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## MEASUREMENT OF ECONOMIC AND DEMOGRAPHIC VARIABLES EFFECT ON FOOD ITEMS CONSUMPTION PATTERN IN PAKISTAN

Kausar Naheed <sup>1</sup>, Ijaz Hussain <sup>1</sup>, Khair Uz Zaman <sup>2</sup> & Naimat Ullah Babar <sup>3</sup>

<sup>1</sup> Department of Economics, Gomal University, Dera Ismail Khan, PAKISTAN.

<sup>2</sup> Institute of Information & Technology, COMSATS University Islamabad, Vehari Campus, PAKISTAN.

<sup>3</sup> Institute of Social Sciences, Gomal University, Dera Ismail Khan, PAKISTAN.

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### ABSTRACT

Food is a basic need for all human beings and has a vast influence on households. In this regard, it becomes vital for a developing country like Pakistan, to get an advantage over the information about food demand determinants to project inclusive social policy towards agricultural food to develop the availability of food items that helps in building the household strength towards a better life. To measure the effects of different variables affecting food items consumption patterns in Pakistan, the study is being conducted using Working-Leser Approach, an econometric model. In Pakistan, as real income increases, the pattern for consumption suffers substantially and experiencing over time variations. Thus, decisions for investment need to be intended by agreeing for consumption patterns towards foods. In this connection, through OLS, regression analysis was done thereby testing the data regarding nine food items (fruit, pulse, sugar, vegetables, ghee, cereals, milk, tea, and meat). The mainstream variables, in the Pakistani context, have a major influence on ghee, cereals, and meat. In this regard, fruit & pulse are influenced by these variables on a secondary basis. Likewise, sugar & vegetables are on the respective series. However, the age of the household head does not influence the consumption of any of nine food items in consideration.

**Disciplinary:** Economic Sciences, Culture and Consumption Studies, Food and Nutrition Sciences.

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## 1. INTRODUCTION

The persistent growing income in developing countries needs the patterns of consumption on a precondition to design the strategies to evade excess and shortages capacities in line with productions. Subsequently, to examine consumption pattern determinants, there is a dire need for the estimation for several constraints in functions towards consumption for numerous commodities

(Allan, 1990). In Pakistan, the econometric demand analysis has been ignored persistently which results in various undesirable outcomes. Therefore, the linear expenditure modified system has been considered as the appropriate method for attaining parameters (LES) deprived of the price independent evidence to be realized (Yanrui, 1997). In recent decades, despite substantial progress, the goalmouth of passable nutrition and food for all is elusive still (Ali, 1981, Naheed and Hussain, 2020). Similarly, reports for world development uttered understanding that in Pakistan, in most studies, diverse models like demand ideal system, linear expenditure system, and linear approximate style have projected (Chihwa, 2001). So that it helps in forecasting future food demand in these revisions the issues those who have massive special effects are economic traditional variables that lead to inclined estimations of the income possessions and in turn food demand projections biased (Aziz, 2010).

Though, to overwhelmed the same problematic issues, several socioeconomic variables in workings model dealing with the age of the household head, household head schooling years, industrial status, adult alike age, and employment simultaneously were measured (Geoffrey, 1998). The starvation is mainly the poverty reflection and common people have no sufficient earnings for foods. In this regard, agreeing to income slow-growing situations related to poor individuals is expected to affect the future, thus a huge number of people might persist underfed to overcome for decades (Ahmad, 1985). The long-term efficient policies are direly needed to rise the poor people's income level. In recent years, economists have to stress hard for “direct outbreak” on the specific policies and poverty for growing insinuations for diverse groups in the societies. Thus, income redistribution is consequently evolving as the main objective policy in numerous countries, comprising Pakistan. Similarly, different ways are available, through which the independence of equitable more income distribution might be attained effectively (Kang & Chern, 2001). Likewise, in Pakistan, the direct transferal of capital (revenue) from the richest to poorest is happening over Ushar and Zakat policies. In this connection, objectives current study is about food pattern consumption in Pakistan to oversee the influence of the variation in income relatives shares of the diverse income level of consumption and groups on-demand composition as well as on the employment level in Pakistan (Ahmad, 1985). Hence the main objectives of the said study focus on;

To expand the supply of essential food items at domestic production to meet probable future demands, being attentive for policy-maker in Pakistan. So the present study is an effort to suggest precautions for future demand in Pakistan.

The foremost aim is to measure the effects of economic and demographic variables on food consumption patterns and then examine the main food-items in Pakistan because of enlarged food imports cost to overwhelm the foreign exchange gap.

## **2. LITERATURE REVIEW**

By clarifying the food demand phenomenon through analysis, the researchers explored these phenomena in different existing studies. More specifically, all earlier studies are given chronological data that presented a new system for demand equations (Deaton & Muellbavour, 1980). The new system highlights the budget shares concerning different supplies are related logarithms linearly to relative prices and real logarithms of entire expenditure. This model provides

a random order first estimate to demand systems. McCarthy and Desmond (1981) suggested consumer behavior theory that varies as of conservative style. The supply charges are presented for the routine goods and considered as quality measures. The quality effects issue towards the behavior of consumers has measured a demand model which is to some extent dissimilar from approaches at traditional manners. Cheema (1984) estimated employment and demand result of distributions alternative of the prevailing along with the income additional created over economic growth were examined in this study. The outcomes indicate that redistribution income all for households' low income might raise the basic requirements to demand like wheat, pulse, and oils edible. Though some extra commodities demand will be declined.

The existing studies revealed that poor household consumption level can be noticeably improved with redistribution income deprived of rich adverse effects. The effect of employment is establishing to be substantial and positive (Ahmad, 1985). The findings of the study revealed that existing income rearrangement with poor will rise the food demands, foot-wear and clothing and accommodation while demand personal belongings, gasoline might be miscellaneous and light services and goods might decline. The supplies by which demands might increase significantly comprise fish, meat, cereals edible and oils poultry. Consumption optimistic special effects are stronger also than in all cases negative special effects, therefore resultant in an aggregate increase in expenditure consumption. Eatazaz (2007) examined rural-urban consequences that show that fringe expenditure consumption is higher in urban areas for households' migrants. The expenditure increased intake is not essentially wicked as these infer the bigger claim for services and goods when these are produced locally might be useful quite.

However, the consumption increased is mainly for services and goods which are forced that one desires to explore the configuration of the said demands cautiously. Burney (1991) observed in Pakistan the consumption household patterns by assessing three diverse functional procedures of curve Engel likewise Working-Leser, double logarithmic and linear for six diverse groups of income. Thus, using household data aiming at the influence of the size of household and households' expenditure patterns for composition. It is clarified using quantitative and qualitative changes in basket intake. It is also pointed out that the scale economies' existence, which is not different only crosswise commodities however widely varies across groups of income. The further evidence reveals that composition in general, for households have not substantial influence in Pakistan on patterns consumption. Kerry and Waehler (2002) examined the same by analyzing the special sound effects of milk advertising demand.

The decision is that, though advertising of milk has an optimistic influence on demand for total milk however is not lucrative for marketers. It is found that numerous cross-commodity sound effects are negative and significant advertising effects cross-advertising for cold-hot drinking goods for demand lower fat-milk. The values revealed that the demands system approach is valuable for revising the sound belongings of fluid advertising general milk. Awadu (2004) pointed out that malnutrition is caused usually by factors and inadequate food that effect utilization nutrients in the bodies of humans. The indication of income and elasticity price for the group foods and individual foods is very reedy (Naheed and Hussain, 2020). Consequently, the current study underwrites literature by consuming the most recent data-survey from Tanzania to study in what way

characteristics of price expenditure, socio-economic and food demands.

### 3. METHODOLOGY

The researcher estimated the special effects of the several economic and demographic variables on each food item's demands. Resultantly, estimation for nine commodities through regression measures comprising sugar, tea, milk, pulses, cereals, meat, ghee, vegetables, and fruit were considered and illustrated over the application of Working-Leser Model (WLM). Some other models are available also likewise Tobit model, almost-ideal demand systems and linear expenditure system, however, because of data usefulness and constraints in the model being single equation model, the researcher applied the WLM. As cross-sectional data is being used that usually has the price given in time in one-point, therefore, WLM is useful as “it does not involve prices”. Consequently, the researcher selected the desired model which can fulfill the assumption pattern. By chance, WLM contents the said assumption. One of the instances of the demands system is Working’s model (1943) which expresses the shares of the budget for goods as it is the log-linear function towards prices and in question, the total expenditure towards foods item.

Given by Leser (1963) and Working (1943), unique form the desired models, WLM is a model for single equations that at a time pact with single equation estimation. More exactly, the following model has been used in the present research study wherein a description of these items have been presented in Table 1:

$$w_i = \alpha_0 + \alpha_i \log x + \sum_j \beta_{ij} \log P_j + \sum_k \gamma_{ij} H_k + \varepsilon_i \quad (1),$$

where  $\alpha_0, \alpha_i, \beta_{ij}, \gamma_{ij}$  are regression coefficients while  $\varepsilon_i$  indicates the error term.

**Table 1:** Description of the Items.

SN	Items	Description
1	$w_i$	Expenditure food share i among food items (nine)
2	$(i, j) \& P_j$	food share i , food items j & Food price ( $P_j$ )
3	$x$	Total expenditure for foods on all items (model)
4	$H_k$	Comprises the below Economic and Demographic variables:
5	EARN	“No of total earners”
6	Age-1Per	“No of family members I up-to 5 years’ age” group
7	Age-2Per	“No of family members I the age group” (6-12years)
8	Age-3Per	“No of family members (I) age group” (above 18 years)
9	Age-4Per	“No of family members (I) age group” (13-18 years)
10	Edu & Age	Head Schooling Years & Household Head Age
11	AGRI	If the head industry is agriculture then 1, else 0
12	Ln (Exp)	Log of food expenditure monthly
13	CONST	If the head industry is construction (=1), else 0
14	Manufacturer	When the head industry is manufacturing then 1, else 0
15	Transport	If a head industry is a transport then 1, else 0
16	S_P_SERV	If “industry of head is social & personal services” 1, otherwise 0
17	W_SALE	If a head industry is wholesales then 1, else 0
18	PE	If a head status of employment is paid-employees then 1, else 0
19	Other	If a head industry is other then 1, else 0
20	Employer	If the head status of employment is employer then 1, else 0
21	SE	If head employment status is self-employed then 1, else 0

Equation (1) is estimated over the method of the ordinary least squares (OLS). Subsequently, the WLM is the model of a single equation, thus, the researchers estimated such math model for share budget about nine commodities. Hence, by varying the criterion variable ( $w_i$ ) concerning nine times, the researcher conduct the regression for the nine commodities which are milk, meat, cereals, vegetables, ghee, tea, fruits, pulses, and sugar.

#### 4. RESULTS

By linking the significance level, the regression procedure is used by applying the Working-Lesser Model (OLS) for data analysis around nine items of foods. Tables 1, 2, and 3 have been depicted and measured the effects of economic and demographic variables on nine food items (j) consumption patterns.

**Table 2: OLS Results (Working-Leser Model).**

Variables	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
	PULSE		TEA		SUGAR	
(Constant)	0.026	<0.001*	0.058	<0.001*	0.107	<0.001*
No. of earners	<0.001	0.006*	-0.002	<0.001*	-0.002	<0.001*
Age1_per	-0.002	0.001*	-0.001	0.678	0.002	0.511
Age2_per	<0.001	0.849	-0.001	0.602	0.003	0.298
Age3_per	-0.001	0.118	-0.001	0.699	-0.001	0.792
Adult equivalence	<0.001	<0.001*	0.001	<0.001*	0.001	<0.001*
Schooling HEAD	<0.001	<0.001*	<0.001	0.252	-0.001	<0.001*
Agriculture	0.003	0.001*	0.005	0.068	0.001	0.686
LN_Food Expend	-0.010	<0.001*	-0.002	0.005*	-0.013	<0.001*
Constant	0.002	0.003*	0.001	0.699	0.001	0.745
Manufacturer	<0.001	0.957	-0.004	0.165	-0.007	0.058
Transport	0.001	0.322	0.007	0.016*	-0.003	0.443
w_sale	<0.001	0.672	0.003	0.215	-0.005	0.229
Others	0.002	0.028*	0.006	0.025*	0.001	0.710
s_p_serv	0.001	0.205	0.001	0.675	-0.002	0.591
Se	-0.001	0.198	-0.004	0.167	0.001	0.800
Pe	-0.001	0.381	0.002	0.485	0.003	0.374
Other	-0.001	0.121	<0.001	0.941	-0.005	0.181
Employer	-0.002	0.120	-0.003	0.445	-0.006	0.350
Age	<0.001	0.020	<0.001	0.795	<0.001	0.845

\*significant 1%, \*\*significant 5%

However, the results Table 2, the regression results of three commodities are discussed one by one. **Tea:** Many earners, Adult Equivalent significantly affecting the consumption of tea. Similarly, its expenditure effect is also significant but negative, because its coefficient is significant at 1 % level. As for as the industrial classification of the household is concerned the heads engaged in the transport and other sector demand more tea as compared with the agriculture sector. For the rest of the household heads, the demand for tea does not matter for the specific industry.

**Sugar:** Several earners and Adult equivalent significantly affect the consumption of sugar. Similarly, its food expenditure effect is significant, years of schooling HEAD too, but negative because its coefficient is significant at 1 % level. As per the industrial classification is concerned, the demand for sugar does not matter for the specific industry. **Pulses:** No. of earners, age2\_per, HEAD schooling years, Adult equivalence, LN-monthly expenditure food, Agri, const and others are the variables affecting the consumption of pulses in Pakistan.



**Table 3: Results OLS (Working-Leser Model)**

Variables	Coefficient	P-value	Coefficient	p-value	Coefficient	p-value
	FRUIT		MILK		MEAT	
(Constant)	0.038	<0.001*	0.236	<0.001*	0.140	<0.001*
No. of earners	<0.001	0.498	0.002	0.087	-0.002	0.013*
Age1_per	0.005	0.001*	-0.006	0.424	-0.024	<0.001*
Age2_per	0.001	0.368	0.020	0.010*	-0.029	<0.001*
Age3_per	0.009	<0.001*	0.002	0.684	-0.027	<0.001*
Adult equivalence	-0.001	<0.001*	-0.009	<0.001*	-0.003	<0.001*
Schooling HEAD	<0.001	<0.001*	<0.001	0.283	0.001	<0.001*
Agriculture	-0.004	0.019*	0.013	0.129	0.005	0.308
LN Food Expend	-0.006	<0.001*	0.062	<0.001*	0.008	<0.001*
Manufacture	-0.001	0.545	0.011	0.229	0.010	0.091
Constant	-0.002	0.222	-0.004	0.682	0.009	0.094
Transport	-0.003	0.115	-0.002	0.867	0.015	0.009*
s_p_serv	-0.002	0.205	0.006	0.503	0.009	0.092
w_sale	-0.002	0.280	-0.003	0.757	0.018	0.001*
Se	0.002	0.343	0.005	0.548	-0.013	0.015*
Pe	0.001	0.782	-0.003	0.696	-0.011	0.043*
Other	-0.002	0.391	-0.004	0.640	-0.011	0.045*
Employer	0.009	0.003*	-0.022	0.119	-0.006	0.455
Age	<0.001	0.137	<0.001	0.240	<0.001	0.742

\*significant 1%, \*\*significant 5%

In Table 3, three food items are considered. The first is Milk! Age1\_per, adult equal, Ln\_monthly expenditure food, are variables affect consumption of Milk in Pakistan. The next food item in the above table is Meat! All most all variables affecting the consumption of meat, which means a very sensitive response to the consumption of meat if there is any kind of change in demographic or economic variables. The last food item in said table (b) is Fruit! Age2\_per, age3\_per, HEAD schooling years, adult equivalence, LN\_monthly expenditure food, Agri, and employer are significantly affecting the consumption of fruit in Pakistan.

**Table 4: Results OLS (Working-Leser Model)**

Variables	Coefficient	P-value	Coefficient	p-value	Coefficient	p-value
	VEGETABLES		GHEE		CEREALS	
(Constant)	0.045	<0.001*	0.178	<0.001*	0.229	<0.001*
No. of earners	<0.001	0.408	0.001	0.018*	-0.001	0.124
Age1_per	<0.001	0.802	0.001	0.867	-0.050	<0.001*
Age2_per	-0.001	0.256	0.012	0.005*	-0.019	0.003*
Age3_per	<0.001	0.792	0.004	0.279	-0.016	0.009*
Adult equivalence	0.001	<0.001*	0.004	<0.001*	0.009	<0.001*
Schooling HEAD	<0.001	<0.001*	<0.001	0.583	-0.004	<0.001*
Agriculture	0.001	0.400	-0.020	<0.001*	-0.006	0.379
LN Food Expend	-0.016	<0.001*	-0.042	<0.001*	-0.042	<0.001*
Manufacturer	-0.002	0.187	-0.010	0.037*	-0.022	0.004*
w_sale	-0.002	0.138	-0.014	0.004*	-0.017	0.023*
Constant	<0.001	0.951	-0.017	0.001*	0.002	0.749
s_p_serv	-0.001	0.565	-0.011	0.015*	-0.012	0.101
Transp	-0.002	0.083	-0.010	0.056	-0.011	0.138
Others	-0.001	0.637	-0.016	0.001*	-0.011	0.154
Se	0.002	0.181	0.011	0.022**	0.011	0.128
Pe	0.001	0.262	0.010	0.027*	0.017	0.019*
Age	<0.001	0.004	<0.001	0.363	<0.001	0.046
Employer	-0.001	0.809	0.020	0.009*	-0.001	0.911

\*Significant 1%. \*\*significant 5%

Table 4, Cereals, Ghee, Vegetables are analyzed to categories the items food that is pretentious by economic variables under consideration. **Cereals:** age 1\_per,2 and 3, schooling years, adult equivalence and LN\_monthly expenditure food, significantly affecting consumption of Cereals but

negative because its coefficient is significant at a 1% level. As for as industrial classification of the household head is concerned the heads engaged in w-sale and pe sector demand more cereals as compared to Agri and Manuf. For the rest of the household heads, the demand for cereals does not matter for the specific industry.

**Ghee:** no of earners, age 2\_per, adult equivalence, LN\_monthly food expenditure significantly affecting consumption of Ghee. The household heads of all most all industries demand Ghee more than other food items. The conclusion explains that if there is a change in demographic or economic variables, the consumption pattern of Ghee must be changed. **Vegetables,** only three variables are there, namely schooling\_HEAD Years, equivalent Adult and third is LN\_monthly expenditure food, affecting the consumption of vegetables.

## 5. CONCLUSION

In Pakistan, the mainstream of variables under considerations have a significant effect on ghee, meat, and cereals. The items fruit and pulse are pretentious by the variables under consideration on the secondary number. Likewise, vegetables and sugar are items on the third number. Though, the head-household age has no significant result on the nine items of the food respectively. Therefore, Table 1 major food items can be ranked in order, keeping in view adult equivalence approach in urban regions as follows; milk, cereals, meat; in rural areas situation is as follows; cereals, milk, vegetables; While in overall Pakistan, results indicate that; milk, cereals, meat; considering Table 2 results, keeping in view average relative share are same in rural, urban and overall Pakistan as follows and cereals, milk, vegetable Table 3. This study offers rich information and a real picture of the effective estimation of food demands in overall Pakistan. Consequently, by using WLM, the data has been analyzed. In regression, the estimation report presents an analysis of the behavior of food consumption considering demographic and economic variables in this regard. The above information can help policymakers in making decisions for allocating scarce resources in the best way, especially in developing countries like Pakistan.

## 6. AVAILABILITY OF DATA AND MATERIAL

Data can be made available by contacting the corresponding authors

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**Kausar Naheed** is a PhD Scholar at department of economics, Gomal University Dera Ismaiel Khan (KPK) Pakistan. She is Principal of Quid-e-Azam Academy for Educational Development Kamalia.



**Dr. Ijaz Hussain** is an Associate Professor at Department of Economics, Gomal University Dera Ismail Khan. He got a PhD degree in Economics. His research is in the field of Economics. He can be reached at [ijazecoqau@gmail.com](mailto:ijazecoqau@gmail.com).



**Dr. Khair Uz Zaman** is Professor and Director at COMSATS Institute of Information & Technology, Vihari Campus. He got a PhD degree in Economics. He is well-known researcher in the field of Economics relevant to Information & Technology.



**Dr. Naimatullah Babar** is Professor and Director at Institute of Social Sciences, Gomal University, Dera Ismail Khan. His research is in the field of Economics. He got a PhD degree in Economics. He can be reached at [niamatullahbabar@gmail.com](mailto:niamatullahbabar@gmail.com).

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