Fitting of engel curve

Fitting of Engel Curve: Rural Maharashtra Managerial Economics I: Section D Group 6 Completed Under the Guidance of Prof. Kaushik Bhattacharya September 2011 Indian Institute of Management, Lucknow Submitted on September 5th, 2012 ? Executive Summary This study aims to estimate and analyze the relationship between the monthly per capita expenditure onfoodand the monthly per capita total expenditure for households in rural Maharashtra. This relation is estimated by using the Engel Curve Model which proves that as the income levels rise the percentage expenditure on food items decreases.

The National Sample Survey Organisation (NSSO) conducted an all-India survey of households and unorganised service enterprises in the 63rd round of NSS during July 2006-June 2007. Surveys on consumer expenditure are being conducted once in every five years on a large sample of households from the 27th round (October 1972 – September 1973). For this project Data from the 63rd Round of the National Sample Survey was used as a sample for analysis. The regression analysis was carried out using Linear, Working-Lesser and Double Log Models.

The income elasticity was calculated in each case which confirmed the fact that food is a necessity good. Qualitative factors such as seasonality, occupation and social group were also incorporated into the regression analysis using dummy variables. A multivariate regression analysis revealed the prominence of occupation as a relatively more significant factor compared to the others factors. The analysis is subject to certain limitations due to the assumptions made with the most primary assumption being that

the total expenditure on all goods is representative of the income of the individual.

Other limitations arising out of the content of the survey have also been listed. Contents Executive Summary2 Introduction4 Understanding the Data6 Data Collection6 Data processing6 Function Formulation6 Regression Analysis7 ? Introduction The nature of a particular good can be determined by an important parameter known as Income elasticity which helps us classifying the good as either inferior, a necessity or luxury. This parameter allows us to predict what goods will be determined by a society during various stages of development and provide insights into the behaviour of various sections of society to that good.

In today’s economic scenario Income elasticity of food in particular is of major significance. From a production perspective, it is important to determine the relationship between the food expenditure and income. This will help in predicting the demand in a growing economy and thus reduce the demand-supply gap. Form a policy perspective, the income elasticity becomes all the more important as government aims to have an inclusive development. Knowing the income elasticity withrespectto food expenditure will help in framing policies which fulfil their aim of better economy.

Income elasticity can be estimated empirically through Demand curves and Engel Curves. Engel curves describe how household expenditure on particular goods or services depends on household income. The name comes from the German statistician Ernst Engel (1821–1896) who was the first one to investigate this relationship systematically in an article published about 150 years ago. The best-known single result from the article is “ Engel’s

law," which states that the poorer afamilyis, the larger the budget share it spends on nourishment.

Engel curves may also depend on demographic variables and other consumer characteristics. Empirical Engel curves are close to linear for some goods, and highly nonlinear for others. Engel curves are used for equivalence scale calculations and related welfare comparisons, and determine properties of demand systems such as agreeability and rank. Engel curves for normal goods Engel curves for inferior goods The relationship between the food consumption and income on the Engel Curve has been analysed through various models, each with its own benefits.

The three models used in this study are: 1. Linear Regression Model: It assumes a linear relationship between the two variables. It uses the equation: Y = A0 + A1X. The elasticity is calculated through this model using the equation ? = (X/Y) dy/dx = (X/Y) A1 2. Working-Lesser Model: This model uses the equation Wi= A0+AilnX. Working-Lesser Model is the first empirical model applied in the study of consumption analysis In the Working-Leser model, each share of the food item is simply a linear function of the log of prices and of the total expenditure on all the food items under consideration.

Here i represents each food items , wi is the expenditure share of food i among the n food items and x is the total expenditure of all food items included in the model. This model can be estimated for each food item by the ordinary. 3. Double Log Model: This model assumes linear relationship between logarithms of the dependent and independent variable. The greatest benefit of this relationship is that the coefficients of the income

variable directly represent the income elasticity. Its equation is lnY = A0 + A1 lnX.

The elasticity is directly available as the co-efficient of the independent variable i. e. ?= A1. Understanding the Data Data Collection The data collected by The National Sample Survey (NSS), during its 63th round of data collection during July 1st 2005 to 30th June 2006, has been used in this project. The survey contained data regarding the expenditure of a on various items such as food, clothing, medical, alcohol etc. It also contains demographic information about each family pertaining to the religion, caste, occupation, age, sex etc. The survey is divided into two samples for data validation.

We first analyzed both the samples individually and then combined them to verify the validity of the results obtained. Data processing We calculated the per capita total expenditure on food for 1702 families from Rural Maharashtra. Instead of income, which wasn't available, we calculated and used the monthly per capita total expenditure for each family to find the Engel Curve. The consumption of food of a family can depend on numerous variables. The variables that we included in our analysis are the social group or caste, occupation and seasonality. The factors which were excluded are_____.

Rural Maharashtra is fairly homogenous and hence the region or district of the respondent wasn't considered as a variable. Function Formulation We did a multivariate regression where the monthly per capita expenditure was the independent variable (i. e. X) while the per capita food expenditure was the dependent variable (i. e. Y). The factors of seasonality, caste and occupation

were taken as dummy variables as they have only a qualitative and not a quantitative effect. ValuesDummy Variables SeasonalityJul-Sep, Oct-Dec, Jan-Mar, Apr-Jun CasteSC/ST, OBC, Others Occupation Self-Employed, Salary/Wage Earning,

Casual Labor, Others Monthly per capita food expenditure = f (monthly per capita total expenditure, dummy variables) This functional form was used to model the various regression models namely linear regression, double log regression and the working-lesser form. Weighted least square method was used to factor in the weights assigned to each household. Regression analysis was carried out for using the SPSS tool which was also used for extracting data from the flat file. A scatter plot of food versus total expenditure was also plotted to prove the Engel’s law. Regression Analysis