CHAPTER II

THEORETICAL FRAMEWORK

The classical theories of consumption behaviour seek to explain the individual consumer's behaviour in terms of utility maximization. Although many of the results derived apply to time series data, synchronous cross-sectional empirical analysis also needs to be validated by a similar plausible theoretical framework. Methodological problems which arise in applied work often involve theoretical considerations and it is the object of the following paragraph to discuss certain issues closely associated with our study.

The Concept of the Typical Consumer

Demand analysis originates with the individual consumer and assumes his set of preferences as given. In family budget studies however the households' expenditure on commodities and services are aggregated for each item and averaged in some suitable manner to derive per capita

expenditures, which are supposed to reflect the behaviour of a single consumer. When households are classified into income classes and the mean per capita expenditures are worked out on the various items a further supposition is made that these figures reflect the behaviour of a single consumer as his income moves to higher levels.[1]

Philips states that applied econometricians generally ignore the aggregation problem citing Houthakker and Taylor that '... of all the errors likely to be made in demand analysis, the aggregation error is the least troublesome.'[2] It is, however, more important to consider how far the concept of a typical consumer operating at different income levels, as derived from study of budgets, is tenable. One basic assumption of all consumption studies is the rationality of consumer behaviour with implications such as that a consumer will consistently try to maximize his satisfaction etc. A second assumption is that consumers in general react in substantially the same manner and any differences are due to the result of differences in

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[1] An excellent treatment of the theoretical requirements for cross section budget study is found in L.Philips, Applied Consumption Analysis, Amsterdam : North Holland Publ.Co., 1974, especially Chapter IV, pp.91-115.

[2] H.Houthakker and L.D.Taylor : Consumer Demand in the United States, 1929-70, cited in L.Philips, ibid., p.100.

circumstances.[3] Hence if all circumstances (household size, composition, geographical region, occupation etc.) except income are kept same then any differences noticed in the consumption behaviour can be attributed to the effects of income. The concept of a typical consumer is thus, seen to be quite plausible. As cross-section studies are generally done at a single point of time only the above procedure seems to be the most ideal. This however raises the issue of the circumstances which influence the preferences of a consumer, which of them are to be taken into account, how they are to be controlled and which could be subsumed under the error term.

The Ceteris Paribus Condition

For a long time only income and price were deemed worthy of study in the field of consumption behaviour. The ignoring of other economic and non-economic variables under the ceteris paribus clause might have been justified in Marshallian era, when wants were relatively limited, but in the modern age it is necessary to be more rigorous in resorting to this condition.

Household composition and size are major determinants of the variations in the consumption pattern of households.

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[3] See S.J.Prais and H.S.Houthakker, The Analysis of Family Budgets, Cambridge : University Press, 1955, p.8.

Houthakker has cautioned against ignoring household size arguing strongly, that 'in most samples of household expenditures that are available there is a positive correlation between household income and household size, so that biased estimates will result if household size is not explicitly treated. Secondly, variations in household size have comparatively large effects on consumption, so that in most samples of household expenditures the magnitude of the variations in consumption due to household-size variations is, for some commodities, greater than that due to income variations.'[4] As pointed out by Phlips variables which have systematic influence on consumption and which are observable cannot be subsumed under the error term.[5]

The problem of developing a suitable consumer equivalent scale (discrete or continuous, and commodity-wise) has been the subject matter of numerous studies since the time Prais and Houthakker reactivated interest in this topic.[6] For our purpose a uniform scale for all items based on age was adopted. (vide p. 71).

Choice of Explanatory Variables

The preferences of a consumer are the result of numerous and varied economic, social and psychological factors. Some

[4] S.J.Prais and H.S.Houthakker, ibid., p.88.

[5] L.Phlips. op.cit.,p.96.

[6] J.Blokland, Continuous Consumer Equivalence Scales, The Hague, Martinus Nijhoff, 1976. (See Bibliography there for additional references)

of these preferences have become stable through habit formation, some are potential, that is will manifest themselves at a future date due to the effect of lags, some may be of a transitory nature ; the preferences may also be to some extent interdependent with those of other households due to demonstration effect. This may be true of especially conspicuous items of expenditure. Faced with this situation the researcher is tempted to involve many variables. On the other hand this may necessitate partitioning the sample into numerous homogeneous sub-samples thereby reducing the sample size considerably so that it might not be possible to draw any meaningful conclusions. The researcher has therefore to limit his study to a reasonable number of explanatory variables.[7]

Engel Curves

An engel curve describes the functional relationship between expenditure on a commodity or service and total income (or any suitable proxy). The following forms have been tried by Prais and Houthakkar ;

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[7]The belief that only a multidisciplinary approach can provide greater insight into the complex behavioral patterns of consumer behaviour is reflected in recent works such as that of G.H.Sellon Jr., A Want-Hierarchy Approach to the Theory of Consumer Behavior, Ph.D. Thesis, University of Michigan, 1974.

(1) $\log v_i = \alpha + \beta \log v_o$ (Log linear or double log)

(2) $\log v_i = \alpha - \beta/v_o$ (Log inverse)

(3) $v_i = \alpha + \beta \log v_o$ (Semi-log)

(4) $v_i = \alpha + \beta v_o$ (Linear)

(5) $v_i = \alpha - \beta/v_o$ (Hyperbolic)

where v_i is expenditure on ith commodity and v_o represents total income.[8]

Various other forms have been tried by other researchers, for instance :

(6) $v_i = \alpha + \beta v_o + \gamma v_o^2$ (Parabolic)

(7) $v_i = \alpha + \beta/v_o$ (Hyperbolic)

(8) $v_i = \alpha + \beta \log v_o + \gamma/v_o$ (Semi-log inverse)

(9) $\log v_i = \alpha + \beta/v_o$ (log-inverse)

(10) $\log v_i = \alpha + \beta v_o$ (exponential)

(11) $\log v_i = \alpha + \beta v_o + \gamma v_o^2$ (log-parabolic) [9]

The theory behind the Engel curve formulations has been extensively dealt with by Stone, Allen and Bowley, Prais, Houthakker, Aitchison and Brown, Champernowne, Sreenivasa Iyengar, Balvir Singh, and others. A brief exposition has been given in the review of literature (pp. 28-60). Here we

[8] Models (1) to (5) are reproduced from Prais and Houthakker, op.cit., p.87.

[9] Balvir Singh, 'The Role of Occupational Factors in Household Consumption Patterns,' Indian Economic Review, Vol.3 (New Series), 1968, pp.85-110.

shall touch upon only a few points.

Engel Curve and Grouping of Commodities

To keep calculations within manageable proportions it is customary to group goods into broad commodity groups. The need for grouping is implied in Prais and Houthakker's argument that for any specific item of expenditure it seems unlikely that Engel curve will have a positive slope at a very high level of income.[10] Interesting results are thus unlikely unless there is some commodity grouping. It is interesting to note how Champernowne arrives at the same conclusion from a formal and entirely different angle. Denoting by $f(u_i)$ a preference function of commodity u_i, the bundle of $(u_1, u_2, \ldots u_n)$ per week is preferred to the bundle of $(v_1, v_2, \ldots v_m)$ whenever

$$f_i(u_i) > f_i(v_i) \qquad (11)$$

The above inequality means that one's preferences between two goods g_i and g_j may be compared independent of the scale of one's consumption of other goods g_k and g_l. This will be realistic only if commodities and services are grouped into ' goods ' in such a way that different goods

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[10] Prais and Houthakker, op.cit., p.16.

[11] D.G.Champernowne, 'Uncertainty and Estimation in Economics,' Vol.2, Edinburg : Oliver and Boyd, 1969,p.264.

satisfy different wants, e.g. the wants for nourishment, lodging, warmth, clothing etc. In such cases the preferences can be compared independently as suggested above, with a separate preference function for each ' good '.

Engel Curve and Elasticity

The determination of total expenditure elasticities for estimating the influence of income on consumption level is one of the primary goals of empirical analysis.[12] Ignoring income redistribution effects, the choice of the form of the Engel curve has automatically implications for the marginal propensity to consume and the income elasticity. Phlips has criticized the linearity assumption since luxury goods (intercept negative) have then an income elasticity that declines with increasing income (marginal propensity being positive). One would on the other hand intuitively expect that income elasticity increases with increasing income for luxury goods.[13] If it is assumed that elasticity is a linear function of total expenditure i.e.

$$n = a + bv_0$$

then the corresponding Engel form is seen to be (through integration) :

$$\log v_1 = a \log v_0 + b v_0 + c$$

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[12]The term 'total expenditure elasticity' immediately makes it clear that total expenditure has been used as proxy for income. The income elasticity might be ten percent less. See Prais and Houthakker, op.cit.,p.103.

[13]L.Phlips, op.cit., p.109.

the coefficients of which can be easily calculated using standard least squares method. It may be seen however that the additivity criterion will not be satisfied in this case. It is thus clear that if some desirable properties are expected of the Engel form then there is a corresponding sacrifice in some other property.

A serious question raised by our empirical study relates to the fundamental issue : should there be one Engel form for the entire income range or is it justifiable to segment the income range into three smaller ranges and derive the Engel forms separately ? Income is an indicator of social rank. Thus a household with an income of Rs. 2000 p.m. considers itself to be superior to a household whose income is only Rs. 1000 per month, irrespective of household size. When per capita figures are taken then it might turn out that the two households may be enjoying only the same level of consumption due to the fact that the higher income household has a larger number of household members. If it is argued that social rank has influence on consumption level over and above that of per capita disposable income then some homogenous grouping of households according to social rank seems called for. Thus when households are divided into low, middle and high income classes on the basis of total household expenditure, and then the Engel curves are

fitted on the basis of per capita values, the resulting forms may be considered to have taken into account an important factor. The part of our investigations based on these assumptions yielded results which appear to be more realistic. Thus two consumers purchasing certain quantities of a commodity at a particular consumption level will react differently when their consumption level goes up, depending upon which Engel curve they are on.

The foregoing are some of the theoretical considerations which have had direct relevance for the present applied work. In the following chapter some earlier empirical studies on consumption are reviewed, with the object of indicating the methods employed, the nature of relevant findings and the trend of research in this area in the recent past, which - it is hoped - will render adequate support to our survey design and analysis.
