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Consumption Pattern In Rajasthan

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Objectives And Scope Of The Study

The knowledge of the magnitude and composition of future demand is essential for undertaking plans of economic development. For this, a number of factors, such as level and distribution of national income, consumption behaviour, prices, population composition and growth, e.t.c., are required. In this study, the focus is on the analysis of the consumption pattern. More specifically, the rural-urban differentials in the marginal propensity to consume and income elasticity of demand with respect to total expenditure are examined over a decade.

During the course of last 25 years, specially after 1960, numerous studies relating to consumer behaviour have been made in India. Some of these relate to consumption behaviour in India as a whole and others to regional patterns. The analysis generally refers to 1 or 2 rounds of the NSS or surveys undertaken by the NCAER.

Significant differences in consumption pattern in different states have been found. This is expected because of great degree of heterogeneity of the states regarding level and rate of economic development, geo-physical conditions and social and historical reasons. In such a situation, regional studies gain added significance. In this study, therefore, attempt is made at

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understanding the consumption pattern in one state in India, i. e. Rajasthan. Rajasthan is of special importance with its feudal history, arid climate and fast changing socio-economic setting.

As already pointed out, in most of the studies, the period of analysis is 1 or 2 rounds of NSS. Thus, temporal variations in consumption pattern cannot be studied. The analysis of the temporal pattern is necessary for studying the stability of the relationships used to explain consumption behaviour. We are, therefore, covering NSS Round No. 17 to 24 and Round No. 28 streching from 1961-62 to 1973-74.

Survey Of Literature

Past consumption pattern studies have been experimented with a number of Engel functions. A survey of these studies reveals that.

(i) For one commodity or commodity-group, different functional forms give rise to widely differing elasticities.

(ii) No one Engel curve is appropriate for all or most of the consumption goods or groups; and

(iii) For the same commodity or commodity-group, different Engel curves will be appropriate in different regions and at different times.

Hence it is desirable to investigate the suitability of different Engel curves for different commodity-groups in different years in Rajasthan.

Before doing this, we discuss the nature of the variables considered and the date used.

The Variables

National Sample Survey data are used for analysis. The data are given for 13 per capita monthly expenditure groups of households in rural and urban areas separately. Household income data are not collected. Thus, per capita monthly expenditure on a particular commodity-group (Y) and per capita monthly total expenditure (X) are used as the dependent

and independent variables respectively.

The following remarks are relevant:

(1) The dependent variable is expenditure on consumption and not consumption itself. Economic theory would prefer consumption (use) as compared to expenditure (purchase). However, in case of India, the relevant information about staggering consumption of durable consumer goods are not available.

(2) We are taking current total expenditure as a proxy for income, more suitably permanent income. This is not entirely defensible. But data do not permit further refinement. Thus, the elasticity derived in our analysis would be expenditure elasticity and not income elasticity.

(3) As already mentioned, we have taken expenditure on a particular group of commodities and not the quantity consumed as the dependent variable. This is inevitable because the group itself is heterogeneous-the quantities cannot be added up. Thus we have calculated value elasticity instead of quantity elasticity. The quantity elasticity is generally lower than the expenditure elasticity.

(4) The aggregate expenditure which is independent variable is by definition aggregation of expenditures on individual commodity-groups. This causes correlation between the random disturbance term and the explanatory variables. Hence O.L.S. estimate will be biased. However, this bias is to a large extent eliminated in our case because the expenditure data are group-data, and group averages have been used. For achieving best results, the individual observations are classified according to total income expenditure (Cramer 1968, 145).

Functional Forms

The following 8 functional forms have been studied:

1. Linear (L): $Y = a + bx$
2. Quadratic (Q) : $Y = a + bx + cx^2$

3. Hyperbolic (H): $Y = a + \frac{b}{X}$

4. Semi-Log (SL): $Y = a + b \log X$

5. Log-Inverse (LI): $\text{Log } Y = a + \frac{b}{X}$

6. Log-Log or Double-Logor-Log Linear (LL):

$$\text{Log } Y = a + b \log X$$

7. Log-Log-Inverse (LLI): $\text{Log } Y = a + b \log X + \frac{c}{X}$

8. Log–Log Log–Square (LLLS):

$$\text{Log } Y = a + b \log x + c (\log X)_2$$

The properties of the 8 Engel functions (curves) are given in Table 1 and the likely shapes are given in Figure 1 to 8.

The expressions for marginal propensity to consume (i. e, marginal propensity to spend on a particular commodity) change in marginal propensity to consume with respect to total expenditure, income elasticity (i. e, expenditure elasticity) are given for each from and critical values are identified.

Criteria For Choosing An Appropriate Engel Curve

Following economic considerations are relevant in choosing an appropriate Engel curve.

1) An Engel curve should be valid over the entire range or at least the greater part of income or expenditure range. In many cases income elasticity is expected to increase initially at very low level of income and ultimately decrease-In any case, it is expected to be decreasing around the mean value of income. This assumes that there is a satiety level. The form of the curve is expected to be a sigmoid. However, this may not be the case with many commodities within the income range covered by the field surveys in developing countries.

Thus, from the point of view of economic theory of consumer behaviour, a curvi–linear function would be desirable. This is because the linear function forces the MPC for a commodity to be constant and income elasticity approaching unity either from below or above as income inereases. In empirical analysis, we might, in fact, like to test these very proper-

ties. Hence, we should take a curvi-linear form of function which is general enough to lead to various shapes of the curve given different signs and values of the parameters.

As already pointed out, the full shape of the curve will be revealed only if the income range is very wide, this is particularly true of commodity-group as compared to ndependen commodities. In the case of a commodity-group, when total expenditure or income rises, then some commodities in the group under study may be substituted by costlier commodities belonging to the same group. Hence, because of intra-group substitution, fall in expenditure on the commodity-group can be postponed for not so large income changes. Thus, only a part of the curve is approximated at a particular time. Over time, however, as the composition of the commodity-group changes or as income distribution or other structural and institutional factors change, the other parts of the curve may also be revealed. Thus, one functional form may be relevant for one period and other in subsequent periods.

2) To ensure theoretical plausibility, the estimated Engel curve should satisfy the general restrictions of the demand theory. They are:

i) Homogeniety of degree zero in prices and income (expenditure);

ii) Negativity of own substitution effect;

iii) Symmetry;

iv) The adding up condition.

Since in the cross-section analysis, prices remain unchanged, hence the problem is simplified drastically. The only general restriction is that of the adding up condition, which states that the sum of the marginal propensity to spend on commodity groups or marginal budget shares should equal one. Alternatively, expenditure elasticities weighted by the respective budget shares should sum to unity.

3) Though individual commodities may be inferior (negative elasticity), commodity-groups are expected to be normal. The possibility of negative elasticity is minimised due to intra-group substitution.

Econometric Criteria

The econometric criteria for selecting a functional form are as follows:

1) High co-efficient of determination;

2) No auto-corelation in the disturbance term as evidenced by Durbin-Watson (D-W) statistic or any other criterion;
3) Low standard error of the additional parameters;
4) Preference to a form, which other things remaining the same, is computationally convenient;
5) Consistency over time.

Method

Ordinary Least Square (OLS) method is used for estimating the parameters of the 8 alternative specifications.

Problems of errors in variables, heteroscedasticity and serial auto-corelation in disturbance term may arise. Theoretically, perhaps, permanent income is the ture causative factor of household consumption. Taking measured (actual) income as a proxy for permanent income will entail errors in variables. Errors in variables are, however, minimised if total expenditure is chosen to represent permanent income. As already pointed out, total expenditure has been taken as the explanatory variable in the model.

The problem of auto-corelation is handled by considering results from only those fits in which autocorelation is not present.

As already pointed out, aggregate expenditure (independent variable) includes expenditure on the commodity-group (dependent variable). Hence, the disturbance term is not independent of the explanatory variables. Thus one of the assumptions of the classical OLS is not met. The OLS estimates will be biased. This problem is minimised by classifying the individual observations according to the independent variable (i. e. total expenditure) into different groups and using group averages.

However, grouping may cause heteroscedasticity. To eliminate this, each variable in the model is weighted by the percentage of households in each expenditure class.

It has been found that grouping of data not affect the elasticity estimates (Cramer 1968, 151).

Separate Engel functions have been fitted for the following 8 commodity groups:

(1) Foodgrains
(2) Milk and Milk Products
[3] Edible Oils
[4] Sugar and Cur
[5] Clothing
[6] Fuel and Light
[7] Other Non-food Items
]8] Other Food Items.

Results

The results for the 8 commodity-groups in round 17 to 28 for rural and urban Rajasthan separately for each of the 8 functional forms are (i) Engel Elasticity, (ii) R^2, (iii) Absence of auto-corelated disturbance term (marked*). The mean co-efficient of determination and its variation were also oftained. Average expenditure elasticity for each commodity group in the case of different Engel functions were also estimated in this study.

Relevant information (number of non-autocorelation cases, R^2, co-efficient of variation in R^2, elasticity and significant cases of additional parameters) for helping us in the selection of appropriate functional form for each commodity-group in rural and urban areas were also separately calculated.

Absence of Auto-Corelation

The results showed that the hyperbolic function is the worst sufferer from this point of view. Semi-log (SL) and Log-inverse (LI) functions also suffer from high positive of negative auto-corelation. In rural areas, the Quadratic function (Q) gives the least number of cases of auto-corelation followed by the Linear (L), Log-Log Inverse (LLI) and Double Log (LL) functions. The Quadratic (Q), Log-Log Log-Square (LLLS), Linear (L), Log-Log (LL) and Log-Log Inverse (LLI) functions give nearly equal proportion of auto-corelation free cases in urban areas.

Considering roundwise situation, the Log-Log-Log-Square function (LLLS) is the most suitable function in round 2I and 24 in rural areas and round 20, 2I and 22 in urban

areas, otherwise, Quadratic function [Q] gives the best results in rural areas except in round 28, wherein Double Log [LL] function is the best one. Linear [L] function in rouud 17, 18, 19 and Semi-Log [SL] function in round 17 also give good results. Quadratic [Q] function gives the best results in urban areas in all rounds except round 28 Log-linear [LL] function. Hence except a few cases (specially round 28) the Quadratic function should be preferred to the other functional forms.

Let us now consider auto-corelation free cases for each commodity-group [see also Table 14]. In rural areas, Quadratic function [Q] is well suited for commodity 4, 5, 6 and 7, Linear [L] function for commodity-group 2, 3 and 8 and Log-Log inverse [LLI] function and Log-Log Log-Square function]LLLS] for group 1 and Log-Inverse [LI] function for commodity-group 2. Generally the Quadratic function gives good results for all commodity-groups except group 8 in rural Rajasthan. However, nearly all functional forms [except Hyperbolic function-H] give fairly good results. Log-Log Inverse [LLI] function and Log-Log Log Square [LLLS] function also give good results in all commodity-groups except group 4 and 5.

The pattern is less uniform in urban areas. the pattern for each commodity-group is summarised below:

Commodity-group	Appropriate Functional Form
1	: All except Linear function [L], specially Log-Inverse function [LI]
2	: Linear function [L] followed by Log-Log Log-Saquare function]LLLS].
3	: All except Hyperbolic function [H] specially Log-Linear function [LL], Semi-Log function [SL], Log-Log-Log Square function [LLLS].
4	: Quadratic function [Q]
5	: Linear function [L], Quadratic function [Q]
6	: Log-linear function [LL], followed by Semi-Log function [SL].
7	: Quadratic funotion [Q]
8	: Log-Log Log Square function [LLLS] followed by Quadratic

function [Q], Log-Log-Inverse function [LLI', Log-Linear function [LL].

Hence no one form will serve the purpose for all commodity-groups in urban areas.

Coefficient Of Determination (R^2)

The fits are generally found good except in the case of the Hyperbolic function. However Q gives the best result in the case of most of the rounds in rural Rajasthan. In round 19 to 28, R^2 is larger than 0.95 with very low coefficient of variation. In the case of round 17 and 18 also R^2 is as high as. 86 and. 87 respectively.

The Hyperbolic function gives the worst fits followed by Semi-Log function [SL]. In urban areas also, the Quadratic junction [Q] gives the best results, mean R^2 is 0.94, the coefficient of variation is also low. However, except the Hyperbolic form all other forms give good fits ($R^2 \geq .83$). Best results are obtained in round 24, 20 and 22.

Considering for each commodity-group seperately, the Quadratic function gives good fits in the case of all commodities, specially group 7, 4, 6 and 5 in rural Rajasthan. In the case of group 1, $R^2 \geq .94$ except in round 17 and 18, same is the case with group 2. Coefficient of variation is also low except in group 1 and 2. Similarly, good results are obtained with Log-Log-Inverse (LLI) and Linear (L) functional forms except in the case of commodity-group 1. In fact, in the latter round there is not much to choose between linear function (L) and Quadratic function [Q] form specially in the commodity-groups 4 to 8. Similar remarks apply to Log-Log Log-Square function [LLLS].

Thus, in all the Quadratic function [Q] gives the best results. In most cases, Log-Linear function [LL] will serve the purpose in place of Log-Log Inverse [LLI] and Log-Log Log-Square [LLLS] except in the case of commodity groups 2 and 8.

The Quadratic specification again gives the best fits in urban areas, mean R^2, equal to 94, in most of the cases except group 1, R^2 is between .93 to .98. Quadratic function (Q) shows significant improvement over Linear [L] for all commodity-group except 5 and 8. coefficient of variation in R^2 is low in the case of L and Q except for group 1. Log-Log-Inverse

function [LLI], Log-Log Log-Square function [LLLS] give the best results for groups 1 and 6, and generally good fits for groups 7, 8 and 2. Hyperbolic function gives the worst results for most of the commodity-groups except 4, 2 and 6.

Among the two sets of functions–[a] Linear function [L] Quadratic function [Q] and [b] Log-Linear function [LL], Log-Inverse function [LI], Log-Log-Inverse function [LLI] and Log-Log Log-Square function [LLLS], the first set gives better fits, Quadratic function [Q] is the best functional form. In the second set of functional forms, Log-Inverse function [LI] is better in group 1 to 5 and Log-linear function [LL] in 6, 7, 8, Log-Log Inverse function [LLI] is either nearer to Log-Inverse function [LI] (in 1 to 5) or to Log-Log function [LL] [in 6-8]. Log-Log-Inverse function [LLI] gives significant improvement in only group 6 and 4.

Co-efficient of variation [C.V.] in R^2 is generally very low in Quadratic function [Q] and Linear function [L] both in rural and urban areas followed by Log-Log-Inverse function [LLI]. Hence the Quadratic specification gives uniformly good results in nearly all rounds for nearly all commodity-groups.

Significance Of The Additional Parameter

In Quadratic specification additional parameter has been added to the linear specification. Similarly, one additional parameter is estimated in LLI and LLLS functions as compared to LL and LI functions. Table 14 gives number of significant values of b and c obtained in Q, LLI and LLLS functions. In rural areas, c is statistically significant at 5 % level in almost all commodity-groups except group 8. Hence Quadratic specification adds significantly to our understanding of the consumption pattern in rural areas for nearly all commodity-groups. This is true only in the case of LLI function for commodity-group 2 and 5 as compared to LL function and group 7, 8, 1 and 5 as compared to LIL function. LLLS function gives improved results in groups 2 and 5 as compared to Log-Linear function and in groups 2, 1, 5, 6, 4, 8 as compared to Log-Inverse [LI] function.

In urban areas, c is significant in most cases in groups 1, 2, 5, 6, 7 and 3. Log-Log-Inverse function [LLLI] shows significant c [hence better results than in LL] in the case of groups 2 and 5, and significant b (improvement over Log-Inverse fuction [LI]) in groups 7, 8, 1, 4, and 6. LLLS shows improvement over LL function for commodity 2, 5, 1, 4 and 6 and over Log-Inverse function [LI] for commodity-group 7, 8, 6 and 2.

Hence Quadratic function (Q) is still the best specification. Log-Log Inverse function and Log-Log Log-Sqvare function [LLLS] also show improvement over Log-Inverse function [LI] and Log-Linear function [LL] specifications.

The Adding-Up Condition

The weighted sums of expenditure elasttcity of demand for the 8 commodity-groups in each round were also attaind. These are then averaged over all rounds for each functional form and Co-efficient of variation [C. V.] found.

The weighted sum is 1 by definition for the linear specification. The actual values obtained for Quadratic function [Q] are near 1 both in rural and urban areas; the average value being 1.0019 (C.V.=2.3%) and. 9907 (C.V.=3.9%) in rural and urban areas. In Log-Log-Inverse function [LLI] also the adding-up condition is nearly satisfied. Hyperbolic function grossly underestimates elasticities and Log-Linear, Semi-Log and Log-Log-Log-Square (LL, SL and LLLS] functions overestimate elasticities both in rural and urban areas. Log-Inverse function [LI] specification also underestimates the elasticities slightly.

Hence the Linear, Quadratic [L,Q] set of specification satisfies the adding up conditions and Log-Log Inverse [LLI] function gives the next best results. All other forms either underestimate or overestimate all or some of the elasticities.

Conclusion About The Appropriate Functicnal Forms

Information needed for selecting the appropriate Engel curves for each commodity-group was collected. On the basis of the information the appropriate functional forms can beidentified as below:

Table 1

Appropriate Functional Form

	Commodity-Group	Functional Form Rural	Urban
1.	Foodgrains	Q,LLI	LI,LLI
2.	Milk and Milk Products	Q,LLLS,LI	L,Q,LLLS
3.	Edible Oils	Q	SL
4.	Sugar and Gur	Q	Q,SL
5.	Clothing	Q	L,Q
6.	Fuel and Light	Q,SL	SL,LL
7.	Other Non-food Items	Q,LL	Q,L
8.	Other Food Items	L,LL	LLLS,Q,LL,L

Thus, on the basis of different criteria, the Quadratic Engel Curve is most appropriate in rural Rajasthan for nearly all the commodity-groups, except in group 8 wherein the linear form is the most appropriate. The pattern is not so clear in the case of urban areas Table 1.

Average elasticity is less than 1 in the case of commodity-groups 1 and 6; it approaches 1 from below in commodity groups 8 and 3 in rural areas. It is equal to or more than 2 in commodity-groups 5 and 7 and is slightly above 1 in the case of groups 2 and 4. All functional forms show high coefficient of variation, over time in the elasticity for commodity-groups 4, 6 and 3. Coefficient of variation is low in groups 7 and 8. Hence in some of the groups the consumption behaviour seems to have changed over time (see Table 2).

In urban areas, n is much below unity in commodity-groups 1 and 6 and less than 1 but nearer to it; in group 4 and 3, more than 2 in group 5, high but below 2 in groups 7 and more than 1 in groups 2 and 8.

Table-2

Range of Engel Elasticity in Rural and Urban Areas

Rural		Urban		
All Functions Range	Quadratic	All Functions Range	Quadratic	Best Fit Function
1. 0.4219–0.5766	0.5766	0.2355.0.4000	0.4000	LI 0 287
2. 1.1675–1.7989	1.5712	1.1341–1.5619	1.3948	L 1.1341
3. 0.7291–1.0465	0.7716	0.6495 -0.9476	0.9426	SL 0.7905
4. 1.1146–1.6056	1.1747	0.7413–0.9472	0.8798	Q 0.8798
5. 1.8661–2.7915	1.8668	1.6566–3.2717	1.6566	L 2.0152
6. 0.5573–0.7107	0.7053	0.5417–0.7942	0.7642	SL0.7048
7. 1.2746–2.3439	1.3005	1.3290–2, 000	1.4496	Q 1.4496
8. 0.7800–1.0772	1.0546*	0.8584–1.1609	0.9434	LLLS 1.1046

n is higher in rural areas than in urban areas in the case of Foodgrains fuel, Milk, Products ($n \geqslant 1$) and Sugar and Gur ($n \geqslant 1$ in rural and $n \leqslant 1$ in urban areas'. It is nearly equal in both areas in Edible Oils ($n \leqslant 1$), Fuel and Light ($n \leqslant 1$), and Other Food Items ($n \geqslant 1$). Urban elasticity is larger than rural in Clothing [$n \geqslant 1$] and Other non–Food Items ($m \geqslant 1$].

Thus in the case of essential commodities demand is more elastic in rural areas than in urban areas, reverse is the case with luxury items like Clothing and other Food Items; Sugar and Gur are luxury items in rural Rajasthan and are becoming a necessity in urban areas.

Summary and Conclusions

1. The study of the various Engel functions reveals that no single form is appropriate for all the commodities and for each commodity over all rounds. However, the situation is

* Best Fit L-9066
LL-9.99

much more reassuring in the case of the rural areas than the urban areas. On the basis of the various criteria choosen, the Quadratic form the most appropriate in the case of Sugar and Gur, Edible Oils and Clothing. There is difficulty in choosing between the Quadratic and Log-Log-Inverse forms in the case of Foodgrains. Our results are similar to those obtained by D. B. Gupta for Foodgrains and Clothing for the North-West Region of which Rajasthan is a part. Hence for comparative purposes the Quadratic form should be taken in the case of rural areas (Gupta 1973, 73, 83, 91).

2. The Pattern in urban areas is not so clear. The Linear form performs well and in some cases even better than, the Quadratie form. This is true in the case of Milk and Milk Products, Clothing, Other Non-Food Items and Other Food Items. The various log formulations are better suited to the study of the other commodity-groups like Foodgrains and Fuel and Light. The Semi-Log form is suited to Edible Oils, Sugar and Gur and Fuel and Light. For comparative purposes, however, the same functional form should be used. From this point of view, the Quadratic functton is the obvious choice.

3. Though the usual consumption pattern of positive marginal propensity of consumption and eventually declining elasticitity of demand has been revealed in the case of most of commodity-groups and in most of the rounds, some cases of increasing elasticity have also been noted; this differential pattern is revealed by the different signs of the parameters of the Quadratic function.

In most of the cases (Foodgrains, Milk and Milk Products, Edible Oils and Fuel and Light in both rural and urban areas and Sugar and Gur in urban areas only) $b \geqslant 0$ and $c \leqslant 0$. This implies that the MPC is decreasing and, after a critical value, may become negative. But this critical value of total expenditure is generally greater than Rs 90. Of the above mentioned cases, the intercept a is positive for foodgrains, Edible Oils and Fuel and Light in rural areas and Foodgrains in urban areas. This implies subsistence consumption of these commodities and also that the elasticity, which is less than 1 falls monotonically after an early high value. In contrast, in the case of Sugar and Gur and Milk and Milk Products, the value of a negative implying a threshold income (total expenditure) level only after attaining which the consumption of these commodities starts. The elasticity pattern is also reverse of the one mentioned above. There are some commodity-groups like other Non-Food Items for which $b \leqslant o$, $c \geqslant 0$ or $b < 0$ anb $c < 0$, both of these imply an increasing MPC. The Quadraric form is able to handle all these situatious of increasing and decreasing MPC.

4. The elasticity values are very similar to those for the less developed countries in general and other states in India. It is relatively low in the case of Foodgrains and Fuel, very near unity in the case of Edible Oils and Other Food Items. However, in the case of Sugar and Gur and Milk and Milk Products elasticity is much higher, specially in rural areas. In the developed economies, the elasticity for all these commodity-groups is less than one and in some cases nearing zero and becoming negative. Alongwith Milk and Milk Products, Clothing and Other Non-Food items are also luxury items of consumption in India in general and Rajasthan in particular. The pattern is very similar to those obtained for Tamilnadu and Gujarat. (see appendix)

5. Elasticity at mean expenditure levels is generally lower in urban areas than in rural areas in the case of Foodgrains and Other Food Items and larger in urban places in the case of non-food items specially Clothing. This pattern is also similar to these obtained by other researchers for other parts of India. Hence the increased pace of urbanisation is expected to chang thee consumption pattern significantly, specially in the case of Foodgrains, Clothing and Sugar and Gur.

6. In earlier studies relating to Gujarat and Tamilnadu it was found that the Engel curves are stable over time. These results might have been obtained because of the relatively short period of 4 rounds covered by those studies. Since the period covered by us in this study is much larger, much more meaningful results can be expected and it can be hypothesised that the consumption pattern might have changed significantly over this period. However, excepting few cases, there is no clear-cut temporal pattern in elasticity in either rural or urban areas. For Foodgrains, elasticity seems to be an inverted U shaped function of time (and total expenditure); it increased first and after reaching a maximum value in the 20th round it began to decline. The pattern is simialr in rural and urban areas; however, in each round elasticity in rual areas is larger than that in urban areas. Generally, elasticity is more variable over time in urban areas than in rural areas, specially, in the case of Milk and Milk Products Sugar and Gur and Clothing. However, there is no clear temporal pattern. Elasticity shows high coefficient of variation in the case of Edible Oils in rural areas and it approaches unity in the last round. In contrast, in urban areas, n is nearly constant over time. Looking at table 7, 12a and 12b, we find that rural consumption pattern is much more stable than

urban one. However, except Foodgrains, there is no consistent pattern even when C. V. is quite high.

The result is quite interesting in as much as the period covered in experienced significant changes in money income, price level, relative prices and other parameters of the structure of the economy. The relative stability of the pattern of consumption implies that the above mentioned changes in the structure of the economy alongwith the effect of the change in distribution of income, family size and composition have acted in a complex way and produced a nearly stable pattern. Further research is required to isolate the effects of all these factors on the income (expenditure) elasticity of demand. In fact, this is one of the merits of the Engel curve analysis that these effects can be isolated and studied separately. Combining the cross-section and time series data to estimate the various forms of the LES function or the Rotterdom system may not reveal these relationships.

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Notes

1. Estimation of price, income and substitution elasticities has not been attempted in this study since the aim of the study is to choose appropriate Engel functions and

to see if the chossen relationship is stable over time. This is useful for planning, specially regional planning since appropriate price information is rarely available at this level of disaggreration; prediction of future relative prices is even more difficult.

2. For references to earlier studies, see Gupta (1973) pp. 2, 36.
3. See Cramer (1968), Desai (1972).
4. For earlier work on form of Engel Curves, see Prais and Houthakker (1955), Goreux. (1960), Lesre (1963), Gupta (1973) and Desai (1972).
5. See note number 3 and 4.

Appendix

Engel Elasticities for Some States in India

Commodity-Group	GUJRAT		TAMILNADU		INDIA
	Murthy	Radhakrihna	Murthy	Soundararajan	Desai
	L,LL,SL		LL	LL	LL
RURAL					
Foodgrains	0.52-0.60	0 43	0.53-0.65	0.65	0.52
Milk and Milk Products	1. 12-1.61	1.63	2.29-2.74	1.10	1.59
Other Food	0.80-1.02		1.04-1.23		
Clothing Products	1.45-2.98	3.92	2.02-2.73	2.19	1.87
Fuel and Light	0.64-0.81	0.46	0.58-0.79	0.62	
Other Non-Food Items	1.46-1.92		1.44-1.62		
URBAN					
Foodgrains	0.39-0.50	0.26	0.27-0.32	0.44	0.30
Milk and Milk Products	0.99-1.45	1.04	1.82-2.01	1.11	1.38
Other Food Items	0.81-1.03		1.05-1.19		
Clothing	1.92-3.84	4.23	2.00-3.07	1.84	2.12
Fuel and Light	0.61-0.88	0.66	0.73-0.84	0.69	
Other Non-Food Items	1.32-1.88		1.53-1.64		

Note: The ranges are the minimum and maximum values of elasticities for all rounds covered in each study. Forms of functions used have already been indicated in the table.

Sources: Murthy, G.V.S.N. (1971), Kairajan (1972), Radhakrishna and Murthy (1973), Desai, B. M. (1972) and Soundararajan (1974).