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Who Shops at Supermarkets? A Study of Retail Patronage in Nicaragua

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This research analyzes the retail patronage of Nicaraguan households. Supermarket patronage is relatively low, with only four percent of all households purchasing most of their food in supermarkets. A multinomial logistic model is used to explain the choice between markets, small-grocery stores (*pulperías*), supermarkets, and wholesalers. The model is estimated using household data of 2,320 families living in urban areas. Empirical results show that supermarkets are the place to shop for richer households, with larger families, higher dependency ratios, and higher education levels. Furthermore, results show that the types of productive activities the household is involved in is a determinant of choice for supermarkets.

Globalisation of retail markets has received increased attention in the literature. The growing importance of supermarkets in developing countries has been studied since the early 1980s (Findlay et al. 1990; Yavas, Kaynak, and Borak 1981, 1982). More recently, development economists have become concerned about the relation between supermarkets and economic growth. If supermarkets procure from local producers and entrepreneurs, they could contribute to economic growth. If, on the other hand, supermarkets bypass local producers and purchase their products in international markets, this could inhibit local growth. Most relevant studies have focused on the purchasing strategy of supermarkets (Balsevich et al. 2003; Berdegué et al. 2005; Dries, Reardon, and Swinnen 2004; Reardon and Berdegué 2002; Weatherspoon and Reardon 2003). The growth-stimulating or -inhibiting potential of supermarkets depends, however, not only on their purchasing strategy but also on the relative importance of supermarkets compared to small-scale shopping outlets. We therefore analyze the patronage and characteristics of clients of different retail-outlets available to Nicaraguan households.

We use country-wide consumer data for more than 4000 households in 2001 to analyze outlet patronage and the share of consumers who shop at supermarkets. The data reveal that local markets and small grocery stores, or *pulperías*, remain by far the most important shopping place for Nicaraguans. Only four percent of households

purchase the majority of their food at supermarkets, mostly in urban areas. The results of a multinomial regression indicate that these are households with relatively high income, high education levels, large families, and high dependency ratios. Economic development is therefore likely to stimulate the growth of supermarkets, but at the moment the impact of supermarkets on economic growth will be relatively small, whatever their procurement strategy may be.

Research Methodology

Data

We use data from the Nicaragua Living Standards Measurement Survey 2001 collected by the government of Nicaragua and the World Bank. The survey includes detailed information on household composition, economic activity, and consumptive expenditures for more than 4,000 households in seven domains: Managua, Pacific Rural, Pacific Urban, Central Rural, Central Urban, Atlantic Rural, and Atlantic Urban. Essential for this paper was the question "Where do you get most food for your household?" Answers were classified as follows: market, producer fair, street stall, home business, *pulperia*, supermarket, wholesaler, own production, and did not buy.

Model

Following Arnold, Oum, and Tigert (1983) and Medina and Ward (1999), we used a multinomial logit model to estimate the determinants of shopping-outlet choice. The different outlets are

considered unordered outcomes of choice Y , which are conditioned by a set of variables x , including age of the household head, household composition, education, total consumption, occupational category, and regional dummies. Total consumption is used as a proxy for family income. It includes all food consumed; the use value of the home and durable consumer goods; and expenditures for education, health care and insurance, transport, (non-durable) consumer goods, and housing services such as water and electricity. The probabilities of outlet selection are (Greene 1997; Woodbridge 2002)

$$(1) \text{Prob}(Y=j) = \frac{e^{\beta_j x}}{1 + \sum_{k=1}^J e^{\beta_k x}} \quad \text{for } j=1, 2, \dots, J.$$

As the response probabilities must sum to unity,

$$(2) \text{Prob}(Y=0) = \frac{1}{1 + \sum_{k=1}^J e^{\beta_k x}}$$

The parameters β are estimated by maximum-likelihood estimation using sample weights and correcting for clustered sampling and stratification (StataCorp 2005). Similar corrections are used for the descriptive statistics.

Multinomial logit estimation requires a reasonable number of observations in each category. We therefore merged similar outlets into superclasses. Markets, producer fairs, and street stalls are all very small-scale, often mobile, outlets and are grouped under the name "market."

Home businesses are grouped with *pulperías*, which are very typical, small-scale, permanent outlets. Supermarkets and wholesalers are separate groups.

Results and Discussion

Despite accounts on the increasing importance of supermarkets in Central America (Berdegué et al. 2005), the traditional *pulperia* is still by far the most important outlet for food in Nicaragua, with a patronage of more than 60 percent of all households (Table 1). The market is the second important outlet, frequented especially in Managua and the Pacific. Four to six percent of households patronize wholesalers in all domains except the Atlantic urban domain, with eleven percent patronage. Supermarkets are mostly an urban phenomenon, with a patronage of ten percent in Managua, five percent in the Central urban, four percent in the Pacific urban, and one percent in the Atlantic urban domain. Only in the Pacific do rural areas have a negligible supermarket patronage of two percent. Overall, supermarket patronage in urban areas is seven percent.

Since supermarkets are highly concentrated in urban areas, we estimate a multinomial logit model for urban areas only. Table 2 compares the characteristics of households included in the model over their preferred shopping outlet. The head of the household is on average 46 years old. Households count about five persons, of whom one-third are in the productive age. Consumption

Table 1. Outlet Patronage by Domain in 2001 (% of Households).

	N	Market	Púlperia	Supermarket	Wholesales	Own produce & do not buy
Atlantic urban	323	19	66	1	11	3
Atlantic rural	382	11	82	0	5	2
Central urban	612	9	80	5	6	1
Central rural	856	9	85	0	4	2
Managua	553	42	41	10	6	1
Pacific urban	898	40	51	4	4	1
Pacific rural	549	37	56	2	5	1
Total urban	2351	33	54	7	6	1
Total	4173	28	61	4	5	1

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Table 2. Characteristics of Households According to Preferred Shopping Outlet of Urban Households.

	Market (1)	Pulperia (2)	Supermarket (3)	Wholesales (4)	Equality test ^a
N	712	1319	123	156	
Proportion in sample (%)	33	54	6	6	
Continuous variables					(1) vs (2) (1) vs (3) (1) vs (4) (2) vs (3) (2) vs (4) (3) vs (4)
Age head of household (yrs)	45.62 (0.46)	46.56 (0.38)	46.54 (0.71)	48.68 (0.85)	-2.26** -0.90 2.52** 2.63*** 2.90*** 2.79*** -1.69*
Household size (number)	5.13 (0.09)	5.15 (0.09)	4.62 (0.12)	4.76 (0.19)	-0.28 2.24** -1.07 5.14*** 1.88* -0.51
Dependency ratio (%)	0.35 (0.01)	0.40 (0.01)	0.31 (0.02)	0.37 (0.02)	-5.38*** -8.72*** -5.55*** -8.23*** -11.33*** 5.89***
Consumption per capita (C\$/year)	12 081 (1 114)	8 702 (534)	30 848 (3 126)	16 332 (905)	5.09*** -8.72*** -5.55*** -8.23*** -11.33*** 5.89***
Categorical variables (% yes)					(1) vs. (2) vs. (3) vs. (4)
Secondary education dummy	78	65	95	87	104***
Full-time domestic work dummy	31	37	24	33	13***
Farmer dummy	7	13	2	6	12***
Pacific region dummy	36	28	17	20	34***
Atlantic region dummy	5	10	1	14	36***
Central region dummy	6	31	15	22	192***
Managua	53	30	67	43	154***

^a T-values are given for continuous variables, and Pearson χ^2 statistics for categorical variables.

Linearized standard errors of mean in parentheses.

*** significant at 1%.

** significant at 5%.

* significant at 10%.

Table 3. Multinomial Estimates for Preferred Shopping Outlet of Urban Households (N=2313).

	Market vs. supermarket	Pulperia vs. su- permarket	Wholesales vs. supermarket
Age head of household (yrs)	-0.388* (0.020)	-0.057*** (0.026)	0.026 (0.034)
Age head of household squared	0.0004* (0.000)	0.001*** (0.000)	-0.00008 (0.000)
Household size (number)	-0.119*** (0.037)	-0.234*** (0.049)	-0.178*** (0.063)
Dependency ratio (%)	-1.053*** (0.364)	-0.844*** (0.308)	0.0481 (0.455)
Secondary education dummy	-1.029*** (0.208)	-1.147*** (0.190)	-0.441* (0.249)
Full-time domestic work dummy	0.157 (0.251)	0.245 (0.284)	0.437 (0.312)
Farmer dummy	1.292*** (0.346)	1.440*** (0.285)	0.901* (0.499)
Ln(Consumption per capita)	-1.773*** (0.109)	-2.534*** (0.108)	-0.974*** (0.131)
Pacific region dummy	0.417* (0.241)	0.518** (0.254)	0.285 (0.330)
Atlantic region dummy	1.323 (0.909)	2.429*** (0.918)	2.839*** (0.781)
Central region dummy	-1.240** (0.503)	0.818** (0.386)	0.574 (0.478)
Constant	21.111*** (1.163)	28.773*** (0.954)	9.113*** (1.269)
F(33, 231)= 391.97***			

Standard errors in parentheses.

*** significant at 1%. ** significant at 5%. * significant at 10%.

The same model without survey correction yields a pseudo R-square = 14% and Log-likelihood = -2014.551.

The independence from irrelevant alternatives (IIA) assumption was not rejected by Hausman and Small-Hsiao tests.

per capita, as a proxy of family income, is significantly different between the groups. Households shopping in supermarkets have the highest average income level, followed by those who shop at wholesalers. Average income level is lowest for households shopping at *pulperias*. Levels of education and household activities also differ along outlet preferences. Households shopping at supermarkets count relatively more members with a secondary education, particularly when compared to households shopping at *pulperias*. Furthermore, the group of supermarket patronage counts fewer

households with members involved in full-time domestic work and/or farming.

The results of the multinomial logit model in Table 3 clearly indicate that households who shop at supermarkets have a high income compared to households shopping at more small-scale outlets and wholesalers. This is consistent with the findings of Trail (2006), who concludes on the basis of a cross-country study that income growth will have a significant effect on supermarket penetration in middle-income Latin American and transition countries. Although female participation in the

labour force is considered one of the main drivers of an increasing share of supermarkets in the retail food sector (Trail 2006), the presence of a full-time housewife does not influence the choice of market outlet in our sample. On the other hand, a second proxy for shopping time available, the dependency ratio, does have the expected effect: more children relative to adults increases the probability that a household shops at supermarkets. As buying at a supermarket implies relatively large volumes, it is more attractive for larger families. Farm households are more likely to buy their food at the market, *pulperías*, and wholesaler than in the supermarket, probably because they live in the more remote parts of urban areas with no supermarket nearby. Finally, household shopping at supermarkets have relatively high levels of education and older household heads.

Conclusion

This paper deals with the consumer side of supermarket development. Supermarkets need clients in order to achieve their promising role of promoting agricultural development. Using data from a representative sample of more than 4,000 households, we find that four percent of these households purchases most of their food at supermarkets. The share is somewhat higher in urban areas.

Supermarket patronage is mostly an urban phenomenon, especially in Managua. This illustrates the importance of accessibility. Infrastructure is, without a doubt, better developed in Managua than in the other domains. Managua is therefore more conducive to supermarket development than are other domains. Still, most households did not find their way to the supermarkets.

Similar to previous studies, we find that supermarket patronage is closely related to higher income levels. Arguably, the degree of supermarket patronage will therefore increase with average household's wealth status. These results point to new potential clients for supermarkets when average income levels increase for the any families who are currently shopping at markets and *pulperías*. Supermarkets might want to become more easily accessible and/or adapt their assortment offered to this new clientele.

A challenge for the future is to put our results into a more dynamic perspective. Several new research

questions arise. What exactly attracts consumers to supermarkets as an alternative to markets and *pulperías*? Will supermarkets need to adapt their product assortment to attract the less-endowed and/or open new branches that are better accessible for lower-income households? Will families automatically tend to choose supermarkets as their income increases? And if so, what are the drivers behind this change in outlet patronage?

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