Local Food Purchasing Frequency by Locavores across Market Channels Comparison between National and Kentucky Food Consumers

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Abstract

This study examines customer preference toward local food purchase by using alternative questions on survey that categorizes consumers according to their preference for local products utilizing a 'periphery', 'mid-level', and 'core' consumer designation. We used two sets of samples from a national consumer survey with 612 usable observations and a Kentucky residents survey with 1987 observations. The main goal of the study is to determine how these designations, together with other demographic variables, explain the frequency of local products purchased in each of the three market channels – farmers markets, restaurants, and grocers. Tobit regression models for each market in the national data suggest greater frequency of purchases by 'core' takes place in farmers markets, while in Kentucky data frequency of purchases by 'core' is the highest in grocers. Positive income effects are observed in each model, as expected, while a negative age effect is only observed in the local product purchase frequency in restaurant in National data and in both grocers and restaurant in Kentucky data. Male consumers were observed to have lower frequency of local food products only in farm markets.

Background and Objective

- There are three different channels for local food distribution: farmers' market, local restaurants and mainstream retailers (Local Food Marketing Practices Survey, 2015).
- Survey data from the U.S. shows 53% of the 2,271 adult respondents are locavores, meaning they purchase and consume local food (Packaged Facts National Consumer Survey, 2014). The increasing number of locavores has been a great motivation on the retail front.
- A survey by National Grocery Association (2016) shows almost 87 percent of shoppers indicated that in their choice of supermarket, the availability of local food is important to them. Also, restaurants which source their ingredients from local sources are more likely to be visited by restaurants patrons.
- The main driving factors of local food purchase have been investigated in many studies. Among these studied factors are price (Brown, 2003; Kezis et al., 1998), product attributes (Adams and Adams, 2011), and consumers characteristics like age, gender, income, education (Arsil et al., et al., 2018).
- Understanding the affecting determinants of local food purchase could be of interest to grocers, restaurants, and policymakers involved in local food value chain.
- The main objective of this study is to measure the determinants of purchase frequency of local products and compare them across market channels where local foods are typically distributed in National data vs. Kentucky data.

Data and Methodology

This study examines customer preference toward local food purchase by using alternative questions on survey ranging from "not at all important" to "very important" along with other questions that measure the number of times customers purchased local food within the last 12 months. Based on their responses, we categorized them as the periphery, mid-level, and core customers. The purchase of local food was also considered from three different sources; purchase of local food from farmers market, grocery markets and local restaurants. Other independent factors in our model are demographic characteristics of local food buyers including gender, education, age, and earnings.

This study uses data gathered from customer feedback through two surveys from a sample of the U.S. and Kentucky food consumer population with 682 and 1987 respondent, respectively.

Several approaches are available to infer predictor variable effects on probabilities of purchase while classifying potential buyers into different levels range from "most likely to buy", to "unlikely to buy". One of the common approaches is Tobit model. In this study, we used Tobit model to capture both probability and extent of local food purchase.

Model Specification

We created three different customer groups based on the responses to the question "How important is local food to your customer choices?" from the survey. Table 1. Shows different customer groups:

Table 1.Customer Groups

Importance of Local Food Purchase	KY		Na	
	Customer Groups	Avg.12.mo. Purchase	Customer Groups	Avg.12.mo. Purchase
Not at all, Slightly important, Neutral	Periphery (55.6%)	11.09	Periphery (45.4%)	11.45
Moderately important	Mid-Level (31.2%)	18.29	Mid-Level (38.2%)	18.94
Very important	Core (13.1%)	22.65	Core (16.3%)	22.30

Three Tobit models were estimated to know how different customer preferences along with demographic variables (gender, age, education, income and type of residency) explain changes in purchase from farmers' market, grocers and local restaurants. We defined the customer preference by j, where j=1 for "Core" customer and j=2 for "Mid-Level" customer. The non-observable underlying utility function which ranks the preference of the i^{th} customer is given by U (M_{ji}, A_j).

where M is the vector of customer and customer-specific attributes (e.g. gender, age, education, income, type of residency and years lived in current area) and A is the vector of the different customers' preferences. The functional form of our model is specified with a Tobit model, where μ_i is i.i.d with zero mean and constant variance σ^2:

$$Y_i = X_i\beta \quad \text{if } i^* = X_i\beta + \mu_i > T$$
$$= 0 \quad \text{if } i^* = X_i\beta + \mu_i < T$$

where Yi is the predicted local food purchase frequency, i* is a non-observable latent variable, and T is a non-observed threshold level. The Tobit model (Tobin, 1958) therefore measures the extent to which the independent variables help explain variation in the purchase frequency.

Table 2. Definitions of Variables in the Empirical Model

Variable	Definition	Kentucky		National	
		Mean	Variance	Mean	Variance
Local food purchase	Farmers market purchases within the last 12 months	3.97	4.28	5.42	5.10
	Grocery purchase within the last 12 months	6.56	5.07	7.70	5.64
	Restaurant purchase within the last 12 months	4.12	4.27	3.40	4.35
Male	=1 if a respondent is Male, and 0 otherwise	0.28	0.45	0.52	0.50
Age	Age of the customer (years)	45.51	15.85	47.40	16.61
Education	The highest level of education customer has completed (years)	13.94	2.23	15.37	1.92
Income	Total income before taxes during the past 12 months ($$$)	57.92	48.25	73.97	56.99

Table 3. Purchase Frequency by Income (events/12 months)

	% in Sample		Farmers market		Grocers		Restaurant	
Income	KY %	Na %	KY	Na	KY	Na	KY	Na
<$20,000	26.87	21.90	3.18	3.97	6.01	6.54	3.44	3.25
$20,000-$49,000	18.57	23.04	3.46	5.91	6.45	8.00	4.05	3.10
$50,000-$99,000	40.06	29.09	8.37	5.20	6.65	7.35	4.22	3.03
$100,000<	14.05	25.98	4.74	6.47	7.49	8.81	0.88	4.38
Average			4.93	5.42	6.65	7.70	3.14	2.22

Table 4. Purchase Frequency by Gender (events/12 months)

	% in Sample		Farmers Market		Grocers		Restaurant	
Gender	KY %	Na %	KY	Na	KY	Na	KY	Na
Female	71.51	51.80	3.98	5.24	6.72	7.71	4.17	3.28
Male	28.49	48.20	3.96	5.62	6.15	7.69	4.02	3.62
Average			3.97	5.42	6.43	7.70	4.02	2.22

Descriptive Statistics

- Table (3) shows customers with the highest average income have the highest avg. purchase frequency of local food from grocers both in National and Kentucky samples.
- Table (4) suggests females constitute the majority of the sample both in Kentucky and National data. Moreover, the frequency of purchase for women from farmers market and grocers in National sample are higher than that of Kentucky sample. However, local food purchase frequency from restaurants is higher for females in Kentucky data.

Table 5. Purchase Frequency by Education (events/12 months)

	% in Sample		Farmers Market		Grocers		Restaurant	
Education	KY %	Na %	KY	Na	KY	Na	KY	Na
Some high school	4.98	1.14	2.78	1.29	6.96	4.57	4.00	1.29
High school graduate	25.62	10.29	3.54	4.98	6.50	7.19	3.89	3.35
Some college technical/trade certificate	37.49	28.76	4.69	5.36	6.28	7.91	3.73	3.28
College graduate	19.83	38.40	4.29	5.57	6.99	7.31	4.69	3.46
Postgraduate degree	12.48	21.41	4.76	5.68	6.72	8.51	5.10	3.80
Average			4.01	5.42	6.6	7.70	4.28	2.22

- Results from Table (5) shows most of the respondents in National data have college degree, whereas the majority of sample in Kentucky have some college education. Individuals with higher education, in National and Kentucky data, tend to purchase local foods more from grocers and farmers market than restaurant.
- Table (6) provides information on purchase frequency by category in different market channels for Kentucky and the US. Most of the respondents in National and Kentucky sample stated that they purchased one to five times from farmers market and restaurant in the past 12 months. However, in National data, respondents stated they purchased local food from grocers more than 11 times in the past 12 months.

Table 6. Purchase Frequency Percentage

	Farmers market		Grocers		Restaurant	
Purchase Frequency	KY (%)	National (%)	KY (%)	National (%)	KY (%)	National (%)
No purchase	25.25	22.22	9.23	11.93	23.48	39.54
1 to 5 time(s)	47.74	40.03	41.01	32.68	47.45	40.20
6 to 10 times	16.39	20.59	23.83	22.71	18.50	11.44
11 or more times	10.62	17.16	25.94	32.68	10.57	8.82
Total	100	100	100	100	100	100

Importance of Local food to the respondents' customer choice:

- In National data, 45.4%, and in Kentucky data 55.6% of the respondents are Periphery group of customers who are the major group of respondents. They declared "Not at all important, slightly important or neutral" importance of local food to their customer choices for local food.

Results

- We estimated three Tobit models for each dependent variable : Local food purchase from Farmers market, purchase from grocers, and purchase from local restaurants.

Table 7. Purchase Frequency Determinants by Market

	Farmers market Model (1)		Grocers Model (2)		Restaurants Model (3)	
	KY	National	KY	National	KY	National
Customer preferences						
Mid-level	3.52***	2.79***	3.41***	3.77***	2.98***	2.72***
	(0.255)	(0.503)	(0.270)	(0.505)	(0.284)	(0.554)
Core	4.48***	6.64***	4.70***	4.72***	4.45***	3.45***
	(0.349)	(0.658)	(0.368)	(0.668)	(0.378)	(0.729)
Male	-0.01	-0.93**	-0.45*	-0.47	-0.05	-0.79
	(0.257)	(0.471)	(0.273)	(0.475)	(0.283)	(0.519)
Age	0.08*	0.07	-0.03	0.02	0.014	-0.04
	(0.044)	(0.084)	(0.047)	(0.085)	(0.051)	(0.095)
Age^2	-0.0007	-0.0008	-0.0007	-0.0002	-0.0006	-0.0003
	(0.0004)	(0.0008)	(0.0004)	(0.0008)	(0.0005)	(0.001)
Education	0.12**	0.06	-0.003	0.07	0.12*	0.07
	(0.059)	(0.129)	(0.062)	(0.129)	(0.065)	(0.142)
Income	0.03***	0.034**	0.02***	0.02**	0.03***	0.02**
	(0.006)	(0.010)	(0.006)	(0.011)	(0.006)	(0.012)
Income^2	-0.0001***	-0.00009**	-0.00006**	-0.00007**	-0.00008***	-0.00004
	(0.00002)	(0.00003)	(0.00002)	(0.00003)	0.00002	(0.00003)
Urban	-0.24	0.59	0.70*	-0.67	0.04	-1.23**
	(0.365)	(0.529)	(0.387)	(0.532)	(0.402)	(0.580)
Suburban	-0.37	0.42	0.49*	-0.218	0.48*	-1.00
	(0.252)	(0.604)	(0.266)	(0.60)	(0.281)	(0.667)
N	1987	612	1792	612	1566	612
Pseudo R^2 (%)	.03	.03	.02	.02	.03	.02
LR chi2 (10)	335.51	113.69	290.18	84.61	266.29	74.80

- *Standard errors in parentheses*
- **Significant at 10% ** Significant at 5% *** Significant at 1%*
- *'Periphery' and 'Rural' are reference groups for 'Customer preferences' and 'Residency type', in order.*

Conclusion

- This paper uses three Tobit models to determine how customer preferences, together with other demographic variables, explain frequency of local food purchase in each of the three market channels – farmers markets, restaurants, and grocery.
- Table (7) shows customer preferences (Core and Mid-level) are significant and positive in all three models. However, 'Core' customers coefficient for farmers market purchase in National data is higher than that of Kentucky data, whereas, 'Core' coefficient for Kentucky data is higher for grocers and local restaurant markets.
- Results also suggest core customers buy more from farmers market in National data and more from restaurant in Kentucky data.
- As expected, income and education are positively associated with local food purchase frequency across all markets. Furthermore, income coefficient is highest for local food purchase from restaurants in both data sets.
- Age is statistically significant only in the Kentucky data not in the national data. Results show that younger consumers are more likely to purchase local food from restaurants and grocers while older ones prefer purchasing from farmers markets.
- Male coefficient is significant in the National data and reflects a higher local food purchasing from restaurant, however, in Kentucky data, male coefficient is higher for purchasing from grocers.
- Urban and suburban proximity is positively related to purchase frequency in any grocers in Kentucky data, but only urban coefficient is significant in National data that suggests a negative association with purchase frequency in restaurant.
- Factors contributing to local food purchase frequency appear to be somewhat different across market channels.
- Finally, our data has some limitations. We need more national samples to be confident about comparing National and Kentucky data. Furthermore, the income mean in National data is well higher than Kentucky data, this suggests our sample might not adequately represent purchases by low income consumers group.

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