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Does Brand Affect the Demand of Dairy Products in District Mardan Khyber Pakhtunkhwa, Pakistan?

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ABSTRACT

Linear Approximate Almost Ideal demand system (LA-AIDS) was used to investigate the effect of brand on the quantity demand of dairy products. Survey data were collected from the eighty urban households in district Mardan Khyber Pakhtunkhwa. LA-AIDS model was estimated for milk, cream and yogurt due to its major share in dairy products. The effect of brand on the demand for the three dairy products (i.e. milk, cream and yogurt) was estimated using a dummy, which took the value of 1 for Nestle and zero for the rest of brands. Among all the three products, expenditures on Nestle was high and statistically significant as compared to other brand such as Haleeb, Olper and Adam. Consumers spent five-times more on Nestle milk as compared to other brands. Similarly, consumers spent six-times more on Nestle cream and yogurt as compared to other brands. Hence, it was concluded that the brand plays an important role in forming consumer's preference towards dairy products and is important determinant of expenditure on dairy products.

KEY WORDS: Brand, Elasticities, Dairy demand, LA-AIDS

INTRODUCTION

Brand is a name, term, sign, symbol or package design that differentiate goods and services of one producer from those of others (American Marketing Association, 1995). Brand is used as a trademark that recognizes and differentiates products of one seller from the competitors products (David A Aaker, 1991). Similarly, the history of brand shows that the producers use brand for duel objectives, one to differentiate products and second to influence consumers' purchase decision. Consumers buy products of a brand as a sign of quality (Sarker et al. 2013; Alamgir et al. 2010) followed by other characteristics like physical appearance, price and reputation (Vranesevic and Stancec, 2003). Some consumers give more preference to brand because of their lack of experience in purchasing (Joshi, 2013). It has been proven that the brand plays a vital role in the purchase decision of consumers (Keller, 2013; Leighton and Bird, 2012; Einwiller, 2001).

The significance of brand is also obvious from the fact that brand reveals some guidelines on hygienic aspects and composition of product. Similarly, brand also delineates the producers' pledge on quality and safety attributes of the products. So, it reduces the amount of risk and increases the level of confidence in consumers' purchase decision. However, if producers fail to meet their promise, then their reputation can rapidly diminish. Brands represent extremely valuable legal property that can influence consumer behavior, and result in sustained future revenues (Keller, 2013). Several studies (Bhattacharya and Mitra, 2012; Jin et al. 2008; Brucks et al. 2000; Dawar and parker, 1994) have investigated the buyers' tendencies towards brand as an indicator of quality and their positive effects on consumers' purchase decisions.

Dairy sector is an important component of Pakistan's economy. The value of milk alone exceeds the combined value of wheat, rice, maize and sugarcane in the country. Pakistan's dairy sector produced 50.99 million tons of milk in 2013-14 making Pakistan the 4th largest producer of milk in the world (GoP, 2014). Although, this production falls short to meet national demand. As a result milk is imported to fulfill the demand. This situation has made the large segment of the population to be dependent on branded milk and other dairy products. Various brands such as Nestle, Haleeb, Olper, Adam and good-milk compete to build customer loyalty using branding strategy.

Given the significance role of branding, marketing manager and producers' are using various branding strategies to capture a large market share. The dairy sector is not an exception to this growing trend of branding as a

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strategy for gaining the heart of consumers. However, we are unaware of consumers' preferences for the dairy products produced by these multinationals and whether brand is the main element influencing consumer's choices or not. It is also assumed that food demand is inelastic and is not influenced by brand and other characteristics. This study is an attempt to investigate the effect of brand on the quantity demanded of dairy products in the district Mardan, Khyber Pakhtunkhwa Pakistan as a case study.

MATERIALS AND METHODS

The study was conducted in the urban area of district Mardan, Khyber Pakhtunkhwa. Eighty households were selected using the following relationship of Casley and Kumar (1988) for sample size determination.

$$n = \frac{K^2V^2}{D^2} \quad \ldots\ldots (1)$$

where n is the required sample size, K is the standard normal deviate for the required confidence interval, V is the coefficient of variation (i.e. standard deviation as a proportion of mean) of the variable under study and D is the margin of error, expressed in absolute percentage points and representing the largest acceptable error in the estimates. Data were collected though a questionnaire. The questionnaire was pre-tested and covered respondents' consumption behavior and perception toward dairy brands. The data on perception was collected using Likert's scale.

This study used the Linear Approximation of Almost Ideal Demand System (LA-AIDS) of Deaton and Muellbauer (1980) for the estimation of the effect of brand on households' demand for dairy products. This is an ideal demand system because this system satisfies exactly the axioms of choice, simple to estimate and testing the empirical validity of the restrictions of symmetry and homogeneity and also has a functional form that is consistent with known household budget data. The share equation is given as follows:

$$w_i = \alpha_i + \sum_j \gamma_{ij} \ln p_j + \beta_i \ln\left(\frac{X}{P}\right) + \varepsilon_i \quad \ldots\ldots (2)$$

where w_i is the budget share of ith dairy product , P_i is the price of ith dairy product, X is the total expenditures on dairy products and P is the price index approximated by the Stone price index $\ln(P) = \sum_j w_j \ln p_j$, ln represents natural logarithm and α_i, γ_{ij} and β_i are the estimated parameters and ε_i are the random errors. The conditions of additivity, symmetry and homogeneity are imposed as under.

$$\sum_i \alpha_i = 1, \ \sum_i \gamma_{ij} = 0, \sum_i \beta_i = 0 \quad \ldots\ldots (3)$$

The study further augment equation (2) with socio-economic variables such as household size, education and number of children and products specific dummies for milk, cream and yogurt. The last three dummies are added to the model to estimate the effect of brand on dairy products demand.

$$w_i = \alpha_i + \sum_j \gamma_{ij} \ln p_j + \beta_i \ln\left(\frac{X}{P}\right) + \sum_j \delta_i B_j + \sum_j \theta_i D_j + \varepsilon_i \quad \ldots\ldots (4)$$

Where B is the vector of brand dummies and δ_i is its vector of parameters and D is a vector of socio-economic variables and θ is its vector of parameters.

The model is estimated using Zellner's seemingly unrelated regression. The statistical significance of estimated elasticities are derived using the delta method (STATA, 2005). In case of missing prices average prices are used in the analysis (Cox and Wohlgenant, 1986). Imposing the property of additivity of the expenditure function makes the variance and covariance matrix singular and one of the equation needs to be omitted to estimate the LA-AIDS. The expenditure equation for "yogurts" was omitted and the coefficients for the omitted equation were derived using the theoretical conditions imposed on the estimation process. The coefficient estimated using LA-AIDS are invariant to the omitted equation.

RESULTS AND DISCUSSION

The effect of brand on dairy products demand was estimated using Linear Approximate Almost Ideal Demand system (LA-AIDS) for urban households in district Mardan, Khyber Pakhtunkhwa. The model was estimated using Zellner's seemingly unrelated regression procedure. The data were collected from eighty households in the targeted area for eight dairy products, including milk, cream, butter, yogurt, lassi, cheese, ice-cream and powder-milk. Linear AIDS model was estimated only for three products milk, cream and yogurt due to their major share in dairy expenditure as well as suitable number of consumers. Adding up, homogeneity and symmetry conditions were imposed before estimation of LA-AIDS.

The estimated coefficients are reported in (Table 1). Most coefficients of the prices are significant at 1% level of significance. The coefficient of milk and cream prices are statistically insignificant in yogurt expenditures. Hence, we can say that milk and cream prices has no effect on yogurts expenditure. Consumption of branded yogurts are not consumed like, milk and cream in the population and therefore, not effected by their prices. The R- square values are 0.96, 0.94 and 0.66 for milk, cream and yogurt expenditure respectively, implying that the model is good fit. All parameters estimated for socio-economic variables are statistically insignificant.

The effect of brand on the demand for the three dairy products (i.e. milk, cream and yogurt) is estimated using a dummy, which takes the value of 1 for Nestle and zero for the rest of brands. Brand statistically significantly determines dairy products demand (Table 1). For all the three products, expenditures on Nestle is high and statistically significant as compare to other brand such as Haleeb, Olper and Adam. Consumers are spending five-times more on Nestle milk as compared to other brands. Similarly, Consumers are spending six-times more on Nestle cream and yogurt as compared to other brands. Which indicates an obvious increase in mean expenditure of households because of brand selection. Hence, results reflect that brand is an important determinant of expenditure on dairy products.

Table 1 Parameter estimates of the LA-AIDS model for dairy products

Explanatory variable	Milk	Cream	Yogurts
Log of price of milk	0.398** (0.199)	-0.426** (0.206)	0.028 (0.38)
Log of price of cream	0.254* (0.064)	-0.263* (0.066)	0.009 (0.122)
Log of price of yogurts	-0.053* (0.007)	-0.068* (0.008)	0.121* (0.014)
Log of food Expenditure	-0.796* (0.05)	0.822* (0.052)	-0.026* (0.095)
Education	-0.001 (0.002)	0.001 (0.002)	0.001 (0.004)
Household size	-.0002 (0.001)	0.001 (0.001)	.0017 (0.002)
No. Children	-0.002 (0.004)	-0.001 (0.004)	0.003 (0.007)
Dummy for milk Brand	0.057*** (0.03)	0.005 (0.032)	-0.063 (0.058)
Dummy for cream Brand	0.007 (0.017)	0.062* (0.017)	-0.068** (0.032)
Dummy for yogurts Brand	-0.019 (0.013)	-0.042* (0.013)	0.06** (0.024)
Constant	1.437 (1.027)	-0.199 (1.066)	-0.238 (1.963)
R-squared	0.96	0.94	0.66
Chi	1244	851	86.11

Source: Own estimations from survey data Figures in parenthesis are showing standard error
*indicates significance at 1 %, ** at 5 % and *** at 10 % level of significance.

Table 2 reports estimates of Marshallian own and cross price elasticities. Most of the price elasticities are statistically significant at 1 percent level of significance and have expected signs. The own price elasticities for milk, cream and yogurt are -1.3, -1.2 and -0.49 respectively. These elasticities show that the demand for milk and cream is price elastic whereas the demand for yogurt is unexpectedly price inelastic. A one percent increase in the price leads to 1.3, 1.2 and 0.4 percent decrease in the demand for milk, cream and yogurt respectively. Implying that households are more responsive to the prices of milk and cream as compare to yogurt. Cross price elasticities indicate the effect of price change in one product on the demand for another products. The cross price elasticities of three products are positive and are gross substitutes. Three of six cross price elasticities are negative and showing gross complements of each other.

Table 2: Marshallian own and cross price elasticities

	Milk	Cream	Yogurt
Milk	**-1.281** (0.000)	-0.812 (0.299)	0.144 (0.923)
Cream	-0.479 (0.000)	**-1.199** (0.000)	0.07 (0.883)
Yogurt	-0.9 (0.000)	0.536 (0.000)	**-0.493** (0.000)

Source: Own estimation from survey data.

Conclusion

The study has been an attempt to investigate consumers' preferences for brands in dairy products and to estimate the effect brand on the quantity demand of dairy products. The study based on the survey data conducted among the urban households in district Mardan Khyber Pakhtunkhwa. Almost Ideal Demand system was employed for estimating the parameters and especially the price elasticities. The empirical results reported here are reliable in term of economic theory and statistical fitness. The price elasticities were estimated using parameters estimates of LA-AIDs model. All own price elasticities have correct negative sign and highly significant. The parameters estimates of products dummy using LA-AIDS procedure indicates that for all the three cases, expenditure on Nestle is high as compared to other brands and statistically significant at 90 percent level. Hence, brand is an important determinant of expenditure on dairy products.

The study is limited only to a small geographical area of urban households in district Mardan. Secondly in the targeted area consumption pattern of the households are very different, most of the households buy milk from street vendors as fresh produce. Other dairy products are also consumed as open and considered tasty as compared to the branded dairy products. Our analysis confirm that for all the three cases, brand plays a significant role in dairy products demand. Manufacturer may concentrate more on brand amongst product related strategies to increase demand for their products.

REFERENCES

1. Joshi, D., 2013. Effects of branding on buying behaviour. The Macrotheme Review, 2(7), 156-159.
2. American Marketing Association.,1995. Retrieved from Dictionary: https://www.ama.org/resources/Pages/Dictionary.aspx?dLetter=B
3. Bhattacharya, S., & Mitra, S., 2012. Consumer behaviour and impact of brand - a study on south zone of kolkata city. Voice of Research, 1.
4. Brucks, M., Zeithaml, V., & Naylor, G., 2000. Price and Brand Name as Indicators of Quality Dimensions for Consumer Durables. Journal of the Academy of Marketing Science, 28(3), 359-374.
5. Casley, D. J., & Kumar, K., 1988. The Collection, Analysis, and Use of Monitoring and Evaluation Data. The Johns Hopkins University Press.
6. Cox, T., & Wohlgenant, M., 1986, 9. Prices and Quality Effects in Cross-Sectional Demand Analysis. American Journal of Agriculture Economics, 909-919.
7. David A., 1991. Managing Brand Equity. New York N.Y: San Francisco: Free Press.
8. Dawar, N., & Parker, P. , 1994. Marketing Universals: Consumers' Use of Brand Name, Price, Physical Appearance, and Retailer Reputation as Signals of Product Quality. Journal of Marketing, 98(2), 81-95.
9. Deaton, A., & Muellbauer, J., 1980. An Almost Ideal Demand System. American Economic Review, 70(3), 312-26.
10. Einwiller, S., 2001. The Significance of Reputation and Brand for Creating Trust in the Different Stages of a Relationship between an Online Vendor and its Customers. Eighth Research Symposium on Emerging Electronic Markets.
11. GoP., 2014. Government of Pakistan.Economic Survey of Pakistan. Ministry of Finance, Islamabad.
12. Jin, Y., Zilberman, D., & heiman, A., 2008. Choosing brands: fresh produce versus other products. American Agricultural Economics Association, 90(2), 463–475.
13. Keller, K. L., 2013. Strategic Brand Management (4 ed.). PEARSON.

14. Leighton, J., & Bird, G., n.d. The Effect of Branding on Consumer Choice. Mountainview Learning.
15. Sarker, S., Yousaf, S., & manzoor, M. Z., 2013. Influences on brand selection decisions of staple goods: A study on toothpaste users of Khulna city. Journal of World Economic Research, 2(3), 58-66.
16. Vranesevic, T., & Stancec, R., 2003. The effect of the brand on the perceived quality of food products. British Food Journal, 105(11), 811-825.