DEPARTMENT OF ECONOMICS

Food Purchasing & Nutrition: The Role of Dollar Stores in Rural Areas

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Acknowledgments & Data Disclaimer

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- Data from NielsenIQ: These are the “researchers' own analyses calculated (or derived) based in part on data from Nielsen Consumer LLC and marketing databases provided through the NielsenIQ Datasets at the Kilts Center for Marketing Data Center at The University of Chicago Booth School of Business. The conclusions drawn from the NielsenIQ data are those of the researchers and do not reflect the views of NielsenIQ. NielsenIQ is not responsible for, had no role in, and was not involved in analyzing and preparing the results reported herein.”

Motivation & Research Question

Our prior work (funded through RPSP) explored nutritional choices in NM households

- Data: Grocery store scanner data on NM household purchases from NielsenIQ
- Outcomes: Developed measures of the diversity of foods purchased and fruit and vegetable purchasing
- Treatment: Living in a zip code designated as rural or a food desert
- Key Results: Rural highly correlated with reduced diversity-in-purchasing and fruit and vegetable purchase; food desert not highly correlated with either measure

This study's extension: What role do dollar stores play, particularly in rural areas?

- Reduced distance to food relative to grocery retailers
- Reduced range of products available, rarely fresh produce

Data

NaNDA data on Dollar Stores

- National Neighborhood Data Archive (University of Michigan)
- Number and density of dollar stores and grocery stores by zip code from 1990-2021
- Sources from the National Establishment Time Series Database (based on SIC codes)

NielsenIQ Consumer Panel data on household purchases

- ~60,000 households report daily purchase data; ~5.25 yrs in panel
- Demographically representative sample of households at the national level but not necessarily representative at other levels; some underrepresentation of groups with less phone/internet access (e.g., low income)

Data Sample:

- Collapsed daily NCP data into monthly household-level data
- Merged NaNDA data at zip code level
- 14,703 household-by-month observations in NM 2018-2021 (approx. 300 households each year)
- USDA RUCA codes used to categorize rural and urban zip codes

Dollar Store Prevalence

	Percentage of zip codes	
Any DS in zip code?	Urban	Rural
No	6.9	19.5
Yes	93.1	80.5
	Average counts per zip codes	
Count variables for stores	Urban	Rural
Dollar stores	3.10	4.29
Grocery stores	3.98	3.82
Supermarkets	2.45	1.62

Outcome Variables

Range of Types of Food Consumed:

- The Dietary Diversity Score (DDS); developed by USAID Food and Nutrition Technical Assistance
  - 14 diversified food groups (12 from USAID, we add snack food and prepared food)
    - a score of 1 is assigned if the household purchases an item of food group in the given month
    - DDS = sum of scores of all food groups
    - Captures range of types of products purchased (little difference in previous work between DDS-12 and DDS-14)

Fruit and Vegetable Consumption:

- Produce Monthly Purchases Measures (overall, fresh, frozen, and canned)
  - Produce Purchase {0,1}
  - Count of produce products purchased

Total Expenditure on Food (2015 USD)

Estimation Approach

$$y_{hzmy} = \alpha + \beta DS_{zy} + \gamma X_{hy} + \tau_{zy} + \delta_z + \lambda_m + \theta_y + \varepsilon_{hzmy}$$

y_{hzmy}: outcome measures for household h in zip code z in month m in year y

DS_{zy}: dollar store measure in zip code z in year y

X_{hy}: household demographics

τ_{zy}: counts of grocery stores and supermarkets in zip code z in year y

Fixed effects: zip code, month, year

Standard errors clustered at the zip-code level

Subgroups: Urban, rural zip codes

Gardner (2022) two-stage difference-in-differences model to account in variation in treatment timing

Dietary Diversity Score (DDS)

	Urban Average = 9.01	**Rural** Average = 9.29
Has DS (1=Yes)	-3.161***	1.379***
	(0.956)	(0.531)

Total Household Expenditure (2015 USD)

	Urban Average = $214.60	**Rural** Average = $225.28
Has DS (1=Yes)	-192.165***	22.179
	(47.216)	(27.168)

Any Fruit or Vegetable Purchase

	Urban Average = 0.88	**Rural** Average = 0.88
Has DS (1=Yes)	-0.081	0.045
	(0.109)	(0.059)

Count of Fruits & Vegetables

	Urban Average = 9.84	**Rural** Average = 8.53
Has DS (1=Yes)	-3.569	1.776
	(3.892)	(2.025)

	Any Purchase		Product Count	
	Urban	**Rural**	**Urban**	Rural
			Fresh	
Has DS (1=Yes)	0.047	0.034	-2.655	1.163
	(0.148)	(0.059)	(3.594)	(1.919)
			Frozen	
Has DS (1=Yes)	-0.228***	-0.059	-0.660***	0.053
	(0.073)	(0.074)	(0.206)	(0.250)
			Canned	
Has DS (1=Yes)	-0.199	0.205***	-0.254	0.560***
	(0.134)	(0.051)	(0.362)	(0.122)

Conclusions & Next Steps

Urban areas:
- DS decreases DDS
- DS increases expenditures
- DS decreases purchase of frozen fruits and vegetables
- Implication: Substitute for more distant grocery stores

Rural areas:
- DS increases DDS
- DS increases purchase of canned produce
- Implication: Substitute for the gas station

Fresh produce is not affected

Policy implication: DS benefit rural communities but should not be encouraged in urban areas

Caveats: relatively small sample of NM households in the NielsenIQ data (~300/yr); outlier issues for expenditure analyses

Next steps: larger sample, national-level study; changes in distribution of shopping trips; weighted DDS to account for health differences across categories; address expenditure outliers

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THANK YOU!

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