

SOCIOECONOMIC DETERMINANTS OF RURAL HOUSEHOLD FOOD EXPENDITURES IN RAWALPINDI

Hafiz Saqib Habib*, Arshad Mahmood Malik*, Abid Ali** and Muhammad Aamir Khan***

ABSTRACT:- Higher food expenditures disturb the delicate balance of allocated decisions of household monthly expenditures. Several past studies in Pakistan have been committed on determining household consumer's characteristics on requirement for specific kinds of food; however less consideration has been devoted to the parameters of household food expenditures. Present study aimed to analyze the socioeconomic factors effecting total food expenditures of households in rural area of Rawalpindi tehsil. Respondents were selected randomly and data were collected through questionnaire. A multiple double log regression model was used because it has an advantage that estimated parameter can easily be explained as expenditures elasticity. This model is used to give details of responses in socioeconomic factors to monthly household food expenditures. Regression analysis showed that 23 % of the changes in the food expenditures were due to explanatory variables. Household incomes, marital status of household head and number of earners variables have significant impact on households' food expenditures. The qualification of household head, age and gender were insignificant regarding impacts on households' food expenditures. All the socioeconomic factors were positively elastic regarding food expenditures except marital status variable. Engels law analysis regarding necessities such as food items was confirmed by the food expenditures value of 0.20. The study provides important food policy tools reducing negative impacts of higher food expenditures on rural households.

Key Words: Food Expenditure; Rural Household; Engels Law; Socio-economics Factors; Pakistan.

INTRODUCTION

Several research studies have focused on analyzing the factors affecting household consumption expenditures choices. It had been observed that investigating determinants of household expenditures were important concern of past researchers and many of them made key contribution regarding evaluation of factors effecting household consumption expenditures (Engel, 1895; Barton, 1955; Becker, 1976). Engel has evaluated the relation-

ship between food expenses and income of households. Engel concluded that the amount of income spent on food reduces as the ratio of income increases implying that food is a necessity for those household whose consumption of items does not accelerate with equal proportion as income rises (Nicholson, 1992). Engel also illustrated that there is also a superior tendency of households facing mounting income to use up a larger fraction of the food budget on various types of diet thus enhancing the dietary rank of

* Department of Economics and Agri Economics, PMAS-Arid Agricultural University, Rawalpindi, Pakistan.

** Department of Agronomy, PMAS-Arid Agricultural University Rawalpindi, Pakistan.

*** Department of Management Sciences, COMSATS, Islamabad, Pakistan.

Corresponding author: arshadmm@uaar.edu.pk

the household members. This is particularly significant in developing countries where expenditures on food items constitute for a comparatively larger share of household income (Dickinson et al., 2003). Many studies have been initiated on diverse determinants of food expenditures i.e., socioeconomic determinants (Raper et al., 2002; Jae et al., 2000). As projected, per capita monthly income is most vital determinants of household expenditures on food. More predominantly, there is an existence of positive association between expenditures on food items and income (Davis et al., 1983; Caepps and Love, 1983; Fan et al., 1994; McDowell et al., 1997; Ghany et al., 2002; Kirkpatrick and Tarasuk, 2003; Ricciuto et al., 2006). On the other hand, there exists also non-linear relationship between income and food expenditures (Banks et al., 1997 and Vitaliano, 2010). As far as purchaser age is concerned, various past studies have provided evidence of different priorities regarding food between younger and older age purchasers which leads to different food expenditures (Sabates et al., 2001; Raper et al., 2002; Ricciuto et al., 2006). Consumers in urban areas have no own agriculture production while those in rural areas have their own agriculture production which leads to lower food expenditures as compared to urban areas (Mihalopoulos and Demoussis, 2001; Moss et al., 2007; Tekguc, 2012). The poorest 20% families on average in developing countries have 70% share of food among all households expenditures categories. Almost any extent of rise in prices of food items will have a main impact. Ultimately this would lead to buying lower quality food items, reduction in food consumption expenditures and other crucial expenditures on health-care or education (Gustafson, 2013). It

has been observed in UAE that among factors affecting household expenditures on meat, rice and fish items, income and household size are key factors and it was also concluded that expenditures on these food items were not so elastic to the variations in incomes of households (Gheblawi and Sherif, 2007). According to Booyesen (2003), household's income and level of education was positively related to expenditure on food commodities.

According to an authoritative survey the expenditures on food, non-alcoholic beverages and tobacco accounted to 45.01% of household monthly expenditures in Pakistan. The rural population of Pakistan spends 50.58% of their monthly expenditures on these items (HIES, 2012).

Previous studies have provided evidence that poverty in developing countries like Pakistan, takes various forms such as higher level of malnutrition, low enrollment of children in schools, higher expenditures on food, high expenditures and low earning and less investments on social services. There were well detailed research work done in previous studies regarding nexus among food security, food expenditures and social welfare (Hamelin et al. 1999 and 2002; Kirkpatrick and Tarasuk, 2003). Therefore, analyzing the determinants of food expenditures is important and of policy significance in rural areas of Tehsil Rawalpindi and most parts of Pakistan for the purpose of enhancing food security and to improve their living standards.

MATERIALS AND METHOD

The data for the study were collected from Tehsil Rawalpindi during December 2013. One hundred and eighteen households were interviewed through a detailed questionnaire. The

information was collected through a well-structured questionnaire by considering households as the unit of analysis. Questionnaire was included the questions about household head's age & qualification status, earning members in household, monthly income, monthly expenditures which could affect household's food expenses during food inflation crises. Data on food expenditures were obtained by memory recall methodology. Simple random sampling technique has been used for the collection of information. Pre testing is important to test the validity and accuracy of questionnaire. To check its reliability and authentication technique was used with five respondents. After pre-testing, necessary adjustments were made in the questionnaire. Statistical softwares STATA, SPSS and MS Excel were used to collect data. Data were then analyzed by using descriptive statistics and multiple double log regression models. The explanatory variables were selected on the basis of previous studies of McCracken and Brandt (1987) and Steward et al. (2004). The study concentrates on various food items used by households. The foods consumed were classified from crops produce, from livestock's produce (meat, milk), sea food (fish) and the remaining were grouped under others. The regression model was anticipated as follows.

$$Y_t = \beta X_t + \mu_t$$

where,

Y_t = Dependent variable representing log of total food expenditures,

β = Set of parameters to be estimated

X_t = Vector of independent variables

μ_t = Error term

The socioeconomic factors hypothesized to affect the food expenditures were members of earners, gender, household income, qualification, marital status and age (Table 1).

Table 1. Description of explanatory variables in model

Variable	Description
HH_Qualification	Qualification of Household Head
HH_Income	Total Monthly Gross Income in Rs.*
HH_Gender	Gender of Household head (0=Female,1=Male)
HH_Age	Age of Household Head
HH_Earners	Household Total number of earners
Marital_Status	0=Unmarried,1=Married

* Rupees is local currency unit of Pakistan

Qualification of household head causes variation in decision making regarding consumption, tastes and preferences for purchasing of food commodities. Income of household was key determinant of food expenditures because it was highly associated with ability of purchasing and consumption of household food items. Number of earning hands and gender of household head can also be affected on household food expenditure. The age of household head was considered as independent variable in the study and it was assumed that younger and older age household head have different tastes, preferences and eating habits for purchasing of food commodities could impact on food expenditures decisions.

RESULTS AND DISCUSSION

Demographic Characteristics of Respondents

Youngest head of household were 25 years old while oldest head were 80 years old with 56 years mean age (Table 2). It was noted that age of household head had positively affected household chicken food preference

Table 2. Socioeconomic characteristics of respondents

Variables	Minimum	Maximum	Mean	St. Dev.
Social Factors				
Age	25	80	56	13.12
Qualification	1	6	2	1.18
Marital status	0	1	1	0.16
Economic Factors				
Total income (Rs.*)	4500	67000	28568	13308
Earners	0	5	1	0.853
Food Expenditure (Rs.)				
Wheat flour	220	4200	1338.87	917.40
Vegetable	300	9000	3891.86	1584.40
Fruit	200	3000	882	561.36
Fish	200	1900	646.58	372.57
Milk	400	7500	2851.33	1622.80
Meat	300	2500	850.88	478.41
Egg	50	1700	292.92	275.48
Pulses	250	3500	708.90	467.17
Edible oil	500	5000	1771.18	628.49
Sugar	130	2500	1028.12	467.89

* Rupees is local currency unit of Pakistan

decisions patterns (Ehirim, 2010). Households qualification level ranges from (1-6) which comprises illiteracy to graduation educational status with mean (1.18) schooling qualification equivalent to primary level. In economic factors, income was important determinant of food expenditures (Gheblawi and Sheriff, 2007). Analyzing the data it was observed that household total income had significant variation from lowest Rs. 4500 to highest Rs. 67000 with the mean income of Rs. 28568 (Table 2). Number of earners in household range from 0 to 5 with mean earners equal to 1. Wheat flour expenses ranged from Rs. 220 to Rs. 4200 with an average of Rs. 1338.87. Among all food expenses there were greater variation in vegetable expenses might be due to greater variation based on time period of data collection when there was highest vegetable inflation in these rural areas. Minimum vegetable expenses were Rs. 300 while maximum

expenses were Rs. 9000.

Unlike the Tobit model, normality and heteroscedasticity are not required for consistency of the estimator. Conversely, it is recognized that the OLS estimate of the residual variance will be unfair in the presence of heteroscedasticity so robust standard errors are incorporated.

For this regression model, total income ($t=3.03$), log earners ($t=2.18$) and marital status ($t=-2.32$) were the significant predictor for household food expenditures. While age of household head ($t=1.21$), gender ($t=-1.11$) and qualification of household head ($t=-0.25$) seemed not important regarding explanation for household food expenditures. The regression model explained as a whole ($R^2=0.23$) changes in the model. The F ratio for this model was 5.77 which was highly significant at 5% level of confidence. It is actually used for the overall evaluation of significance in regression equation. Kernel density estimates of residuals follow normal distribution indicating probability density function of normally distributed observations (Figure 1).

The results of the regression model investigation on the factors influencing food expenditures of household imply that total household income, number of

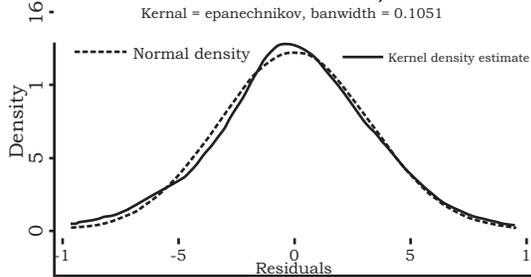


Figure 1. Kernel density estimates of residuals follow normal distribution indicating probability density function of normally distributed observations

earners and marital status of household head significantly affect total monthly expenditure (Table 3). One percent increase in income lead to 20% increase in household food expenditures. It is signifying that higher the income, higher the propensity of household to spend on food expenditures items. This is in agreement with the findings of Babalola and Isitor (2014) and Sekhampu (2012) and Garcia and Grande (2010). However, this result is in contrast with the findings of Umeh and Asogwa (2012) who found that log of per capita income negatively related to food expenditure in rural Nigeria. Similarly, number of earners also has positive relationship with food expenditures variable by positive coefficient sign and it is significant at 5% level of confidence.

Table 3. Estimation results of modeling household food expenditure with robust-standard errors

	Model (1)	Model (2)	Model (3)	Model (4)
Log of total income	0.282*** (0.0777)	0.266*** (0.0781)	0.215** (0.0786)	0.205* (0.0845)
Marital status		-0.440*** (0.0659)	-0.427*** (0.0511)	-0.480*** (0.108)
Log of earners			0.188* (0.0902)	0.192* (0.0933)
Log of age				0.154 (0.134)
Qualification				0.0068 (0.0267)
Gender				0.103 (0.0831)
Constant	6.414*** (0.794)	7.006*** (0.822)	7.368*** (0.807)	7.010*** (0.905)
N	118	118	118	
R-sq	0.154	0.188	0.220	0.238
adj. R	0.146	0.174	0.199	0.196
RMSE	0.344	0.338	0.333	0.334

()= Standard errors *, ** and *** = $P < 0.05$, < 0.01 and < 0.001 , respectively

Unlike the Tobit model, normality and heteroscedasticity are not required for consistency of the estimator. Conversely, it is recognized that the OLS estimate of the residual variance will be unfair in the presence of heteroscedasticity so robust standard errors are incorporated.

One percent increase in earning members was associated with 19% increase in household food expenditures. Result of this study regarding number of earning members in household are consistent with Cage (1989) and Sdrali (2002). Whenever earning hands increase in household, ultimately they have to face reduction in barrier regarding consumption expenditures of well nutritional diet which causes consumption expenditures to rise. Negative coefficient sign of marital status of household head variable was significant at 5% level of confidence and showed that when household was headed by married person then food expenses tend to be reduced. One unit increase in married household head causes food expenses to decrease by 48%. This is in conformity with those of Sekhampu (2012) in South Africa where households food expenses affected by marital status of household head. Households which were headed by male might get benefit from an additional partner regarding help for the allocation of income among food expenditure commodities which ultimately created efficient resource allocation and reduced the food consumption expenditures. While variables qualification of household head, gender and age were insignificant regarding determining factors of food expenditures. It is also concluded that food expenditures elasticity was 0.20 (less than unity) and it is consistent with Engel's law explanation regarding food consumption as a necessary item.

Regression result regarding food expenditures indicated that household spends more on consumption of food items as the members of earning in households tend to increase.

However, a negative relationship exists between marital status of household head and household food expenditures. There should be proper food policy for reducing food expenditures burden on low income rural households. Government authorities should enhance vegetable growing through kitchen gardening guidelines for rural households to reduce their vegetable expenditures. Result also recommend that government should also provide proper job opportunities to household members in area for their economic welfare and for the purpose of ensuring food security. The results presented in this study give input supply to the emerging body of empirical knowledge concerning food insecurity alleviation efforts in Rawalpindi region and advocated that socioeconomic characteristics were key predictors of the food expenditure patterns of household. This study could be an allusion source for formulating effective food policies in Rawalpindi region.

LITERATURE CITED

- Babalola, D.A. and S.U. Isitor. 2014. Analysis of the determinants of food expenditure patterns among urban household in Nigeria: Evidence from Lagos State. *J. Agric. and Vet. Sci.* 7(5): 71-75.
- Banks, J., R. Blundell and A. Lewbe. 1997. Quadratic Engel Curves and consumer demand. *The Rev. Econ. Stat.* 79: 527-539.
- Barton, S. 1955. The life cycle and buying patterns. In: Clark, L. (ed.). New York Univ. Press. p. 53-57.
- Becker, G. 1976. The economic approach to human behavior. Chicago, The Univ. of Chicago Press. p. 15-17.
- Booyesen, F. 2003. Chronic and transitory poverty in the face of HIV/AIDS related morbidity and mortality: Evidence from South Africa. Paper presented at Inter. Conf. on Chronic Poverty and Development Policy, 7-9 April, Chronic Poverty Centre, Univ. of Manchester, UK.
- Caepps, O. and L. Love. 1983. Determinants of household expenditure on fresh vegetables. *Southern J. Agri. Econ.* 15: 127-132.
- Cage, R. 1989. Spending differences across occupational fields. *Monthly Labor Review*, 112(12): 33-43.
- Davis, C., M. Moussie, S. Dinning and G. Christakis. 1983. Socio-economic determinants of food expenditure patterns among racially different low-income households. An empirical analysis. *Western J. Agric. Econ.* 8: 183-196.
- Dewey, K.G. 1981. Nutritional consequences of the transformation from subsistence to commercial agriculture in Tabasco, Mexico. *Human Ecol.* 9: 151-187.
- Dickinson, D., J. Hobbs and D. Bailey. 2003. A comparison of US and Canadian consumers' willingness to pay for red meat traceability. *The American Agric. Econ. Assoc. Ann. Meeting*, Montreal, Canada. p.1-16.
- Ehirim, N.C. 2010. Determinants of consumers' preference for safe chicken consumption in Imo State, Nigeria. *Sci. Pub. J.* 2(12): 42-50.
- Engel, E. 1895. Die Lebenskosten Belgischer Arbeiter-Familien Fruher and Jetzt. *Intern. Statistical Institute Bull.* 9: 1-74.
- Fan, S., G. Cramer and E. Wailes. 1994. Food demand in rural China: Evidence from rural household survey. *Agric. Econ.* 11: 61-69.
- Garcia, T. and I. Grande. 2010. Determinants of food expenditure patterns among older consumers: The

- Spanish case. *Appetite*, 24: 62-70.
- Ghany, M.A., J.L. Silver and A. Gehlken. 2002. Do consumption expenditures depend on the household's relative position in the income distribution. *Inter. J. Consumer Studies*, 26: 2-6.
- Gheblawi, M. and S. Sherif. 2007. Determination of factors affecting expenditures on three major food groups in Al-Ain, The United Arab Emirates (UAE). *Emirates J. Food and Agri.* 19(2): 15-23.
- Gustafson, D.J. 2013. Rising food costs and global food security key issues and relevance for India. *Indian J. Medical Res.* 138(3): 398-410.
- Hamelin, A.M., M. Beaudry and J.P. Habicht. 2002. Characterization of household food insecurity in Quebec: Food and feelings. *Social Sci. & Medicine*, 54: 119-132.
- Hamelin, A.M., J.P. Habicht and M. Beaudry. 1999. Food insecurity consequences for the household and broader social implications. *J. Nutr.* 129: 525-528.
- HIES. 2012. Household integrated economics survey, Federal Bureau Statistics, Government of Pakistan.
- Jae, M.K Tarasuk. 2003. The relationship between low income and household food expenditure patterns in Canada. *Public Health Food.* 6: 589-597.
- McCracken, V. and J. Brandt. 1987. Household consumption of food away from home total expenditure and by type of food facility. *Amer. J. Agric. Econ.* 69: 274-284.
- McDowell, R., E. Allen-Smith and M. McLean. 1997. Food expenditure and socioeconomic characteristics focus on income class. *Ameri. J. Agric. Econ.* 79: 1444-1451.
- Mihalopoulos, V. and M. Demoussis. 2001. Greek household consumption of food away from home. A micro econometric approach, *European Rev. Agric. Econ.* 28: 421-432.
- Moss, Z., S. Moss, K. Kilbride and L. Rubinstein. 2007. Frail men's perspectives on food and eating. *J. Aging Studies.* 21: 314-324.
- Nicholson, W. 1992. *Microeconomic theory basic principles and extensions*, 5th edn. Fort Worth: The Dryden Press.
- Raper, K., M. Wanzala and M. Nayga. 2002. Food expenditures and household demographic composition in the US: A demand systems approach *Appl. Econometrics*, 34: 981-992.
- Ricciuto, L., V. Tarasuk and A. Yatchew. 2006. Socio-demographic influences on food purchasing among Canadian households. *European J. Clinical Food.* 60: 778-790.
- Sabates, B., B. Gould and H. Villareal. 2001. Household composition and food expenditures: A cross-country comparison. *Food Policy.* 26: 571-586., J.S. Ryu and M.A. Ghany. 2000. Family characteristics and convenience food expenditure in urban Korea. *J. Consumer and Home Econ.* 24: 252-256.
- Kirkpatrick, S. and V. Sdrali, D. 2002. Effects of socio-demographic and economic factors on food expenditure in a prefecture of Greece. Department of Home Economics and Ecology, Harokopio University Athens.
- Sekhampu, T.J. 2012. Socio-economic determinants of household food expenditure in a low income township in South Africa. *Medi-terranean J. Social Sci.* 3(3): 449-453.

- Steward, H., N. Blisard, S. Byuyan and R. Nayga. 2004. The demand for food from home: Full-service or fast food. Retrieved June 10, 2012.
- Tekguc, H. 2012. Separability between own food consumption production and consumption in Turkey, Rev. Econ. Household. 12: 423-439.
- Umeh, J.C. and B.C. Asogwa. 2012. Determinants of farm household food expenditure: Implications for food security in rural Nigeria. Intern. Conf. on Ecol. Agric. and Chem. Engr. p. 212-217.
- Vitaliano, D. 2010. Engel curves and the unitary theory of the household. Intern. J. Consumer Studies. 34: 69-72.

AUTHORSHIP AND CONTRIBUTION DECLARATION

S. No	Author Name	Contribution to the paper
1.	Hafiz Saqib Habib	Conceived the idea, Wrote abstract, Methodology, Did SPSS analysis, Conclusion
2.	Dr. Arshad Mahmood Malik	Overall management of the article, Technical input at every step, Did SPSS and SATA analysis, Conclusion
3.	Mr. Abid Ali	Technical input at every step
4.	Dr. Muhammad Aamir Khan	Technical input at every step

(Received April 2015 and Accepted October 2015)