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It's OK – It's Organic! Hedonic Analysis of Snack Bars

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It's OK – It's Organic! Hedonic Analysis Of Snack Bars



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INTRODUCTION

Snacking has increased steadily over time, and currently accounts for roughly a quarter of daily calories for children and adults (Bleich and Wolfson, 2015; Kant and Graubard, 2015). Within this, more and more consumers are choosing organic snacks; 27% of consumers eat more organic and organic-labeled snacks than a year ago (Crawford, 2015).

This growing demand has led to increased sales and new product introductions in this category. In 2015 alone, snack bar sales in the U.S. topped \$6.8 billion. This sector is among the fastest-growing within the organic food market and currently has an annual growth rate of 14% which is second only to the meat/fish/poultry category (OTA, 2016). Moreover, the category of organic snack foods has been a leader in new product introductions among all food and beverage products. In 2015, 509 new snacks containing organic ingredients were launched in the US market, representing about 21% of snack food introductions and 3% of all new food and beverage product introductions (GNPD, 2016).

OBJECTIVE

Given its economic importance, level of consumption, and extent of innovation, the snack food category offers a particularly useful setting in which to examine the relative value consumers place on a product's organic content relative to other product attributes. **The objective of this study** is to identify and examine the price premiums applied to snacks with different levels of organic content to understand the value consumers place on these and other product attributes.

Figure 1. Snack Bars Weekly Prices by Organic Content, 2014-2015

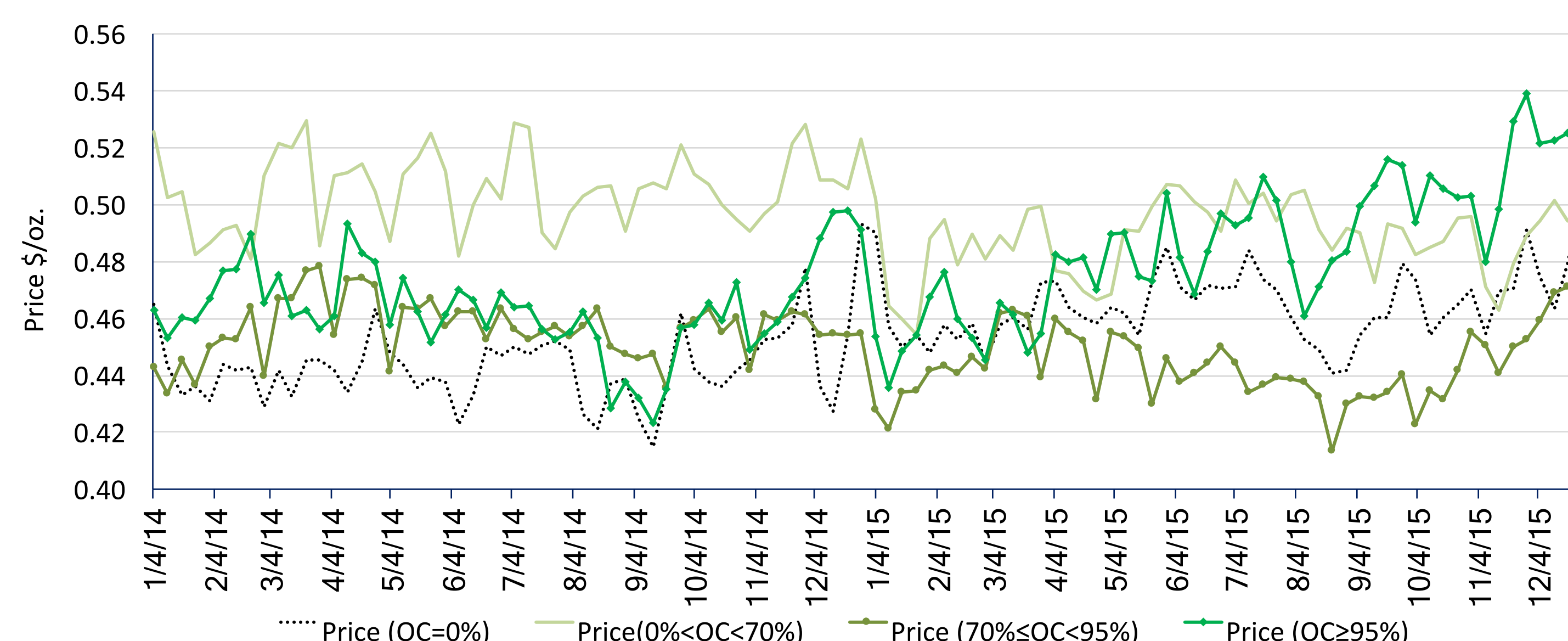
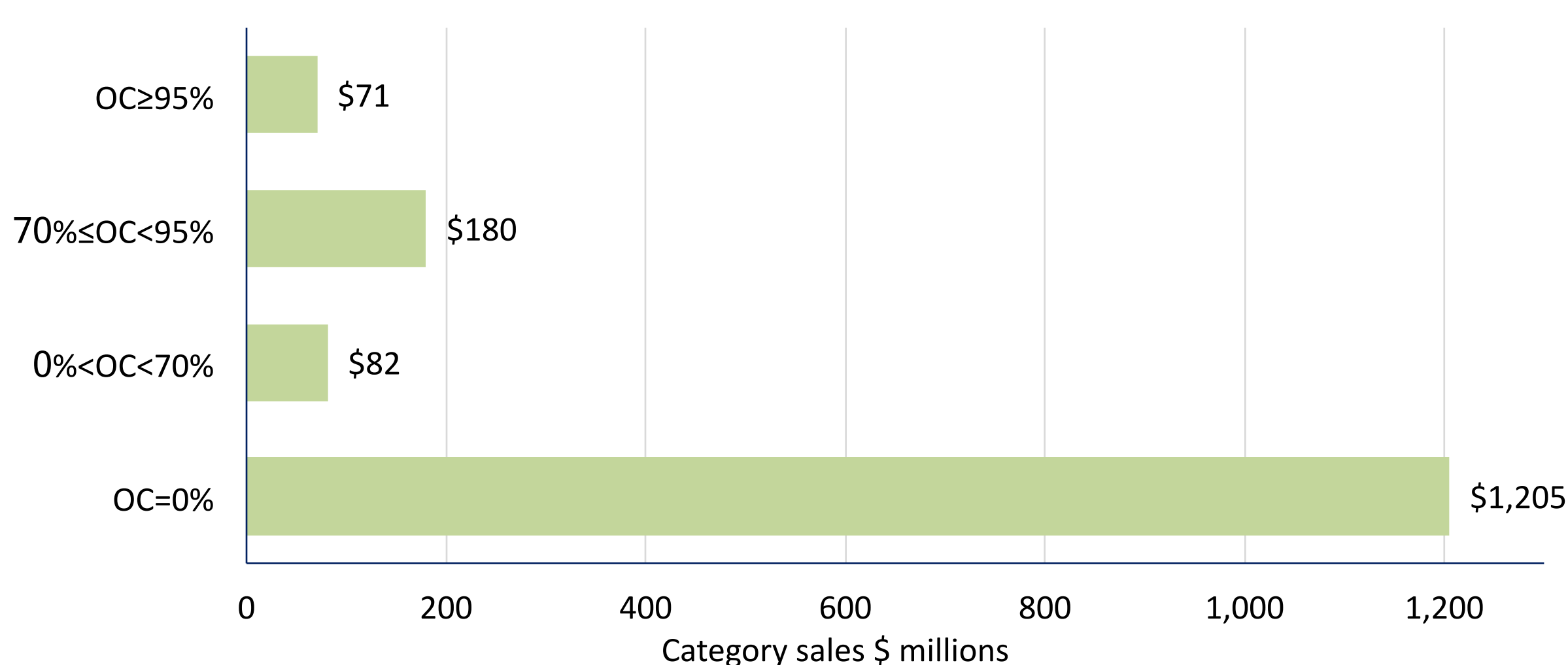


Figure 2. Snack Bars Annual Sales by Organic Content, Average 2014-2015



Note: OC stands for the percentage content of organic ingredients in a product.

Source: Nielsen Retail Scanner Dataset, Kilts Center for Marketing Data Center at The University of Chicago Booth School of Business.

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METHODS AND DATA

A linear hedonic pricing model is used to identify the premiums for organic content and other product attributes:

$$P_{ist} = \beta_0 + \beta_1 Organic_i + \beta_2 Feature_{ist} + \beta_3 Display_{ist} + \sum_{k=1}^K \beta_k Z_{ki} + \beta_4 Channel_s + \phi_i + \delta_t + \gamma_s + \varepsilon_{ist}$$

where P is the weekly average price per ounce for snack bar product i sold in store s , in week t . $Organic$ is a categorical variable indicating the percent of organic content in a product reflecting no organic content ($OC=0\%$), less than 70% organic content ($0\%<OC<70\%$), products which may be labelled “made with organic ingredients” ($70\%\leq OC<95\%$), and “Organic” products ($OC\geq 95\%$). $Feature$ and $Display$ are binary variables which denote the presence of feature advertising or in-store display during week t . The product group, bar type, and chocolate as a product attribute are represented by vector Z . $Channel$ is a categorical variable representing the type of store s , and ε denotes the error term. Brand, time (year, month), and state fixed effects are included.

The baseline version of the model considers the premium paid for (all levels of) organic content verses products which do not contain organic ingredients (conventional products). Alternative model specifications explore the premiums for different amounts of organic content. Data used in this analysis are obtained from the Nielsen Retail Scanner Data for 2014-2015. Through barcode matching, product innovation database, Mintel was used to identify the amount of organic content in each product permitting a total of 4,132 products to be included in this analysis.

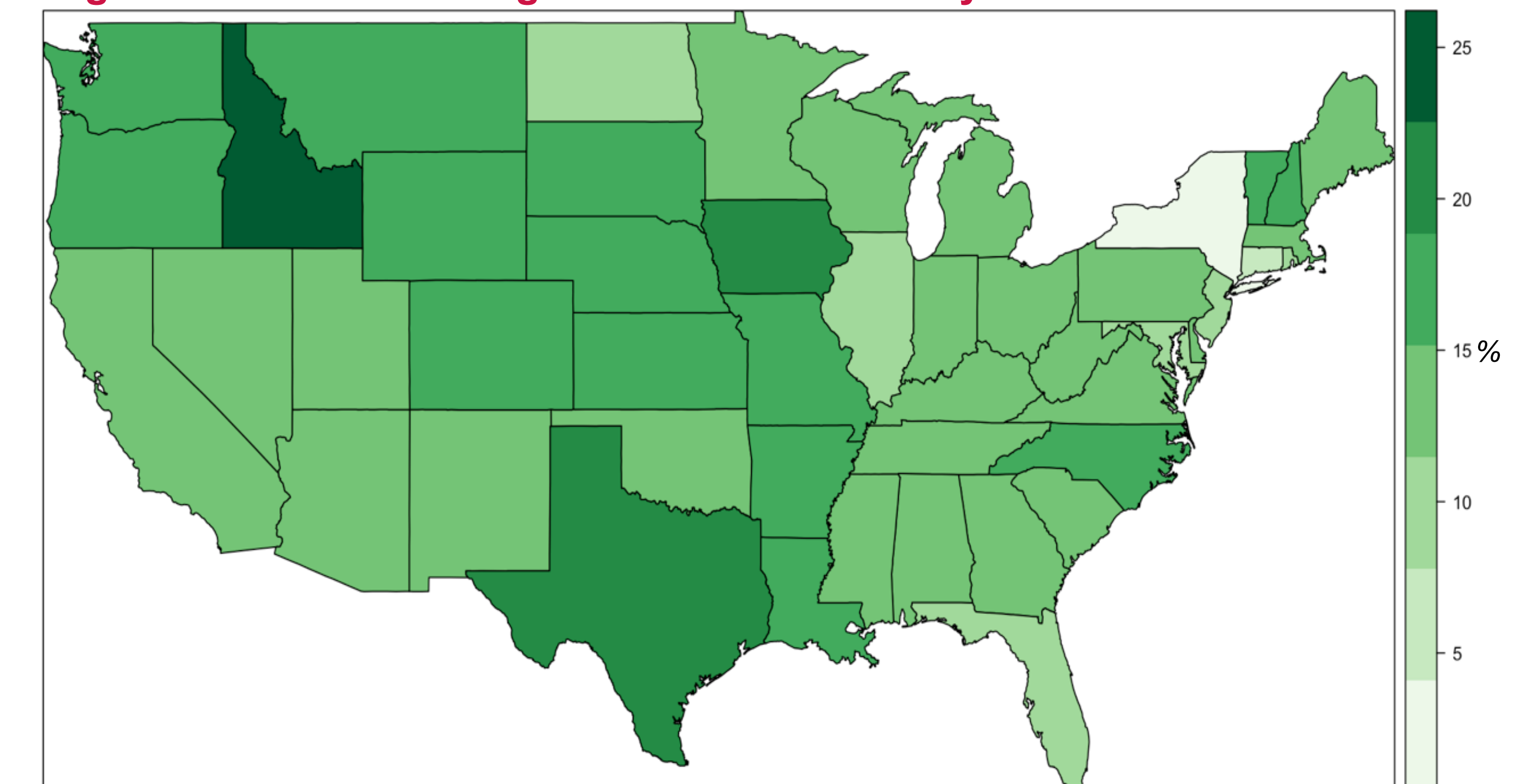
Table. Hedonic Pricing Model Estimation Results by Organic Content

Organic Baseline category	Price (\$/oz.)		
	(1) Conventional (OC=0%)	(2) Non-Organic (OC<95%)	(3) Conventional (OC=0%)
Organic content			
OC>0%	0.002***		
0%<OC<70%			0.007***
70%≤OC<95%			-0.016***
95%≤OC≤100%		0.126***	0.115***
Retailer promotional activities			
Feature	-0.067***	-0.066***	-0.067***
In-store display	-0.019***	-0.020***	-0.020***
Product group (Snacks=0)			
Breakfast food	0.225***	0.198***	0.192***
Bar types (All others=0)			
Fruit & nut	0.069***	0.064***	0.065***
Granola	-0.162***	-0.160***	-0.160***
Nutrition	0.051***	0.051***	0.044***
Chocolate	0.009***	0.010***	0.010***
Total net weight (oz.)	-0.007***	-0.007***	-0.007***
Retailer channel type (Mass merchandiser=0)			
C-store	0.360***	0.361***	0.361***
Drug	0.173***	0.174***	0.174***
Grocery	0.053***	0.053***	0.053***
Liquor	0.187***	0.187***	0.190***
Constant	0.440***	0.450***	0.457***
Brand FE	Yes	Yes	Yes
Time (year and month) FE	Yes	Yes	Yes
State FE	Yes	Yes	Yes
Observations	233,178,036	233,178,036	233,178,036
R ²	0.7291	0.7307	0.7308

Note: *, **, *** and **** indicate statistical significance at 10, 5 and 1% respectively.

4,134 products and 532 brands in total (3,161 products (OC=0%), 232 (0%<OC<70%), 317 (70%≤OC<95%), 424 95%≤OC≤100%).

Figure 3. Snack Bars Organic Price Premium by State



Source: data derived from estimated coefficients on the interaction terms between organic 95%≤OC≤100% and state dummies.

RESULTS

The national average organic price premium for snack bars is 12.6¢/oz. controlling for other factors. Across all specifications, results suggest that product attributes, retailer promotional activities, and store channel significantly influence the price of snack bars. Snack bars with some organic ingredients and are marketed as a breakfast food, which contain fruit and nuts, and chocolate, and which are sold through convenience stores command the highest price.

The price premium paid for products with different levels of organic content is explored in Columns 2 and 3. Interestingly, products “Made with organic ingredients” (70%≤OC<95%) have lower prices compared with products with no organic content. Thus, the positive price premiums observed for organic snack bars are due to the margins paid for products which are “Organic” (OC≥95%) and which contain some organic ingredients (0%<OC<70%). A price difference of 13.1¢/oz. is found between products which are “Made with organic ingredients” and “Organic” products. Price premia were also found to vary by brand and by state. State results range from 2% in New York to 25% in Idaho compared to average prices while controlling for all other factors.

CONCLUSIONS

Using market price information and a uniquely constructed dataset of product attributes, this study examines the price premium for different levels of organic content and other attributes of snack bars. Results indicate that the organic price premium is largely captured by truly “Organic” products; using organic content at levels which qualify only for being labelled as “Made with Organic Ingredients”(70%≤OC<95%) does not offer manufactures any price benefits.

KEY REFERENCES

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