Multinomial Logistic Analysis of the Most Frequent Market Venues for Locally Grown Fresh Produce among Online Shoppers

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INTRODUCTION

- Internet is shaping the way consumers shop
- Existence of mobile devices, smartphones, and tablets, online shopping became more convenient (Judith, 2012)
- Web presence among consumers and organizations is becoming increasingly common (Kotler and Armstrong, 2012 and Rigby, 2012)
- Online retailers of fresh produce have tremendous opportunity to do well in the online market environment (Neilson Company, 2015)
- Most of the previous studies focused on consumers at famers' markets.
  - Examples: Conner et al. (2010), Ruelas et al., (2012), Abello et al., (2012), Gumirakiza et al., 2014, Zepeda et al., (2014), Freedman et al., (2014), Racine et al., (2010), Kraschnewski et al., (2014).
- Other studies focused on CSA programs
  - Examples: Curtis et al. (2015), Meyer, (2012), Conner et al., (2010), Connolly and Klaiber, (2012), Woods and Troppy, (2015)
- Very few, if any, investigated consumer preferences for local/regional fresh produce among online shoppers

RESEARCH QUESTIONS

1. Given that consumers are becoming “online shoppers”, what are their most preferred market venues for local/ regional fresh produce?
2. Will the offline direct-to-consumer market outlets prevail?
3. Are these online shoppers interested in purchasing for fresh produce in the online market?

RESEARCH OBJECTIVES

1. Describe consumer characteristics that explain the preferred market venues for local/regional fresh produce among online shoppers,
2. Estimate the relative likelihood for online shoppers to purchase fresh produce at a given market venue,
3. Explain marginal effects that the consumer characteristics have on each specific preferred market venue for local/ regional fresh produce among online shoppers

PURPOSE AND USES

1. Basis for future analyses interested in preferred market venues for local/regional food among online shoppers
2. Provides information to producers about preferred market venues among a growing consumer group
3. Help marketers to develop new market strategies to make local/regional produce available to online shoppers

DATA COLLECTION

- Used a stratified randomly selected sample of 1,205 online shoppers
- Targeted consumers who have made at least two online purchases of any kind within six months prior to participating in this study
- Targeted online shoppers in the “South Region”as defined by the (U.S. Census Bureau, 2016): Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, West Virginia, and the District of Columbia
- Used Qualtrics software
  - Survey questions were designed in a way that avoids possible bias
  - The software has integrated capabilities to make possible the accurate tracking, profiling, monitoring of responses for each respondent
  - Partners with over 20 online panel providers to obtain diverse and quality respondents
- The survey was emailed to respondents within the Qualtrics actively managed market research panels and to those using social media such as Facebook, and Twitter
- Conducted from March through July 2016

MODEL SPECIFICATION

- To estimate the relative probabilities of choosing a particular market alternative to be most frequent, a **Multinomial Logistic Model** was used.
- Relies on three main assumptions within a random utility framework:
  - Online shoppers are rational
  - Independence from Irrelevant Alternatives holds true
  - The consumer with a finite set of choice alternatives will select the one that they believe has the maximum amount of utility
- The probability (P) that an individual i chooses alternative j is expressed as:

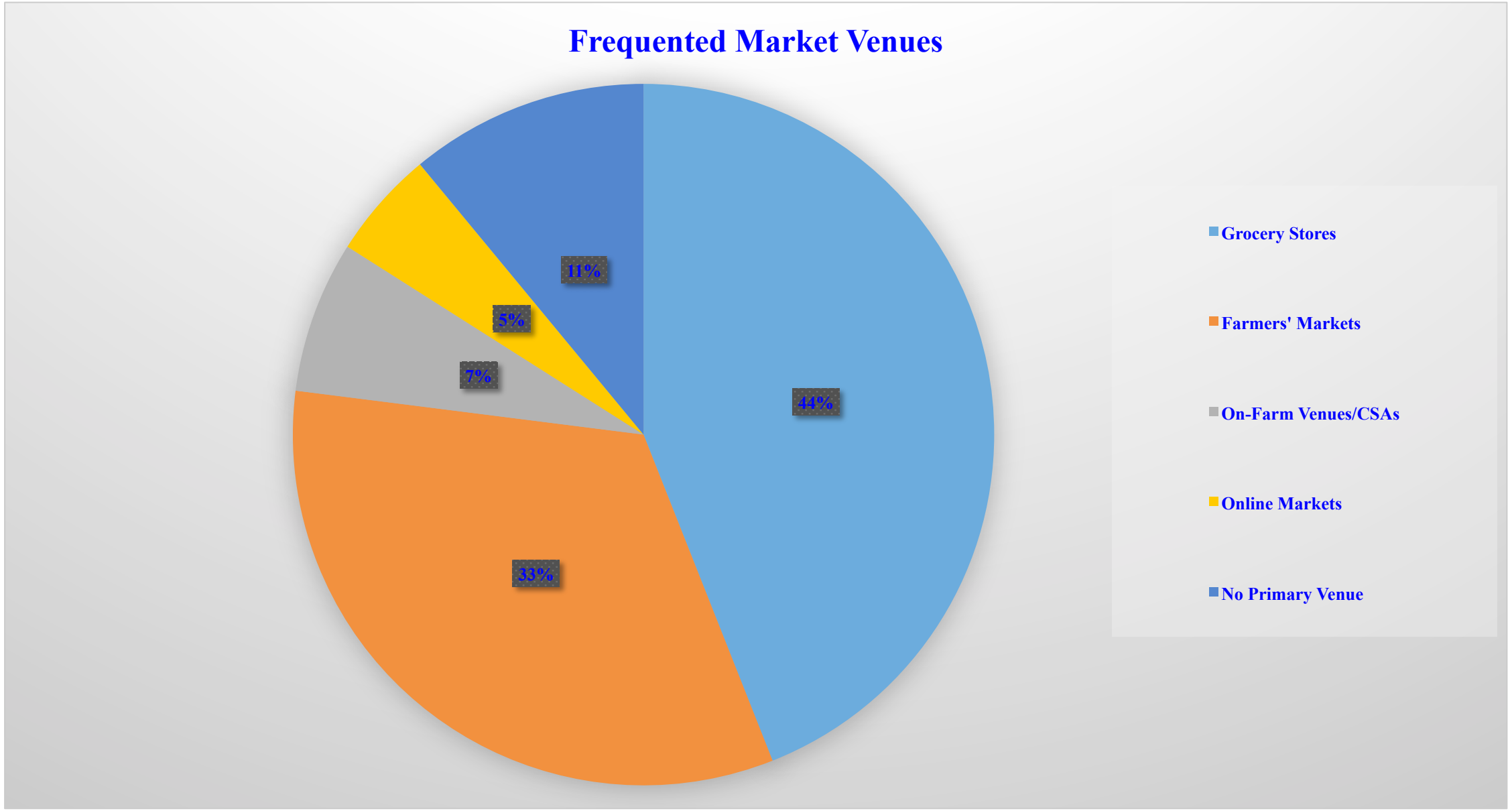
$$P_{ij} = P(y_i = j) = \frac{exp(\beta_k^{'} X_{ij})}{\sum_i \beta_k^{'} X_{ij}}$$

DESCRIPTIVE STATISTICS

Markets	Age	Urban	Female	Married	Locavore	Educat~n	GovAss~e	FMSpen~t	Inte~lFP	Monthl~e
Farmers' Markets	46.954	0.731	0.594	0.594	0.789	3.404	0.896	40.277	4.124	62.092
On-Farm&CSA	51.171	0.573	0.634	0.610	0.829	3.098	0.817	38.951	4.183	56.803
Online Markets	35.085	0.881	0.492	0.593	0.746	3.542	0.695	78.847	3.983	119.897
Grocery Stores	46.676	0.797	0.645	0.543	0.750	3.419	0.843	38.558	3.917	60.437
None	49.112	0.727	0.615	0.490	0.385	3.133	0.811	15.573	2.797	15.279
Total	46.794	0.756	0.617	0.560	0.724	3.364	0.847	38.392	3.873	57.809

An average online shopper in this study:

- Is 47 years old
- Completed a 2-year associate's degree
- Would spend $38.39 per one visit to a farmers' market
- Spends $57.81 – per month on local/regional fresh produce


Frequented Market Venues
44%
33%
7%
5%
11%
Grocery Stores
Farmers' Markets
On-Farm Venues/CSAs
Online Markets
No Primary Venue

Marginal Effects from the Multinomial Logistic Model

Variable	Farmers Markets = 33%	On-Farm/ CSA's = 07%	Online Market = 05%	Grocery Stores = 44%	None = 11%
	dy/dx	dy/dx	dy/dx	dy/dx	dy/dx
Age	-0.0011	0.0018***	-0.0013***	0.0007	0.0000
Urban	-0.0659*	-0.0369**	0.0096	0.0918**	0.0013
Female	-0.0691**	-0.0019	-0.0166	0.0871***	-0.0006
Married	0.0227	0.0019	0.0101	0.0393*	0.0046
Locavore	0.0490***	0.0158***	0.041*	0.0303***	-0.0303***
Education	0.0012	-0.0127**	0.0002	0.0136	-0.0025
GovAssistance	0.1053**	-0.0286	-0.0221	-0.0443	-0.0102
FMSpendperVisit	0.041***	0.020***	0.0002	-0.007***	0.006***
InterestLevelLocalFP	0.0419**	0.0166**	0.026***	-0.0398**	0.0161***
MonthlySpentFreshProduce	0.025***	0.061***	0.045***	0.01***	0.051***

The *, **, *** denote significance at the 10%, 5%, and 1% level, respectively.

KEY FINDINGS

1. The relative probability that an online shopper prefers purchasing fresh produce at farmers markets is 36 percent.
2. The relative probability that an online shopper prefers purchasing fresh produce on-farm or through a CSA is 7 percent
3. The relative probability that an online shopper prefers purchasing fresh produce through an online market is 5 percent
4. The relative probability that an online shopper prefers purchasing fresh produce at a grocery store is 44 percent
5. The relative probability that an online shopper has no preferred market when purchasing fresh produce is 11 percent

SUGGESTIONS

- Adoption of online shopping for fresh produce still low. We suggest that further studies aiming at explaining reasons behind this be conducted
- Marketing strategies by those who promote farmers markets should target online shoppers. Grocery stores should do likewise
- Growers of local/regional fresh produce are encouraged to revise their marking strategies based on the consumer characteristics that are found to increase the likelihood of preferring their specific market venue