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The Retailer Choice of SNAP Participants for Fill-In Purchases

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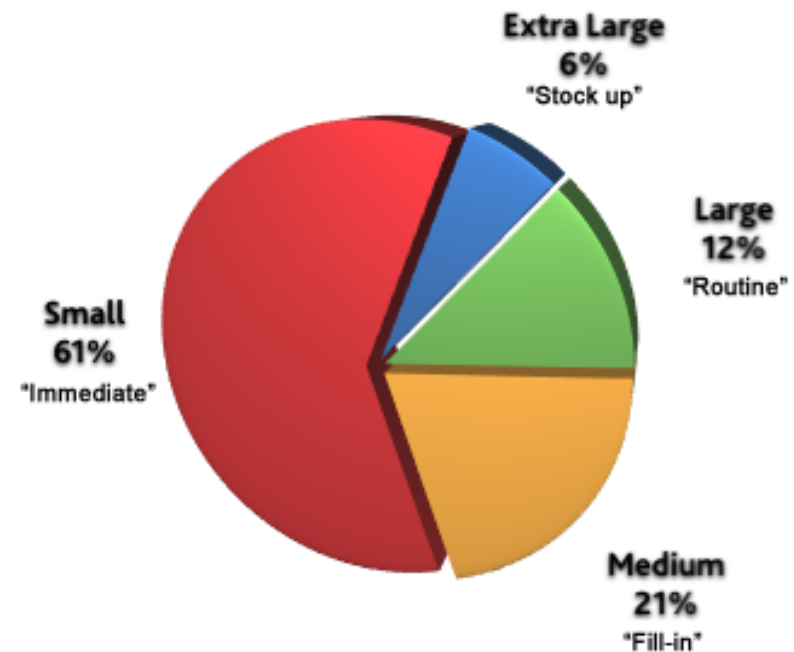
Low Income Household's Store Choices

- ▶ Policymakers are pursuing initiatives to increase food access for low-income households.
- ▶ However, improved food store access will not necessarily change dietary habits and leads to a healthier diet, especially for the low income households.
- ▶ It is important to understand the determinants of store choice among low-income households before implementing policies that incentivize retailers to do business in food deserts

Fill-in Trips

- ▶ Between regular main shopping visits, households may need to refill their pantry/refrigerator with staple items
 - ▶ smaller purchased food basket
 - ▶ shorter expected time for the shopping trip
 - ▶ different choice of retailer: smaller retailers

The Majority of U.S. Shopping Trips are "small" or "immediate" need driven

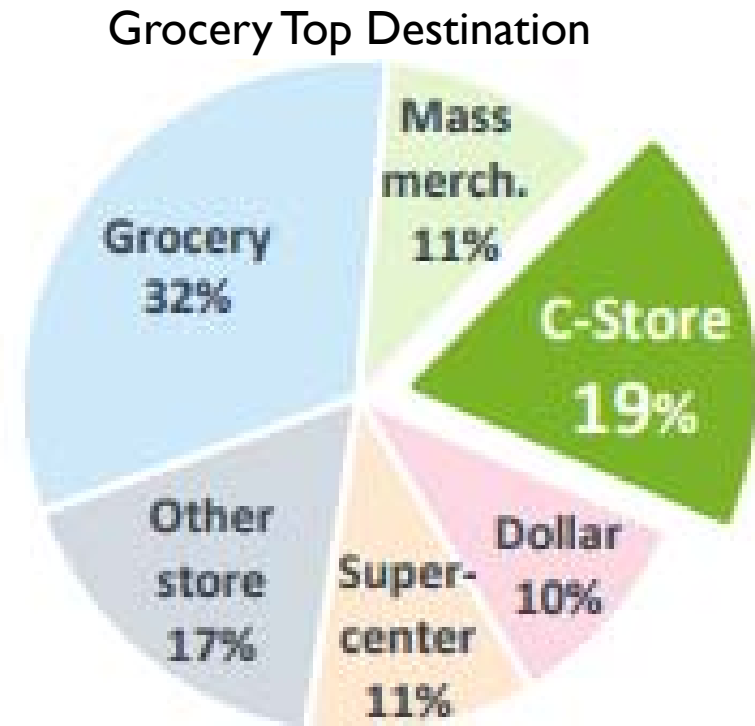


Source: The Nielsen Company

Source: Nielsen Study, 2011

Small Retailers: C-Stores

- ▶ Purchases at smaller stores may have a negative impact on SNAP participants' ability to purchase healthier items and may limit their food expenditures due to higher food prices at these stores.



Source: General Mills Fill-In Trip Study, 2014

SNAP-Authorized Retailers

- ▶ In 2016, USDA published a federal rule aimed to increase the number of healthy items in stock
 - ▶ “Enhancing Retailer Standards in the Supplemental Nutrition Assistance Program (SNAP)” at [81 FR 90675](#).
- ▶ This expanded retailer stocking requirements would likely remove many convenience stores from participation in SNAP.

Previous Work

- ▶ Research examining the store choice of SNAP recipients is scarce
- ▶ Taylor and Villas-Boas (2016) studied the role of distance traveled on store choice
 - ▶ households are willing to pay more to travel to a larger grocery store than a convenience store.

Study

Objective:

Assess the factors that influence households store choice during fill-in trips when purchases of bread, eggs, or milk occurred.

We focus on store choices between:

- ▶ SNAP and non-SNAP participants
- ▶ Fill-in Trips and Main Shopping

Defining fill-in trips in the FoodAPS data








General definition:

- ▶ Fill-in trip is any trip which expenditures are below a threshold (Kahn and Schmittlein, 1989)
- ▶ We use the median of expenditures per household member as a threshold (Anić and Radas, 2006)
- ▶ Threshold was determined using IRI Academic dataset (trips data)

Fill-in trips to buy staples:

- ▶ Fill-in Trips in which milk, bread, or eggs are purchased

Top Items most often purchased during Fill-in Trips

	Milk	57%
	Bread	50%
	Soda	42%
	Eggs	39%
	Salty Snacks	28%
	Ice cream	27%
	Cheese	25%

Source: General Mills Fill-In Trip Study, 2014

Data

USDA's National Household Food Acquisition and Purchase Survey (FoodAPS),

- ▶ 4,317 Households who reported 13,819 food at home purchases from stores.

- ▶ We classify shopping trips:
 - ▶ Main Shopping Trip
 - ▶ Fill-in Trips when bread, milk, or eggs are purchased
 - ▶ Fill-in Trips (bread, milk, eggs are not purchased)

- ▶ Six Store Choices:
 - ▶ supermarkets, superstores, convenience stores, grocery stores,

Empirical Framework

Multinomial Logit (Greene, 2003)

$$p_{ij} = \Pr(y_j = i) = \begin{cases} \frac{1}{1 + \sum_{m=2}^k \exp(x_j \beta_m)}, & \text{if } i = 1 \\ \frac{\exp(x_j \beta_m)}{1 + \sum_{m=2}^k \exp(x_j \beta_m)}, & \text{if } i > 1 \end{cases}$$

where:

p_{ij} : Probability that the response for the j th observation is equal to the i th categorical outcome. There are k categorical outcomes.

β_m : coefficient vector for outcome m

X : vector of independent variables

Data

Table 1 Shopping Trips

Variable	Main	Fill-in Staples	Fill-in No Staples
Milk, bread, or eggs were purchased	0.49	1	0
Total Expenditures (\$)	94	26	15
Per capita expenditures (\$)	42	8	5
Driving Distance (miles)	7.26	4.83	6
Number of USDA Food Categories (out of 33)	11	6	3
Use of Coupon	8%	4%	2%
N	2692	4634	6160

▶ 11 Note: * Variables in the regression

Data

- Compared to main shopping trips, low income households pay higher prices for a typical basket of food products for both fill-in trips with and without staples.

Data

Table 2 Summary Statistics of Store Visits

Variables	Convenience	Grocery	Supermarket	Superstore
SNAP HH	0.50	0.40	0.33	0.33
WIC HH	0.14	0.18	0.11	0.14
Fill-in Trip Staples	0.25	0.35	0.39	0.35
distance (miles)	4.61	3.72	5.10	6.27
Number of USDA food categories	2.22	3.43	5.98	6
Coupon Use	0.01	0.01	0.05	0.04
N	552	503	4673	5552

Preliminary Results

Table 3 Average Marginal Effects Main Shopping Trips

Coupon Use	Convenience	Grocery	Supermarket	Super
<i>Main Shopping Trips</i>				
High Income Household	0.003	-0.004*	0.085	-0.075
Non-SNAP low-income Household	-0.000	-0.009*	0.113	-0.093
SNAP Household	-0.001	-0.015**	0.156*	-0.160*
<i>Fill-in Trip No Staples</i>				
High Income Household	0.004	-0.000	0.054	-0.035
Non-SNAP low-income Household	0.052	-0.052***	0.168	-0.072
SNAP Household	-0.049*	-0.038*	0.266*	-0.124
<i>Fill-in Trip Staples</i>				
High Income Household	0.007	-0.021	0.075	-0.133
Non-SNAP low-income Household	-0.015***	-0.023***	0.161	-0.042
SNAP Household	-0.011	-0.008	0.237	-0.207

Results

Table 3 Average Marginal Effects All Shopping Trips

Variables	Convenience	Grocery	Supermarket	Super
log(Driving distance, miles)				
<i>Main Shopping Trips</i>				
Non-SNAP low-income Household	-0.000	-0.001	0.065*	0.008
High Income Household	-0.001	0.001	0.050	0.009
SNAP Household	-0.001	0.001	0.100	-0.047
<i>Fill-in Trips No Staples</i>				
Non-SNAP low-income Household	-0.027	0.010	0.160	0.022
High Income Household	-0.018	0.010	0.175	0.032
SNAP Household	-0.042	-0.001	0.157	0.070
<i>Fill-in Trips Staples</i>				
Non-SNAP low-income Household	-0.011	-0.003	0.107	-0.045
High Income Household	-0.003	0.011	0.098	-0.047
SNAP Household	-0.009	-0.003	0.131	-0.032

Results

Table 3 Average Marginal Effects Main Shopping Trips

Log(Price Paid)	Convenience	Grocery	Supermarket	Super
<i>Main Shopping Trips</i>				
Non-SNAP low-income Household	-0.001	-0.000	-0.105	0.142
High Income Household	-0.002	-0.000	-0.122	0.155**
SNAP Household	-0.001	0.002	-0.079	0.112
<i>Fill-in Trips No Staples</i>				
Non-SNAP low-income Household	-0.029	-0.026	0.234	0.306
High Income Household	-0.004	0.001	0.214	0.089
SNAP Household	-0.051	0.021	0.294	0.201
<i>Fill-in Trips Staples</i>				
Non-SNAP low-income Household	-0.002	-0.024	0.080	-0.010
High Income Household	-0.009	-0.000	0.088	0.067
SNAP Household	0.006	0.014	0.003	0.088

Preliminary Results

- ▶ **For fill-in trips in which milk, bread, or eggs were purchased**, price (coupon use) was the major feature influencing the choice of the majority of options of where to shop for non-SNAP low-income households.
- ▶ **During fill-in trips in which milk, bread, or eggs were not purchased (Small Trips)**, coupon use was the only factor associated with the choice of the majority of store options for SNAP and non-SNAP low-income households.

Results

Table 3 Average Effects Main Shopping Trips

Number of food categories, USDA	Convenience	Grocery	Supermarket	Super
<i>Main Shopping Trips</i>				
non-SNAP Low Income Household	-0.000	-0.001	0.015	-0.014
High Income Household	0.000	-0.000	0.017*	-0.015
SNAP Household	-0.000	-0.000	0.010	-0.009
<i>Fill-in Trips No Staples</i>				
non-SNAP Low Income Household	-0.004	-0.004	0.012	-0.011
High Income Household	-0.002	-0.001	0.007	-0.003
SNAP Household	0.001	-0.006	0.009	-0.006
<i>Fill-in Trips</i>				
non-SNAP Low Income Household	0.000	-0.000	0.009	-0.007
High Income Household	-0.001	-0.003	0.009	-0.006
SNAP Household	-0.001	-0.007	0.010	-0.001
Observations	13486	13486	13486	13486

Conclusion

- ▶ **During fill-in trips in which milk, bread, or eggs were purchased**, price (coupon use) was the major feature influencing the choice of the majority of options of where to shop for non-SNAP low-income households. Price paid only influenced SNAP households' likelihood of choosing a Combination store.
- ▶ **During fill-in trips in which milk, bread, or eggs were not purchased (Small Trips)**, coupon use was the only factor associated with the choice of the majority of store options for SNAP and non-SNAP low-income households.
- ▶ **During main shopping trips**, travel distance, number of food categories, and coupon use were important influencing high-income and non-SNAP households' likelihood to choose a store. Only price paid was associated with the likelihood to choose a Supermarket for high-income consumers.

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