DEMAND FUNCTIONS AND THEIR DEVELOPMENT IMPLICATIONS IN A DUAL ECONOMY: INDIA

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A. *Introduction*

THE changes in the economic structure of an economy reflected in its differential sectoral output and price movements can be mainly traced in the successive adjustments between the production possibilities and demand patterns. The relative importance of these two forces depends on whether we are interested in the long-term or near-term problems. In the long run it is the production technique, i.e., production cost, that sets the price structure. Consequently, as the economy is transferred from that of one vintage to that of a later vintage, the long-run price structure moves from that relating to the technology of the former to that of the latter. In reality the long-run price movements can never be observed in any economy and they only influence the observed short-run price movements. In the short run, since the production possibilities do not react to price mechanism, i.e., production is almost given, it is the price flexibility influenced by demand that clears the market.

Thus there is need to put emphasis on demand relations in a short-run economic policy model. In a decision model where one attempts to solve the implementation problem as far as possible, by arranging zero demand pressure in the consumer market, it becomes imperative to estimate the complete set of price effects—direct as well as cross—besides income effects [2]. It has also got to be realized that these effects themselves do change with changes in price structure and income.

The studies on consumer behavior in India have mostly been confined to the Engel curve analysis. The income elasticities obtained from them have become the conceptual tools for demand projections making the following assumptions: insensitivity of consumer expenditure to price changes; invariance of income elasticities over time and over changes in the price structure; and stability of income distribution. The influence of prices both on household consumption and income elasticities has been sharply brought into focus by the studies on complete demand systems carried out for developed countries [3] [4]. It would also be unrealistic to ignore the interdependencies between shifts in income distribution and demand projections as there is great deal of variation in the scale of preferences among certain definable groups within the economy. In

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addition, it might be worthwhile to take note of the existence of dualisms—regional (rural vs urban) and technological (traditional vs modern).

For analytical purposes it might also be useful to classify the commodities according to their production technology (traditional, modern), source of origin (rural, urban), and factor content (capital, labor, foreign exchange). In the absence of adequate data, some guesses on the characteristics of the commodities can be made by looking at their main consumption agents. For example, the cloth consumed by the rural poor can be identified with traditional sector and the cloth consumed by the rich with the modern sector. In the absence of reliable data, any classification would be subject to large errors.

Against the above background, the present study attempts to analyze the consumption patterns of India. Broadly speaking, the objectives of this study are twofold. We have attempted to study the influence of prices and income on household consumption incorporating the structural aspects of the Indian economy to the extent which the available data permit. This has been pursued by estimating the linear expenditure system (LES) for three income groups of rural and urban areas. (Incidentally the relevance of the LES has been examined.) The other broad objective is to utilize the estimated demand relationships for analyzing the destabilization effects due to shifts in demand in the grains market. The consequences of development on demand patterns have also been examined.

We have utilized here the linear expenditure system which has been extensively applied in analyzing the consumption patterns of the United Kingdom and other countries.[1] The LES is usually written in the form

$$\hat{p}q=\hat{p}c+b(\mu-p'c). \qquad \sum b_i=1. \tag{1}$$

The vector q represents the quantities of each commodity, p is a vector of prices, and μ is total expenditure (income). For the sake of simplicity we express total expenditure as income. The vectors b and c are the parameters of the system. The b's are the marginal budget shares. The c's are sometimes interpreted as committed quantities to which the consumer is committed. This interpretation is only suggestive and it is not always possible particularly when c_i is negative. This negativity is not inconsistent with theory. The LES can be derived from the ordinal utility function.

$$u(q)=\sum b_i \log (q_i-c_i). \qquad \sum b_i=1. \tag{2}$$

The fulfilment of the second order condition of equilibrium requires that $b_i>0$, i.e., no inferior goods and $\mu>p'c$. Since it can be derived from a utility function, it meets the theoretical properties—additivity, homogeneity, and symmetric Slutsky matrix. The LES has a few limitations. Since the underlying utility function is additive, it becomes an unrealistic specification when we deal with finer groups of commodities. The additivity, besides not allowing for inferior goods, imposes too strong a specification on price effects. Nevertheless, it may not be an unrealistic assumption for broad grouping of commodities. The

[1] See [1].

unattractive linear Engel curve specification also may not be unrealistic when the range of income variation is small.

For good i, the income elasticity (η_{i0}), own price elasticity (η_{ii}), and cross price elasticity with respect to jth price (η_{ij}) are given by:

$$\eta_{i0}=b_i/W_i\,. \qquad W_i=P_iq_i/\mu\,. \tag{3.1}$$

$$\eta_{ii}=-1+(1-b_i)C_i/q_i\,. \tag{3.1'}$$

$$\eta_{ij}=-b_iP_jC_j/p_iq_i\,. \qquad (j\neq i) \tag{3.1''}$$

It is obvious that the ith commodity is price inelastic (elastic) if $c_i>0$ (<0), and direct price and income elasticities tend to be unity for large values of income, i.e., cross price elasticities tend to zero.

B. *Data*

The consumption data used for the estimations of the LES are the time series of cross-section data on consumer expenditure provided by the reports of the National Sample Survey (NSS) for the rounds 8 through 14.[2] The NSS reports provide the estimates of average monthly per capita expenditure on: foodgrains (q_1), milk and milk products (q_2), edible oil (q_3), meat, eggs, and fish (q_4), sugar and gur (q_5), other food (q_6), clothing (q_7), fuel and light (q_8), and other non-food (q_9) for twelve monthly expenditure classes.[3]

Group price indices with base 1952–53 (i.e., 1952–53 = 1.000) have been computed for the above nine commodity groups over the rounds from the Economic Advisor's monthly wholesale price relations for detailed items. For rural and urban areas separate weighing diagrams based on the thirteenth round NSS data on consumer expenditure have been used.

C. *Formation of Income Groups*

The available consumption data fall far short of the requirements of demand models for different socioeconomic groups and can only meet the requirements of demand models by income groups. We have, therefore, adopted the following procedure for forming the income groups [6].

The cross-section data over time covering twelve total expenditure classes for the rounds 8 through 14 have been used for estimating the LES for nine commodity groups without distinguishing expenditure classes. The residuals, given by $[p_iq_i-\hat{C}_ip_i-\hat{b}_i(\mu-\sum\hat{C}_ip_i)]$, have been estimated for each item over the expenditure classes and rounds. The residuals have shown clear trends over the expenditure classes for each item over the rounds: the residuals of the first four expenditure classes have similar signs; so we have the next four and the following classes. Also, the different commodity groups are amenable to similar group-

[2] The periods of the surveys are: July 1954–March 1955 (round 8); May 1955–November 1955 (round 9); December 1955–May 1956 (round 10); August 1956–January 1957 (round 11); March 1957–August 1957 (round 12); September 1957–May 1958 (round 13); June 1958–June 1959 (round 14).

[3] The expenditure classes are: Rs. 0–8, 8–11, 11–13, 13–15, 15–18, 18–21, 21–24, 24–28, 28–34, 34–42, 42–55, and 55 and above.

ing. Thus the pattern in residuals has enabled us to form appropriate total expenditure groups. Experiments with double log type of demand function have also yielded similar patterns. Thus we have formed three total expenditure groups—the first four groups forming the low income group, the next four forming the middle income group, the last four forming the higher income group. On the whole, the results given later in this paper tend to confirm the appropriateness of this grouping. Since total expenditure is a monotonic function of income, we have treated the total expenditure groups as income groups. Nevertheless, it should be noted that for each group we are interested in the allocation of total expenditure among specific items. For stylistic reasons, we shall hereafter use total expenditure and income as synonymous.

D. *Estimates of the Linear Expenditure System*

We have estimated the LES for each group by employing the two-stage iterative procedure given in Stone [7]. We have taken the convergence of the iterative scheme to occur when the absolute difference between two successive estimates for all the parameters is within 0.0001. This ensured that all the estimates are stable within 0.1 per cent.

Table I provides the estimates of the LES. In order to examine the goodness of fit, we have computed the following crude (R^2) which is the proportion of variation in the expenditures explained by the fitted models [3]:

TABLE I

PARAMETER ESTIMATES OF THE LINEAR EXPENDITURE SYSTEM

Commodity Group	Lower Income Group		Middle Income Group		Higher Income Group	
	b_i	c_i	b_i	c_i	b_i	c_i
Rural:						
1. Foodgrains (FG)	0.4241	5.8002	0.1798	7.6649	0.0684	11.3419
2. Milk & milk products (MM)	0.0969	0.4426	0.1589	0.5168	0.0700	3.9759
3. Edible oil (EO)	0.0343	0.2301	0.0288	0.3044	0.0213	0.7548
4. Meat, eggs & fish (ME)	0.0348	0.2357	0.0361	0.3053	0.0126	0.9530
5. Sugar & gur (SG)	0.0321	0.2017	0.0372	0.2948	0.0230	1.1072
6. Other food (OF)	0.1124	1.1196	0.1082	1.4936	0.0668	3.5039
7. Clothing (CL)	0.0937	0.4632	0.1615	0.5372	0.1510	3.6389
8. Fuel & light (FL)	0.0509	0.8229	0.0527	0.9282	0.0222	1.8374
9. Other non-food (ON)	0.1249	0.8220	0.2359	0.8906	0.5649	5.6262
Urban:						
1. Foodgrains (FG)	0.2631	2.8424	0.1191	4.5816	0.0269	6.0125
2. Milk & milk products (MM)	0.1086	–0.2184	0.1354	–0.4023	0.0947	–1.3911
3. Edible oil (EO)	0.0398	0.0669	0.0290	0.2725	0.0136	0.3464
4. Meat, eggs & fish (ME)	0.0403	–0.0044	0.0455	–0.0518	0.0208	0.0336
5. Sugar & gur (SG)	0.0355	–0.0032	0.0278	0.1799	0.0139	0.2905
6. Other food (OF)	0.1541	0.3319	0.1486	0.4640	0.1149	–1.0454
7. Clothing (CL)	0.0667	–0.1481	0.1310	–0.8304	0.1190	–4.1748
8. Fuel & light (FL)	0.0674	0.3524	0.0529	0.5251	0.0288	0.3736
9. Other non-food (ON)	0.2247	–0.2089	0.3107	–1.1329	0.5637	–24.7563

TABLE II

GOODNESS OF FIT (R^2)

Commodity Group	Rural			Urban		
	Lower Income Group	Middle Income Group	Higher Income Group	Lower Income Group	Middle Income Group	Higher Income Group
1. Foodgrains (FG)	0.9688	0.9462	0.8021	0.9168	0.8612	0.5908
2. Milk & milk products (MM)	0.9026	0.9125	0.5472	0.8809	0.8439	0.8830
3. Edible oil (EO)	0.8952	0.8124	0.7077	0.8774	0.7679	0.7773
4. Meat, eggs & fish (ME)	0.9106	0.7200	0.3011	0.7269	0.4845	0.4580
5. Sugar & gur (SG)	0.9497	0.8895	0.7416	0.8942	0.6668	0.7722
6. Other food (OF)	0.8963	0.8817	0.8753	0.8809	0.7282	0.8221
7. Clothing (CL)	0.9269	0.8459	0.8588	0.6308	0.6505	0.7491
8. Fuel & light (FL)	0.9064	0.6302	0.4991	0.8659	0.9024	0.8863
9. Other non-food (ON)	0.9229	0.9240	0.9504	0.8614	0.9359	0.9872

$$R_i^2 = 1 - \frac{\sum_j (e_{ij})^2}{\sum_j (V_{ij} - \bar{V}_i)^2}, \qquad (i = 1, \cdots, n),$$

where $e_{ij} = (v_{ij} - \hat{v}_{ij})$ is the residual of the ith commodity for jth observations. In our exercise j runs from 1 to 4×7 as there are four observations in each round. V_{ij} is the expenditure on the ith item corresponding to the jth observation and $\bar{V}_i$ is the average expenditure on the ith item over all observations (i.e., twenty-eight observations). The R^2 are reported in Table II. It can be seen from the table that the LES is giving good fit.

E. *Marginal Budget Shares*

In Table I, b's give the marginal budget shares. It is obvious that there are sizeable variations in them both across income groups and between rural and urban areas. Nevertheless there are some visible patterns. Foodgrains take a major share of the marginal budgets of the lower income groups and its weightage loses with the income level. The shares of other food items either uniformly decline or initially increase and then decline. The marginal budget shares of higher income groups (both in rural and urban areas) are striking in their heavy weightage given to non-food items particularly to other non-food groups. As regards rural-urban variations, the marginal budgets of the lower and middle income urban groups are more varied and diversified than their counterparts in rural areas.

The above results imply that the expansion of demand for individual items very much depend on which group or groups the growth favors. It is the lower income groups which exert a significantly greater influence on the expansion or contraction of agricultural products like foodgrains. Any policy of income transfers to these groups will result in demand pressure in the foodgrains market. Also any growth of supply of foodgrains has to be absorbed by the growth of incomes of the group. On the other hand, the demand for non-food items which are mostly the products of industry expands with the incomes of the higher income groups in rural and urban areas.

TABLE III

MARGINAL BUDGET SHARE OF FOOD

A. For India

	Lower Income Group	Middle Income Group	Higher Income Group
Rural	0.73	0.55	0.26
Urban	0.66	0.51	0.29

B. For Developed Countries

U.S.A.	0.08
U.K.	0.17
France	0.24
Italy	0.39
Japan*	0.10

Sources: The figures for India are arrived at by adding the marginal budget shares of food items given in Table I, the figure for Japan is taken from [8], and the figures for other countries are taken from [3].

* For primary commodity group.

Since marginal budget shares given by the LES are pure numbers independent of prices, it would be of interest to compare them with those of developed countries. This we have attempted in Table III. It should be noted that estimates for developed countries were available for food as a whole. Also these estimates were obtained from mean level data and thus they refer to the average consumer. It is interesting to observe that the marginal budget shares of the higher income groups of India are approximating the average consumer of developed countries.

F. *Income Elasticities*

We have computed the income elasticities at the mean level using the formula (3), and presented them in Table IV. These elasticities more or less reinforce the findings based on marginal budget shares. The income elasticities decline

TABLE IV

INCOME ELASTICITIES (η_{i0}) AT MEAN LEVEL

Commodity Group	Rural			Urban		
	Lower Income Group	Middle Income Group	Higher Income Group	Lower Income Group	Middle Income Group	Higher Income Group
1. Foodgrains (FG)	0.784	0.440	0.268	0.580	0.392	0.161
2. Milk & milk products (MM)	2.255	1.828	0.653	2.010	1.434	0.803
3. Edible oil (EO)	1.246	1.005	0.843	1.113	0.749	0.452
4. Meat, eggs & fish (ME)	1.337	1.258	0.513	1.447	1.281	0.623
5. Sugar & gur (SG)	1.542	1.262	0.721	1.445	0.855	0.480
6. Other food (OF)	0.873	0.867	0.621	1.012	0.968	0.757
7. Clothing (CL)	1.903	1.776	1.183	2.193	1.985	1.392
8. Fuel & light (FL)	0.625	0.819	0.479	0.789	0.749	0.529
9. Other non-food (ON)	1.462	1.727	2.066	1.643	1.517	1.725

with income level with the exception of the increases in the other non-food group. Generally, rural elasticities are higher for food items and lower for non-food items as compared with urban elasticities. It is also worth noting that the income elasticities are not tending to unity as we move from lower to higher income groups indicating thereby the unsuitability of linear approximation for all groups put together and justifying our piece-wise LES approximation.

G. *Direct and Cross Price Elasticities*

We have also computed the own and cross price elasticities at the mean level using the formulae given in (3). The own price elasticities are given in Table V and cross price elasticities in Table VI.

TABLE V

OWN PRICE ELASTICITIES (η_{ii}) AT MEAN LEVEL

Commodity Group	Rural			Urban		
	Lower Income Group	Middle Income Group	Higher Income Group	Lower Income Group	Middle Income Group	Higher Income Group
1. Foodgrains (FG)	–0.445	–0.325	–0.155	–0.575	–0.410	–0.261
2. Milk & milk products (MM)	–0.019	–0.777	–0.280	–1.414	–1.181	–1.182
3. Edible oil (EO)	–0.089	–0.421	–0.307	–0.818	–0.643	–0.679
4. Meat, eggs & fish (ME)	–0.090	–0.524	–0.188	–1.052	–1.077	–0.934
5. Sugar & gur (SG)	–0.100	–0.526	–0.267	–1.051	–0.729	–0.722
6. Other food (OF)	–0.148	–0.419	–0.267	–0.777	–0.844	–1.120
7. Clothing (CL)	–0.173	–0.760	–0.498	–1.557	–1.586	–1.955
8. Fuel & light (FL)	–0.078	–0.365	–0.184	–0.603	–0.651	–0.797
9. Other non-food (ON)	–0.184	–0.766	–0.876	–1.152	–1.193	–1.690

The own price elasticities of the rural lower income group are striking and it needs some explanation. Its own price elasticity for foodgrains is numerically large as compared with other items. This is mainly because of the fact that this group devotes almost all its budget for foodgrains and marginally for other items. Any increase in foodgrains price has a strong income effect and reduces not only the intake of foodgrains but also all other items (Table VI). Since other items are consumed mainly for bare necessity coupled with the fact that the income effect of their price changes is small, their prices have negligible impact on their consumption.

There is a tendency for the own price elasticities for food items to fall with income and for non-food items to increase. That is with development, conceived as a shift of population from lower to higher income groups, price flexibility of food items increases.[4] Generally, the cross effects are low in magnitude with the exception of foodgrains price effect on the demand for other items, i.e., cross

[4] The diagonal elements of the inverse of the direct and cross price elasticity matrix will show the price flexibility. In our case, since cross price and elasticities are small compared to direct price elasticities, we can roughly treat the reciprocal of own price elasticity as price flexibility.

TABLE
DIRECT AND CROSS PRICE

A. Rural

	FG	MM	EO	ME	SG	OF	CL	FL	ON
Lower income group:									
FG	–44	–3	–2	–2	–2	–10	–4	–6	–6
MM	–117	–2	–6	–5	–4	–28	–10	–18	–18
EO	–64	–48	–9	–3	–2	–15	–6	–10	–10
ME	–70	–5	–3	–9	–3	–16	–6	–11	–11
SG	–80	–6	–4	–3	–10	–19	–7	–12	–12
OF	–46	–3	–2	–2	–2	–15	–4	–7	–7
CL	–99	–7	–5	–4	–4	–24	–17	–15	–15
FL	–33	–2	–2	–1	–1	–8	–3	–8	–5
ON	–76	–5	–4	–3	–3	–18	–7	–12	–18
Middle income group:									
FG	–32	–1	–1	–1	–1	–4	–1	–2	–2
MM	–62	–78	–3	–3	–3	–15	–5	–8	–8
EO	–34	–2	–42	–1	–1	–8	–3	–4	–4
ME	–42	–3	–2	–52	–2	–10	–3	–5	–5
SG	–43	–3	–2	–2	–53	–10	–3	–5	–5
OF	–29	–2	–1	–1	–1	–42	–2	–4	–4
CL	–60	–4	–3	–3	–3	–14	–76	–8	–7
FL	–28	–2	–1	–1	–1	–7	–2	–36	–3
ON	–58	–4	–3	–2	–3	–14	–4	–14	–7
Higher income group:									
FG	–16	–2	0	–1	–1	–2	–2	–1	–2
MM	–15	–28	–1	–1	–2	–5	–5	–3	–5
EO	–20	–7	–31	–2	–2	–7	–6	–3	–6
ME	–12	–4	–1	–19	–1	–4	–4	–2	–4
SG	–17	–6	–1	–1	–27	–6	–5	–3	–6
OF	–14	–5	–1	–1	–1	–27	–5	–2	–5
CL	–27	–10	–2	–2	–3	–10	–50	–5	–9
FL	–11	–4	–1	–1	–1	–4	–4	–18	–4
ON	–48	–17	–4	–4	–5	–17	–16	–8	–88

Note: All entries have to be multiplied by 10^{-2}.

price effect due to foodgrain price change is significant and negative (Table VI). It is also noticeable that the extent of influence declines with income level.

H. *Demand Potential for Foodgrains*

The per capita demand for foodgrains (q_1) for each group[5] expressed in time derivatives can be written as

$$\dot{q}_1 = \eta_{10}\dot{\mu} + \sum_{j=1}^{n} \eta_{1j}\dot{p}_j ,$$

where dot over a variable denotes its rate of growth.

Denoting for each group Q_1 as its aggregate foodgrains demand, Y as its

[5] In what follows we shall be paying more attention to foodgrains as it plays a key role in the Indian economy.

VI

ELASTICITIES AT MEAN LEVEL

B. Urban

	FG	MM	EO	ME	SG	OF	CL	FL	ON
Lower income group:									
FG	–57	1	0	0	0	–2	1	–2	2
MM	–52	–141	–1	0	0	–8	4	–7	1
EO	–29	3	–82	0	0	–4	2	–4	3
ME	–38	4	–1	–105	0	–6	3	–5	4
SG	–38	4	–1	0	–105	–6	3	–5	4
OF	–26	3	–1	0	0	–8	2	–4	3
CL	–57	5	–1	0	0	–9	–156	–8	6
FL	–20	2	–1	0	0	–3	1	–60	2
ON	–43	4	–1	0	0	–7	3	–6	–115
Middle income group:									
FG	–41	1	–1	0	0	–1	2	–1	2
MM	–29	–118	–2	0	–1	–4	6	–4	8
EO	–15	1	–64	0	–1	–2	3	–2	5
ME	–26	3	–2	–107	–1	–4	6	–3	7
SG	–17	2	–1	0	–73	–2	4	–2	5
OF	–20	2	–1	0	–1	–84	4	–3	6
CL	–40	4	–2	1	–2	–6	–159	–5	11
FL	–15	1	–1	0	–1	–2	3	–65	4
ON	–31	3	–2	0	–1	–4	7	–4	–119
Higher income group:									
FG	–26	0	0	0	0	0	1	0	8
MM	–10	–118	–1	0	–1	1	7	–1	41
EO	–6	1	–68	0	0	1	4	–1	23
ME	–8	1	–1	–93	–1	1	6	–1	32
SG	–6	1	0	0	–72	1	4	–1	25
OF	–10	2	–1	0	–1	–112	7	–1	39
CL	–17	3	–1	0	–1	3	–195	–2	72
FL	–7	1	–1	0	0	1	5	–80	27
ON	–22	4	–2	0	–1	3	16	–2	–169

aggregate income, and r as its population growth, we can write the aggregate foodgrains demand for each group as

$$\dot{Q}_1 = r(1-\eta_{10}) + \eta_{10}\dot{Y} + \sum_{j=1}^{n} \eta_{1j}\dot{p}_j .$$

In the above expression we can ignore the cross price elasticities as they are minimal (Table VI). For rural lower income group, since its income elasticity (η_{10}) is close to unity, its foodgrains demand can be expressed as

$$\dot{Q}_1 \simeq \eta_{10}\dot{Y} + \eta_{11}\dot{p}_1 ,$$

and for higher income groups (rural and urban), since income and price elasticities are low, their foodgrains demand can be expressed as

$$\dot{Q}_1 \simeq r .$$

It is clear from the above expressions that demand for foodgrains by the

rural lower income group depends on its income while for higher income groups, on their population growth. The demand relations of other groups lie in between the above two polar cases. The above results imply that in the short run it is the incomes of the lower strata that influence the demand for foodgrains. Incidentally it may be noted that any substantial strides in the grains production, if at all possible, due to the Green Revolution will be absorbed without any fall in its price if the prosperity is widespread and augments the incomes of the lower strata.

I. *Foodgrains Price Fluctuations*

The low value observed for own price elasticity for foodgrains, ranging between -0.57 (urban lower income group) and -0.15 (rural higher income group) implies that any turns (up or down) in grains production releases forces of destabilization. Any extra demand created by either autonomous investment or defense expenditure, etc., if not accompanied by corresponding increase in grains supply, will set inflationary forces in the grains market. If the shortages are not expected to be temporary, the traders will tend to hold on to their stocks and accentuate the price rise.[6] On the other hand, with a sizeable increase in grains production due to favorable weather, grains price will crash. Production may often be more than what the market clears at a price that covers the cost of production. Paradoxically, this phenomenon may coexist with low level of intake by the lower strata.

J. *Effects of Foodgrains Price Rise*

The consequences of foodgrains price rise can also be analyzed with our results. The effects of foodgrains price on the consumption of different items for urban groups can be had from the cross price elasticities given in Table VI. It can be seen that any increase in grains price will reduce the demand for all items consumed by the lower and middle groups and also marginally for the items which the higher income group consumes.

In order to examine the impact of foodgrain price rise in rural areas, the cross price elasticities given in Table VI need to be adjusted for changes in the incomes of the rural groups as a sequel to foodgrains price rise. Suppose the income of a group increases by α per cent due to 1 per cent increase in foodgrains price. Now the percentage change in the demand for the ith commodity due to the 1 per cent change in foodgrains price rise will be given by $\eta_{i1} + \alpha\eta_{i0}$. We do not have any reliable information on the gains to various groups accruing as a consequence of foodgrains price rise. Assuming that $\alpha = 0$ for the lower income group, ranges between 0.1 and 0.3 for the middle income group, and between 0.7 and 0.8 for the higher groups, we computed for illustrative purposes the effect of 1 per cent rise in foodgrains price on the demand for various items

[6] In the developmental literature this phenomenon is known as "short term backward bending supply curve" [5]. One might argue that the rise in grains price will augment production and thereby marketed surplus. This could be possible, if at all, after a lag, not within a crop cycle.

TABLE VII

PERCENTAGE INCREASE IN THE DEMAND DUE TO 1 PER CENT RISE IN FOODGRAINS PRICE RISE IN RURAL AREAS UNDER HYPOTHETICAL ASSUMPTIONS ABOUT THE GAINS TO VARIOUS GROUPS

Commodity Group	Lower Income Group $\alpha=0$	Middle Income Group			Higher Income Group	
		$\alpha=0.10$	$\alpha=0.20$	$\alpha=0.30$	$\alpha=0.70$	$\alpha=0.80$
1. Foodgrains	–0.44	–0.28	–0.22	–0.16	0.03	0.04
2. Milk & milk products	–1.18	–0.43	–0.25	–0.07	0.31	0.37
3. Edible oil	–0.65	–0.24	–0.14	–0.04	0.39	0.48
4. Meat, eggs & fish	–0.70	–0.30	–0.25	–0.19	0.24	0.29
5. Sugar & gur	–0.80	–0.30	–0.25	–0.19	0.34	0.41
6. Other food	–0.45	–0.28	–0.16	–0.05	0.29	0.35
7. Clothing	–0.99	–0.42	–0.24	–0.07	0.55	0.67
8. Fuel & light	–0.32	–0.19	–0.11	–0.03	0.22	0.27
9. Other non-food	–0.76	–0.41	–0.24	–0.06	0.97	1.17

in rural areas[7] (Table VII). With these assumptions, the table indicates the decline in the consumption of all items by the lower and middle income groups and an increase in the consumption of all items by the higher income groups.[8]

Juxtaposing Table VII with Table VI, we can infer that a rise in foodgrains price will reduce the demand for all items consumed by the lower and middle income groups of rural and urban areas. The items which are likely to be affected significantly are: milk and milk products, clothing, other non-food, and foodgrains. Assuming that most of the production of the traditional sector is consumed by these groups, we might expect that any rise in foodgrains price will reduce their demand. In contrast, there will be an expansion in demand for all items other than foodgrains by the rural higher income group. The expansion of the demand for other non-food and clothing is likely to be sizeable. The urban higher income group slightly reduces the consumption of foodgrains and the cut in the consumption of all other items is minimal. Under the likely assumption that the components of other non-food group of the rural higher income group comprise of durables, electric appliances, etc. produced by the modern sector and that the clothing group comprises of mill cloth, we might expect an expansion in demand for some of the products of the modern sector as a sequel to foodgrain price rise.

The above results suggest an explanation for the "sectoral bias" of wage goods inflation. There is a great deal of evidence that prices do not move uniformly during Indian inflation.

[7] The basis for this guess is the presumption that the lower income group which constitutes the agricultural laborers does not gain anything from the foodgrains price rise, while the middle and higher income groups gain and the higher income group nets relatively more.

[8] This finding will be unaffected even if we moderately change the assumptions we made about the gains due to price rise.

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