been widely used in the literature (e.g., Brown, 2008).

2.2. Income and demand elasticities

Although data on  $V$  and  $D$  are not available, we can still estimate their income and price elasticities while distinguishing between quality and quantity components. Their elasticities are derived from the estimated parameters in eqs. (10)–(13). The relationship

between the estimated parameters and the elasticities are expressed in the following equations.

$$\begin{aligned} \eta_D = \eta_{w_D} + 1 &= \frac{1}{w_D} [\gamma_1^D + \gamma_4^D \beta_1^D] + 1 \\ \eta_V = \eta_{w_V} + 1 &= \frac{1}{w_V} [\gamma_1^V + \gamma_4^V \beta_1^V] + 1 \end{aligned} \quad (14)$$

The income elasticity of quality is of the following form:

$$\begin{aligned} \eta_{q_D} = \eta_{\pi_D} = \frac{d \ln \pi_D}{d \ln Y} &= \beta_1^D \\ \eta_{q_V} = \eta_{\pi_V} = \frac{d \ln \pi_V}{d \ln Y} &= \beta_1^V \end{aligned} \quad (15)$$

$\eta_{d_q}$  and  $\eta_{v_q}$  are calculated from eqs. (6), (14) and (15).

The income elasticity of the length of the vacation,  $\eta_L$ , is derived from the two elasticities in eq. (14):

$$\eta_L = \eta_{d_q} - \eta_{v_q} \quad (16)$$

Based on Deaton (1987) and Chung (2006), price elasticity can also be derived from the unit value and quality elasticity as follows:

$$\begin{aligned} \varepsilon_{d_q} &= \frac{(\gamma_4^D - w_D) \eta_{d_q}}{w_D \eta_{d_q} - (\gamma_4^D - w_D) \eta_{q_D}} \\ \varepsilon_{v_q} &= \frac{(\gamma_4^V - w_V) \eta_{v_q}}{w_V \eta_{v_q} - (\gamma_4^V - w_V) \eta_{q_V}} \end{aligned} \quad (17)$$

$$\begin{aligned} \varepsilon_{q_D} &= \varepsilon_{d_q} \frac{\eta_{q_D}}{\eta_{d_q}} \\ \varepsilon_{q_V} &= \varepsilon_{v_q} \frac{\eta_{q_V}}{\eta_{v_q}} \end{aligned} \quad (18)$$

3. Data

The model was applied to the 2007 household expenditure survey of Israel, conducted over a 13-month period from January 2007 to January 2008. The survey (was designed to be representative of the population and of the various periods of the investigation year). Therefore, the interviewing quotas were allocated such that the sample would be represented in each quarter year, in a balanced fashion, according to various socioeconomic and geographical characteristics. In the survey, the households were asked to report on each of their vacations during the survey period, i.e. the 3 months leading up to the survey. This information included details on each vacation, such as destination (domestic or abroad), travel expenses, on-site expenses, the duration of each vacation and the number of family members participating in each vacation.

The fact that the households were asked about their trip expenditures during the 3 months preceding the survey is an advantage because they could better recall the expenditures. However, in the case of tourism-related expenditures, this presents a disadvantage because of the seasonality effect. For example, a household could travel during the survey year but not during the three months they reported on. Therefore, although they traveled, it appears in the survey as if they did not. This is especially relevant for households that were surveyed during the off season (in Israel the major season for travel is the summer). In view of this issue, seasonality was accounted for in our estimates by adding dummy variables for each month.

A total of 6169 households were surveyed, 4359 of which had not taken a vacation during the survey period. Seventy-nine households reported taking a vacation but did not report any expenses and thus were omitted from the sample. The rest of the households reported taking a vacation and expenditures for at least one of the two

categories: traveling and on-site expenditures. It is common in Israel to receive a company car as a fringe benefit; as a result, households that took their vacation in Israel and traveled by company car reported zero travel expenditure. Thus, we divided the sample into two subgroups: the first includes households that took their vacation only in Israel: 495 households in this subgroup reported travel expenses and 989 reported on-site expenditures. This means that for half of the sample, a vacation in Israel entailed on-site expenses only, as a result of traveling with a company car. The rest of the sample consisted of households that took at least one vacation abroad, of which 706 reported travel expenses and 742 on-site expenses. Summary statistics of the data is presented in Table 1.

4. Results

It is important to understand the specific conditions in Israel that may have an effect on the vacation consumption patterns of its population. Israel is a small country, and therefore households usually travel by car to their destination when they take their vacation domestically. In this case, there is not much room for improvement in the quality of the travel and there is no extra travel cost for additional household members. Another important factor affecting vacation patterns is the geopolitical situation in Israel. Generally, to take a vacation abroad, Israelis have to fly. This implies relatively much higher travel expenses than for domestic vacations, an additional household member joining the vacation increases the travel cost significantly, and there is room for quality improvement. These special conditions strengthened the decision to estimate the model for the two subsamples.

Table 2 presents the results of the selection equations: an examination of the significant coefficients of the control variables reveals the expected signs. Total expenditures (as a proxy for permanent income), age and years of schooling of the head of household, value of assets, and a household with a working head all have a positive and significant effect on the probability of taking a vacation. Two variables that have a significant negative effect on the probability of taking a vacation are number of household members and a female head of household. The coefficients of the monthly dummy variables indicate that households in Israel tend to take more vacations in the summer and fall than in the winter.

Tables 3 and 4 depict the estimated coefficients for the travel and on-site models, respectively. The signs and significance levels are as expected but for our purposes, the more interesting results are the calculated income and price elasticities presented in Table 5. These elasticities are based on the estimated parameters (eqs. (14)–(18)) and are calculated for the two sample subsets—only domestic vacations and at least one vacation abroad.

Elasticities provide an indication of the sensitivity of the travel and on-site expenses to changes in income and prices. We can see in Table 5 that the elasticities differ to a large extent between the different subsets, which justifies the importance of decomposing them. The following discussion of the elasticities is conducted under the assumption that the Israeli household's income is increasing

Table 1 Descriptive statistics of travel and on-site expenditures

	Travel expenditures		On-site expenditures	
	Mean	S.D.	Mean	S.D.
No. of vacations	1.35	0.62	1.28	0.56
Total no. of days	9.0	10.6	7.0	8.7
Unit value (NIS)	2965	3,168	584 (per day)	526
(per vacation)				
Total expenditures	2965	4,107	3,429	3,807
Share of total expenditures (%)	7.33%	8.0	8.71%	9.0

Table 2 Selection model for travel and on-site expenditures.

	Domestic vacations only		At least one vacation abroad	
	Coef.	Std. err.	Coef.	Std. err.
<b>Travel expenditures</b>				
Constant	-40.49*	7.499	-11.82*	0.534
ln (total expenditures)	7.087*	1.445	1.054*	0.053
ln (total expenditures) squared	-0.321*	0.070	—	—
ln (number of family members)	-0.052	0.057	-0.371*	0.049
Age of HH head	-0.000	0.002	0.002	0.002
=1 if HH head is female	-0.204*	0.063	-0.081	0.057
No. of school years of HH head	0.035*	0.007	0.003	0.006
Value of real-estate assets (in million NIS)	-0.011	0.033	0.098*	0.036
=1 if HH head was born in Israel	0.224*	0.060	-0.078	0.056
No. of business trips abroad	-0.000	0.064	-0.113**	0.063
=1 if HH was surveyed in January	0.035	0.125	-0.083	0.119
=1 if HH was surveyed in February	-0.108	0.126	-0.248**	0.139
=1 if HH was surveyed in March	-0.303*	0.134	-0.235**	0.126
=1 if HH was surveyed in April	-0.175	0.144	-0.279**	0.146
=1 if HH was surveyed in May	0.024	0.126	-0.033	0.123
=1 if HH was surveyed in June	-0.068	0.127	-0.142	0.134
=1 if HH was surveyed in July	-0.062	0.128	0.181	0.119
=1 if HH was surveyed in August	0.180	0.117	0.343*	0.118
=1 if HH was surveyed in September	0.253*	0.128	0.366*	0.121
=1 if HH was surveyed in October	0.092	0.127	0.385*	0.115
=1 if HH was surveyed in November	-0.031	0.131	0.322*	0.113
<b>On-site expenditures</b>				
Constant	-26.58*	4.789	-11.28*	0.498
ln (total expenditures)	4.536*	0.935	1.022*	0.051
ln (total expenditures) squared	-0.200*	0.046	—	—
ln (number of family members)	-0.129*	0.045	-0.395*	0.050
Age of HH head	0.000	0.002	-0.000	0.002
=1 if HH head is female	-0.145*	0.050	-0.059	0.056
No. of school years of HH head	0.030*	0.006	0.003	0.007
Value of real-estate assets (in million NIS)	0.029	0.030	0.106*	0.035
=1 if HH head was born in Israel	0.248*	0.049	-0.051	0.053
No. of business trips abroad	-0.001	0.053	-0.147*	0.061
=1 if HH was surveyed in January	-0.057	0.100	-0.107	0.115
=1 if HH was surveyed in February	-0.111	0.103	-0.219**	0.131
=1 if HH was surveyed in March	-0.207*	0.106	-0.184	0.122
=1 if HH was surveyed in April	-0.135	0.117	-0.317*	0.143
=1 if HH was surveyed in May	0.008	0.100	-0.025	0.120
=1 if HH was surveyed in June	-0.128	0.105	-0.197	0.131
=1 if HH was surveyed in July	-0.039	0.097	0.079	0.113
=1 if HH was surveyed in August	0.137	0.098	0.306*	0.115
=1 if HH was surveyed in September	0.208**	0.109	0.275*	0.120
=1 if HH was surveyed in October	0.099	0.101	0.326*	0.113
=1 if HH was surveyed in November	0.029	0.102	0.252*	0.111

Note: HH = household. \*, \*\* Significant at 5% and 10%, respectively.

continuously over time and that the price per unit of quality of travel and on-site services tends to decrease over time. The latter assumption is based on the competition between airlines (e.g. low-cost carriers) and tourism destinations that drives prices downward for the same level of quality. It should be noted that an increase in fuel prices can push prices in the other direction in the short run, but we assumed that the move toward more competitive markets dictated the long-term trend of decreasing prices. Brons, Pels, Nijkamp, and Rietveld (2002) in their meta-analysis of price elasticities of demand for passenger air travel made similar assumptions.

From Table 5, we can see that a 1% increase in the income of households that took only domestic vacations does not change the quality of the travel significantly, but the number of vacations increases by 0.32%. Nevertheless, their on-site elasticities move in the opposite direction: a 1% increase in income leads to a 0.37% increase in the level of quality and no significant effect on the number of vacation days. An increase in the number of vacations with no increase in total number of vacation days leads to the

**Table 3**  
MLE estimates of unit value and expenditure share for travel.

	Domestic vacations only		For at least one vacation abroad	
	Coef.	Std. err.	Coef.	Std. err.
<b>Unit value (<math>\pi_v</math>)</b>				
Constant	6.726*	1.640	1.367	1.933
ln (total expenditures)	-0.049	0.117	0.615*	0.160
ln (number of family members)	0.180*	0.083	-0.180*	0.086
Age of HH head	-0.003	0.003	-0.003	0.011
Age of HH head squared	-	-	0.000	0.000
=1 if HH has Internet	0.023	0.090	0.226*	0.090
=1 if all expenses were paid for by the HH	0.281*	0.087	-0.541*	0.114
=1 if on-site expenditures > 0	0.225	0.195	0.318*	0.069
No. of school years of HH head	-0.023**	0.012	0.006	0.010
=1 if HH head was born in Israel	-0.040	0.093	0.063	0.069
=1 if HH head is female	-0.052	0.114	0.031	0.074
=1 if HH was surveyed in January	0.132	0.158	-0.353*	0.169
=1 if HH was surveyed in February	-0.183	0.179	-0.099	0.182
=1 if HH was surveyed in March	0.055	0.182	-0.077	0.184
=1 if HH was surveyed in April	-0.067	0.180	-0.198	0.170
=1 if HH was surveyed in May	-0.172	0.168	-0.061	0.174
=1 if HH was surveyed in June	0.004	0.144	-0.052	0.177
=1 if HH was surveyed in July	0.204	0.182	-0.343*	0.161
=1 if HH was surveyed in August	-0.039	0.147	-0.107	0.172
=1 if HH was surveyed in September	0.085	0.153	0.191	0.176
=1 if HH was surveyed in October	0.062	0.141	0.087	0.168
=1 if HH was surveyed in November	0.090	0.175	0.038	0.174
rho	-0.721*		0.058	
$\chi^2$	6.23*		0.07	
<b>Expenditure share (<math>W_v</math>)</b>				
Constant	0.057*	0.019	0.327*	0.094
ln (total expenditures)	-0.007*	0.001	-0.073*	0.010
ln (number of family members)	-0.000	0.001	0.007	0.008
Age of HH head	-0.000	0.000	-0.000	0.001
Age of HH head squared	-	-	0.000	0.000
No. of school years of HH head	0.000	0.000	-0.000	0.001
=1 if HH head is female	-0.000	0.001	0.008	0.007
=1 if HH head was born in Israel	0.001*	0.001	0.013*	0.007
=1 if HH has Internet	0.001	0.001	0.010	0.008
Value of real-estate assets (in million NIS)	0.000	0.001	-0.003	0.003
Calculated unit value ( $\hat{\pi}_v$ )	0.004*	0.002	0.071*	0.014
rho	-0.218**		-0.172	
$\chi^2$	2.88**		2.42	

Note: HH = household  
\*,\*\* Significant at 5% and 10%, respectively.

inevitable result of a negative and significant income elasticity of average vacation length. This means that with an increase in income, households are expected to take more but shorter domestic vacations with higher-quality on-site hospitality services.

Households that took at least one vacation abroad conduct themselves differently. An increase in income leads to a 0.61% improvement in the quality of travel and to a slight increase (0.13%) in the number of vacations. Their quality of on-site consumption increases by over 0.9% while number of vacation days does not change significantly. As a result, the income elasticity of vacation duration for this subsample, although negative, is not significant.

Under the assumption of decreasing price per unit quality, price elasticities show the same direction of impact as an increase in income. For the subsample of households that took only a domestic vacation, a decrease in the price level of travel will lead to a 0.61% increase in the number of vacations with no significant impact on their quality. However, a decrease in the on-site price level will bring about an increase in the quality of services purchased on site, with no significant change in the number of vacation days.

Households that traveled at least once abroad react to the change in travel price level by increasing the level of quality of travel (0.63%) and exhibiting a slight change in the number of

**Table 4**  
MLE estimates of unit value and expenditure share for travel.

	Domestic vacations only		For at least one vacation abroad	
	Coef.	Std. err.	Coef.	Std. err.
<b>Unit value (<math>\pi_d</math>)</b>				
Constant	1.424**	0.753	-3.948*	1.367
ln (total expenditures)	0.370*	0.063	0.919*	0.124
ln (number of family members)	0.048	0.061	-0.110	0.080
Age of HH head	0.011	0.010	-0.010	0.013
Age of HH head squared	-0.000	0.000	0.000	0.000
=1 if all expenses were paid by the HH	0.820*	0.078	0.350*	0.075
=1 if on-site expenditures > 0	-0.444*	0.080	0.074	0.117
=1 if HH head is female	-0.094	0.059	-	-
=1 if HH has Internet	0.099	0.072	-0.050	0.112
=1 if HH head was born in Israel	0.099**	0.061	-	-
No. of school years of HH head	-	-	-0.015	0.012
Value of real-estate assets (in million NIS)	0.084**	0.047	-0.005	0.040
=1 if HH was surveyed in January	-0.120	0.106	0.217	0.154
=1 if HH was surveyed in February	-0.232*	0.108	0.023	0.197
=1 if HH was surveyed in March	-0.072	0.109	-0.107	0.154
=1 if HH was surveyed in April	-0.104	0.109	0.001	0.210
=1 if HH was surveyed in May	-0.081	0.105	0.000	0.157
=1 if HH was surveyed in June	-0.240*	0.122	0.314**	0.172
=1 if HH was surveyed in July	-0.100	0.107	0.231**	0.134
=1 if HH was surveyed in August	0.013	0.101	0.436*	0.162
=1 if HH was surveyed in September	-0.057	0.130	0.243**	0.145
=1 if HH was surveyed in October	-0.007	0.109	0.295**	0.153
=1 if HH was surveyed in November	-0.033	0.115	0.228	0.146
rho	0.252*		0.266**	
$\chi^2$	5.45*		3.24**	
<b>Expenditure share (<math>W_d</math>)</b>				
Constant	0.352*	0.058	0.376*	0.134
ln (total expenditures)	-0.045*	0.005	-0.041*	0.016
ln (number of family members)	0.001	0.004	-0.006	0.009
Age of HH head	-0.000	0.001	-0.001	0.002
Age of HH head squared	0.000	0.000	0.000	0.000
=1 if HH head was born in Israel	-0.007**	0.004	-0.003	0.008
No. of school years of HH head	-0.001*	0.000	-	-
=1 if HH has Internet	-0.006	0.006	-0.000	0.011
Value of real-estate assets (in million NIS)	-0.000	0.003	-0.008*	0.004
Calculated Unit Value ( $\hat{\pi}_D$ )	0.035*	0.005	0.042*	0.015
rho(1,2)	-0.110		-0.267**	
sigma(1)	0.4		2.78**	

Note: HH = household.  
\*,\*\* Significant at 5% and 10%, respectively.

**Table 5**  
Income and price elasticities by vacation destination.

	Domestic vacations only	For at least one vacation abroad
<b>Income elasticities</b>		
$\eta_{qv}$ quality of travel	-0.049	0.615*
$\eta_{vq}$ number of vacations	0.328*	0.137*
$\eta_v$ total travel	0.279*	0.752*
$\eta_{qD}$ quality of on-site services	0.370*	0.919*
$\eta_{d_q}$ number of vacation days	0.050	0.065
$\eta_D$ total on-site	0.420*	0.984*
$\eta_L$ length of vacation	-0.277*	-0.072
<b>Price elasticities</b>		
$\epsilon_{qv}$ quality of travel	0.091	-0.635*
$\epsilon_{v_q}$ number of vacations	-0.614*	-0.141*
$\epsilon_v$ total travel	-0.523*	-0.776*
$\epsilon_{qD}$ quality of on-site services	-0.725*	-0.903*
$\epsilon_{d_q}$ number of vacation days	-0.098	-0.064
$\epsilon_D$ total on-site	-0.823*	-0.967*

\*,\*\* Significant at 5% and 10%, respectively.  
Note: Significance level was calculated using bootstrapping procedure.

vacations (0.14%). The difference in their on-site behavior is more dramatic. They mainly increase the quality of on-site activities (0.9%) with no significant change in the number of vacation days.

## 5. Summary and conclusions

We modeled the household demand for vacations and applied it to household expenditure data of Israel. In the model, we made two main distinctions. First, in the demand for vacations, we distinguished between the total number of vacation days, the number of vacations, and their duration. This enabled us to understand the impact of changes in household vacation expenditures on travel and on-site tourism firms. Second, we distinguished between quantity and quality of vacations, mainly because an increase in holiday expenditures does not necessarily mean more vacation days as claimed by Gokovali et al. (2007). Instead, it can reflect a decision to switch to high-quality tourism services. These distinctions are important for the firms supplying travel and on-site tourism services, since foreseeing a change in total holiday expenditures of households is not sufficient to understand the implications for the industry. Suppliers of tourism services have to know where this increase in expenditure is going: to more travel or better travel, to more days of vacation or better on-site services.

We find, under the reasonable assumption that real income increases over time and quality price decreases, that households will tend to take more but shorter vacations, and more so domestically. This means that one cannot look at the tourism industry en bloc. Furthermore, changes in the vacation consumption patterns of households resulting from economic forces have a different effect on the travel industry than on the hospitality industry. Our results suggest that the travel industry will face increasing demand for travel with some increase in its quality. We also show that these are the economic trends responsible for cutting down the duration of domestic vacations. If Europeans consider traveling within Europe domestic travel, then this might explain the decrease in the vacation duration of tourists in the Balearic Islands reported by Alegre and Pou (2006). These trends benefit the travel industry since more but shorter vacations means more traveling. However this has an adverse impact on the environment. More pressure on the transportation infrastructure, air pollution and emission of greenhouse gases resulting from tourism-related travel must be taken into consideration by environmental organizations.

Unlike the travel industry which might benefit from these trends, the hospitality industry is facing an increase in the turnover of guests. More guests coming for shorter durations are likely to require more work hours per guest. This can lead to a rise in operation costs. Another industry that has to adjust to these trends is that of the tour organizers, especially as related to all-inclusive package holidays. Most of the package holidays in the Mediterranean sun-and-sand destinations are booked for periods of 1–2 weeks. Our findings indicate that in order to adjust the package holiday to trends in demand, tour organizers will have to change and offer packages that are shorter or of more flexible duration. Alegre and Pou (2006) noticed this trend of shorter length of stay in the Balearic Islands and claimed that it was inevitable due to changes in the socio-demographic characteristics of the tourists. We strengthen their claim of this trend's inevitability by showing that economic growth and structural changes in the tourism industry also lead to shorter vacations.

Another important finding is that except for domestic travel, an increase in income and a decrease in price levels boost vacationers' demand for better quality of travel, and even more so the demand for a higher level of service quality at the destination.

The important implication for hotels and other on-site services is that they will have to offer a higher-quality product, rather than

invest in expanding their facilities. The recent trend of an increase in boutique hotels shows that the industry has started to react. The fact that these trends do not affect the quality of domestic travel might stem from the small size of the country, where most of the travel to vacation sites is by car. Thus, the options for improvement in the level of quality of travel are few. This implies that similar results would be expected in other countries for short-distance vacations.

One of the reasons why households do not increase the total number of vacation days as fast as the level of quality of the vacation is because the former is limited. These are mainly people who work as employees and their number of vacation days is set. However, it should be noted that in some cases, employees who do not take all of their vacation days can cash them in for additional income. For people who do not work or are self-employed, the number of available vacation days is not expected to be as binding a constraint as for salaried employees. However, people who are self-employed and enjoy high earnings have a high alternative cost for a day of vacation which makes their vacation more expensive than their lower-earning counterparts. Our findings hold true for the whole sample: however, if we could distinguish between the households according to their limit of vacation days, we could safely assume that the more binding the constraint of number of vacation days, the more likely the households would be to increase their expenditure on quality rather than quantity. Such households would include those that have a very small number of vacation days or have already used most of them.

We also find, in agreement with many others, that the important variables determining the decision to take a vacation are high socioeconomic level as reflected by income, assets and education level. These have a positive effect on the probability of taking a vacation. This means that on the macro level, as an economy grows rapidly, so will the number of households entering the tourism market. Another finding is that households with a female head or a large number of children are less likely to take vacations than other households. This reflects the fact that a vacation for a large household is more expensive than for a small one. However, it can also serve as a signal to destination managers that there is a potential market with special needs that is currently not being catered to and adjustments could be made to attract these households.

As a follow-up to this study, it would be interesting to determine whether these trends are intrinsic to Israeli vacationers or are more universal. Another complementary study might consider the limit of vacation days explicitly in the analysis, which would enable distinguishing between subsamples with and without limits to see how this affects their demand for vacations.

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