

An Empirical Investigation of Consumption Function under Relative Income Hypothesis: Evidence from Farm Households in Northern Pakistan

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ABSTRACT

The main objective of this research was to empirically investigate the relationship between income and consumption of farm households in District Peshawar, Khyber Pakhtunkhwa province of Pakistan. For this purpose, a household level survey was conducted in summer 2012 in two selected villages, namely Tarnab and Akbarpura. Out of the total 3244 households, a sample of 300 households was randomly selected. The study found that household current level of income, family size, education of household head, and social status were the significant determinants contributing positively to household consumption. Only age of household head was negatively related to household consumption. The results of the study confirms that farm households follow Dusenberry's relative income hypothesis and that household consumption is not only affected by household current level of income but by the highest level of income previously attained as well as the consumption patterns of other households.

Key words: Consumption function, relative income hypothesis, farm households, Pakistan.

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I. Introduction

1.1 Problem Specification

Consumption is the most important component of national income accounting and the aggregate demand. It is the ultimate economic activity on which the welfare of the economy depends. It plays a pivotal role in determining national income of the economy. It also constitutes a major portion of disposable income of households on microeconomic level. The consumption-income relationship was first stated by Keynes in his psychological law of consumption. Keynes stated: “*The fundamental psychological law...is that men [women] are disposed, as a rule and on average, to increase their consumption as their income increases, but not by as much as the increase in their income*¹.”

Since the World War II, the theory of consumption has occupied a central position in macroeconomic research. The Keynes’ theory of the aggregate consumption function dominated the initial thinking. According to Keynes’s theory, aggregate consumption was a positive but diminishing function of aggregate income. The Absolute Income Hypothesis is theory of consumption propounded by J. M. Keynes (1936) and later on refined by James Tobin (1951). Simon Kuznets, a noble laureate, pointed out a paradox that could not be explained by the simple linear consumption function. The Kuznets paradox was that the percentage of disposable income that is consumed is remarkably constant in the long run, which suggests a proportional consumption function, i.e., that the intercept term a is equal to zero. However, estimates across individual households or using short-run aggregate time-series fluctuations in income and consumption consistently produce estimates implying that $a > 0$, which means that the share of income consumed declines as income rises. Explaining the Kuznets paradox became a primary goal of consumption theorists in the 1950s (Palley 2008).

One such approach was the relative income hypothesis which was developed by James Duesenberry (1948, 1949) who challenged Keynes’ theory of aggregate consumption by including psychological factors associated with habit formation and social interdependencies based on relative

¹ John Maynard Keynes, *The General Theory of Employment, Interest, and Money*, Harcourt Brace Jovanovich, Inc., New Yor, 1936, p. 96.

income concerns. Dusenberry believed that a household's consumption depends not only on its current disposable income, but also on current income relative to the highest level of income previously attained and relative to the income of other households. This hypothesis enjoyed considerable popularity in the 1950s. However, in the 1950s Duesenberry's theory of consumption was displaced by Modigliani and Brumberg's (1954) lifecycle theory of consumption and Friedman's (1957) permanent income hypothesis. These latter theories stripped consumption theory of social interdependency and restored an atomistic approach that emphasized utility maximization without regard for social concerns². These two theoretical approaches have largely merged to become "modern consumption theory." In their original forms, they differed mainly in that the life-cycle theory emphasized natural variations in earnings over a finite lifetime whereas the permanent-income model stressed general variations in income over an indefinite horizon (Palley 2008).

Over the last decade there has been a revival of interest in Duesenberry's and Veblen's ideas on relative consumption and conspicuous consumption. This new research has been primarily sociological and microeconomic in focus. Empirical work by Easterlin (1974, 1995) finds that relative income is the dominant determinant of happiness. Experimental work by Alpizar et al. (2005) also confirms that relative income and consumption matter for people.

This paper therefore investigates empirical evidence on the relative income hypothesis using cross sectional data of farm households in northern Pakistan. The paper estimates empirically the consumption function under the "relative income hypothesis" in the study area. It also estimates other major determinants of consumption in the study area. This is the pioneering study in Pakistan.

II. Materials and Methods

This section provides information about area of the study, sample size and sampling, data collection and analysis and econometric model used for empirical analysis.

2.1 Area of the Study and Sample Size

² Mason (2000) has examined the history of Duesenberry's theory of consumption within the economics profession.

All farm households in the two villages (i.e., Tarnab and Akbarpura) constituted the area of this study. The study area is important from agricultural point of view where major and minor crops, vegetables, fruit etc. are grown. This area is irrigated by canals as well as private tube wells. The study area is also close the famous river *Kabul* which during summer flooding add fertile soil to the adjacent farms in the area. The overwhelming majority (90%) of the study area constitutes farm households. The total number of farm households in the area is 3244. These households depends exclusively on farming and other allied activities including poultry, livestock, plant nursery, bee-keeping, growing fruit trees, etc.

Following Mawakaje (2013), the sample size was determined by using the sample selection formula given below.

$$n = \frac{N}{1 + Ne^2}$$

Where, n is the sample size, N is population of total farm households in the study area and e is the desired margin of error. Using e equal to 0.055 as the desired margin of error and N equal to 3244 as population, a sample size of 300 was determined for this study. The distribution of total and sample households is given in below table.

Table 1: Total and Sample Farm Households in the Study Area

| Village | Total Farm Households | Sample Households |
|-----------|-----------------------|-------------------|
| Tarnab | 1362 | 126 |
| Akbarpura | 1882 | 174 |
| All | 3244 | 300 |

Source: Union Councils of Akbarpura and Tarnab.

2.2 Collection of Data and Sampling Procedure

Two villages namely, Tarnab and Akbarpura, were purposively selected because a vast majority of households (90%) are farm households in these villages. The sample respondents were randomly selected from the list of total farm households. In order to collect data for this study, a detailed interview schedule was designed which had questions about the socio-economic background of the sample households, age, gender, education, income, consumption, and landholdings of respondents. The interview schedule was pretested before actual data collection and revised based on feedback from the sample respondents. During the interview, the

background of the study was explained to the respondents and a rapport was generated for the purpose of collecting quality data. The respondents were cooperative in giving data. In case, some respondent refused to give data, then the next household was selected for interview. The data were collected during June-August, 2012. Thus, the study was based on cross sectional data collected during the household level survey. For data analysis, we used Statistical Package for Social Sciences (SPSS).

2.4 Conceptual Framework³

Let us assume that a representative household is a unit of the study which has a fixed income (I) which it spends on good x which is a purely non-positional good and good y which is a purely positional good. It implies that the household purchases good x solely for its functionality and good y solely to derive status within the community. This assumption permits us to separate potential consumptive motivations. We may think of x as the purchase of a Lamborghini car and y might be, in some cases, a charitable contribution. The household's budget constraint, then, may be written as follows:

$$I = P_x x + P_y y \quad (1)$$

The representative household chooses x and y such that it maximizes its utility: $\text{Max } U(x,y)$, subject to the budget constraint, $I = P_x x + P_y y$. The household chooses x and y such that $MRS_{xy} = \frac{MU_x}{MU_y} = \frac{P_x}{P_y}$. (2)

From this conventional household optimum choice problem, we may think of a slight modifying standard that the representative household chooses between a non-positional good, x , and community status, s , where the latter good is derived through the implicit purchase of units of the positional good, x . As expenditure on status is derived strictly from positional good expenditures within the model and positional good expenditures are made strictly to derive status, we know that $P_s s^* = P_y y^*$ (3)

Where s^* is the household's optimal status allocation given as follows:

$$s^* = \frac{y^*}{\bar{y}(\bar{I})} \quad (4)$$

³ This section heavily draws on Sanders (2008).

where \bar{y} is (exogenous) per capita consumption of the positional good by other households of the community, \bar{I} represents (exogenous) per capita income level across all other households of the community, \bar{y} is positively dependent upon \bar{I} given the aggregated choice problems of other community members (i.e., positional goods are taken to be normal), and is the representative household's optimal allocation of the positional good from the first choice problem above. Equation (4) depicts that the household's community status is equal to the level of its positional good consumption in relation to the per capita level of such consumption on the part of other households. The status function described in (4) is in line with the empirical models of Duesenberry (1949) and Luttmer (2005) in which the consumer's utility in a good is determined by her consumption of that good relative to exogenous consumption of the good by other households in the society.

2.5 Econometric Model

Consequent upon the above theoretical framework we estimated the following model of consumption function:

$$C_i = \alpha + \beta Y_i^r + \varepsilon_i \quad (5)$$

Where, C_i is the consumption expenditure of the i th household and Y_i^r is the i th household relative income. In equation 5, the intercept (α) stands for autonomous consumption of the household and β is the marginal propensity to consume (MPC) which is rate of change of C with respect to a unit change in relative income of the household. However, Y^r is different from what James Tobin called current income (Y). Following Dusenberry (1949) we claim that household's consumption expenditure is not only determined by its current income but also by the highest level of income previously attained as well as by the consumption patterns of other households.

In addition, consumption was also regressed on other factors as follows:

$$C_i = \alpha + \beta_i \sum_{i=1}^k X_i + \mu_i \quad (6)$$

Where, X_i stands for household relative income, household size, education of household head, status dummy, gender and age. The μ_i represents stochastic error term.

III. Results and Discussion

3.1 General Descriptive Characteristics of Farm Households

Age is an important factor affecting consumption of household. The study found that more than one-fifth (22%) of farm household heads belong to age group of up to 30 years. As many as 42% of household heads had age between 30-50 years. Some 36% were of the age above 50 years.

Education of household head also affects consumption expenditures of the household. More than one-third (35%) farm households' head were illiterate. One-fourth (25%) had education up to high school level. About 40 % of farm household heads had education above high school.

Family size is another important factor affecting consumption of a household. Household consumption and its family size may be thought of as positively correlated. Majority (73%) of sample households had family members between 6-9. About one-fifth (21%) had family size of up to 5 members. A small number of households had larger family size of more than 9 members.

Consumption may also vary with gender. Majorities (85%) of sample households were male-headed and the remaining 15% were headed by females. A vast majority (94%) of sample household heads was married and 65 were either single or widowed.

Income is the most important determinant of consumption. The average monthly income of the sample respondents was Rs.80,398 with the minimum and maximum income of Rs.1,08,000 and Rs.49,768, respectively. The average consumption of the sample respondents was Rs.571,06 with the minimum and maximum consumption of Rs.32,045 and Rs.80,922, respectively.

3.2 Estimated Consumption Function

The findings of the study showed that household income, education of household head and family size were the major determined on farm household consumption. The regression coefficients of these three explanatory variables were positive and highly significant. The algebraic signs of these variables are in line with theoretical expectation. Age had a negative coefficient which was highly statistically significant. This implies that households' consumption expenditures varied inversely with age of the household head. This may be true because young people usually spend more than old people. In addition to quantitative explanatory variables, we also used two dummy independent variables; namely, gender of the household head and status of the household. Both the dummies had positive coefficients. In order to know if the sample households were subject to demonstration effect, we used the status dummy which took the value of 1 if the representative household consumption was affected by other households' consumption and 0 if it is not affected by other's consumption. The coefficient of the status dummy was positive and highly significant. This confirms that the sample farm households were following the relative income hypothesis. Thus, findings of this study support the results found by Dusenberry (1949) and Luttmer (2005). It can, therefore, be inferred from the findings of the study that the consumption expenditures of the farm households are not only determined by the households disposable income, but also by the current relative to the highest level of income previously attained as well as consumption expenditures of other households.

Table 2: Estimated Regression Model of Farm Households in the Study Area

| Variable | Coefficient | Standard Error | t-ratio | p-value |
|-----------------------------|-------------|----------------|---------|---------|
| Intercept | 21224.44 | 5076.2 | 4.18 | .000 |
| Income (Rs./month | 0.565 | 0.060 | 9.41 | .000 |
| Family Size | 0.169 | 0.041 | 4.071 | .000 |
| Age of Household Head | -0.173 | 0.077 | -2.246 | 0.04 |
| Education of Household Head | 0.446 | 0.093 | 4.773 | .000 |
| Gender of Household Head | 0.062 | .271 | 0.228 | 0.23 |
| Status dummy | 0.383 | 0.067 | 5.716 | .000 |
| R ² | 0.65 | | | |
| Adj.R ² | 0.64 | | | |
| F-Stat. | 85.4 (.000) | | | |

The coefficient of determination (R^2) indicates that 65% of the variation in household consumption expenditures is explained by the independent variables used in the model. The F-stat value shows that the overall model is highly significant. Thus, the results of the above model are reliable. The findings of the model based on t-ratios of individual coefficients as well as those based on F-stat are in line with each other.

We also estimated a separate regression of household consumption on their income and the following estimated equation was fitted.

$$C_i = 2401.027 + 0.832Y_i \quad (7)$$

t-ratios (4.34) (5.26)

Equation 7 shows that the estimated MPC of the farm households was 0.83. Following the results of our study, it means that when household income changes by one unit then consumption expenditures change by 0.83 units. Under the “Relative Income Hypothesis”, it would mean that when household income increases by a unit, then there will 0.83 units increase in consumption. However, the opposite will not be true implying that in case of a unit decrease in household income; their consumption will not decrease by 0.83 but by somewhat less than this. These results are in agreement with Luttmer (2005) as well Dusenberry (1948).

IV. Conclusion and Recommendations

The paper concludes that income, family size, education, age, and social status are the important factors determining consumption of farm households in northern Pakistan. The marginal propensity to consume was found as 0.83. The study supported relative income hypothesis. Social status was one of the most important factors affecting household consumption expenditure. Although, evidence exists in literature that relative income hypothesis has no relevance in consumption-income relationships, yet our study provided empirical evidence on the validity of this theory. The present study is based on cross sectional data. Such study may also be conducted using time series data. The study provided a new avenue for further research.

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