

EFFECTS OF ADVERTISING ON DEMAND FOR NON-CARBONATED DRINKS IN DISTRICT MARDAN KHYBER PAKHTUNKHWA

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ABSTRACT

Linear Approximate Almost Ideal Demand System (LA/AIDS) model has been used to investigate the effect of advertising on the quantity demanded of non-carbonated drinks (NCDs) in Mardan, Khyber Pakhtunkhwa. In this study, non-carbonated drinks are categorized into three groups i.e. fruit juices, mineral water and milk packs. Primary data were collected from 272 respondents in Mardan city. Chi-square statistics and F-statistics are computed to see the relationship between different variables. Estimated results from the LA/AIDS model for the three categories of NCDs reveal that brand advertising has statistically significant impact on demand for NCDs. Results also show that all demographic variables like household size, household age, number of children and dummy for literacy are found significant for the two groups, fruit juice and milk pack of NCDs. While these demographic variables are found insignificant for the third group, mineral water. All uncompensated own price, cross price and expenditure elasticities are significant and have the expected signs. The demand for all three groups is price inelastic. All expenditure elasticities are positive showing that all the drinks in this study are normal goods with respect to their expenditure.

Keywords: Advertising, Almost Ideal Demand System, Price Elasticity, Expenditure Elasticity

INTRODUCTION

Advertising is one of the major sources of marketing consumer products, it provides lasting effect on consumers' mind (Katke, 2007). Advertising is one of the major tools for product awareness (Ampofo, 2014). Various types of advertising influence consumers purchasing decisions. However, television (TV) is one of the most effective medium influencing the consumer behavior (Asadollahi & Tanha, 2012; Siddiqui, 2014). Advertising is a type of communication which makes people aware of products. Advertising of commodities and services convince the customers to consume the products or services based on the stated qualities or attributes (Frolova, 2014). Previous research has shown mixed results. Some of the research has revealed that advertising has positive effect on the consumer demand (Kumar, Gangal, & Singh, 2011; Li & Lopez, 2012; Powers, 1989; Philip, 2007; Patalinghug, 2013; Rojas & Peterson, 2008; Rehman, Nawaz, Khan, & Hyder, 2014; Snokusare, 2013). On the other hand, several studies (Capps, David, Bessler, & Williams, 2004; Jensen & Schroeter, 1992; Rickersten, Chalphant, & Steen, 1995; Xiao, Kinnucan, & Kaiser, 1999) found that advertising has no effect on consumers' demand.

Contemporary advertising industry flourished to its peak, and the global advertising spending was recorded \$500 billion in 2016. US, China and Japan are the world's largest advertising markets, where multinational spend \$180 billion on advertising their products. Pakistan advertising industry is worth \$650 million. In Pakistan, TV is one of the most influential source of advertising. In non-carbonated drinks, Nestle is one of the five top advertisers (Narula, 2017). Advertising on non-carbonated drinks via print and electronic media has been increasing in Pakistan. Nestle for instance incurred advertising

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expenditure of Rs 5.52 billion in 2013 compared to Rs 3.76 billion in 2012, and similarly Engro Foods spent Rs 2.65 in 2013 compared to Rs 2.41 billion in 2012 on advertising.

Consumer tastes and preferences differ with different goods and services with respect to their qualities that are important to the consumer. The consumer's preferences change with awareness campaigns on goods and services. Taste and preference change over time. Taste and preferences of the consumer change with advertising (Hirschman & Thompson, 1997).

A bundle of literature exists to study the effect of advertising on consumer demand. Chang and Green (1989) claimed, the advertisements have positive effect on own price elasticity that is, the demand for goods and services become more price inelastic with the increase of advertising expenditure. They further found that advertising and expenditure elasticity for all food groups are negatively related.

Powers (1989) found that own prices, prices of the other commodities, income and advertising affect demand for goods and services. Junaid, Nasreen, Ahmad, and Hamdard, (2013) while studying the effects of advertising on cosmetics products concluded that income of the female consumer and demand for cosmetics products are positively related and this is made possible by the advertisement made on them. It has been proved that not only price but the quality of a good influences consumer demand as well (Kumar et al., 2011). Consumer's intention and buying behaviors mainly impressed from brand image, persuasiveness, and celebrity endorsement in advertisement (Ahmad & Ashfaq, 2013).

A large body of literature has mixed results (positive, negative, or no effect) about the effect of advertising on consumer demand in many countries but so far no study has estimated the effect of advertisement on demand for non-carbonated drinks in Pakistan. Thus, in this study an attempt will be made to know the impact of advertisement and other socio-economic factors on consumer demand for Non-Carbonated Drinks in Khyber Pakhtunkhwa based on primary data collected from 272 household using Linear Approximate Almost Ideal Demand System (LA/AIDS). The results obtained from this study shall inform the firms about the role of various types of advertisements (mode of advertisements and type of advertisements) on the demand for non-carbonated drinks. Secondly the firms/producers will also know about other factors influencing consumers' demand for NCDs. Finally, this study will help various beverages companies to develop and revised their promotional policies as well as know advertisements strategy for marketing their products.

LITERATURE REVIEW

Advertising is more than a tool for selling. One principle standard of the advertisements is to position a brand in relation to the competitors so as to create an increased demand by informing about the superior quality and price. Some of the earlier studies on the role of advertisements to affect consumer demand summarized as follows:

Most of the studies provide support to the statement that advertising has significant affect on the consumer demand like the study of Morrison (1984) examined generic advertising of farm products in the USA. Study found that, successful advertising shifts the demand curve outward either by attracting new consumers or increasing the demand of the existing consumers. Advertising play vital role in product promotion because it is due to advertising consumers are well aware about the products and qualities associated with it as Shapiro and Grossman (1984) studied the role of promotional expenditures. Study found that improved efficiency of advertising increase the product competitiveness because advertising informs customers about the useful characteristics of the

products.

Previous studies also highlighted other socio-economic factors that affect consumers purchasing decisions as the study Green, Carman and McManus (1991) investigated advertising effects on demand for dried fruits i.e California figs, prunes, and raisins. The study found that as compared to price and total expenditure, advertising has weakly affected the demand for fruits. Similarly the study of Jensen and Schroeter (1992) examined the impacts of TV advertising on demand for beef in United States. Single equation linear model was used. They found that price, income and consumers' demographics are important determinants of consumers' fresh beef demand, while advertising is not significant factor to increase consumer demand for fresh beef.

Capps et al. (2002) assessed various factors effecting demand for U.S pork using data from 1994-1996. This study used double-hurdle model. During their study they found brand and generic advertising to be main factors affecting demand of the consumers. Furthermore, they also found that region, urbanization, age, income, seasonality and race affect the consumer demand for U.S pork. Ahmed and Ashfaq (2013) studied the relationship between brand advertising and purchasing behavior of consumer. Primary data were collected by using a questionnaire. This study was conducted in January 2013 using a sample of 120 respondents including 50 government and semi government employees, 30 businessmen and 40 private employees. Empirical results showed that brand advertising have positive effect on consumer's buying behavior.

As in today's world carbonated drinks and NCD's industries are spending a lot on advertising, so whether this huge spending is fruitful for these industries previous studies provide a valid evidence in support of advertising like Xiao et al. (1999) examined the effects of advertising on U.S. Non-Alcoholic beverage (Fluid Milk, Fruit Juices, Soft drinks, Tea and Coffee) demand. The results of the study indicate that demand for non-alcoholic beverages is not affected by the advertising on them. However, advertising affects the demand within the beverage group. Milk products are least effected but coffee and tea are mostly effected by other beverage advertising. Similarly, milk advertising exerts the least while juice advertising exerts the largest influence within the beverage group.

Kumar et al. (2011) analyzed the impact of advertisings on consumer purchasing behavior with reference to Nestle products. They used mean and standard deviation techniques on the data collected from a sample of 200 randomly selected consumers in Agra city. Study found that advertising has high influence on the demand for Nestle products. Lopez et al. (2015) studied the relation of spillover effects of television advertising and consumer demand for Carbonated Soft drinks (CSDs). This study used random coefficients logit model. It was found that television advertising had direct effect on consumer demand for CSDs. there is positive relationship between television advertising and consumer demand for carbonated soft drinks.

While some studies found weak indications in support of advertising strategies as Capps et al. (2004) analyzed the impact of Florida Department of Citrus (FDOC) and brand advertising on the demand for orange juice at the retail level using vector auto regression models. The data were selected from AC Nielson and competitive media reporting from 1989-2002. During their study they found that FDOC advertising's increased total consumption of orange juices from 3.31 percent to 7.67 percent. Contrary to the previous result, it was also found that advertising on a specific product had no effect on consumer's demand. Concluding that most of the previous studies investigated the role of advertising in consumer decision making and most of studies found that advertising is positively and significantly related to the consumer demand (Kumar et al., 2013; Li & Lopez, 2012; Rehman et al., 2014).

RESEARCH METHODS AND DATA

This section presents determination of the sample size for this study. Also, we provide an overview of the data collection method. Finally, a theoretical model is presented with detail explanation to provide a background for the empirical model.

Theoretical Model

In this section we discuss and derive the demand function used for studying the impact of prices, income, exposure to advertising and other socioeconomic variables on consumer' demand for NCDs in the city of Mardan Khyber Pakhtunkhwa. Linearly approximated Almost Ideal Demand System (LA/AIDS) is used for estimating the required parameters. We also estimate the uncompensated (Marshallian) price elasticities.

Although advertising's effects on demand have usually been studied within a single equation framework (Ampofo, 2014; Powers, 1989; Rehman et al., 2014), recently there has been efforts to study the demand in the demand systems of many commodities (Duffy, 1987; Duffy, 1991; Chang & Green, 1989; Goddard & Amuah 1989; Piggott, Zhen, Beach, & Wohlgenant, 1991). A demand system is a group of demand equations that can be estimated simultaneously. Demand system can be estimated using different methods like Simultaneous Equation System and Seemingly Unrelated Regression (SUR). Various demand models, such as the Rotterdam model by Duffy (1987), the linear expenditure system by Chang and Green (1989), the indirect translog model by Goddard and Amuah (1989), the almost ideal demand system by Piggott et al., (1991), and Linear approximate almost ideal demand system by Duffy (1991) have been estimated. The linear approximate almost ideal demand system (LA/AIDS) is selected for this study. The LA/AIDS has several theoretical advantages over other demand models. The AIDS model is simple to estimate because it does not need using the translog price index. AIDS model can be estimated using simple price index such as stone price index. The derivations of the LA/AIDS model is presented as follows:

Let $V(p, M)$ and $E(p, u)$ denote indirect utility and expenditure functions defined by,

$$V(p, M) = \max_x \{u(x) : p'x \leq M\} \text{----- (1)}$$

$$E(p, u) = \min_x \{p'x : u(x) \geq u\} \text{----- (2)}$$

Where $u(x)$ is direct utility function, x is the consumption bundle of a consumer such that $x = (x_1, x_2, \dots, x_n)$, p is corresponding $n \times 1$ price vector, M is income/expenditure, and u is a pre-determined utility level.

By duality

$$E(p, V(p, M)) = M \text{----- (3)}$$

$$x_{i(p, M)} = \hat{h}_i(p, V(p, M)) \quad i = 1, \dots, n \text{----- (4)}$$

Hickian demand $\hat{h}_i(p, u) = \frac{\partial E(p, u)}{\partial p_i}$ is obtained via Shephard's lemma

Following Deaton and Muellbauer (1980) the logarithm of expenditure function $E(p, u)$ takes the Gorman form specified as,

$$\ln E(p, u) = a(p) + u b(p) \text{ ----- (5)}$$

Where $a(p)$ can be thought of as subsistence expenditure and $b(p)$ is bliss expenditure.

$$a(p) = \sigma + \sum_{i=1}^n \alpha_i \ln p_i + \frac{1}{2} \sum_{i=1}^n \sum_{j=1}^n \gamma_{ij} \ln p_i \ln p_j \text{ ----- (6)}$$

$$b(p) = \exp[\sum_{i=1}^n \beta_i \ln p_i] \text{ ----- (7)}$$

By equation (5), we have

$$u = \frac{\ln E(p, u) - a(p)}{b(p)} \quad \therefore u = V(p, M) \text{ ----- (8)}$$

$$\therefore E(p, u) = M$$

$$V(p, M) = \frac{\ln M - a(p)}{b(p)} \text{ ----- (9)}$$

Differentiating equation (5) with respect to $\ln p_i$, we get

$$\frac{\partial \ln E(p, u)}{\partial \ln p_i} = \frac{\partial (a(p) + u b(p))}{\partial \ln p_i} \text{ ----- (10)}$$

Putting equation (6) and (7) in equation (10) we get

$$\frac{\partial \ln E(p, u)}{\partial \ln p_i} = \frac{\partial}{\partial \ln p_i} \left[\sigma + \sum_{i=1}^n \alpha_i \ln p_i + \frac{1}{2} \sum_{i=1}^n \sum_{j=1}^n \gamma_{ij} \ln p_i \ln p_j + \exp[\sum_{i=1}^n \beta_i \ln p_i] \right]$$

It is a fundamental property of the cost function (Ronald Shephar, 1953, 1970; Diewert's, 1974) that price derivative of cost function is the quantity demanded i.e

$$\frac{\partial E(p, u)}{\partial p_i} = q_i \text{ ----- (11)}$$

Multiplying both sides of the above equation (11) by $\frac{p_i}{E(p, u)}$, we get

$$w_i = \alpha_i + \sum_{j=1}^n \gamma_{ij} \ln p_j + \beta_i [\ln M - \ln P^*] \text{ ----- (12)}$$

Where w_i is the budget share of the i th good, p_j is the price of good j , q_j is the quantity consumed of good j , $\ln M$ is the total expenditure and $\ln P^*$ is the Price Index given as

$$\ln(P) = \alpha_0 + \sum_{i=1}^n \alpha_i \ln p_i + \frac{1}{2} \sum_{i=1}^n \sum_{j=1}^n \beta_{ij} \ln p_i \ln p_j \text{ ----- (13)}$$

Where $\alpha_0, \alpha_i, \beta_i$ and γ_{ij} are parameters to be estimated.

$\ln(P)$, could not be calculated due to unobservable utility so it is approximated as,

$$\log(P^*) = \sum_i^n w_i \log(p_i) \text{ ----- (14)}$$

The stone price index is a function of expenditure shares and prices at a fix point in time. First stone price index is estimated and then the model. The AIDS model is Linear Approximate (LA) AIDS due to use of stone price index.

Empirical econometric model

Equation (12) can be written as

$$\omega_i = \alpha_i + \sum_{j=1}^n \gamma_{ij} \ln p_j + \beta_i \ln(M/P^*) \text{ ----- (15)}$$

We assume that demand shifters such as advertising and socioeconomic characteristics act to shift the demand for the commodities. This assumption requires an additive augmentation of the demand system proposed by Pollack and Wales (1978) and can be incorporated as,

$$\omega_i = \alpha_i + \sum_{j=1}^N \gamma_{ij} \ln p_j + \beta_i \ln(M/P^*) + \sum_{k=1}^N \gamma_k H_k + u_i \text{ ----- (16)}$$

Where

$$i, j = 1, 2, 3 \text{ NCDs categories.}$$

$$k = 1, 2, 3, \dots \dots \dots 272 \text{ households}$$

H_k includes demographic variable of household size and no of children, and dummy variable for literacy of household head and dummy for advertising.

Dummy variables are equal to one if the phenomenon exist and zero otherwise.

For example, advertising equals one when the household was exposed to advertising and zero otherwise.

LA/AIDS is a flexible demand system that satisfies the following properties.

Adding up, Homogeneity and symmetry. The adding up property is satisfied with given

$\sum w_i = 1$ for all j : Theoretically the adding up restriction ensures that the sum of individual expenditures is equal to total expenditures. Homogeneity restrictions ensures that the demand is homogenous of degree zero in prices and total expenditures. This means that if prices and expenditures increase by a constant k the quantity demanded of the good does not change. The symmetry means that the cross price effect for Hicksian demands are equal (Slutsky equation).

$$\sum_i \alpha_i = 1, \sum_i \gamma_{ij} = 0, \sum_i \beta_i = 0 \text{ (adding up) ----- (17)}$$

$$\sum_j \gamma_{ij} = 0 \text{ (homogeneity) ----- (18)}$$

$$\gamma_{ij} = \gamma_{ji} \text{ (symmetry) ----- (19)}$$

Estimated parameters of the LA/AIDS model given in equation (16) are used to compute own price, cross price and expenditure elasticities by the following formulas (Carpio; Deaton & Muellbauer, 1980, p. 313-314).

$$\epsilon_{ii} = 1 + \frac{\gamma_{ii}}{w_i} - \beta_i \text{ ----- (20)}$$

$$\epsilon_{ij} = \frac{\gamma_{ij}}{w_i} - \beta_i \left(\frac{w_j}{w_i} \right) \text{ ----- (21)}$$

Where ϵ denotes the uncompensated elasticity (Marshallian elasticity measure).

The expenditure elasticity can be estimated by,

$$\eta_{ii} = 1 + \left(\frac{\beta_i}{w_i} \right) \text{ ----- (22)}$$

Data on expenditures on NCDs, prices, income, frequency of viewing advertising about NCDs, and other socio-economic characteristics were obtained from randomly selected 272 individuals from the city of Mardan using a well structured structured survey schedule. Data used in this study were collected from different consumers at shopping malls, Superstores and local shops. Non-carbonated drinks are selected for this study as they are routinely used in many households and also served to

guests. These drinks have become a fashion and style especially for the youth. Owing to their huge popularity and demand, there has been fierce competition for capturing the market share among many multinational and local manufacturers. They use advertising, print media and other social media outlets to attract the consumers to their products. The non-carbonated drinks included fruit juices, mineral water and milk packs. Fruit juices included brands like Nestle fruta vitals, Olfrute, Olala and others. Mineral water brands consumed were Nestle pure water, Equa pure water and others. Milk packs used in the area were Olper, Good milk, Milk pack, Tarang. Majority of these commonly used drinks have been selected to capture the major share of the budget spent on normally drink products.

RESULTS AND DISCUSSION

This section has been divided into two subsections. The first section reports descriptive analysis and the second one has the estimated results from estimating an econometrics model. Our main focus is on testing the hypothesis that advertising does not have an impact on demand for non-carbonated drinks?

General Characteristics of the Respondents

Table 1 shows the profile of the households interviewed for this study. The given table indicates that 41 percent of the respondents aged between 30 years to 60 years, 35.3 percent of the respondents were illiterate and 30.5 percent of the respondents were highly educated. The table also shows that 57.4 percent of the household's head were self-employed.

Table 1: General Characteristics of the Respondents

Characteristics	Category	Frequency	Percent
Age	18 to 30	59	21.7
	30 to 60	113	41.5
	60 and above	100	36.8
Total		272	100%
Education of Respondents	No education	96	35.3
	Primary Education	14	5.1
	Secondary Education	79	29
	Higher Education	83	30.5
Total		272	100%
Occupation of Respondents	Student	16	5.90
	Government employees	65	23.90
	Self employed	156	57.4
	Retired	16	5.9
	Private employee	19	7
Total		272	100

Source: Author's own analysis of the survey data

Preferred medium of advertising influencing consumers' purchases of NCDs:

Table 2 indicates that the most preferred source of advertising for consumers is the television. We observe that 69.1 percent of the consumers give importance to the advertising broadcasted on television when deciding about a certain brand of NCDs.

Table 2: Most preferred medium of advertising

Mode of Advertising	Frequency	Percent
Don't consider advertising	55	20.2
Television	188	69.1
Print Media	23	8.5
Internet	6	2.2
Total	272	100.0

Source: Author's own analysis of the survey data

Effects of advertising on buying behavior of consumers

To find out the importance of advertisings in purchasing decisions about NCDs, we find that 54 percent of the consumer in fruit juices, 44.9 percent of the consumers in mineral water and 53.3 percent of the consumers in milk pack gave importance to advertising while buying the non-carbonated drinks.

Table 3: Effects of advertising on buying behavior of consumers

		Not important at all	Not important	Does not matter	Important	Very important	No reply	Total
Extent to which consumers consider advertising when buying Fruit Juices	Frequency	5	29	51	147	44	1	272
	Percent	1.8	10.7	18.8	54	16.2	0.4	100
Extent to which consumers consider advertising when buying Mineral water.	Frequency	1	26	35	122	42	46	272
	Percent	0.4	9.6	12.9	44.9	15.4	16.9	100
Extent to which consumers consider advertising during buying Milk pack.	Frequency	0	28	44	145	47	8	272
	Percent	0	10.3	16.2	53.3	17.3	2.9	100

Source: Author's own calculation from the survey data

Effects of quality on buying behavior of consumers

Table 4 shows that quality is the top most concern for the consumers while purchasing NCDs.

Majority of the consumers (81.2 percent) of the respondents using fruit juices consider quality the important attribute, 68.8 percent of the respondents using mineral water, consider quality the important attribute and 80.9 percent of the consumers using milk pack, consider quality the most important attribute of milk pack.

Table 4: Effects of quality on buying behavior of consumers

		Not important at all	Not important	Does not matter	Important	Very important	No reply	Total
Extent to which consumers consider quality when buying Fruit Juices	Frequency	1	2	2	45	221	1	272
	Percent	0.4	0.7	0.7	16.5	81.2	0.4	100
Extent to which consumers consider quality when buying Mineral water	Frequency	1	1	2	34	187	47	272
	Percent	0.4	0.4	0.7	12.5	68.8	17.3	100
Extent to which consumers consider quality when buying Milk pack	Frequency	1	1	2	40	220	8	272
	Percent	0.4	0.4	0.7	14.7	80.9	2.9	100

Source: Author's own calculation from the survey data.

Effect of Price on buying behavior of consumers

Table 5 reveals that price of non-carbonated drinks is the most important variable for consumers during buying. Price is considered important by 55 percent of the consumers using fruit juices, 44.5 percent of the respondents using mineral water and 54.8 percent of the consumers using milk pack. Price is the only attribute of the non-carbonated drinks where on average 56.25 percent of the respondents consider it very important.

Table 5: Effect of price on buying behavior of consumers

		Not important at all	Not important	Does not matter	Important	Very important	No reply	Total
Extent to which consumers consider price when buying Fruit Juices	Frequency	2	0	8	150	111	1	272
	Percent	0.7	0	2.9	55.1	40.8	0.4	100
Extent to which consumers	Frequency	2	0	14	121	88	47	272

consider price when buying Mineral water	Percent	0.7	0	5.1	44.5	32.4	17.3	100
Extent to which consumers consider price when buying Milk pack	Frequency	2	0	6	149	107	8	272
	Percent	0.7	0	2.2	54.8	39.3	2.9	100

Source: Author's own calculation from the survey data.

The effect of advertising on NCDs demand - An econometric estimation of the LA-AIDS Model:

Owing to a group of commodities involving shares in total expenditures, Seemingly unrelated regression (SUR) model is used for estimation purpose after imposition of the theoretical restrictions of adding up, homogeneity and symmetry. The estimated coefficients of the LA-AIDS model are given in Table 6. The table indicates that all the equations in the system are statistically significant based upon the chi square values. The significant drivers of the demand for NCDs are: Prices of NCDs, Household size, Number of children, Literacy, and age. The last four variables are not significant for mineral water. Furthermore, Table 7 reveals that the exposure of the consumers to the advertising has significant effect on consumer demand except for mineral water. Demand for fruit juices and milk pack is positively related to advertising at 90 percent and 95 percent levels of significance respectively.

The R square values are 0.32, 0.28 and 0.34 for fruit juice, Mineral water and Milk pack respectively shows that 30, 28 and 34 percent variations in the dependent variables for fruit juices, mineral water and milk pack are explained by the variation in the explanatory variables. Although, R square values are low but not uncommon for cross sectional studies like these.

Table 6: Parameter estimates and standard errors of the coefficients in LA-AIDS model for Non-Carbonated drinks.

Explanatory variables	Fruit Juices	Mineral Water	Milk pack
Log of Price of Fruit Juice	0.115 (0.026) ***	-0.0005 (0.017)	-0.119 (0.029) ***
Log of Price of Mineral Water	-0.019 (0.006) ***	0.038 (0.004) ***	-0.018 (0.008) ***
Log of Price of Milk pack	-0.128 (0.015) ***	-0.025 (0.009) ***	0.154 (0.017) ***
Dummy for advertisement	0.107 (0.059) *	0.008 (0.036)	0.116 (0.064) **
Household size	-0.008 (0.003) **	0.001 (0.002)	0.007 (0.004) *
No of child	0.021 (0.007) ***	-0.006 (0.004)	0.016 (0.007) *
Dummy for Literacy	0.068 (0.058) *	0.036 (0.018)	0.034 (0.063) **
Log of age	-0.089 (0.052) *	-0.056 (0.032)	0.028 (0.057) *
Constant	0.265 (0.240)	0.056 (0.124)	0.834 (0.213) ***
R-Squared	0.31	0.28	0.34
Chi	122.63 ***	104.46***	142.39***

Source: Author's own calculation from the survey data

Significance levels are denoted by*, **, and *** for 90, 95 and 99 percent level, respectively. Standard Errors are in parenthesis.

Estimates of Elasticities.

The own price, cross price and expenditure elasticities of demand for NCDs are summarized in table 7. It has been shown in the table that all the own price elasticities are negative, expected, and statistically significant at 99 percent level. The negative own price elasticities mean that they have inverse relationship with each other that is, as the price of the commodity increases their demand decreases. The price elasticities for fruit juice, mineral water and milk pack are -0.673, -0.620 and -0.693 respectively. This means that the demand for all fruit juices, milk packs and mineral water at the retail demand level are inelastic. One percent change in real fruit juice price leads to a 0.67 percent change in demand for fruit juice and one percent change in real mineral water price leads to a 0.62 percent change in the demand for mineral water. Similarly, one percent change in real milk pack price leads to a 0.69 percent change in the demand for milk pack. The table also shows that the demand for all the three categories of NCDs are price inelastic. Demand for milk pack is comparatively more elastic than demand for fruit juice and mineral water. The cross price elasticities measure the effects on the quantity of a good demanded with respect to change in the price of another good. Cross price elasticity can be positive or negative. The cross price elasticities with negative signs implies that the goods are complements for each other's and the positive cross price elasticities shows that the goods are substitutes. Expenditure elasticities measure the changes in quantity demanded with respect to changes in expenditures. Expenditure elasticities may be positive or negative. Positive expenditure elasticity means that the good is normal and negative expenditure elasticity mean that the product is inferior. In the given table all the expenditure elasticities are positive showing that all the beverages in the table are normal good with respect to their expenditures.

Table 7: Estimated Own Price, Cross Price and Expenditure Elasticities

	Fruit Juices	Mineral Water	Milk Packs	Expenditure Elasticities
Fruit Juices	-0.67*** (0.09)	0.0004 (0.17)	-0.13* (0.05)	1.18*** (.06)
Mineral Water	0.12*** (0.03)	-0.62*** (0.05)	0.02 (0.02)	0.95*** (0.10)
Milk Packs	-0.50*** (0.06)	0.25* (0.10)	-0.69*** (0.03)	0.92*** (0.03)

Standard Errors are reported in parenthesis.

*** Significant at 1% level, ** Significant at 5% level, * Significant at the 10% level.

DISCUSSIONS AND CONCLUSION

This research attempted to analyze the effects of advertising and other socioeconomic variables on demand for Non-Carbonated Drinks in district Mardan KP. Data were obtained from randomly selected 272 individuals from the city of Mardan using a well structured survey schedule. The Linearly Approximated Almost Ideal Demand System proposed by Deaton and Meulbauer (1980) is employed for estimating the parameters. We found that a number of demographic variables are

significant determinants of NCDs demand. We found that the own price elasticities of demand for all the three categories of NCDs i.e. fruit juices, mineral water and milk packs are -0.651, -0.617, -0.698 respectively. There is also evidence that economic factors, not surprisingly, continue to be major determinants of NCDs demand. All own price elasticities are negative, as expected. Cross price elasticities are giving mixed results. All the expenditure elasticities are positive showing that all the beverages in the table are normal good with respect to their expenditures and since mineral water and milk pack are more necessary goods, they are relative less elastic compared to the juices (Chang and Green, 1989).

The main variable of this study, advertising, was found significant for two categories of NCDs, fruit juice and milk pack except for mineral water at 90% and 95% level of significance. Our results are in conformity to previous research (Kumar, Gangal, & Singh, 2011; Li & Lopez, 2012; Powers, 1989; Philip, 2007; Patalinghug, 2013; Rojas & Peterson, 2008; Rehman, Nawaz, Khan, & Hyder, 2014; Snokusare, 2013). Hence advertising is an important determinant of purchase of NCDs. However, the findings of this study suggests the importance of studying advertising effectiveness and point out the need for further research in this area to extend and generalize these findings. Major limitations of this study are that this study is based upon primary data it was very difficult to record the most accurate information about exposure of consumer to advertising. Small sample size was used during study, so it is suggested to use large sample by covering almost main parts of the areas. Another point that we pondered upon was to collect data on the firm side such as sale or revenue of/from the products and advertising expenditures by the manufacturers of the products in question. Getting data and accessing such data was not possible due to sensitivity of the information for the firm. Our findings confirm that exposure to advertising is the main driver of consumer's demand. So the firms should focus on advertising to increase of their brand's demand. The study also shows that the most preferred medium of advertising was electronic media. About 69.1 percent of the consumers impressed from television advertising. So during advertising strategy, focused should be on television advertising. Our study found that during purchasing, nutritional characteristics and word of mouth was mostly not considered.

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