Local food purchasing frequency by locavores across market channels – implications for local food system development

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Abstract

Our study is a national consumer survey with 612 usable observations categorizes consumers according to their preference for local products utilizing a 'periphery', 'mid-level', and 'core' consumer designation. The main goal of the study is to determine how these designations, together with other demographic variables, explains frequency of local products purchased in each of three market channels – farmers markets, restaurants, and grocery. Tobit regression models for each market suggest greater frequency of purchases by 'core' consumers over 'mid-level' and 'periphery' take place in farm markets, followed by restaurants and then grocery. Positive income effects are observed in each model, as expected, while a negative age effect is only observed in local product purchase frequency in the restaurant setting. Female consumers were observed to have lower frequency of local food products only in farm markets.

Background

- There has been a surge in consumer demand for locally produced foods over the past 10 years (Hu et al., 2010).
- Data from a November 2014 proprietary Packaged Facts National Consumer Survey published in Shopping for Local Foods in the U.S. shows 53% of the 2,271 adult respondents are locavores. While, the main reason for local food purchase of 60% of them is freshness, more than half (52%) of consumers say they buy local products to support local businesses (fig.1).
- Local foods are distributed through different marketing channels including farmers' market, local restaurants and mainstream retailers (Wolf et al., 2005).
- The number of farmers markets in the United States has grown rapidly in recent years to more than 8,600 markets currently registered in the USDA. Mainstream retailers, local and regional grocers and multi-regional retailers like Kroger, Meijer, and even Walmart are trying to add more local products, highlight them and give them the priority (fig.2) (Package Facts, 2015).
- The local food movement has witnessed a shift in customers' preferences in buying local products.
- According to consumer survey by Package Facts, number of consumers who buy local products from supermarkets/grocery stores is two out of three and almost half of the respondents said they by these products at farmers' markets.

Fig. 1. Supporting Local Food

SLOW FOOD • AUSTIN •

WHOLE FOODS MARKET

local harvest CAFE & CATERING

LEGAL SEA FOODS — RESTAURANT • OYSTER BAR — *If it isn't fresh, it isn't Legal!*

Fig. 2. Local foods marketing channels

Research Objective

- We designed three level of customers according to their local products preferences 'periphery', 'mid-level', and 'core' consumer.
- The main goal of this study is to measure the frequency purchase of local products explained by customer designations and other demographic variables.

Fig. 3. United States Local foods

Data and Methodology

This study examines customer preference toward local food purchase by 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 categorize them as the periphery, mid-level, and the core customers.
Purchase of local food was also considered from three different sources; purchase of local food from farmer's 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 a survey from a sample of the U.S. food consumer population with 682 respondent.
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

Three Tobit models were estimated to know how different customer preferences along with demographic variables (gender, age, education, income) explain changes in purchase from farmers'' markets, grocers and local restaurants.
Define the customer preference by j, where j = 1 for the
"'core" customer and j = 2 for the "mid-level" customer. The non-observable underlying utility function which ranks the preference of the ith customer is given by U(Mji, A j).
Where M is a vector of customer and customer-specific attributes (e.g.,gender, age, education, income) and A is a vector of the different customers' preferences.
The functional form of our model is specified with a Tobit model, where μi 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 probability of local food purchase, i* is a non-observable latent variable, and T is non-observed threshold level.
The Tobit model (Tobin, 1958) therefore measures the probability that a customer will buy a local food product .

Table 1..Definitions of variables in the Empirical Model

Dependent variable		Mean	Variance
Local food purchase	farmers' market purchase within the last 12 months	5.42	5.1
	grocery purchase within the last 12 months	7.7	5.64
	Restaurant purchase within the last 12 months	3.4	4.35
Independent variable			
Customer preferences	periphery:PERI=Reference consumer segment	0.45	0.51
	mid-level:=1 if a respondent belongs to the mid-level group, and 0 otherwise	0.38	0.49
	core =1 if a respondent belongs to the Core group, and 0 otherwise	0.16	0.37
Gender	=1 if a respondent is male, and 0 otherwise	1.48	0.5
Age	Age of the customer, measured in years	47.4	16.61
Education	the highest level of education customer has completed	15.37	1.92
Income	total income before taxes during the past 12 months	73.97	56.99
Type of Residency	Rural: Reference variable	0.25	0.43
	Urban:=1 if a respondent lives in Urban area group, and 0 otherwise	0.32	0.47
	Suburban::=1 if a respondent lives in Suburban area group, and 0 otherwise	0.43	0.51
N of years lived in the current area	Less than 1 year, 1-2 years, 3-4 years, 5-6 years, 7-8 years, 9-10 years, more than 10 years	10.38	5.68

Descriptive Statistics

- The periphery group has the highest average income with $75,100, and the core group has the lowest average income with $68,400.

Table 2. Income – Consumer Type Relationship

Income	Periphery	Mid-Level	Core	Total
$20,000>=	58	47	29	134(22%)
$20,000-$87,500	147	125	47	319(52%)
$87,500-$162,500	53	48	15	116(19%)
$162,500<	20	14	9	43(7%)
Total	287	234	100	612

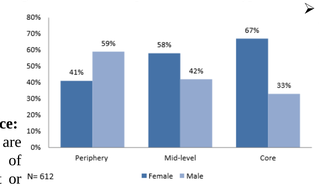
- While majority of the sample have annual income between $20,000 and $87,000 only 7% of customer made more than $162,500 annually among which 21% , 33% and 47% belong to Core, Mid-Level and Periphery groups of customer, respectively.

Table 3. Education – Consumer Type Relationship

Education	Periphery	Mid-Level	Core	Total
Some high school	4	3	0	7 (1%)
High school graduate	32	18	13	63 (10%)
Some Collage technical/trade certificate	74	69	33	176 (29%)
Collage graduate	109	84	42	235 (39%)
Postgraduate degree	59	60	12	131 (21%)
Total	278(47%)	234(38%)	100(16%)	612 (100%)

- As table 3. shows, individuals with more engagement to local food, in general, are college graduates or have some college education.
- The average age for the periphery, mid-level, and core groups were 46.3, 47.9, and 49.1 years, respectively.
- Females are more engaged in local food compared to male consumers.

Fig.3. Gender with Respect to Consumer Type



Importance of Local food to the respondents' customer choice:

- As can be seen from tables, 278 (45.4%) respondents are Periphery group of customers are the major group of respondents. They declared "Not at all, slightly important or neutral" importance of local food to their customer choices.
- 234 (38.2%) respondents in our sample show "Moderately importance" of local food choice to their choices while only 100 (16.3%) declared choosing local food is "Very important" for them.

Results

- We estimate three Tobit models for each dependent variable : Local food purchase from Farmers' market, purchase from grocers, purchase from local restaurants.
- Each model tries to determine how customer preferences, together with other demographic variables, explains frequency of local products purchased in each of three market channels – farmers markets, restaurants, and grocery.

Table 4. Purchase from Farmers Markets

	Model(1) *Purchase from farmers' market*	Model(2) *Purchase from Grocers*	Model(3) *Purchase from Local Restaurants*
Customer preferences			
Mid-level	2.89*** (0.528)	3.964*** (0.532)	2.88*** (0.582)
Core	6.83*** (0.688)	4.872*** (0.702)	3.56*** (0.765)
Demographic variables			
Male	-1.066** (0.495)	-0.565 (0.501)	-0.821 (0.547)
Age	0.003 (0.0157)	-0.003 (0.0158)	-0.082*** (0.0176)
Education	0.095 (0.135)	0.1 (0.136)	0.092 (0.149)
Income	0.0107** (0.004)	0.0099** (0.0047)	0.022*** (0.005)
Type of Residency			
Urban	0.235 (0.59)	-0.49 (0.61)	-0.2 (0.67)
Suburban	-0.45 (0.64)	0.19 (0.64)	1.06 (0.703)
N of years lived in the current area	(0.31) (0.45)	0.032 (0.045)	-0.038 (0.051)

Standard errors in parentheses
* Significant at 10%
** Significant at 5%
*** Significant at 1%

Conclusion

- Customer preferences (Core and Mid-level) are significant in all three models. However, differences between 'core' and 'mid-level' may not be as significant in some markets as others.
- Results also suggest core customers buy more from farmers' market than grocers and restaurants.
- As expected, income is positively associated with local food purchases frequency across all markets. Furthermore, Income coefficient is highest for local food purchase from restaurants while purchasing from farmers' market and grocers are in the second and third places, respectively.
- On the other hand, Age coefficient shows a negative effect on local food purchase from restaurants only.
- Considering that primary shoppers in families are mostly females, female coefficient is lower for local food purchase from farmers' market. This is probably because buying from supermarkets is more accessible, convenient, always available, washed, cut and packaged, and purchased without needing cash.
- Factors contributing to local food purchase frequency appear to be somewhat different across market channels.
- 'City size' and 'length of residency in the current area' are not significant.
- Finally, since data were collected through survey and it is self-reported there might be bias of over/under estimations. Moreover, while other literature used a continuous variable such as 'customers' expenditure' on local food, we analyzed 'purchase frequency' that faces more limitation like dealing with ordinal observations.

Idea for future research:

- One interesting idea for future discussion might be focusing on the correlation of different markets and use simultaneous estimation among different local food markets and different groups of customers.

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