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An Emperical Study into the Relation of Income and Consumption Using Cross-Sectional Data

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***Abstract*---The main objective of this research is to measure the relationship between income and consumption. For this purpose both the primary and secondary data sets were used. Secondary data for the year 1980 to 2012 was obtained from the Ministry of Finance Government of Pakistan. Primary data was collected from two public sector universities of Peshawar. Out of the total 697 respondents 150 were randomly interviewed using lottery method. The overall results of the secondary data are in line with the Keynesian Psychological law of consumption, that consumption is the positive function of income. The coefficients of income is 0.86 which is statistically significant at 1 percent level showing, as national income of Pakistan increases by Rs. 1 million, the consumption increases by Rs.0.86 million. The potential of consumption was higher in higher income households. Findings are in line with the Keynes economic theory [1], which suggests that the income variable has positive effect on household consumption. There are positive relationships between income, education and family size, they are statistically significant. The study recommends that in order to enhance the purchasing power of the people, increase in salaries, wages, reduction in personal taxes and subsidy on basic necessities be provided.**

I. SPECIFICATION OF PROBLEM

Consumption accounts for two thirds of GDP in most countries and is the most important determinant of welfare. In addition, consumer attitudes to saving which is based on consumption decision are very important for capital accumulation, the process of investment, growth and development. These facts make consumption and saving among most popular Research areas both in macroeconomics and microeconomics [2].

Consumption is the most important single element in aggregate demand, so that its accurate estimation is essential to the management of the economy. Keynes related consumption to current disposable income [1], and for many years this was widely accepted. In 1950s evidence was recorded for discrepancy between the consumption function estimated from long-run time series data, and the much flatter consumption function estimated from short-run time series and cross-section data. The Keynesian consumption function therefore could not resolve this discrepancy, and it was together with the need for more accurate forecasts of consumption, that led to the development of the permanent income, life cycle and relative income hypotheses.

The central position of the consumption function in Keynesian economics has therefore led to many attempts to estimate and question that would indeed predict consumer expenditure. Unfortunately, most of the early Keynesian types of equations failed to explain some of the more interesting feature of aggregate consumer behavior. Alternative theories were therefore developed in the 1950s and 1960s which, it was claimed, fitted the facts rather batter than simple Keynesian view of consumption. Therefore the present study was conducted:

A. Objective of the Study

1. To test various income hypothesis including Absolute and Relative income hypothesis in the study area.
2. To study the main determinants of consumption in the study area.
3. To suggest policy recommendations on the basis of findings of the study.

B. Hypothesis

Ho': Increase in income does not lead to absolute increase in consumption.

H1': increase in income leads to absolute increase in consumption.

Ho'': Factors like income, Education and family size do not affect consumption.

H1'': Factors like income, Education and family size affect consumption.

II. LITERATURE REVIEW

This section highlights some of the important literature review which is conducted by different researchers. Keynes (1936) reported that whatever is not consumed is saved. In the studies of Latin American countries show increased capital formation and increase in income with fall is saving from 23% to 8.8%. It indicates that the shift of 14.2% of income must have gone to increase the consumption rate. Total income (Y) being equal to 1. MPC is always positive showing increased consumption with proportionate increase in income and will lie between 0 and 1 [1].

The coefficient of household size comprises of two types of effects, such as specific effects and income effects. The specific effect resulting from increase in the need for various commodities as household size increases, whereas, the income effect arises because: a family becomes relatively poorer with an increase in the household size. The specific effect does not move proportionately with household size because of economies of scale in consumption, which exist in the large households [3].

A different approach used by [4] to define consumption. Theory of consumption titled "Life cycle hypothesis'' distinguishes between two types of wealth. Net worth of one's stock of assets and the present value of one's expected labor income stream. According to this theory, consumption of any time depends both on the flow of expected labor income and on stock of wealth.

The relative income hypothesis postulated that consumption depends on current income and past peak income. If income exceeds the previous peak level of income no downward adjustment in living standards is necessary and consumption will adjust to income according to one set of relation if, however, income falls below previous peak income than consumption will react more gradually to change in income [5].

[6] follows the well-known Engel's law which states that the proportion of expenditure on food with respect to the total expenditure declines with the rise in income, a useful indication of relative consumption patterns is derived by comparing the income elasticity. The main advantage of following this approach is that income elasticity does depend on the units of measurement of income and consumption, and is, therefore, directly comparable between countries and commodities.

Poverty is measured in relation with food consumption in India and found that one third of the rural population was living below the poverty line and suggested that development strategic should include an income distribution component [7]. In [8] it is confirmed the existence of economies of scale in the consumption of majority of the commodity groups. They found that the degrees of these economies of scale are not only different across commodities but also between sectors and across the income groups within each sector. The level and distribution of various food commodities are an important indicator of social welfare status of the area. Furthermore, in order to examine the impact of urbanization on the household's consumption patterns, several studies have obtained separate estimates for the urban and the rural sectors.

Consumption pattern of food is studied in Egypt and concluded that the rate of increase in food consumption was dependent on household size and population growth, and suggested implementation of socio economic and national population programs [9].

A study on food consumption patterns in South Africa and found that quality and price were both important considerations for consumer food purchase, particularly for rural consumers [10]. They also concluded that higher incomes people consume more meat and could afford more fruit and ready-made food. [11] Reported that low income population have a traditional Mediterranean (fish/seafood) consumption pattern, whereas wealthy dwellers were inclined to western behavior which had a negative effect on food industries in Turkey [11].

Low income households are likely to spend a greater share of their income on food particularly on rice. Agriculture laborers spend 59.4 percent of their food

budget on rice and the corresponding figure for professional group is 38.5 percent. The share of wheat in total food budget varies from 2 percent for large farmers to 4.9 percent for semi-skilled workers. Apart from rice and wheat the major spending is done on fish, pulses, beef and vegetable. The richest group (Professionals) spends about 16 percent of its food budget on fish while the poor (Agriculture labor) spend 9 percent. In fact the budget share for fish is likely to increase with increase in income. The same observation holds true for beef and vegetables. However the semi-skilled workers spend a higher proportion on pulses compared to professional and high income groups. However, they report households size have significant effect on shares of consumption behavior in most of the commodities [12].

A. Concluding Remarks

Various research studies have been conducted in different parts of the world to measure income and consumption relationship using primary and secondary data. The main determinants were food and education expenses. Most of the studies are in line with the economic theories that income increases consumption also increase but less proportionality.

III. UNIVERSE OF THE STUDY

The teachers working at University of Peshawar and the University of Agriculture Peshawar constitute the population of the study as shown in table 3.1

Table 3.1: Total and sample Household in the study area

Name of universities	***Total number of respondents***	***Sample selection***
University of Peshawar	499	108
Agriculture University	198	42
Total	**697**	**150**

Source: i) Registrar Office, University of Peshawar [13].
ii) Registrar Office, Agriculture university of Peshawar [14].

A. Data Collection

Questionnaire was used to collect the required information. In order to measure the relationship between income and expenditure two data set were used. Secondary data obtained from the Ministry of Finance Govt. Of Pakistan and primary data was collect from the employees of the universities. The following econometric model was used to measure the relationship.

B. Analytical Frame work

$$C = \boldsymbol{a} + \boldsymbol{bY}$$

Where a >0 and 0<b<1

Where C is the consumption expenditure, Y is the household income. Here (a) represents autonomous consumption while "b" stands for induced change in consumption due to income (MPC).

In addition, consumption will also be regressed on other determinants of the consumption as specified below.

$$\mathbf{C = \alpha + \beta X} \quad \sum_{1=i}^{K} \boldsymbol{X}$$

Where

C_1 = Consumption Expenditure
X_1= Income
X_2= Family Size
X_3= Education
ϵ = Random Error

IV. RESULTS AND DISCUSSIONS

A. Education Level of Respondent

Teachers of Agriculture University and Peshawar University were respondents. Therefore the sample respondents were educated and they were divided into three major groups according to their qualifications i.e. Master level, M.Phil/Ms and Ph.D. As evidence from table4.1 that majority (47) were Ms/M.Phil degree holders. The second large qualifications of the respondents were master's degree. It was 30 % of the total respondents. In the sample respondents 23% were holding PhD degree in their respective disciplines.

Table4.1:Education of family head of the Sample Respondents.

Types of Degree	*Numbers*	*Percentage*
PhD	35	23
Ms/M.phil	70	47
Master	45	30
All	150	100

Source: Survey 2012

1) Family Size of Respondents.

Family size also matter for a household consumption expenditure. It is assumed that, people having large family size have higher consumption expenditure. Household size has been divided into three groups. Table 4.2 shows that majority (73%) of the respondents possess 6 to 9 family members while 21% have family size in the range of 5 or less and only 6% were having extended family size.

Table4.2: Household size of sample respondents

Size	*No.*	*Percentage*
Less or equal to 5	32	21
6-9	109	73
10-11	9	6
All	150	100

Source: Survey 2012

B. Income, Consumption and Saving Of The Respondents

1. Descriptive Statistics of Sample Respondents.

Table 4.3 shows that total sample respondents were 150. The average income of the sample respondents was Rs 80,398.05 while minimum and maximum income was Rs 108.000 and Rs 49,768. The average consumption of the sample respondents was Rs 571.06.33 while minimum and maximum consumption was Rs 32,045 and Rs 80,922. Average saving of the sample respondents was Rs 23,291.7 while maximum and minimum was Rs 43.500 and Rs 8,459 respectively.

Table4.3: Descriptive statistics of sample respondents

Variables	*No. of Respon*	*Mean*	*Min*	*Max*
	dents			
Income	150	80398.05	49768	108000
Consumption	150	57106.33	32045	80922
Saving	150	23291.73	8459	43500

Source: Survey 2012

2) Average Income of Respondents.

Money income plays a key role for livelihood. When income increases, one can make more choices to purchase the goods. In the study area income was divided into 7 different age groups as shown in the table below. Highest mean income of Rs.99658.57 was observed in the age group of 50 to 54. The second higher mean income of Rs.95717.80 in the age group of 55 to 59 was observed. The third higher mean income of Rs.82548.39 is in the age group of 35 to 39. The age group below 29 has less saving as compared to other age groups. The age groups 45 to 49, 40 to 44 and 35 to 39 have an average income of Rs.83,203.44, Rs.81, 8950 and Rs.82,548.39 respectively as reflected by table4.4.

Table 4.4: Mean of Household Disposable income by Age groups

Age	*Mean Income*
<_29	67190.50
30—34	70490.45
35—39	82548.39
40—44	81895.10
45—49	82203.44
50—54	99658.57
55 and above	95717.30
All	579622.80

Source: Survey 2012

3) Expenses of Sample Respondents

Household expenses play important role in the consumption expenditure of a family. Major household expenses include expenses on children education, vegetable/fruit, and milk. According to the table 4.5 the main expenditure was on average on the children education was Rs 4249.30 with maximum of Rs 5000 and minimum of Rs 1600. The second largest expenditure was on vegetables/fruits and on the average it was Rs 31690 with maximum in Rs 5500 and minimum of Rs 1200. The other expenses internet/telephone, electricity gas and other

expenses were on the average Rs 2431.97, Rs 1958.67, Rs 1596.67 and Rs 10613.3 respectively.

Table 4.5: Descriptive Statistics of Expenses of sample Respondents

Household expences	***Average***	***Max***	***Min***
Electricity	1958.67	4000	600
Gas	1696.67	3200	500
Water	63.60	100	35
Milk	3116	5000	1500
House repairs/ renewals	1200.67	2200	700
Vegetables/ Fruits	3169.33	5500	1200
Cooking Oil	2510	5000	1800
Education Exp.	4249.30	5000	1600
Health Exp.	1640	900	400
Tele/Internet	2431.97	4500	1500
Laundry	874.80	1500	500
Other Exp.	10613.30	15000	6000

Source: Field Survey 2012

C. Estimation of Income Consumption Relationship Using Cross Section

1) Econometric Model Using Cross Sectional Data for Different Determinants

In order to measure the effect of various determinants effecting the household's consumption, the following econometric model for the cross sectional data was estimated.

HHC = F (INC,FMS,EDU).

Where

HHC=Household consumption,

INC=Personal income

FMS= Family size,

EDU= Education,

The multiple regression results of the above mention model are presented in Table 4.6 Data fitted to the specified model showed that 77% variation in the dependent variable is explained by independent variables. In table, the F value 95.465 shows over all significance of the model. Among all the explanatory variables income, family size and education were the most important variables of consumption expenditure. These variables were highly statistically significant. These finding are in agreement with those of [15]. The finding of Cross sectional data shows the sample respondent follow the Relative income Hypothesis implying that when the income increases consumption also increases but when the income decreases, consumption does not decrease at the same proportionate rate.

Table 4.6: Estimate of parameters in Linear Model

Variables	***Coefficient***	***S.E***	***t-Value***
Income (Rs/month)	0.565	0.060	7.713
Family size	0.169	299.699	4.071
Education	0.446	459.472	4.773
F(7,118)	95.465		
R. Squared	0.768		
Adj. R-squared	0.760		

Source: Field Survey 2012

2) Estimation of Income and Consumption Relationship Using Cross Section Data

$$\mathbf{C = 2401.027 + 0.832Y}$$

Income has a positive relation with consumption, as one unit increase in income brings Rs. 0.832 units increase in consumption, which reveals marginal propensity to consume, was Rs. 0.832. This shows the consumption have a positive relationship with income. Marginal propensity to save was Rs. 0.168. The results are in line with [16] in which he has estimated a non-liner consumption function from cross-section and the same results were found.

The multiple regression results showed that consumption expenditure of the sample household depends on income, family size, and education of the household however; among all the explanatory variables, income, family size and education are the most important variables of consumption expenditure. These variables were statistically significant. The correlation between the observed consumption and estimated consumption is 87%

which is very high. The R^2 show that almost 77 percent variation in consumption is explained by the consumption expenditure. The F-test shows that the overall model is significant.

V. CONCLUSION

The purpose of the research was to test the previous established theories of consumption. Both the primary data and secondary data of consumption was used as dependent variable. The results shows that the determinants income, education, family size were highly effecting the consumption. The overall result support the view of Keynes as consumption is a positive function of income so our study also supports the theory of Keynesian Consumption. The potential of consumption was higher in higher income group. Findings are also in line with the Absolute theory of consumption, which suggest that as income increases consumption also increases but as income decreases, consumption does not decrease in the same proportion.

VI. RECOMMENDATIONS

In Macroeconomics consumption has an important role. The higher inflationary rate has badly affected the purchasing power of the households. The households cannot buy the basic necessities of life. In order to enhance the purchasing power of the household, the wages/salaries should be increased. Moreover, the personal taxes should be reduced so that the household get more money for purchasing the goods. Besides to maximize the welfare of the consumers basic necessities are to be provided at subsidized rate to the consumers.

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