AGRICULTURAL ECONOMICS

Agricultural Economics 42 (2011) 141–152

Willingness to pay for brands: a cross-region, cross-category analysis

Yanhong H. Jin[a,*], David Zilberman[b], Amir Heiman[c], Ying Li[d]

[a]*Department of Agricultural, Food and Resource Economics, Rutgers University, New Brunswick, NJ 08901, USA*
[b]*Department of Agricultural and Resource Economics, University of California, Berkeley, and Giannini Foundation of Agricultural Economics, Berkeley, CA 94720, USA*
[c]*Department of Agricultural Economics and Management, Hebrew University, Israel*
[d]*Department of Information and Operations Management, Texas A&M University, College Station, TX 77843, USA*

Received 17 November 2008; received in revised form 23 April 2010; accepted 23 April 2010

Abstract

Using survey data collected in multiple locations (California and Texas in the United States and Revohot in Israel), we quantify category- and location-specific variations of consumers' willingness to pay (WTP) for brand products after controlling for consumer characteristics. We find that consumers have a similar qualitative assessment of brand value in different product categories across different locations. That is, consumers have a stronger preference and higher WTP for brands in consumer electronics, followed by clothing and then processed food, and the lowest in fresh produce. Furthermore, we simulate price premiums and market shares of brands relative to generic products in different categories. Simulation results suggest that brands in fresh produce have the highest price premium but lowest market share. Despite the similarities, the magnitude of WTP for brands as well as the simulated price premium and the corresponding market share in the same product category are location variant. The similarities and dissimilarities suggest validity of having global brand strategies adapted to local conditions, that is, the so-called "thinking globally and acting locally" strategy.

JEL classifications: D12, M31, Q13

Keywords: Brands; Willingness to pay; Regional differences; Price premium; Maximum entropy

1. Introduction

Brands are signals that provide information about the products and sometimes about the buyers. Brand equity is the additional value relative to generic products (Aaker, 1991; Keller, 1993). Strong brands command great price premiums (Agrawal, 1996; Park and Srinivasan, 1994; Sethuraman, 1996), lower price elasticity (Sivakumar and Raj, 1997), strengthen consumer response to advertisement (Hsu and Liu, 2000), induce better consumer judgment of product attributes (Biehal and Chakravarti, 1983), and facilitate growth and expansion into other product categories (Hoeffler and Keller, 2003). Brands are not born but made—establishment of a brand requires a significant investment and continuous nurturing. Firms value knowledge of the driving factors that contribute to the variations in willingness to pay (WTP) for brand products. Identifying such factors and quantifying their contributions become even harder in a context of cross-cultural and global branding and/or brand leverage across categories. The cross-cultural analysis helps brand managers to choose the optimal degree of localization of branding and marketing communications in a global era (Grewal and Levy, 2007; Keller and Lehmann, 2006). The cross-category analysis helps brand managers leverage brand equity across categories (Aaker and Keller, 1990; Manchanda et al., 2000). It is not surprising that these two types of analyses are listed among future research priorities in the branding literature (Grewal and Levy, 2007; Keller and Lehmann, 2006).

Utilizing survey data collected in three locations, we explore similarities and dissimilarities of consumers' brand preferences across product categories and locations. Four product categories were selected—electronics, clothing, processed food, and fresh fruits and vegetables. These four product categories cover the

*Corresponding author. Tel.: +1-932-932-9155 (ext. 221); fax: +1-732-932-8887.
E-mail address: yjin@aesop.rutgers.edu (Y.H. Jin).

Data Appendix Available Online

A data appendix to replicate main results is available in the online version of this article. Please note: Wiley-Blackwell, Inc. is not responsible for the content or functionality of any supporting information supplied by the authors. Any queries (other than missing material) should be directed to the corresponding author for the article.

DOI: 10.1111/j.1574-0862.2010.00477.x

majority of shopping experience but reflect notable differences between categories such as durable, nondurable, or even perishable characteristics, as well as different technical requirements and costs of quality search. Surveys were conducted in Texas and California in the United States and Revohot, Israel. We selected these three locations for pragmatic and programmatic reasons as each of the authors lives in one of the locations. With that being said, the three locations have sufficient differences to make comparisons meaningful, yet sufficient similarities to allow identifying basic patterns of WTP for brands. All three locations are college towns in technologically advanced regions with moderate to warm climate; yet, they differ in many aspects. Revohot is relatively poor and more import dependent on electronics and clothing. The marketing networks are different between the United States and Israel—the food supply chain in Israel is characterized by various small- or medium-sized specialized stores, while the United States has major grocery stores mixed with few local markets.

We find that the overall ordering of the WTP for brands in the different product categories is the same across locations, with the highest WTP in consumer electronics, followed by clothing and then processed food, and the lowest in fresh produce. Yet, there are differences in the size of the WTP for brands in each product category across locations. These findings suggest validity of having global brand strategies adapted to local conditions, that is, the so-called "thinking globally and acting locally" strategy (Kamakura and Kang, 2006).

2. The value of brands to consumers

The literature on hedonic pricing suggests that the prices of a good may be decomposed to account for the value provided by its attributes (Becker, 1965; Lancaster, 1966; Muth, 1966; Rosen, 1974). We denote the extra WTP for a branded product compared to a generic product by ΔV. Studies suggest that brand products are more valuable because consumers associate them with better quality (Erdem et al., 2004), design/appearance (Holbrook, 1992; Vranešević and Stančec, 2003), and prestige (Aaker and Joachimsthaler, 2002; Wang et al., 2004). Jin et al. (2008) suggest a linear decomposition of the WTP for a brand product relative to a generic product (ΔV) into the gains in the extra quality (ΔV^Q), better design (ΔV^D), and extra prestige (ΔV^P) associated with brands:

$$\Delta V = \Delta V^Q + \Delta V^D + \Delta V^P. \tag{1}$$

To account for differences in value between product categories, we will compare the relative extra WTP for brands:

$$\Delta v = \frac{\Delta V}{V} = \Delta v^Q + \Delta v^D + \Delta v^P, \tag{2}$$

where V is the WTP for the generic product, and $\Delta v^m = \Delta \frac{V^m}{V}$ is the relative WTP for the extra quality ($m = Q$), better design ($m = D$), or extra prestige ($m = P$) of brands.

By its nature, product purchase is a risky choice. To reduce the uncertainty faced by the potential buyer, retailers offer prepurchase demonstrations and sampling (Heiman and Muller, 1996; Heiman et al., 2001), warranties (Boulding and Kirmani, 1993), return policies such as money-back guarantees (MBGs) (Heiman et al., 2001, 2002), and other marketing strategies. However, these efforts do not completely eliminate the risk of buying, and the suitability of these marketing tools varies across countries (e.g., MBGs are not developed in Israel). Branding is a ubiquitous marketing tool globally. Brands are signals that reflect the cumulative effects of past marketing strategies and activities (Erdem and Swait, 2004) and embody reputational information (Herbig and Milewicz, 1993).

Brands are signals that convey quality information such as reliability and durability. They are especially valuable in providing information about quality of experienced goods when *ex ante* learning is limited. Caves and Greene (1996) state that the value of brands as a quality signal is greater for durables because buyers cannot frequently adjust purchasing behavior. Since electronics and clothing are durable products, but processed and fresh foods are consumables, we expect that brands are more important quality signals for electronics and clothing. The value of brands also varies across product categories as transaction costs of quality search differ between product categories. To a great extent customers cannot visually examine the quality of electronics, as the majority of consumers do not have technical expertise to make quality judgment. In the case of clothing, even though buyers can try them on, the satisfaction of the purchase depends on how the particular item of clothing fits the rest of the shopper's wardrobe and the comments from families and friends. Even though processed food lacks a sensory quality assessment, the costs associated with experiencing processed food through purchase and consumption are certainly lower and more immediate than one would expect with electronics and clothing. Brands are likely to be less valuable in fresh produce compared with other categories, as buyers can engage in a sensory assessment of fresh products by seeing, touching, or even sampling these products.

Improved product design and more attractive appearance are used to attain a competitive edge by incumbent brands over generic products. Design and appearance are major attributes of brands of fashion products (Moore et al., 2000). Holbrook (1992) suggests that electronic brands gain when their products are differentiated by their external design. Vranešević and Stančec (2003) suggest that food brands gain from a better appearance and/or packaging. Brands in electronics and clothing have a higher extra value for design or appearance benefit compared with food brands.

Consumers use brand products to create and communicate their self-images/concepts (Aaker, 1997; Chaplin and John, 2005). Auty and Elliot (1999) find that fashion brands affect the self-image of buyers, and Holbrook (1992) argues that image effects contribute to the value of brands in electronics to the extent that consumption is seen by others. The literature leads us to conclude that brands of clothing provide the most prestige, as it has the most exposure to other people, followed by electronic gadgets. Consumers may belong to a certain community when they buy organic food or fair-trade food items, but the prestige impacts in food brands are likely to be much lower than for clothing or electronics.

The above discussion on the value of brands across different product categories in three dimensions—quality, design/appearance, and prestige—leads us to conjecture hypothesis 1 on the differentiated values of brands to consumers across product categories and locations.

H1: *The qualitative ranking of WTP for brands in different product categories is the same in the three regions—consumers have the highest WTP for brands of electronics and clothing, followed by processed food, and the lowest WTP in fresh produce.*

However, despite the possible regional-invariant order of WTP for brands across product categories that is projected in hypothesis 1, the size of WTP for brands in each product category is likely to be regional-specific as socioeconomic and cultural conditions as well as consumer characteristics vary across regions. Hoch et al. (1995) find that consumer demographic characteristics dominate competitive characteristics in influencing price responsiveness after analyzing store-level scanner data for 18 product categories in 83 supermarket locations. In the case of cultural differences, some studies argue that location-specific cultural differences have minimal or no impact on consumer behavior (Dawar and Parker, 1994), while others believe that cultural differences actually exist and may be increasing (Ackerman and Tellis, 2001). We consider how quality, prestige, and design concerns about the products vary across locations and cultural groups and, therefore, contributing to the regional differences of the WTP for brands.

The WTP for brands because of quality concerns increases: (i) in locations where products are more expensive (because of transportation costs, lack of competition, or tariffs) and product support is weaker; (ii) among populations whose ability to bear risks is lower, which is likely to be in locations with lower income (since there is significant evidence supporting Arrow's hypothesis that absolute risk aversion declines with wealth); (iii) among populations who lack education, skills, experience, or product knowledge to assess product quality; and (iv) among population whose time is constrained or too valuable to intensively engage in pre-purchase product quality assessments.

The WTP for brands associated with better design and appearance increases: (i) among high-income consumers who can pay for the marginal benefits of improved design; and (ii) among individuals who use the product in extreme conditions where design matters. Better design and improved appearance are what economists call luxury goods where demand is increasing in income. Indeed high-income individuals are the buyers of the high-end electronic goods such as Bang and Olufsen, known for their superior design and high price. The best-designed electronics are required by professional musicians and scientists; the best-designed items of clothing are, for example, worn by mountain climbers, performers, etc.

The WTP for brands associated with higher prestige increases: (i) among populations of lower social status such as minorities (Deshpande et al., 1986) or less-educated individuals (Fussell, 1983); and (ii) among individuals who seek social identity and prestige (Wang et al., 2004). Owning famous brands is often regarded as a symbol of being assimilated into the new society by new immigrants (Amit, 2007). Teenagers or young adults may be willing to pay extra for brands of clothing and/or electronics to conform to or establish identity (Chaplin and John, 2005).

Based on the discussion of consumers' characteristics that affect the WTP for brands from the perspective of quality, appearance/design, and prestige, we examine below regional differences of WTP. Since Israel is relatively poor compared with the United States, Israelis are likely to have relatively low WTP for brands in general. All three locations are advanced technologically. Relative to the national average, both Texas and California have a much larger high-tech share of the overall GDP and high-tech manufacturing employment ratio (Milken Institute, 2010). Israel has the highest percentage of engineers with 135 per 10,000 persons, as compared to 85 in the United States (Israel MOFA, 2008). Avnimelech and Teubal (2004) point out that the share of high-tech products in the manufacturing industry, as well as the share of information and communication technologies in business sectors in Israel, is among the world's highest level. However, the majority of electronics in Israel are imported from other countries and subject to a 15% purchase tax in addition to a 15.5% value-added tax, which results in approximately 20% more in prices of electronics in Tel Aviv, Israel, than in New York (Avivit, 2006). Product support such as warranties, replacement, and return policies in Israel is not as good as those in the United States even if it is available. Thus, a higher risk aversion relating to a lower income and higher cost of failure may lead to a higher WTP for electronic brands in Israel than in the United States. In the case of fresh produce, prices of fresh produce in Israel are almost half of that in the United States. Almost all the produce are locally grown and stay fresh by having a 1- to 3-day supply in chain stores. Israelis feel comfortable tasting, in addition to seeing, touching, and smelling fresh produce. Therefore, the low price and comfortable *ex ante* learning environment for fresh produce may reduce the value of brands to consumers in Israel. We expect that consumers in Israel are willing to pay significantly less for brands of fresh produce than consumers in the United States. The above discussions suggest the following hypothesis.

H2: *The size of WTP for brands is regional specific. Consumers in the United States have a higher WTP for brands than Israelis in general, but Israelis may have a higher WTP for consumer electronic brands.*

3. Survey

The literature does not reach definite conclusions about the value of brands to consumers and factors that account for the variations in the WTP for brands. The majority of previous studies use actual brand purchase data and, hence, they need control for confounding factors such as marketing mix and competition within and across categories and stores. By explicitly asking respondents their WTP for brands across different product categories in different locations, we are able to isolate these confounding factors and identify and quantify variations of WTP for brands across product categories, locations, and socioeconomic groups.

Sekaran (1983) identifies two primary ways to achieve sample comparability: drawing nationally representative samples or selecting matched samples on the basis of some set of characteristics of interest.[1] Budgetary constraints prevent nationally representative sampling, but research grants allow us to conduct similar surveys at college towns in different locations, including Rehovot, Israel; Bryan/College Station, Texas; and Berkeley, California. The differences between the three survey sites allow us to identify the impacts of various factors on WTP for brands across products and locations.

In each location, we conducted face-to-face interviews at the top grocery stores in fall 2006. For example, the Texas survey was conducted at one HEB store, two Albertson stores, one Wal-Mart Supercenter, and one local grocery store in College Station and Bryan, Texas. No payment was made to the respondents for their participation to avoid a possible endowment effect. In each location, surveys were conducted at different times of a day and different days of a week. In each site visit, random "next to pass" shoppers were approached to fill out the questionnaire. The respondents were asked to report demographic information and to answer questions pertaining to their preference and WTP for brands relative to generic products in four categories (electronics, clothing, processed food, and fresh produce).

We conducted open-ended surveys in Texas and Israel, while California respondents were asked to choose a WTP range. In the open-ended survey, we did not assign prior value and ask people to make dichotomous choices using the procedure developed by Hanemann et al. (1991) because we did not have a good prior of the range of WTP for brands, and the respondents have intuitive assessment of their WTP and express their preference more freely. This is consistent with the findings of Geer (1991) and the literature review on survey research by Krosnick (1999).

A total of 499 usable observations were collected, including 298 in Texas, 91 in California, and 110 in Israel. As shown in Table 1, the usable samples fairly represent the population of the study areas based on the demographic information. Obviously, the sample is affected by who collected the data and where the collection was done. For example, because the data were collected by a Chinese–Canadian student in Texas, the percentage of Asian respondents is higher than otherwise. Similarly, the percentage with college education is higher than the U.S. Census Bureau data for the overall population because the Census Bureau does not account for students.

[1] The term "match" does not mean that the sample elements are matched pairwise. Instead, it suggests that samples are similar in certain attributes pertaining to the research questions. We thank an anonymous referee for this clarification.

4. Empirical analyses and discussions

4.1. Clinical analysis of WTP between product categories and locations

The respondents were asked to report their brand preference on a 10-point Likert scale from 0 (do not buy brands at all) to 10 (always buy brands). Individuals with a brand preference ranking of eight and above are considered to have a strong brand preference. As shown in Table 2, the respondents have a qualitatively similar brand preference pattern between locations—more than half exhibit a strong brand preference for electronics, but much fewer in clothing, and least for food. A higher share of Texan and Californian respondents reported to have a strong brand preference than of Israelis in all product categories.

The respondents were asked to report their WTP for brands in each product category in the Texas and Israel surveys, or to choose a WTP range among six intervals (0–20%, 20–40%, 40–60%, 60–80%, 80–100%, and at least 100%) in the California survey. To compare WTP between three locations, we transform categorical WTP data collected in the California survey into a continuous variable. We apply Wu and Perloff's (2007) maximum entropy-density method to estimate an empirical probability density function of WTP for brands. In particular, we use a flexible functional form that nests many commonly used distributions,

$$f\left(W_{ik}^{*}\right) = \exp\left(-\sum_{m=0}^{M} \lambda_m \left(W_{ik}^{*}\right)^{m}\right), \tag{3}$$

where W_{ik}^{*} is the underlying WTP of California consumer i for a brand product in category $k \in \{e, c, p, f\}$ that is unobservable to researchers, λ_m's are parameters to be estimated, and $m = 0, 1, \ldots M$ are polynomial orders. Fig. 1 shows that the estimated density function matches well with the actual histogram for each product category.

Since WTP for brands is highly skewed (the skewness ranges from 1.6 to 2.9), the traditional Student's t-test for equal mean is not appropriate as it is highly sensitive to the normality assumptions. The nonparametric Wilcoxon-Mann-Whitney equal mean tests are undertaken to compare WTP for brands between categories and locations. The comparison results reported in Table 3 yield the findings below.

Similarities of WTP across locations. The rank of WTP for brands across product categories is qualitatively the same in

Table 1
Sample representativeness[a]

	Texas, U.S.		California, U.S.		Revohot, Israel	
	Census	Survey	Census	Survey	Census	Survey
Gender: male (%)	50.98	56.58	49.43	41.57	50.63	54.55
Income per capita ($)	18,707	25,221	30,632	18,631	20,357	16,290
Household size	2.39	2.40	2.76	3.57	3.74	2.86
Age distribution among those who are at least 20 years old but younger than 85[b]						
20–24	31.54	24.56	9.16	65.17	28.3	30.00
25–34	20.53	29.54	19.26	14.61	15.2	50.73
35–44	15.04	11.74	22.87	7.87	11.7	7.27
45–54	14.18	16.01	21.11	4.49	10.8	5.45
55–59	5.64	4.98	8.56	1.12	7.9	2.73
60–84	13.07	13.17	19.04	6.74	9.9	1.82
Race:						
White (%)	60.16	65.10	37.19	49.45		
Black or African-American (%)	10.64	5.70	12.75	0.00		
Asian (%)	4.96	22.15	25.15	37.36		
Hispanic (%)	20.88	5.03	21.44	4.40		
Others (%)	1.46	2.01	3.48	8.79		
Education among 25+-year-olds						
High school and above (%)	85.80	100	85.30	100	58.00[c]	100
Bachelor and above (%)	36.90	85.38	28.60	64.52	39.60[c]	71.43

Note: [a]County-level census data for California (Alameda County) and Texas (Brazos County) are from the 2006 American Community Survey Data of the U.S. Census Bureau at http://factfinder.census.gov/servlet/ADPGeoSearchByListServlet?ds_name=ACS_2006_EST_G00_&_lang=en&_ts=281019611236. Israeli 2005 census data are available at http://he.wikipedia.org/wikiישראל_דמוגרפיה_של2005_census_data.

[b]The American Community Survey Data report age brackets of population who are younger than 20 and older than 84. The survey subjects are at least 18 years old who meet the IRB (Institutional Review Board) requirements for this study. Thus, we report the age distribution among those who are at least 20 years old but younger than 85 for both the survey and census data. The Israeli census data are slightly different in age distribution. The first age group that is relevant to our study is 15–24.

[c]School education in Israeli census data is measured by percentages of individuals with (i) 5–12 years of schooling; (ii) 12–15 years of schooling; and (iii) 16 years and up of schooling. We use the percent of individuals with 16 years and up of schooling for "Bachelor and above." The Israel census also reports percent of individuals who have completed their matriculation examination, that is, finished high school, which is used for "high school and above."

Table 2
Percent of respondents with a strong brand preference

Product category	Texas, U.S.	California, U.S.	Revohot, Israel
Electronics	65.10	63.74	52.73
Clothing	30.54	38.46	28.18
Processed food	22.48	16.48	19.09
Fresh produce	27.52	10.99	10.00

three locations: consumers have the highest WTP for electronics brands, followed by clothing then processed food, and the lowest in fresh produce. In each location, the WTP for brands between categories is significantly different with the exception of electronic brands. The respondents in California have a higher WTP for electronics than clothing, but the difference is not statistically significant (P-value $= 0.54$ for the equal mean WTP test). In each location, the WTP for brands of electronics and clothing is statistically higher than that for food brands.

Dissimilarities of WTP across locations. The magnitudes of the average WTP in the same product category are different across locations. In general, U.S. consumers have a higher WTP for brands in all product categories than those in Israel with the exception that Israelis have a higher WTP for electronic brands than Texas. Specifically, the average WTP for electronics brands is statistically higher in California than in Texas and Israel. Israeli consumers have a statistically lower WTP for brands in fresh produce, but the difference of the WTP between California and Texas is not statistically significant. The average WTP for brands in processed foods is the highest in California, followed by Texas, and the lowest in Israel. The regional differences of the mean WTP in processed foods are statistically significant.

The results on similarities and dissimilarities of WTP for brands across product categories and locations support hypothesis 1. Since consumers' idiosyncratic characteristics will also affect WTP for brands, we employ econometric analysis to investigate whether these similarities and dissimilarities are still present and/or some new findings emerge after controlling for the relevant sociodemographic variations.

4.2. *Econometric analysis of WTP between product categories and locations*

Pooling survey data collected in multiple locations will lose some explanatory information. For example, race will be excluded in the pooled estimation since the Israeli survey did not ask the respondents to report their race. Even if asked, race information is not comparable between the United States and Israel. Therefore, we first conduct a separate estimation

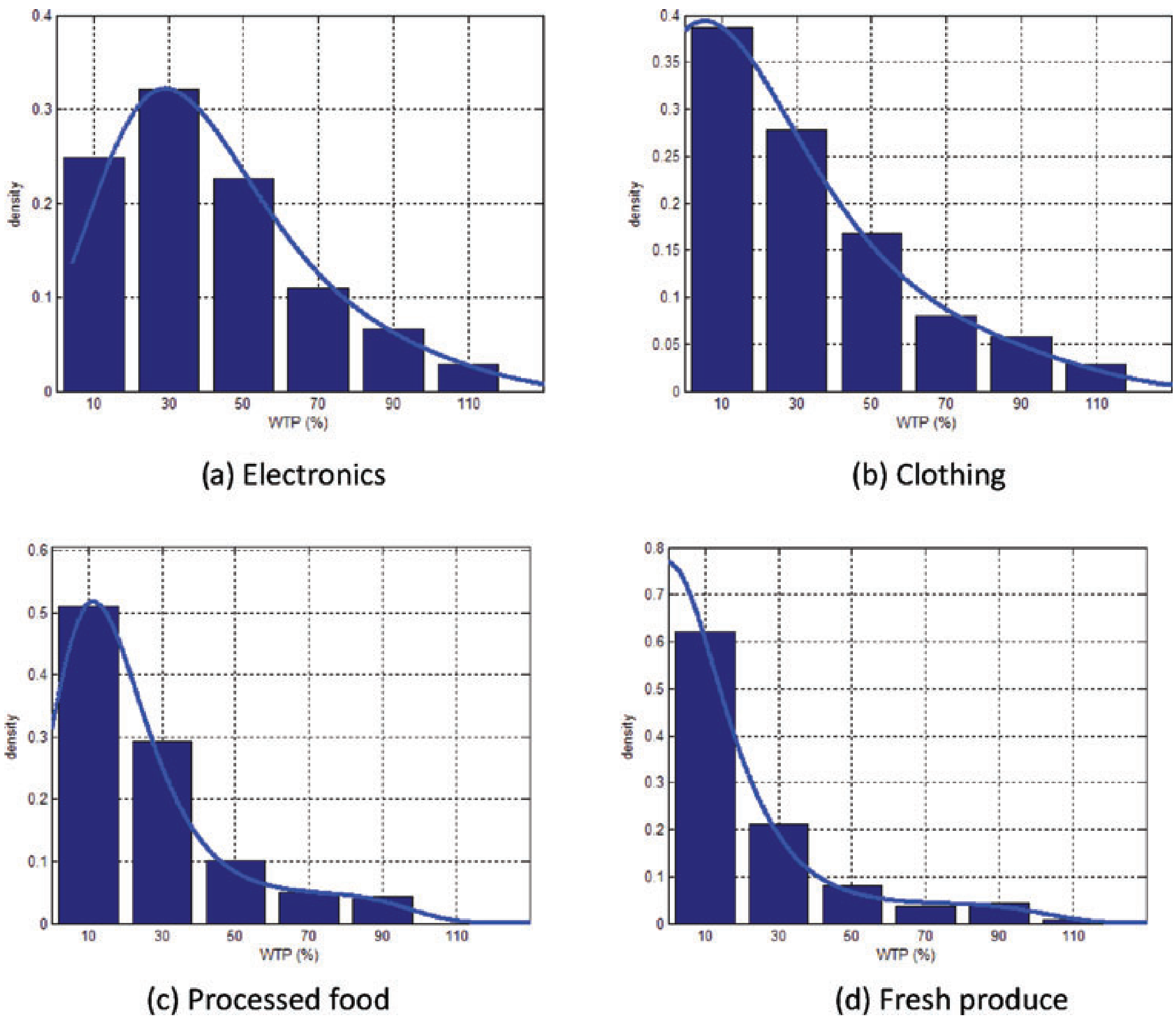

Fig. 1. Estimated density and actual histogram of WTP for brand products of each product category (California).

using the survey data collected in each location to test for the variations of WTP across consumers and product categories, and then use the pooled survey data to test for regional differences of WTP.

The dependent variable is the stated WTP for brands. We assume the WTP of consumer *i* in region $j \in \{T, C, S\}$ for brands in product category $k \in \{e, c, p, f\}$ is a linear function of individual characteristics represented by $\mathbf{Z_i^j}$, category-specific attributes measured by category dummies $\mathbf{IP_k}$, and region dummies $\mathbf{R^j}$. We also incorporate the interaction term of dummies for product categories and regions, $\mathbf{IP_{ik}^j} \otimes \mathbf{R^j}$, to further explore the variations of WTP attributed by product categories and locations. Formally, the stated WTP for brands in product category *k* of consumer *i* in region *j* is

$$W_{ik}^j = \boldsymbol{\beta}^{\mathbf{j}}\,\mathbf{Z_{ik}^j} + \boldsymbol{\gamma}^{\mathbf{j}}\,\mathbf{IP_{ik}^j} + \boldsymbol{\varsigma}^{\mathbf{j}}\,\mathbf{R^j} + \boldsymbol{\delta}^{\mathbf{j}}\,\mathbf{IP_{ik}^j} \otimes \mathbf{R^j} + \boldsymbol{\varepsilon}_{ik}^j + \mu_i^j, \quad (4)$$

where $\boldsymbol{\beta}^{\mathbf{j}}$, $\boldsymbol{\gamma}^{\mathbf{j}}$, $\boldsymbol{\varsigma}^{\mathbf{j}}$, and $\boldsymbol{\delta}^{\mathbf{j}}$ are vectors of the associated coefficients, ε_{ik}^j depicts idiosyncratic disturbances, and μ_i^j is the individual-specific residual reflecting individual heterogeneity. We include the following demographic characteristics in Z_{ik}^j: age and its quadratic term, education where *edu* equals one if the respondent has a Bachelor's degree or above and zero otherwise, gender, household size, and income measures.

In the separate estimation for each location, we use the income per household member in thousand dollars denoted by INC_i^j for consumer *i* in region *j* and its squared terms. Since INC_i^j is not comparable across locations because of purchase power disparities, we use the income percentile measures in the pooled estimation. We denote the corresponding dummy variables by $DINC_i^j$, where $DINC_{ij}^l = 1$ if the income of an individual *i* falls into the percentile *j* given the income distribution in location *j* and zero otherwise. In particular, we use the first and fourth quartiles and those between the 25th and 75th percentile.

We conduct the Breusch and Pagan Lagrangian multiplier test for random effects (Breusch and Pagan, 1980). A

Table 3
WTP for brands: Summary statistics and regional- and category-invariant differences

Average WTP for brands relative to generic products (%)	Texas, U.S.	California, U.S.[a]	Revohot, Israel
Electronics	31.39	41.39	33.49
	[24.36]	[27.91]	[26.01]
Clothing	28.71	35.06	27.14
	[38.48]	[29.00]	[26.52]
Processed food	22.44	26.56	18.35
	[23.56]	[22.02]	[22.79]
Fresh produce	21.61	22.26	10.72
	[25.74]	[23.29]	[22.33]
Tests for equal mean WTP between product categories			
Electronics versus clothing	2.58***	6.33***	6.35**
	(16.68)	(16.75)	(6.16)
Clothing versus processed food	6.27**	8.50	8.79***
	(5.89)	(0.38)	(8.20)
Processed food versus fresh produce	0.83*	4.30***	7.63***
	(3.04)	(32.81)	(16.91)
Tests for equal mean WTP between survey locations	California versus Texas	California versus Israel	Texas versus Israel
Electronics	10.00***	7.90	−2.10
	(9.05)	(1.91)	(0.71)
Clothing	6.25	7.92	1.67
	(1.80)	(1.53)	(0.01)
Processed food	4.12***	8.21***	4.09**
	(18.22)	(23.74)	(4.87)
Fresh produce	0.65	11.54***	10.89***
	(0.50)	(40.03)	(38.08)

Note: Figures inside the brackets are standard deviations of WTP, while figures inside the parentheses are statistics of nonparametric Wilcoxon-Mann-Whitney tests for the equal mean WTP either between product categories (in the middle part of the table) or between locations.
*, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.
[a]The respondents in the California survey were asked to choose a WTP range that best describes their maximum WTP for brands among six intervals (0–20%, 20–40%, 40–60%, 60–80%, 80–100%, and at least 100% more relative to generic products). We adopt Wu and Perloff's (2007) maximum entropy density method based on the reported interval frequency to estimate the underlying distribution of WTP and use the interval mean for WTP.

rejection of the null hypothesis $VAR(\mu_i^j) = 0$ suggests that the random-effects model is statistically more appropriate than the fixed-effects model for region *j*. The chi-square test statistic for the null hypothesis $VAR(\mu_i^j) = 0$ with one degree of freedom is $\chi_T^2(1) = 237$ (*P*-value = 0.00) for the Texas estimation, $\chi_C^2(1) = 96$ (*P*-value = 0.00) for the California estimation, and $\chi_I^2(1) = 154$ (*P*-value = 0.00) for the Israeli estimation. Similarly, we reject the null hypothesis for $VAR(\mu_i^j) = 0$ for the pooled estimation, where $\chi^2(1) = 572$ with a zero *P*-value. Therefore, a random-effects model is more appropriate than the fixed-effects model in all four estimations.[2]

The estimation results in Table 4 show that the WTP for brands is likely to be higher among individuals who are less educated and those who are nonwhites. The conjecture that individuals from smaller households will likely have a higher WTP is supported by the estimation based on the Texas survey data but not in the other estimations. Table 4 also shows that the WTP for brands depicts age dependence in the estimation of the Texas and Israeli surveys but not in the California survey. In particular, age decreases the WTP for brands at an increasing rate. High-income consumers have a significantly higher WTP for brands as suggested by the separate estimation for the California and Israeli surveys as well as the pooled estimation. The association between high income and greater preference for brand products is consistent with previous research. Kinsey (1994) states that high income is one of the main drivers for status food products—"... the patterns of an era of conspicuous consumption which is led by the rich and the new rich and emulated by everyone else" (p. 1884S). Using a representative,

[2] We thank an anonymous referee for challenging us on false positive as a great number of parameters estimated in the model, especially in the pooled estimation. Benjamini and Hochberg (1995) argue that "... researchers tend to select the (statistically) significant one for emphasis, discussion, and support conclusions. An unguarded use of single-inference procedures results in a greatly increased false-positive (significance) rate." They proposed a practical and powerful approach to multiple testing by controlling the false discovery rate (FDR) that is widely used in the literature addressing false positive. Applying their FDR procedure into the pooled estimation, given we choose the 10% significance level for single inference, we reject the 13 null hypotheses having *P*-value less than or equal to 0.068. That is, the multiple testing by controlling the FDR suggests that these 13 variables are statistically different from zero at the 10% significance level. Similarly, we applied the FDR procedure for the separate estimation for each survey and obtain qualitatively similar results. We support the significance of the majority of the independent variables with appropriate confidence.

Table 4
Estimation results of the random-effects models

	Texas	California	Israel	Pooled
Product category dummies (base = fresh produce)				
Electronics	9.778***	19.141***	22.890***	22.773***
	(1.813)	(2.552)	(2.262)	(2.723)
Clothing	7.093***	12.799***	16.477***	16.418***
	(1.813)	(2.552)	(2.262)	(2.723)
Processed food	0.831	4.306*	7.697***	7.627***
	(1.813)	(2.552)	(2.262)	(2.723)
Region dummies (base = Israel)				
California, U.S.				7.176*
				(4.082)
Texas, U.S.				12.428***
				(3.103)
Product category dummies interacting with regional dummies				
Electronics + California				−3.632
				(4.047)
Electronics + Texas				−12.994***
				(3.186)
Clothing + California				−3.619
				(4.047)
Clothing + Texas				−9.326***
				(3.186)
Processed food + California				−3.321
				(4.047)
Processed food + Texas				−6.796**
				(3.186)
Demographic and socioeconomic variables				
Male	5.520**	−0.442	9.440**	5.382***
	(2.504)	(4.036)	(3.821)	(1.891)
Education (college +)	−9.788***	−21.024***	−4.402	−7.047***
	(3.704)	(7.774)	(4.037)	(2.443)
Age	−1.007**	1.308	3.243*	−0.754**
	(0.483)	(1.040)	(1.742)	(0.363)
Age square	0.010*	−0.009	−0.045**	0.008*
	(0.005)	(0.010)	(0.022)	(0.004)
Household size	−1.638*	0.789	0.552	−0.059
	(0.965)	(0.617)	(1.193)	(0.507)
Race (base = Whites)				
Black or African-American	21.282***	0.000		
	(5.427)	(0.000)		
Asian and Pacific islander	4.629	11.488***		
	(3.175)	(4.321)		
Hispanics or Latino	8.759	33.044***		
	(5.615)	(9.443)		
Others	−2.451	14.746*		
	(8.616)	(7.550)		
Income measures				
Income per capita	0.201	0.934**	11.311**	
	(0.165)	(0.454)	(5.383)	
Square of income per capita	−0.002	−0.012	−1.619	
	(0.002)	(0.008)	(1.113)	
Income percentile (base = the lowest 25th percentile)				
Income percentile (25–75%)				4.368*
				(2.536)
Income percentile (75% above)				7.232**
				(2.988)
Constant	46.325***	−22.164	−58.673**	23.239***
	(9.125)	(18.419)	(28.880)	(7.348)
Within R^2	0.04	0.20	0.27	0.11
Between R^2	0.12	0.34	0.16	0.06
Overall R^2	0.08	0.29	0.20	0.08
Number of observations	1192	364	436	1996
Number of respondents	298	91	109	499

Note: Figures in the parentheses are standard errors of the estimated coefficients adjusted for clusters. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

Table 5
WTP comparisons between product categories and locations controlling for sociodemographic variations

WTP differences between categories based on **the separate estimation** for each location			
	Texas	California	Israel
Electronics versus clothing ($\bar{W}_e^j - \bar{W}_c^j$)	2.69	6.34***	6.41***
	(2.19)[a]	(6.18)	(8.04)
Clothing versus processed food ($\bar{W}_c^j - \bar{W}_p^j$)	6.26***	8.49***	8.80***
	(11.92)	(11.08)	(15.07)
Processed food versus fresh produce ($\bar{W}_p^j - \bar{W}_f^j$)	0.83	4.30**	7.70***
	(0.21)	(2.85)	(11.58)
WTP difference between categories for each location based on the pooled estimation			
	Texas	California	Israel
Electronics versus clothing ($\bar{W}_e^j - \bar{W}_c^j$)	2.69*	6.34**	6.35***
	(2.64)	(4.49)	(5.45)
Clothing versus processed food ($\bar{W}_c^j - \bar{W}_p^j$)	6.26***	8.49***	8.79***
	(11.92)	(8.05)	(10.42)
Processed food versus fresh produce ($\bar{W}_p^j - \bar{W}_f^j$)	0.83	4.30	7.63***
	(0.25)	(2.07)	(7.85)
WTP difference between locations for each product category based on the pooled estimation			
	California versus Texas	California versus Israel	Texas versus Israel
Electronics ($\bar{W}_e^j - \bar{W}_e^s$)	4.11	3.54	−0.57
	(0.75)	(0.75)	(0.03)
Clothing ($\bar{W}_c^j - \bar{W}_c^s$)	0.45	3.56	3.10
	(0.01)	(0.76)	(1.00)
Processed food ($\bar{W}_p^j - \bar{W}_p^s$)	−1.78	3.86	5.63**
	(0.22)	(0.89)	(3.29)
Fresh produce ($\bar{W}_f^j - \bar{W}_f^s$)	−5.25**	7.18*	12.43***
	(1.93)	(3.09)	(16.04)

Note: $\bar{W}_k^j$ denotes the average WTP for brands in product category k in region j. When comparing the regional difference of WTP, j and s refer to two specific locations. Figures inside the parentheses are test statistics for whether the WTP difference is statistically different from zero. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

nationwide sample of 900 supermarket shoppers collected in 1999, Katsaras et al. (2001) find that high income is associated with one particular shopper cluster ("Back to Nature Shopper") that values quality and selection of natural and organic products as well as quality of environmentally sensitive products much more than the other five shopper clusters.

Table 5 summarizes the regional- and category-specific differences on the WTP for brands. In particular, we compare WTP for brands between product categories based on the separate estimation for each location and the pooled estimation based on the combined data. The results reported in the top and middle parts of Table 5 suggest a same qualitative ranking of WTP for brands between product categories after controlling for demographic and socioeconomic variables. That is, the WTP for brands in electronics is the highest, followed by clothing and then by processed food, and the lowest in fresh produce. The results support hypothesis 1. Specifically, the category-specific variations of WTP for brands are statistically significant in Israel. The WTP of Israeli consumers on average is approximately 6.35% higher in electronic brands than in clothing, 8.79% higher in clothing than in processed food, and 7.63% higher in processed food than in fresh produce. In the United States, the WTP for food brands is statistically lower than that in electronics and clothing by approximately 9–10% and by 6–7%, respectively.

The regional differences of WTP for brands derived based on the pooled estimation are reported in the bottom part of Table 5. Overall, the results largely support hypothesis 2. After controlling for demographic and socioeconomic variations, we find that WTP for brands in Israel is less than in California and Texas in all product categories with the exception that WTP for electronic brands is higher in Israel than in Texas. The higher WTP for electronic brands in Israel than in Texas reflects the higher cost and risk Israelis face when it comes to imported electronic goods as we discussed earlier. However, there are only a few cases showing statistically significant regional differences. First, WTP for brands in fresh produce exhibits statistically significant regional differences, with the highest WTP in Texas, followed by California (7.18% less than in Texas), and the lowest in Israel (5.25% less than in California). Second, in the case of processed food, Texas consumers are willing to pay approximately 5.63% more for brands than Israelis, and the difference in WTP is statistically significant. The regional difference of WTP for brands in electronics and clothing is not statistically significant.

5. Simulating brand premium and market share

The empirical analyses above show that WTP for brands varies by product categories and regions. The questions to retailers and brand managers are: Are the optimal price premiums of brands different between product categories and locations? If so, by how much?

We assume consumers are heterogeneous by their WTP for brands. The empirical density function of WTP for brands of product category k in region j is denoted by $\hat{f}(W_{ik}^{j})$, where $\int_{\bar{W}_k^j}^{\underline{W}_k^j} \hat{f}(s)\,ds = 1$, and $\bar{W}_k^j$ and $\underline{W}_k^j$ are the upper and lower bounds of W_{ik}^{j}, respectively. We assume a monopolistic competitive market in a sense that brands are substitutes for generic products. A firm produces a brand name product with an extra marginal cost c_k^j and charges an extra percentage p_k^j relative to the generic product. An individual consumer will buy the brand if and only if $p_k^j \leq W_{ik}^{j}$. Hence, the market share of this brand is:

$$D_k^j = \int_{p_k^j}^{\bar{W}_k^j} \hat{f}(s)\,ds. \tag{5}$$

This monopolistic firm will choose the optimal premium to maximize profits,

$$\max_{p_k^j} \left(p_k^j - c_k^j\right) N^j D_k^j, \tag{6}$$

where N^j is the total number of potential consumers in region j. The optimal premium is achieved when the marginal revenue equals the marginal cost:

$$p_k^j - \frac{\int_{p_k^j}^{\bar{W}_k^j} \hat{f}(s)\,ds}{\hat{f}(p_k^j)} = c_k^j. \tag{7}$$

Equation (7) shows that a one-unit increase in price will increase the profit by p_k^j, but at a marginal loss $\frac{\int_{p_k^j}^{\bar{W}_k^j} \hat{f}(s)\,ds}{\hat{f}(p_k^j)}$ resulting from a decrease in the demand. Solving Eq. (7) yields the optimal price premium p_k^{j*}. Substituting p_k^{j*} into Eq. (4) yields the corresponding market share thereafter.

The simulation results in Table 6 show that in the three locations the optimal price premium of brands in fresh produce is higher than in electronics, clothing, and processed food; however, the market shares of fresh produce brands are much smaller. For example, when the extra marginal cost of brands is 10% more than the generic products, the brand premium of electronics is 29% with a market share of 50%, and the brand premium in fresh produce is 44% but accounts for only 17% of the market share in Texas. Similar patterns are found in the California and Israeli surveys.

Table 6
Simulated brand premium and market share

	Texas, U.S.		California, U.S.		Revohot, Israel	
	Premium	Share	Premium	Share	Premium	Share
MC = 10%						
Electronics	29.09	50.00	40.14	42.67	42.94	34.46
Clothing	37.02	30.30	41.22	32.08	34.45	37.38
Processed food	39.02	22.90	32.89	26.81	35.70	21.02
Fresh produce	43.62	17.35	41.82	15.94	79.10	5.05
MC = 20%						
Electronics	38.82	29.54	47.94	32.58	50.34	29.05
Clothing	48.46	20.03	50.26	23.90	40.34	28.58
Processed food	48.62	15.76	50.62	13.81	43.54	15.29
Fresh produce	58.50	11.53	56.58	10.45	85.34	4.60

Table 6 also shows regional differences of the brand premiums and the corresponding market shares. First, the price premium of fresh produce brands is much higher, but the market share is much lower in Israel than in the United States. For example, when marginal cost is 10% more to produce brands of fresh produce than the generic products, the price premium is almost doubled in Israel (79% in Israel vs. 44% in Texas and 42% in California), but the market share is less than half (5% in Israel vs. 17% in Texas and 16% in California). One explanation is that on average Israelis have a much lower WTP for brands of fresh produce, but a smaller group of consumers has a substantially high WTP. Second, the price premium of electronic brands is the highest in Israel, which may be induced by the lower income and weaker product support. Third, the price premium and the market share are consistent for brands in clothing and processed foods across the three locations.

6. Conclusions

In an era of globalization, consumers have a similar assessment of the value of brands of product categories across three locations, but there are still some regional differences that suggest validity of having global-brand strategies adapted to local conditions, that is, the so-called "thinking globally and acting locally" strategy. The similarities of consumers' assessment of brand value are illustrated by the location invariant ranking of the percentage of strong brand preferences, the same ranking of consumers' WTP for brands across product categories, and the simulated price premium and the corresponding market share. However, the dissimilarities across locations that are shown by the different magnitudes of WTP for brands in the same product category may reflect the socioeconomic and cultural differences.

Globally, there is a higher value in building a brand in electronics and clothing than in processed food and fresh produce. However, the relative value of an electronic brand is greater in a place like California where people are more high-tech inclined or, like Israel, with weaker product support and high prices but a lower income.

The finding that consumers have the least WTP for brands of fresh produce in all three locations is not a local phenomenon. This finding may partly explain the spare use of branding in fresh produce. For example, only 19% of fresh fruits and vegetables sold in the United States in 1997 were branded (Kaufman et al., 2000), and there is not even one brand of fresh fruits and vegetables among the 100 most valuable grocery brands in the United Kingdom (Intangible Business, 2006). The simulation results further state that brands in fresh produce have a higher price premium but much smaller market share than in other product categories. Fresh produce brands are even less valuable in Israel where people mostly buy locally grown fresh produce with a more comfortable, convenient environment to sample the product, and test for product quality. The simulated price premium and market share suggest the key for branding in fresh produce is to build up a critical consumer base among other concerns.

We have several suggestions for future research. First, this study does not consider the impact of different marketing strategies across locations and product categories due to the lack of relevant quantitative data. Understanding the regional difference in marketing strategies and their impacts on consumers', WTP for brands is an important subject. Second, this study uses stated preferences in a hypothetical setting. We are aware of the differences between stated and revealed preference in environmental studies (see meta-analyses in List and Gallet, 2001; Little and Berrens, 2004; Murphy et al., 2005). Such a gap may exist in the case of brand preference. However, because WTP for brands does not have obvious policy implications, respondents have less incentive to play strategically. Experiments and auctions can be used to identify differences between stated and revealed preferences for a specific brand rather than brands in general. Such analyses will complement the findings in this study.

Acknowledgment

Jin, Zilberman, and Heiman acknowledge the funding support from BARD (Binational Agricultural Research and Development), under the project US-4096-08. The views expressed here are those of the authors and do not necessarily represent the views of BARD.

References

Aaker, D.A., 1991. Managing brand equity. The Free Press, New York.
Aaker, D., Joachimsthaler, E., 2002. Brand leadership: The next level of the brand revolution. Simon and Shuster, London.
Aaker, D., Keller, L., 1990. Consumer evaluations of brand extensions. J. Mark. 54, 27–41.
Aaker, J.L., 1997. Dimensions of brand personality. J. Mark. Res. 34, 347–354.
Ackerman, D., Tellis, G., 2001. Can culture affect prices? A cross-cultural study of shopping and retail prices. J. Retail. 77, 57–82.
Agrawal, D., 1996. Effects of brand loyalty on advertising and trade promotions: A game theoretic analysis with empirical evidence. Mark. Sci. 15, 80–108.
Amit, H., 2007. Moscow on the bank of the Yarkon. Available at http://www.haaretz.co.il/hasite/pages/ShArtPE.jhtml?itemNo=922109&contrassID=2&subContrassID=6&sbSubContrassID=0. Accessed February 11, 2008.
Auty, S., Elliott, R., 1999. Fashion involvement, self-monitoring and the meaning of brands. J. Product and Brand Manag. 7, 109–123.
Avivit, S., 2006. New York is cheaper than Tel Aviv: Is import so expensive: Or someone is making a profit over our account." *TheMarkerService*, November 2nd, 2006. Available at http://www.themarker.com/tmc/article.jhtml?log=tag&ElementId=skira20061214_800923. Accessed on February 11, 2008.
Avnimelech,, G., Teubal, M., 2004. Venture capital start-up co-evolution and the emergence and development of Israel's new high tech cluster. Econ. Innov. New Tech. 13, 33–60.
Becker, G.S., 1965. A theory of the allocation of time. Econ. J. 75, 493–517.
Benjamini, Y., Hochberg Y., 1995. Controlling the false discovery rate: A practical and powerful approach to multiple testing. J. Roy. Stat. Soc., Ser. B (Methodological) 57, 289–300.
Biehal, G., Chakravarti, D., 1983. Information accessibility as a moderator of consumer choice. J. Consum. Res. 10, 1–14.
Boulding, W., Kirmani, A., 1993. A consumer-side experimental examination of signaling theory: Do consumers perceive warranties as signal of quality. J. Consum. Res. 20, 111–123.
Breusch, T., Pagan, A., 1980. The Lagrange multiplier test for the error components model with incomplete panels. Rev. Econ. Stud. 47, 239–253.
Caves, E.R, Greene, D.P., 1996. Brands' quality levels, prices, and advertising outlays: Empirical evidence on signals and information costs. Intl. J. Ind. Org. 14, 29–52.
Chaplin, L.N., John, D.R., 2005. The development of self-brand connections in children and adolescents. J. Consum. Res. 32, 119–129.
Dawar, N., Parker, P., 1994. Marketing universals: Consumers' use of brand name, price, physical appearance, and retailer reputation as signals of product quality. J. Mark. 58, 81–95.
Deshpande, R., Hoyer, W.D., Donthu, N., 1986. The intensity of ethnic affiliation: A study of the sociology of Hispanic consumption. J. Consum. Res. 13, 214–220.
Erdem, T., Swait, J., 2004. Brand credibility, brand consideration, and choice. J. Consum. Res. 31, 191–198.
Erdem, T., Zhao, Y., Valenzuela, A., 2004. Performance of store brands: A cross-country analysis of consumer store-brand preferences, perceptions, and risk. J. Mark. Res. 41, 86–100.
Fussell, P., 1983. Class: A guide through the American status system. Touchstone, New York.
Geer, J. G., 1991. Do open-ended questions measure "salient" issues? Pub. Opin. Q. 55, 360–370.
Grewal, D., Levy, M., 2007. Retailing research: Past, present, and future. J. Retail. 83, 447–464.
Hanemann, M., Loomis, J., Kanninen, B., 1991. Statistical efficiency of double-bounded dichotomous choice contingent valuation. Am. J. Agri. Econ. 73, 1255–1263.
Heiman, A, McWilliams, B., Zhao, J., Zilberman, D., 2002. Valuation and management of money-back guarantee options. J. Retail. 78, 193–205.
Heiman, A., McWilliams, B., Zilberman, D., 2001. Demonstrations and money-back guarantees: Market mechanisms to reduce uncertainty. J. Bus. Res. 54, 71–84.
Heiman, A., Muller, E., 1996. Using demonstration to increase new product acceptance: Controlling demonstration time. J. Mark. Res. 33, 422–430.
Herbig, P., Milewicz, J., 1993. The relationship of reputation and credibility to brand success. J. Consum. Mark. 13, 18–24.
Hoch, J.S., Kim, B.D., Montgomery, A.L., Rossi, P.E., 1995. Determinants of store-level price elasticity. J. Mark. Res. 32, 17–19.
Hoeffler, S., Keller, K.L., 2003. The marketing advantages of strong brands. J. Brand Manag. 10, 421–441.

Holbrook, B.M., 1992. Product quality, attributes, and brand name as determinants of price: The case of consumer electronics. Mark. Lett. 3, 71–83.

Hsu, J.L., Liu, G.S., 2000. Consumer perceptions of fluid milk advertising in Taiwan. Intern. J. Ad. 19, 471–486.

Intangible Business, 2006. The UK's most valuable grocery brands 2007. Available at http://www.intangiblebusiness.com/print.php?pageid=Reports&item_id=The-UKs-Most-Valuable-Grocery-Brands-2007∼941. Accessed on February 11, 2008.

Israel MOFA, 2008. The Israel high-tech industry—fifty years of excellence. Israel Ministry of Foreign Affairs. Available at http://www.mfa.gov.il/mfa/facts%20about%20israel/science%20-%20technology/the%20israel%20high-tech%20industry%20-%20fifty%20years%20of%20exc. Last accessed on April 10, 2010.

Jin, Y.H., Zilberman, D., Heiman, A., 2008. Choosing brands: Fresh produce versus other products. Am. J. Agric. Econ. 90, 463–475.

Kamakura, W.A., Kang, W., 2006. Chain-wide and store-level analysis for cross-category management. J. Retail. 83, 159–170.

Katsaras, N., Wolfson, P., Kinsey, J., Senauer, B., 2001. Data mining: A segmentation analysis of U.S. grocery shoppers. Working paper 01-01, The Retail Food Industry Center, University of Minnesota, St. Paul.

Kaufman, P., Handy, C., McLaughlin, E., Park, K., Green, G., 2000. Understanding the dynamics of produce markets: Consumption and consolidation grow. USDA/ERS AIB-758.

Keller, K.L., 1993. Conceptualizing, measuring, and managing customer-based brand equity. J. Mark. 57, 1–22.

Keller, K.L., Lehmann, D.R., 2006. Brands and branding: Research findings and future priorities. Mark. Sci. 25, 740–759.

Kinsey, J.D., 1994. Food and families' socioeconomic status. J. Nutr. 124, 1878S–1885S.

Krosnick, J.A., 1999. Survey research. Annu. Rev. Psychol. 50, 537–567.

Lancaster, K.J., 1966. A new approach to consumer theory. J. Pol. Econ. 74, 132–156.

List, J.A., Gallet, C.A., 2001. What experimental protocol influence disparities between actual and hypothetical stated values? Evidence from a meta-analysis. Env. Res. Econ. 20, 241–254.

Little, J., Berrens, R., 2004. Explaining disparities between actual and hypothetical stated values: Further investigation using meta-analysis. Econ. Bull. 3, 1–13.

Manchanda, P., Ansari, A., Gupta, S., 2000. The "shopping basket": A model for multicategory purchase incidence decisions. Mark. Sci. 18, 95–114.

Milken Institute, 2010. Manufacturing 2.0. Available for California at http://www.milkeninstitute.org/manufacturing/manufacturing.taf?page=state&state=CA and for Texas at http://www.milkeninstitute.org/manufacturing/manufacturing.taf?page=state&state=TX. Last accessed on April 14, 2010.

Moore, M.C., Fernie, J., Burt, S., 2000. Brand without boundaries: The internationalization of the designer retailer's brand. Euro. J. Mark. 34, 919–937.

Murphy, J., Allen, P.G., Stevens, T.H., Weatherhead, D., 2005. A meta-analysis of hypothetical bias in stated preference valuation. Environ. Res. Econ. 3, 313–325.

Muth, R.F., 1966. Household production and consumer demand functions. Econometrica 34, 699–708.

Park, C.S., Srinivasan, V., 1994. A survey-based method for measuring and understanding brand equity and its extendibility. J. Mark. Res. 31, 271–288.

Rosen, S., 1974. Hedonic prices and implicit markets: Product differentiation in pure competition. J. Pol. Econ. 82, 34–55.

Sethuraman, R., 1996. A model of how discounting high-priced brands affects the sales of low-priced brands. J. Mark. Res. 33, 399–409.

Sekaran, U., 1983. Methodological and theoretical issues and advancements in cross-cultural research. J. Intl. Bus. Stud. 14, 61–73.

Sivakumar, K., Raj, S.P., 1997. Quality tier competition: How price change influences brand choice and category choice. J. Mark. 61, 71–84.

Vranešević, T., Stančec, R., 2003. The effect of the brand on perceived quality of food products. Br. Food J. 105, 811–825.

Wang, C., Siu, N., Hui, A., 2004. Consumer decision-making styles on domestic and imported brand clothing. Eur. J. Mark. 38, 239–252.

Wu, X., Perloff, J., 2007. GMM estimation of maximum entropy density with interval data. J. Econom. 138, 532–546.