Consumer Characteristics Associated with Food Prices

B. Mandleni and FDK Anim

CONSUMER CHARACTERISTICS ASSOCIATED WITH FOOD PRICES

B. Mandleni[1] and FDK Anim[2]

Abstract

To keep up with the recent trends in consumer demand for food products, an understanding of the associated customer characteristics is needed. This study identifies significant characteristics and factors of households who are likely to purchase basic household food when prices are high. The analysis was performed using logit model. The results of the study imply that the following households are more likely to purchase foods when prices are high: those with large sizes of land for farming and for home garden, those who frequently purchase the basic food stuffs, those who receive some advice on prices of food, and those with large household sizes. Educated females with information sources on food prices, and those household who stay far away from the nearest food shops do not appear to be likely to purchase food when prices are high.

Keywords: Food prices, consumer characteristics, logit model.

Introduction

Food prices in South Africa, as measured by the CPI-Food, increased by 15.7% from April 2007 to April 2008. According to NAMC, this is 0.4% higher than the increase in food prices reported for March 2008 (NAMC, 2008). The food categories that made the largest

[1]Lecturer, UNISA, College of Agric. & Environmental. Sciences; Dept. of Agric., Animal Health & Human Ecology; Florida Campus, Private Bag X6 Florida 1710, South Africa, Tel: 011-471-2252; Fax: 011-471-2260; E-mail: mandlb@unisa.ac.za

[2] Associate Professor, UNISA, College of Agric. & Environmental. Sciences; Dept. of Agric., Animal Health & Human Ecology; Florida Campus, Private Bag X6 Florida 1710, South Africa, Tel: 011-471-3231; Fax: 011-471-2260; E-mail: animfdk@unisa.ac.za

contribution to this increase included grain products; milk, cheese and eggs; fats and oils; fruits and nuts; and vegetables. From a food security point of view prices of staples continued to increase. The increase in brown and white bread prices were 21.58% and 26.37%, respectively, year-on-year. The prices of a 5kg bag of super and special maize meal increased by 5.23% and 5.66%, respectively, year-on-year (this is within the inflation target band), bringing some relief to the poor consumers that relied mainly on staple food such as maize meal. Dairy product prices increased, on average, by 24.65%, while meat prices on average continued to increase at a much slower rate than most other food products. The prices of the main vegetables showed year-on-year increases of 32.85%. The increase in grain prices was mainly due to pressure on international and domestic grain stocks, while the increases in vegetables prices could be largely attributed to climate events. Input cost pressures were playing an increasingly important role in pushing prices higher.

These trends point to a growing concern for purchasing household food items when prices are high. Although the agricultural sector has been actively responding to consumer demand by attempts to produce more food, the failure rate of an increase in food supply still remains high. The agricultural sector with its myriad problems has been criticized in this regard for not knowing their customers. To fill this gap, this study examines the consumer characteristics associated with the purchase of food at high prices. Knowledge of these characteristics and factors can be used as guide in developing marketing programmes for products with high prices. The study examines not only consumers' demographic factors but also external factors using a cross sectional data of 390 households in 24 rural communities in the Limpopo province of South Africa.

Methodology

A model is estimated to examine the likelihood that a household will purchase food products that experienced higher than the inflation target increases in prices as at the end of April 2008. The logit framework is used for this purpose. The logit technique is preferred over other categorical variable estimation technique (Fox, 2000), and is a better procedure for capturing the magnitude of the independent variable effects for quantitative dependent variables that are probit models (Pampel 2000)). The logit model is estimated using maximum likelihood estimation as it results in large-sample properties of consistency and asymptotic normality of the parameter estimates. The model is based on the cumulative logistic probability function and is specified as (Pindyck and Rubinfield, 1991):

$$P = F(z) = F(X_i'\beta) = \frac{1}{\left(1 + e^{-z}\right)}$$

Where Z is the theoretical index determined by a set of explanatory variables X; F(Z) is the cumulative logistic function; e represents the base of natural logarithms (approximately equal to 2.718); and P is the probability that a household will make a choice, given the knowledge of X , and ß represents the estimated coefficients.

The logit model centres on the hypothesis that a set of variables influences the decision to purchase food products that experienced higher prices. The logit model is specified as follows:

$Prob = b_o + b_1 GEN + b_2 EDUC + b_3 SIZEF + b_4 SIZEH + b_5 FOOD + b_6 INFO +$

$b_7 EXT + b_8 DIST + b_9 HHS$

where Prob is a binary variable equal to 1 if household purchases food products and 0 otherwise. The description and the means of the independent variables are exhibited in Table 1. The GEN variable is hypothesised to have negative or positive effect on decision to purchase, depending on whether the household's purchasing behaviour is determined by males or females. On the other hand, the variable EDU is expected to have a negative sign in

the model indicating that the more a household head is educated the less likely that he/she will purchase food at high prices. The size of land for farming variable, SIZEF and size of land for home garden variable, SIZEH are both expected to be positively and negatively related to the likelihood of purchasing food at high prices. The decision to purchase will depend on whether the land in each case is productive or not.

The type of food commonly eaten by the family FOOD, and household size, HHS are likely to have negative or positive influence on the decision to purchase at high prices. Exposure to advice on food prices, EXT is likely to impact positively on the decision to purchase when prices are high. Long distances from household dwelling to the nearest shop, DIST are also hypothesised to have negative impact on the decision to purchase.

Data description

Data in this study were collected by in-person interviews from a total of 24 rural households in the Limpopo province between February and March 2008. In all, a total of 390 household heads interviewed at random constituted the sample for the survey. The period of study was chosen purposely to include the time when food products in rural areas experienced higher than the inflation target increases in prices (NAMC, 2008).

The survey contained various socio-economic variables. Sample statistics for the variables used in the model are presented in Table 1. The table shows that households were more educated and female headed. Sizes of farm for farming and home garden were 1.14 and 1.02ha respectively. The small sizes are indications of small scale farming typical in the study areas. Household food commonly purchased appeared to be mostly wheat and maize products. Sources of information on food prices appeared to be between good and average,

while difficulty in getting advice from extension officers ranged between difficult and easy. The average distance from household dwelling to the nearest shop for food purchases was 4.44 km and average household size was estimated to be 5 persons.

Table 1: Description and means of independent variables used in the analysis

Variable name	Description	Mean
GEN	Gender of household head: 1= male; 2=female	1.57
EDUC	Level of education: 1=more than std 8; 2=less than std 8	1.47
SIZEF	Size of land for farming (ha)	1.14
SIZEH	Size of land for home garden (ha)	1.02
FOOD	Household's frequent food purchases	1.84
(1= wheat products; 2= maize products….11=sorghum meal)		
INFO	Information sources on food prices	2.34
(1=very good; 2= good; 3=average 4=poor)		
EXT	Difficult to get advice on food prices from extension officers	2.15
	(1=very difficult; difficult=2; 3=easy; 4=don't know)	
DIST	Distance from house to nearest shop	4.44
	(1= >50km; 2=20-50km; 3= 10-20km; 4= <10km; 5=don't know)	
HHS	Household size (persons)	5.00

Number of cases, n=390

Results and discussion

The maximum likelihood estimates of the model are presented in Table 2. Based on the statistical significance of the estimated coefficients, the results indicat that gender, education, source of information and distance from household to nearest shop are negatively related to the likelihood of purchasing household food commodities at high prices. On the other hand,

size of land for farming and household garden, frequent food purchases, information of prices, and household size are positively related to the purchase of high food prices.

Contrary to expectations, the study suggests that household with large sizes of land for farming and for home garden are more likely to purchase food for household consumption when prices are high. A plausible explanation is that these households may have enough funds raised from income on farm operations to purchase food compared with those households that do not have funds from farm operations.

Households who make frequent purchases of basic food commodities are also more likely to purchase food when prices are high. It could be explained that these households have developed tastes and preferences for such food, hence they cannot do without them. Households with large household sizes and receive advise on prices from extension officers are also more likely to purchase food at high prices.

The perceived importance of information and education are included in the model to test the hypothesis that the two variables negatively affect the likelihood of purchasing food at high prices. Deaton (1990) alluded to the importance of these variables in consumer's food purchase decisions. Educated household heads that have adequate information on food prices are less likely to purchase food for home consumption when prices are high due to their understanding of the effects on the household budget.

Gender differences are included as independent variables because of possible differences in decision making of the household or habits (Deaton and Grosh, 2000). For instance, females other than males have lower financial control rates than their male counterparts in rural areas.

It is therefore possible that females are less aware of the effects of high food prices on the household budgets.

Table 2: Estimated probit model

Variable name	Estimate	Std. Error	Z	Sig.
GEN	-0.300	0.051	-5.882	0.000
EDUC	-0.107	0.052	-2.072	0.038
SIZEF	0.097	0.029	3.316	0.001
SIZEH	0.047	0.026	1.828	0.068
FOOD	0.199	0.027	7.312	0.000
INFO	-0.075	0.028	-2.692	0.007
EXT	0.070	0.024	2.948	0.003
DIST	-0.039	0.009	-4.526	0.000
HHS	0.024	0.012	2.050	0.040
Intercept	-0.795	0.147	-5.398	0.000

PROBIT (P) = Intercept + BX

The study also recognises that long distance from the household dwelling to the nearest shop is likely to negatively affect the decision to purchase at high food prices.

Conclusions and recommendations

To keep up with the recent trends in consumer demand for food products, an understanding of the associated customer characteristics is needed. Due to increasing concerns about high food prices, the food and agribusiness industry is continually interested in creating a vast array of concepts that appeal to specific consumer tastes and preferences. It is therefore imperative that the profile of households who are more likely to purchase food when prices are high be known to the food and agribusiness industry for future planning. This information is

particularly useful for processors and producers who want to anticipate future market changes in prices and derived demand for their products.

The results of the study imply that the following households are more likely to purchase foods when prices are high: those with large sizes of land for farming and for home garden, those who frequently purchase the basic food stuffs, those who receive some advice on prices of food, and those with large household sizes. However, educated females with information sources on food prices and those households who stay far away from the nearest food shops do not appear to be likely to purchase food at high prices.

The identification of households likely to purchase foods at high prices is essential in analysing consumption patterns and developing specific marketing programmes. Food processors and manufacturers selling food at high prices should tailor their products to the taste of these households who are most likely to purchase products to boost sales. Based on the empirical findings, for example, high food prices may be targeted to those households with large sizes of land for farming and for home garden, those who frequently purchase the basic food stuffs, those who receive some advice on prices of food, and those with large household sizes (Gibson and Rozelle, 2002). Conversely, educated females with information sources on food prices, and those households who stay far away from the nearest food shops may be less receptive to marketing campaigns that promote high food prices. Considering the fact that consumer preferences and high prices are related, the findings in this study might be of interest to market analysts not only in South Africa but elsewhere as well.

References

Deaton, A. (1990), "Price Elasticities from Survey Data. Extensions and Indonesian Results", *Journal of Econometrics*, vol. 44, pp. 281-309.

Deaton, A. and Grosh, M. (2000), "Consumption", in M. Grosh and P. Glewwe, (eds.) *Designing Household Questionnaires for Developing Countries: Lessons from Fifteen Years of the Living Standard Measurement Study*. The World Bank, Washington D.C., pp. 91-133.

Fox, John (2000). Multiple and generalized nonparametric regression. Thousand Oaks, CA: Sage Publications. Quantitative Applications in the Social Sciences Series No.131.

Gibson, J. and Rozelle, S. (2002), "Prices and Unit Values in Poverty Measurement and Tax Reform Analysis," mimeo, Department of Economics, University of Waikato.

National Agricultural Marketing Council (NAMC) (2008). Quarterly Food Price Monitor, May 2008, Media Release, Food Price Trends: April 2007 to April 2008.

Pampel, Fred C. (2000). *Logistic regression: A primer*. Sage Quantitative Applications in the Social Sciences Series #132. Thousand Oaks, CA: Sage Publications. Pp. 35-38.

Pindyck, R.S., and Rubinfield, D. (1991). *Econometric models and economic forecasts.* New York; McGraw-Hill.