CHAPTER 5

ESTIMATION INDIFFERENCE SURFACES BY MODIFIED MATUR'S METHOD
1. **Introduction**

This chapter presents the results of the empirical studies based on the articulation of modified Rathur's method for approximate determination of indifference surfaces from family-budget data relating to two differing price structures. The empirical findings have been set out separately for cases 1 and 2. In either case, the whole picture has been structured for 15 groups of commodities followed by that for 8 groups of commodities. The framework of this chapter is as follows. Section 2 introduces briefly the data. It also examines their scope and limitations. Section 3 describes the computational procedures. Section 4 sets out the results of experiments along the broad outline indicated above. Apart from presenting estimates of indifference surfaces, it also gives estimates of the derived complete demand system for the two time-periods/differing price structures, separately for cases 1 and 2. To be more specific, the values of a matrix together with the structure of estimated demand as well as the estimates of direct and cross-price elasticities have been set out. Values of the distance $\Delta$ between the structure of estimated demand and that of the observed demand are also given to shed some light on the predictive power.
of the demand system. Section 5 is devoted to analysis of
the empirical findings and provides resume and conclusions.

2. Data

Application of Muthur's method like Wald's method
assumes a homogeneous group of consumers. To realise this
assumption to as large an extent as possible, this study is
confined to industrial workers of Poona centre. Primary
data on monthly consumer expenditure, which were available
for the years 1953-54 and 1955-56 respectively for 250 sample
households each form the main basis of our empires. Keeping

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1. Section 2.2, chapter 6.
2. Relates to workers covered under the Factories Act 1948,
3. This is one of the about 50 industrial centres dotted
throughout India where family-budget enquiries were
conducted in 1953-59 to provide the weighting diagrams
for building monthly consumer price indices for working
classes. The choice of Poona centre for this study is
purposive and has been guided by the consideration that
we could have an easy access to somewhat detailed data
on consumer expenditure and prices.
4. Data for 1953-59 were kindly made available by the office
of Labour Commissioner, Bombay (Maharashtra) and those for
1955-56 by Gokhale Institute of Politics and Economics,
Poona (Maharashtra). In either case data have been collected
as per concepts and definitions adopted by the NSS for
their consumer expenditure enquiries (cf. chapter 6).
in view the comparability of consumer expenditure data at the two points of time on the one hand and the availability of data on price relatives on the other, the following 15 groups of commodities could be considered for the purpose of our analysis:


1 Retail price data are collected regularly once a week from selected shops patronised by the workers.

2 For the purposes of comparative analysis 15 groups of commodities have been further aggregated into 8: 1. Food grains ((1)+(2)+(3)), 2. Milk and milk products (5), 3. Edible oils (4), 5. Sugar (8), 5. Other food items ((6)+(7)+(9)), 6. Housing (14), 7. Fuel and lighting (15), and 8. Other non-food items (((10)+(11)+(12)+(13))). Figures in parentheses refer to parent group numbers.
Turning to the scope and limitations of the available data, leaving aside the problem of non-sampling errors including measurement errors, it seems that the homogeneity assumption may be violated in varying degrees inasmuch as the sample households at the two points of time are not identical. Besides, the price data which relate to broad groups of commodities not formed in conformity with the price proportionality criterion may, in no small measure, suffer from aggregation problems, thereby affecting the reliability of our results. Evidently these limitation factors may have to be kept in view while interpreting the empirical findings and judging how well the model developed here has captured the phenomenon under observation.

3. Computational Procedures

The following steps seriatim delineate the computational procedures:

1. In fact the 1963-64 sample relates to transport workers only.

2. Section 4, chapter 2.
(a) 250 sample households (1958-59) are grouped into 10 fractile classes on the basis of total monthly expenditure per capita; 1

(b) For each sample household vector of consumption per capita expressed in 1958-59 rupee-worth units is computed. From vector \( \mathbf{q}^0 \) thus worked out for each sample household, overall mean consumption vector \( \overline{\mathbf{q}}^0 \) is obtained and then by virtue of (5.5.4), vector \( \mathbf{x}^0 \) is computed for each household;

(c) By virtue of (5.3.7) vector \( \mathbf{y}^0 \) is calculated for each household. It may be noted that elements of vector \( \mathbf{p}^0 \) needed for the determination of matrix (Cf. (5.5.10)) is unity each because, as mentioned above, the unit of consumption is 1958-59 rupee-worth;

(d) Moment matrices of first (n-1) elements of \( \mathbf{y}^0 \) are worked out, one for each of the 10 fractile classes. From these, pooled moment matrix \( \hat{N} \) is obtained;

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1 Ceteris paribus, expressing consumption-income (total expenditure) data in per capita terms is likely to result in a closer approximation of the assumption of homogeneous group of households (Cf. chapter 6).
(e) Matrix \( \hat{N} \) is inverted and each of its elements is multiplied with \(-1\) so as to obtain the non-bordering elements of \( \hat{a} \) i.e. \( \hat{a}_{11} = -\hat{N} \) (cf. \((3.3.10))\);

(f) For each decile class \( j \), mean vector \( \bar{y}_j \) is computed;

(g) \( \hat{h}_1 \) (i.e. \( n \)) is computed as a constrained least squares regression co-efficient of \( \bar{y}_j \) on \( \bar{y}_n \) (cf. \((3.3.31))\) and fn.1 thereof);

(h) \( \hat{R} \) is worked out by using the formula \((3.3.35))\);

(i) \( \hat{s} \) is computed by substituting the values of \( \hat{R} \) and \( \hat{N} = (\hat{h})^{-1} \) in \((3.3.34))\);

(j) Per capita overall mean consumption value vector \((1963-64)\) is deflated by the corresponding elements of the price relative vector \( p^1 \) \((1963-64)\) to yield \( q^1 \) i.e. 1963-64 overall mean consumption vector expressed in 1953-59 rupee-worth units;

(k) From \((3.4.2))\) \( \hat{v}_n \) is worked out by means of \((3.4.3))\), then, using \((3.4.5))\) followed by \((3.5.6))\), \( \hat{s} \) is obtained;

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Steps (j) and (k) lead to the derivation of \( \hat{N} \) under case 1. Steps (1) onwards lead to the computation of \( \hat{a} \) under case 2 when paraboloid assumption \((3.3.25))\) is relaxed.
(1) For each decile class \( j \) \((j=1,2,...,10)\) per capita mean consumption vectors \( \tilde{q}_j^0, \tilde{q}_j^1 \) (each expressed in 1953-59 rupee-worth units) and the corresponding per capita mean income (total expenditure) values \( \tilde{E}_j^0, \tilde{E}_j^1 \) are computed;

(m) By regressing separately each of the \( n \) elements of \( \tilde{q}_j^0 \) on \( \tilde{E}_j^0 \) and similarly of \( \tilde{q}_j^1 \) on \( \tilde{E}_j^1 \), marginal propensities to consume \( \tilde{\theta}_i^0 \) \((i=1,2,...,n)\) for 1953-59 and \( \tilde{\theta}_i^1 \) \((i=1,2,...,n)\) for 1963-64 respectively are computed for each of \( n \) groups of commodities;

(n) By premultiplying \( p^0, p^1, \tilde{\theta}_i^0, \tilde{\theta}_i^1 \) with \( t, p^0, p^1, \tilde{\theta}_i^0, \tilde{\theta}_i^1 \) respectively are obtained;

(o) From (3.4.15) \( \hat{a}_{nm} \) is worked out by means of (3.4.17);

(p) \( \hat{a} \) having thus been determined \( (Cf. \ (3.5.19)) \), \( \hat{A} \) is obtained by virtue of the identity \( \hat{A} = t' \hat{a} t \).

New \( \hat{A} \) having thus been worked out under case 2, the new \( \hat{B} \) may be obtained by following the steps \((f)\) and \((k)\) referred to above;

(q) For each \( \hat{A} \) estimated under case 1, two values of \( z \) one each for 1953-59 and 1963-64 respectively, are obtained by virtue of \((4.2.15)\). Similarly for \( \hat{A}^* \) estimated under case 2;
(r) For each value of the $x$ matrix, the structure of demand is estimated by using (4.2.9). Further, the matrix of cross and direct-price elasticities is worked out at the overall mean level of consumption by multiplying each $t_{2s}^{t}$ (Cf. (4.2.14)) with $p_{t}/q_{t}$.

(s) Finally, for each decile class as well as all classes taken together the distance between the structure of observed consumption and that of estimated consumption is worked out by applying the following formula:

$$\Delta = \sum_{i=1}^{n} v_{i} (\tilde{q}_{i} - \hat{q}_{i})^2$$

where

$\tilde{q}_{i}$ = Observed value of consumption of the $i$th group of commodities ($i=1,2,...,n$) expressed in 1958-59 rupees-worth units;

$\hat{q}_{i}$ = Estimated value of consumption corresponding to $\tilde{q}_{i}$; and

$\nu_{i} = \frac{\tilde{q}_{i}}{\sum_{i=1}^{n} \tilde{q}_{i}}$
4. *Empirical Findings*

**Case 1**

Following the procedure laid down above, the values of $t, \beta, \alpha, a, b, z, \triangle, \eta$ have been worked out for 15 groups of commodities followed by 8 groups of commodities. Tables 5.4.1 through 5.4.12 present serially the values of these expressions for 15 groups of commodities. Similarly, tables 5.4.13 through 5.4.24 structure the picture for 8 groups of commodities.

**Case 2**

In this case also the picture is structured for 15 groups of commodities followed by 8 groups of commodities.

**15. Groups of Commodities**

Table 5.4.25 presents the vectors $\theta^0, \theta^1, \theta^0, \theta^1, p^0, p^1$ and $g_{12}^0$. Substituting the values of relevant variables from

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1 To simplify the presentation, superscript $^\wedge$ is dropped in the ensuing write-up.
Table 5.4.25 in (5.4.15) the least squares solution of
(3.4.17) is given by

\[
\begin{bmatrix}
\theta_{n+1} \\
\theta_{n+1}^1
\end{bmatrix}
= \begin{bmatrix}
1395.67912 & 93.04258 & 90.12974 & -1 & -0.05002 & -2.73251 \\
93.04258 & 6.26939 & 5.54192 & 0.21682 & = -0.17105 \\
90.12974 & 5.54192 & 4.85054 & 0.25653 & = -0.14794
\end{bmatrix}
\begin{bmatrix}
a_{11} \\
a_{12}
\end{bmatrix}
\]

Since \(a_{11}\) and \(a_{12}\) are already determined (Cf. tables 5.4.2
and 5.4.25 and \(a_{11} = -2.73251\) from the above equation, \(a\) is
completely determined. In consequence \(\Lambda = \text{t}^2\) \(a\) is known.
In table 5.4.26 through table 5.4.33 are set out the values of
\(a, B, \varepsilon, \triangle\) and \(\eta\).

3 Groups of Commodities

Table 5.4.35 presents vectors \(\theta^0, \theta^1, \bar{\theta}, \bar{\bar{\theta}}, \theta^0, \theta^1\) and \(\theta_{12}\)
respectively for 3 groups of commodities. Substituting the values
of relevant variables from tables 5.4.34 and 5.4.14 in (3.4.15)
and using (3.4.17), the following least squares solution is obtained:
\[
\begin{align*}
\begin{bmatrix}
\theta_{n+1}^0 \\
\theta_{n+1}^1
\end{bmatrix} &=
\begin{bmatrix}
2432.79400 & 304.09925 & 267.04796 \\
304.09925 & 55.15741 & 55.35100 \\
267.04796 & 55.35100 & 29.41093
\end{bmatrix}^{-1} \\
&= 
\begin{bmatrix}
-0.03229 \\
0.12591 \\
0.14558
\end{bmatrix}
\begin{bmatrix}
-1.70595 \\
-0.19750 \\
0.17357
\end{bmatrix}
\end{align*}
\]

As \(a_{11}\) and \(a_{12}\) are already determined (Cf. tables 5.4.14 and 5.4.34) and \(a_{nm}\) has been calculated above, \(a\) is known. In consequence \(A\) is also known by virtue of the identity \(A = t^t a t\) . In tables 5.4.35 through 5.4.42 are presented the values of \(A, B, z, \alpha, \gamma\) and \(n\) respectively.

5. Resume and Conclusions

Empirics carried out in this study suggest that the derived complete demand system fulfils the theoretically desirable condition of sufficiency apart from conditions of additivity and homogeneity. This is true whether the model is articulated under case 1 or case 2. However, judged on the basis of the signs of direct-price elasticities, case 2 seems to perform better inasmuch as in proportionately large number of groups of commodities the signs as may be expected a priori are negative. This tendency is discernible for 15 groups of commodities

1

Tables 5.4.7, 5.4.8, 5.4.12, 5.4.20, 5.4.29, 5.4.29, 5.4.37 and 5.4.38. The \(x\) matrices set out in these tables, fulfill conditions (4.2.20) through (4.2.22).
as well as 3 groups of commodities. As far as the predictive power of the model under the two cases is concerned, it appears that case 2 may not have greater discriminating power than case 1.

Even under case 2 the model does not seem to capture the phenomenon under observation so well. It is felt that pending further investigations this may be attributed, inter alia, to non-fulfillment of the assumption that the sample households at the two points of time are homogeneous. Besides price data do not seem to be reliable.

It seems further exploratory work needs to be done before the model articulated here could become a useful tool for demand analysis especially for the purpose of reliable demand projections for fairly disaggregative planning models.

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1 Tables 5.4.11, 5.4.12, 5.4.32, 5.4.35, 5.4.25, 5.4.24, 5.4.41 and 5.4.42.
2 As measured by $\Delta$.
3 Tables 5.4.9, 5.4.10, 5.4.30, 5.4.31, 5.4.21, 5.4.22, 5.4.39 and 5.4.40.
4 Tables 5.4.24 and 5.4.34 show that the marginal propensities to consume differ perceptibly between the two periods of time viz. 1953-54 and 1963-64. Also see section 2 above.
5 Tables 5.4.7 and 5.4.8, and section 2 above.
6 The performance of our model seems better in the case of 15 groups of commodities. Experiments are underway to try out other forms of indifference surfaces viz. cubic and log-quadratic forms. It is hopefully felt that these experiments may yield encouraging results.
Table 5.4.1: t Matrix for 15 Groups of Commodities (Case 1)

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</table>

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<td>6</td>
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<tr>
<td>13</td>
<td>-0.46314</td>
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<tr>
<td>14</td>
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</tbody>
</table>
### Table 5.4.3: h Vector for 15 Groups of Commodities (Case 1)

\[
h^t = (0.05115 \quad 0.11517 \quad 0.05488 \quad -0.13167 \quad 0.03117 \quad 0.00534 \quad 0.03932
-0.00635 \quad -0.35144 \quad 0.17530 \quad -0.23590 \quad 0.13490 \quad 0.02414 \quad 0.03349)
\]

### Table 5.4.4: R Matrix for 15 Groups of Commodities (Case 1)

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<th>Elements of R matrix</th>
</tr>
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<tbody>
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</tr>
<tr>
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<tr>
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<td>0.27450 0.27450 0.27450 0.27450 0.27450 0.27450 0.27450 0.27450</td>
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<td>0.18172 0.18172 0.18172 0.18172 0.18172 0.18172 0.18172 0.18172</td>
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<tr>
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<td>0.15292 0.15292 0.15292 0.15292 0.15292 0.15292 0.15292 0.15292</td>
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<tr>
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<td>0.11077 0.11077 0.11077 0.11077 0.11077 0.11077 0.11077 0.11077</td>
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<tr>
<td>8</td>
<td>0.11965 0.11965 0.11965 0.11965 0.11965 0.11965 0.11965 0.11965</td>
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<tr>
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<td>0.32586 0.32586 0.32586 0.32586 0.32586 0.32586 0.32586 0.32586</td>
</tr>
<tr>
<td>10</td>
<td>0.03947 0.03947 0.03947 0.03947 0.03947 0.03947 0.03947 0.03947</td>
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<tr>
<td>11</td>
<td>0.10935 0.10935 0.10935 0.10935 0.10935 0.10935 0.10935 0.10935</td>
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</tr>
<tr>
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<tr>
<td>14</td>
<td>0.04616 0.04616 0.04616 0.04616 0.04616 0.04616 0.04616 0.04616</td>
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<td>11</td>
<td>0.10935 0.10935 0.10935 0.10935 0.10935 0.10935 0.10935 0.10935</td>
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<tr>
<td>12</td>
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</tr>
<tr>
<td>14</td>
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Table 5.4.5: A Matrix for 15 Groups of Commodities (Case 1)

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<table>
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<td>15</td>
<td>-1.29372</td>
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Table 5.4.6: B Vector for 15 Groups of Commodities (Case 1)

\[
B = \begin{pmatrix}
1.40643 & 1.16511 & 1.36555 & 1.45215 & 2.16155 & 1.90080 & 2.20657 \\
0.94016 & 2.57217 & 1.93654 & 2.47793 & 1.83711 & 1.14511 & 1.43574 \\
0.39928 &
\end{pmatrix}
\]

Table 5.4.7: a Matrix (1953-59) for 15 Groups of Commodities (Case 1)

<table>
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<td>-5.23123 1.32653 -0.05155 0.25469 0.94814 -0.12119 0.31009 0.53201</td>
</tr>
<tr>
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<td>-5.55301 -0.01936 0.01459 0.37396 -0.2743 -0.10243 5.0211</td>
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<tr>
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<td>-1.08775 -0.12681</td>
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<td>0.39426</td>
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<table>
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<tr>
<td>6</td>
<td>-0.52515 1.58299 0.05692 0.23675 -0.07497 -0.23024 0.01479 0.03420</td>
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<tr>
<td>7</td>
<td>-0.52515 0.52515 0.00241 0.1427 0.04115 -0.12022 0.02692</td>
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<tr>
<td>8</td>
<td>-0.52515 1.64596 -0.00241 0.1427 0.04115 -0.12022 0.02692</td>
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<tr>
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</tr>
<tr>
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<td>-26.43686 0.71885 3.79935 0.96527 2.12772 0.91761 0.27898</td>
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<td>14</td>
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<tr>
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<td>-0.91035 0.04435</td>
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</table>

Price vector \( p \) comprises 15 elements, unity each.
Table 5.4.8: a Matrix (1965-24) for 15 Groups of Commodities (Case 1) 1

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<tr>
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<tr>
<td>3</td>
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<tr>
<td>4</td>
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<tr>
<td>8</td>
<td>-0.69287</td>
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</table>

<table>
<thead>
<tr>
<th>Row no.</th>
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</thead>
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<tr>
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<td>-0.07059 1.52450 0.04929 2.53351 -0.02609 0.71539 -0.10102 0.05035</td>
</tr>
<tr>
<td>11</td>
<td>0.01014 1.03567 0.05150 0.23745 -0.02281 0.00239 -0.10194 0.02545</td>
</tr>
<tr>
<td>12</td>
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<tr>
<td>13</td>
<td>0.33924 5.09752 0.07728 0.31473 0.10129 -0.58933 0.05475 0.07552</td>
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<tr>
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</tr>
<tr>
<td>15</td>
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</tr>
<tr>
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</tr>
<tr>
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<td>-1.14570 1.35094 -0.11219 0.64421 -0.15490 0.25044 0.25525 0.04558</td>
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<tr>
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<tr>
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<tr>
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</tr>
<tr>
<td>21</td>
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<tr>
<td>22</td>
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<td>-0.90593 0.03976</td>
</tr>
<tr>
<td>24</td>
<td>0.00000</td>
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</tbody>
</table>

Row price vector p' is (0.394 1.140 1.040 1.140 1.240 1.350 1.120 1.030 1.227 1.140 1.220 1.080 1.180 1.000 1.080)
Table 5.4.9: Structure of Consumption - 15 Groups of Commodities - (1958-59) and Distance $\Delta$, Separately for Each Decile Group and Overall

(Case 1)

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<tbody>
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<td>E</td>
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<td>(4)</td>
<td>(5)</td>
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<td>1.727</td>
<td>1.596</td>
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0 = Observed consumption and E = Estimated consumption (Cf. step(s) of section 5 of this chapter).

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Table 5.4.11: Matrix of Price Elasticities for 15 Groups of Commodities (1959-63)
Table 5.4.12: An Matrix of Price Elasticities of 15 groups of commodities (1955-60)
at Overall Per Capita Mean Level of Consumption (Case 1)

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Table 5.4.13: $t$ Matrix for 8 Groups of Commodities (Case 1)

$$
\begin{bmatrix}
0.70711 & -0.70711 & 0.00000 & 0.00000 & 0.00000 & 0.00000 & 0.00000 & 0.00000 \\
0.40325 & 0.40325 & -0.31622 & 0.00000 & 0.00000 & 0.00000 & 0.00000 & 0.00000 \\
0.29968 & 0.29968 & 0.29968 & -0.29968 & 0.00000 & 0.00000 & 0.00000 & 0.00000 \\
0.22361 & 0.22361 & 0.22361 & 0.22361 & -0.99445 & 0.00000 & 0.00000 & 0.00000 \\
0.13257 & 0.13257 & 0.13257 & 0.13257 & 0.13257 & -0.91287 & 0.00000 & 0.00000 \\
0.15430 & 0.15430 & 0.15430 & 0.15430 & 0.15430 & 0.15430 & -0.92382 & 0.00000 \\
0.15365 & 0.15365 & 0.15365 & 0.15365 & 0.15365 & 0.15365 & 0.15365 & -0.99541 \\
0.35555 & 0.35555 & 0.35555 & 0.35555 & 0.35555 & 0.35555 & 0.35555 & 0.35555
\end{bmatrix}
$$

Table 5.4.14: $a$ Matrix in Triangular Form for 8 Groups of Commodities (Case 1)

$$
-a_{-11} =
\begin{bmatrix}
0.13093 & 0.3457 & 0.17744 & -0.02162 & 0.05805 & -0.03190 & -0.00509 \\
-1.26599 & 0.95688 & 0.26910 & 0.26287 & -0.05381 & 0.06170 \\
-2.23109 & -0.34151 & -0.02960 & 0.64089 & -0.01511 \\
 & -0.34693 & -0.10914 & 0.00755 & -0.02641 \\
 & & -0.43777 & -0.10582 & -0.00477 \\
 & & & -1.22519 & 0.04722 \\
 & & & & -0.04107
\end{bmatrix}
$$

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Table 5.4.15: h Vector for 8 Groups of Commodities (Case 1)

\[ h^* = (0.13441, 0.19372, 0.15804, -0.13854, 0.05798, 0.09536, -1.03778) \]

Table 5.4.16: R Matrix for 8 Groups of Commodities (Case 1)

\[
R = \begin{bmatrix}
0.65959 & -0.75463 & -0.04752 & -0.04752 & -0.04752 & -0.04752 & -0.04752 & -0.04752 \\
0.33976 & 0.33976 & -0.68399 & -0.06439 & -0.06439 & -0.06439 & -0.06439 & -0.06439 \\
0.23230 & 0.23230 & 0.23230 & -0.23230 & -0.23230 & -0.23230 & -0.23230 & -0.23230 \\
0.27259 & 0.27259 & 0.27259 & 0.27259 & 0.27259 & 0.27259 & 0.27259 & 0.27259 \\
0.18207 & 0.18207 & 0.18207 & 0.18207 & 0.18207 & 0.18207 & 0.18207 & 0.18207 \\
0.12041 & 0.12041 & 0.12041 & 0.12041 & 0.12041 & 0.12041 & 0.12041 & 0.12041 \\
0.50054 & 0.50054 & 0.50054 & 0.50054 & 0.50054 & 0.50054 & 0.50054 & 0.50054 \\
\end{bmatrix}
\]

Table 5.4.17: A Matrix in Triangular Form for 8 Groups of Commodities (Case 1)

\[
A = \begin{bmatrix}
-0.08729 & 0.01058 & 0.01509 & 0.00331 & 0.04633 & -0.00746 & 0.02334 & 0.01082 \\
0.25555 & -0.00816 & 0.23040 & 0.02142 & 0.08490 & -0.00237 & 0.01339 & 0.00217 \\
-1.90911 & 0.92147 & 0.25408 & 1.92010 & 0.15649 & 0.09463 & -0.00816 & 0.00331 \\
-1.98936 & -0.07757 & -0.09535 & 0.62445 & -0.03077 & -0.00816 & 0.00331 & 0.00331 \\
0.13065 & 0.00443 & 0.13473 & 0.01251 & -0.00816 & 0.00331 & 0.00331 & 0.00331 \\
0.04879 & 0.14091 & 1.01644 & 0.01251 & 0.00331 & 0.00331 & 0.00331 & 0.00331 \\
\end{bmatrix}
\]
Table 5.4.13: B Vector for 8 Groups of Commodities (Case 1)

\[- B = (2.01075, 2.82715, 2.95318, 1.73636, 2.74701, 2.13542, 1.99379, 2.57785)\]

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<th>1.15651</th>
<th>0.27427</th>
<th>0.22471</th>
<th>0.33549</th>
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<th>0.00927</th>
<th>6.26736</th>
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<td>(-0.57191)</td>
<td>(-0.70543)</td>
<td>(-0.33235)</td>
<td>(-0.77124)</td>
<td>(-0.42996)</td>
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<tr>
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<td>(-0.40015)</td>
<td>(-0.35146)</td>
<td>(-0.47757)</td>
<td>(-0.64742)</td>
<td>2.40687</td>
<td>0.95280</td>
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<td>(-0.42125)</td>
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<td>(-0.50620)</td>
<td>4.73117</td>
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Table 5.4.19: Matrix in Triangular Form (1953-59) for 8 Groups of Commodities (Case 1)

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<th>0.19159</th>
<th>0.44030</th>
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<th>0.04608</th>
<th>5.93326</th>
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<td>(-0.1361)</td>
<td>(-0.76156)</td>
<td>(-0.12711)</td>
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<td>0.07351</td>
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<td></td>
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<tr>
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<td>(-0.10957)</td>
<td>2.41447</td>
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<td>(-0.14538)</td>
<td>(-0.26410)</td>
<td>(-0.44317)</td>
<td>2.77519</td>
<td>0.2221</td>
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<td>(-0.51648)</td>
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Table 5.4.20: Matrix in Triangular Form (1965-64) for 8 Groups of Commodities (Case 1)

Note: Price vector \(p\) comprises 8 elements, unity each in the case of table 5.4.19 and 1.03, 1.24, 1.14, 1.08, 1.25, 1.19, 1.08 and 1.17 in the case of table 5.4.20.
Table 5.4.21: Structure of Consumption - 3 Groups of Commodities - (1938-39) and Distance ∆, Separately for Each Decile Group and Overall
(Case 1)

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<th>Commodities group no. 1</th>
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<th>3</th>
<th>4</th>
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<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
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<td>11.935</td>
<td>5.308</td>
<td>5.471</td>
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<td>11.070</td>
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<td>2.990</td>
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<td>2.755</td>
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<td>9.560</td>
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<td>2.149</td>
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<td>1.617</td>
<td>1.508</td>
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<tr>
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<td>6.542</td>
<td>7.541</td>
<td>0.944</td>
<td>1.025</td>
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</table>

11. Over-

| 3.                  | 6.059                                   | 6.127 | 5.790 | 5.728 | 2.912 | 5.002 | 16.244 | 16.590 | 0.14393 |
| 4.                  | 5.628                                   | 5.394 | 2.790 | 5.372 | 2.741 | 2.748 | 14.540 | 15.715 | 0.20841 |
| 5.                  | 4.819                                   | 5.007 | 5.442 | 5.185 | 2.754 | 2.614 | 11.618 | 12.308 | 0.13595 |
| 6.                  | 4.430                                   | 4.547 | 5.184 | 2.981 | 2.650 | 2.455 | 9.764 | 10.634 | 0.25656 |
| 7.                  | 5.978                                   | 4.115 | 2.845 | 2.750 | 2.129 | 2.304 | 9.365 | 9.053 | 0.31215 |
| 8.                  | 5.861                                   | 5.711 | 2.590 | 2.555 | 2.155 | 2.165 | 7.145 | 7.592 | 0.18215 |
| 9.                  | 5.542                                   | 5.158 | 2.282 | 2.276 | 1.807 | 1.966 | 6.022 | 5.302 | 0.22189 |
| 10.                 | 2.900                                   | 2.999 | 2.051 | 1.919 | 1.699 | 1.971 | 4.034 | 2.324 | 1.58215 |

11. Over-

| 5.265               | 5.265                                   | 3.310 | 3.310 | 2.705 | 2.705 | 13.244 | 13.244 | 0.00000 |

1 Similar footnote as for table 5.4.9.
Table 5.4.22: Structure of Consumption - 8 Groups of Commodities - (1963-64) and Distance $\Delta$, Separately for Each Decile Group and Overall (Case 1)

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<th>Commodities group no.</th>
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<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
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<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
<td>(6)</td>
<td>(7)</td>
</tr>
<tr>
<td>2. 79,681</td>
<td>13.476</td>
<td>12.924</td>
<td>8.018</td>
<td>5.311</td>
<td>3.501</td>
<td>2.640</td>
<td>2.545</td>
</tr>
<tr>
<td>3. 69,005</td>
<td>14.028</td>
<td>11.509</td>
<td>4.425</td>
<td>5.028</td>
<td>2.892</td>
<td>2.625</td>
<td>2.615</td>
</tr>
<tr>
<td>5. 53,223</td>
<td>11.806</td>
<td>10.090</td>
<td>5.403</td>
<td>4.235</td>
<td>2.785</td>
<td>2.005</td>
<td>2.475</td>
</tr>
<tr>
<td>6. 54,927</td>
<td>11.564</td>
<td>9.686</td>
<td>5.913</td>
<td>5.996</td>
<td>2.709</td>
<td>1.995</td>
<td>2.450</td>
</tr>
<tr>
<td>10. 40,277</td>
<td>11.484</td>
<td>7.728</td>
<td>2.131</td>
<td>2.922</td>
<td>1.715</td>
<td>1.471</td>
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</table>

11. Overall 61,610 12,811 10,585 4,675 4,486 2,837 2,104 2,488 2,040

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<tr>
<th>S. Commodities group no.</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>$\Delta$</th>
</tr>
</thead>
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<tr>
<td>1. 16,062</td>
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<td>6,472</td>
<td>5,453</td>
<td>4,342</td>
</tr>
<tr>
<td>2. 11,505</td>
<td>3,985</td>
<td>4,693</td>
<td>4,598</td>
<td>5,017</td>
<td>3,719</td>
</tr>
<tr>
<td>3. 9,596</td>
<td>7,805</td>
<td>5,437</td>
<td>4,519</td>
<td>5,307</td>
<td>3,905</td>
</tr>
<tr>
<td>4. 8,699</td>
<td>7,125</td>
<td>5,504</td>
<td>5,990</td>
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<td>3,071</td>
</tr>
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<td>6,599</td>
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<td>5,754</td>
<td>3,446</td>
<td>2,383</td>
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<td>6,230</td>
<td>4,069</td>
<td>5,555</td>
<td>3,573</td>
<td>2,761</td>
</tr>
<tr>
<td>7. 7,057</td>
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<td>2,476</td>
<td>5,560</td>
<td>3,223</td>
<td>2,621</td>
</tr>
<tr>
<td>8. 6,726</td>
<td>5,879</td>
<td>2,585</td>
<td>5,145</td>
<td>2,976</td>
<td>2,486</td>
</tr>
<tr>
<td>9. 6,149</td>
<td>4,975</td>
<td>2,822</td>
<td>2,946</td>
<td>2,679</td>
<td>2,326</td>
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<td>10. 5,636</td>
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<td>2,554</td>
<td>2,761</td>
<td>2,319</td>
<td>2,194</td>
</tr>
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</table>

11. Overall 8,716 6,976 5,807 3,918 3,744 3,019 15,027 20,771 11,143553

Similar footnote as for table 5.4.21.
Table 5.4.25: \( \eta \) Matrix of Price Elasticities for 8 Groups of Commodities (1958-59) at Overall per Capita Mean Level of Consumption (Case 1)

\[
\begin{bmatrix}
1.38134 & -0.30161 & -0.03680 & -0.07709 & 0.00274 & -0.34066 & -0.05995 & -1.60207 \\
-1.29911 & 5.45662 & 0.22901 & 0.54518 & -0.47762 & 0.55740 & 0.03154 & -4.26541 \\
-0.53417 & 0.39977 & 1.15235 & 0.65607 & 0.39171 & 0.59200 & 0.17444 & -5.55363 \\
\eta = & -0.43315 & 0.37871 & 0.61079 & 1.24033 & 0.11323 & 0.29221 & 0.52699 & -5.78332 \\
-0.10961 & -0.25014 & 0.12045 & 0.01999 & 1.79467 & -0.21507 & 0.17155 & -2.55995 \\
-1.17314 & 0.51893 & 0.32141 & 0.15637 & -0.51277 & 2.24555 & 0.20941 & -2.51345 \\
-0.27050 & 0.07045 & 0.12042 & 0.56475 & 0.37602 & -0.02311 & 0.95676 & -2.23325 \\
-1.55490 & -0.95595 & -0.51095 & -0.53033 & -1.07504 & 0.63263 & -0.51705 & -4.39359
\end{bmatrix}
\]

Table 5.4.24: \( \eta \) Matrix of Price Elasticities for 8 Groups of Commodities (1965-64) at Overall Per Capita Mean Level of Consumption (Case 1)

\[
\begin{bmatrix}
1.35935 & -0.35066 & -0.03489 & -0.06949 & 0.00273 & -0.33085 & -0.05033 & -1.72447 \\
-0.75977 & 2.35351 & 0.13854 & 0.32831 & -0.38235 & 0.32955 & 0.01210 & -5.04556 \\
-0.40939 & 0.33373 & 0.97151 & 0.51023 & 0.31894 & 0.47776 & 0.14000 & -5.21190 \\
\eta = & -0.55114 & 0.35928 & 0.56310 & 1.05866 & 0.09781 & 0.25754 & 0.45238 & -5.66524 \\
-0.05540 & 0.24305 & 0.03529 & 0.01405 & 1.39561 & -0.18484 & 0.11961 & -2.15007 \\
-0.88439 & 0.43300 & 0.28650 & 0.12506 & -0.30665 & 1.80358 & -0.02252 & -2.39176 \\
-0.17601 & 0.04024 & 0.10606 & 0.59317 & 0.33631 & -0.02698 & 0.80447 & -2.13299 \\
-0.36514 & 0.71505 & -0.35004 & -0.35140 & 0.73320 & -0.45106 & -0.51490 & -2.53369
\end{bmatrix}
\]
Table 5.4.25: Vectors $\theta^0$, $\theta^1$, $\tilde{\theta}^0$, $\tilde{\theta}^1$, $\rho^0$, $\rho^1$ and $a_{-12}$ for 15 Groups of Commodities (Case 2)

<table>
<thead>
<tr>
<th>S. no.</th>
<th>$\theta^0$</th>
<th>$\theta^1$</th>
<th>$\tilde{\theta}^0$</th>
<th>$\tilde{\theta}^1$</th>
<th>$\rho^0$</th>
<th>$\rho^1$</th>
<th>$a_{-12}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>0.06839</td>
<td>0.05234</td>
<td>0.00304</td>
<td>0.02390</td>
<td>0.00000</td>
<td>0.17381</td>
<td>-0.00940</td>
</tr>
<tr>
<td>2.</td>
<td>0.05702</td>
<td>0.01854</td>
<td>0.02974</td>
<td>0.00951</td>
<td>0.00000</td>
<td>0.01878</td>
<td>0.23415</td>
</tr>
<tr>
<td>3.</td>
<td>0.02628</td>
<td>0.02379</td>
<td>0.01417</td>
<td>-0.01631</td>
<td>0.00000</td>
<td>0.09938</td>
<td>-0.02725</td>
</tr>
<tr>
<td>4.</td>
<td>0.05420</td>
<td>0.05097</td>
<td>-0.03399</td>
<td>-0.08027</td>
<td>0.00000</td>
<td>0.24194</td>
<td>-0.08492</td>
</tr>
<tr>
<td>5.</td>
<td>0.08448</td>
<td>0.12615</td>
<td>0.02096</td>
<td>-0.00117</td>
<td>0.00000</td>
<td>0.22128</td>
<td>0.04280</td>
</tr>
<tr>
<td>6.</td>
<td>0.03111</td>
<td>0.05564</td>
<td>0.00138</td>
<td>-0.02952</td>
<td>0.00000</td>
<td>-0.02592</td>
<td>-0.13500</td>
</tr>
<tr>
<td>7.</td>
<td>0.04776</td>
<td>0.09646</td>
<td>0.02286</td>
<td>0.04832</td>
<td>0.00000</td>
<td>-0.05987</td>
<td>0.07963</td>
</tr>
<tr>
<td>8.</td>
<td>0.02560</td>
<td>0.00961</td>
<td>-0.00179</td>
<td>0.00335</td>
<td>0.00000</td>
<td>0.06542</td>
<td>-0.09877</td>
</tr>
<tr>
<td>9.</td>
<td>0.04883</td>
<td>0.04397</td>
<td>-0.21985</td>
<td>-0.02102</td>
<td>0.00000</td>
<td>-0.00576</td>
<td>-0.03658</td>
</tr>
<tr>
<td>10.</td>
<td>0.27695</td>
<td>0.07409</td>
<td>0.04497</td>
<td>0.01326</td>
<td>0.00000</td>
<td>0.07107</td>
<td>0.25957</td>
</tr>
<tr>
<td>11.</td>
<td>0.02330</td>
<td>0.03499</td>
<td>-0.07373</td>
<td>-0.22223</td>
<td>0.00000</td>
<td>-0.05546</td>
<td>-0.07161</td>
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<tr>
<td>12.</td>
<td>0.14316</td>
<td>0.23455</td>
<td>0.04774</td>
<td>0.05219</td>
<td>0.00000</td>
<td>0.00232</td>
<td>0.44671</td>
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<tr>
<td>13.</td>
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<td>0.01743</td>
<td>0.00598</td>
<td>-0.00802</td>
<td>0.00000</td>
<td>-0.14259</td>
<td>-0.13174</td>
</tr>
<tr>
<td>14.</td>
<td>0.06246</td>
<td>0.07589</td>
<td>0.02235</td>
<td>0.02182</td>
<td>0.00000</td>
<td>0.16499</td>
<td>-0.06496</td>
</tr>
<tr>
<td>15.</td>
<td>0.04459</td>
<td>0.04558</td>
<td>0.25320</td>
<td>0.25320</td>
<td>-3.37299</td>
<td>-4.44851</td>
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Table 5.4.26: A Matrix for 15 Groups of Commodities (Case 2)

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<td>0.37040</td>
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<td>4</td>
<td>-2.53921</td>
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<tr>
<td>5</td>
<td>-0.45598</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Row no.</th>
<th>Elements of A matrix in triangular form</th>
</tr>
</thead>
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<tr>
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<td>2</td>
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<td>0.5993</td>
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<td>-0.62945</td>
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<tr>
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<td>-0.25055</td>
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<tr>
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</tr>
<tr>
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<tr>
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<tr>
<td>9</td>
<td>-1.27969</td>
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<tr>
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<td>-0.19550</td>
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</tbody>
</table>

<table>
<thead>
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<th>Row no.</th>
<th>Elements of A matrix in triangular form</th>
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<td>3</td>
<td>-0.70592</td>
</tr>
<tr>
<td>4</td>
<td>0.17642</td>
</tr>
<tr>
<td>5</td>
<td>-0.15194</td>
</tr>
<tr>
<td>6</td>
<td>-0.69504</td>
</tr>
<tr>
<td>7</td>
<td>-0.12256</td>
</tr>
<tr>
<td>8</td>
<td>-0.09835</td>
</tr>
<tr>
<td>9</td>
<td>-0.05247</td>
</tr>
<tr>
<td>10</td>
<td>-0.15158</td>
</tr>
<tr>
<td>11</td>
<td>-3.69093</td>
</tr>
<tr>
<td>12</td>
<td>-0.21325</td>
</tr>
<tr>
<td>13</td>
<td>-7.31647</td>
</tr>
<tr>
<td>14</td>
<td>-5.69302</td>
</tr>
<tr>
<td>15</td>
<td>-0.48076</td>
</tr>
</tbody>
</table>
### Table 5.4.27: B Vector for 15 Groups of Commodities (Case 2)

\[ \begin{align*}
B' &= (7.82357 \ 3.15338 \ 7.42444 \ 7.94734 \ 7.33263 \\
    & \quad 7.39919 \ 7.09142 \ 6.35955 \ 6.72782 \ 7.56545 \\
    & \quad 6.82201 \ 7.46269 \ 6.15439 \ 7.62425 \ 3.40711)
\end{align*} \]

### Table 5.4.28: z Matrix (1955-59) for 15 Groups of Commodities (Case 2)

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<td>-1.03775</td>
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<tr>
<td>8</td>
<td>0.93446</td>
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</table>

<table>
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<td>-0.03838</td>
</tr>
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</tr>
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<td>-0.39912</td>
</tr>
<tr>
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<tr>
<td>13</td>
<td>-0.49353</td>
</tr>
<tr>
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<tr>
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<td>-0.91006</td>
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Table 5.4.29 - Matrix (1963-64) for 15 Groups of Commodities (Case 2)

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<td>-5.28577</td>
</tr>
<tr>
<td>3</td>
<td>-0.49578</td>
</tr>
<tr>
<td>4</td>
<td>-0.20315</td>
</tr>
<tr>
<td>5</td>
<td>-5.35135</td>
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<tr>
<td>6</td>
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<tr>
<td>7</td>
<td>-1.05682</td>
</tr>
<tr>
<td>8</td>
<td>-0.63173</td>
</tr>
</tbody>
</table>

<table>
<thead>
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</tr>
</thead>
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<tr>
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<tr>
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<td>-2.90200</td>
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<tr>
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<td>-0.83515</td>
</tr>
<tr>
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</table>
Table 5.4.33: Structure of Consumption - 15 Groups of Commodities (1953-59) and Distance Λ, Separately for Each Decile Group and Overall (Case 2)

<table>
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<tr>
<th>Decile group no.</th>
<th>mean per capita income (total expenditure)</th>
<th>Commodities group no.</th>
</tr>
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<td>(2)</td>
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</tr>
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<td>4</td>
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<td>3.613</td>
</tr>
<tr>
<td>5</td>
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<td>3.193</td>
</tr>
<tr>
<td>6</td>
<td>39.466</td>
<td>2.773</td>
</tr>
<tr>
<td>7</td>
<td>33.090</td>
<td>3.512</td>
</tr>
<tr>
<td>8</td>
<td>29.268</td>
<td>5.509</td>
</tr>
<tr>
<td>10</td>
<td>15.205</td>
<td>1.758</td>
</tr>
</tbody>
</table>

| Total all       | 42.809 | 3.790 | 5.740 | 5.529 | 1.648 | 1.648 | 1.795 | 1.795 |

<table>
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<tr>
<th>Commodities group no.</th>
<th>(1)</th>
<th>(11)</th>
<th>(12)</th>
<th>(13)</th>
<th>(14)</th>
<th>(15)</th>
<th>(16)</th>
<th>(17)</th>
<th>(18)</th>
<th>(19)</th>
<th>(20)</th>
<th>(21)</th>
<th>(22)</th>
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</thead>
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<tr>
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<td>4.157</td>
<td>2.244</td>
<td>2.033</td>
<td>2.017</td>
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<td>2.171</td>
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| Total overall       | 2.905 | 2.935 | 1.635 | 1.655 | 1.948 | 1.948 | 1.901 | 1.901 | 1.681 | 1.681 | 6.632 | 6.63 |

Footnote same as for Table 5.4.9.
### Table 5.4.3D (Contd.)

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Table 5.4.31: Structure of Consumption - 15 Groups of Commodities - (1963-64)
and Distance A, Separately for Each Decile Group and Overall
(Case 2)

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Table 5.4.32: \( n \) Matrix of Price Elasticities for 15 Groups of Commodities (1958-59) at the Overall per Capita Mean Level of Consumption (Case 2)

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Table 5.4.33: \( \eta \) Matrix of Price Elasticities for 15 Groups of Commodities (1963–64) at Overall per Capita Mean Level of Consumption (Case 2)

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Table 5.4.34: Vectors $\theta^0$, $\theta^1$, $p^0$, $p^1$, $\theta^0$, $\theta^1$ and $a_{12}$ for 8 Groups of Commodities (Case 2)

<table>
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<tr>
<th>S. no.</th>
<th>$\theta^0$</th>
<th>$\theta^1$</th>
<th>$p^0$</th>
<th>$p^1$</th>
<th>$\theta^0$</th>
<th>$\theta^1$</th>
<th>$a_{12}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>0.15169</td>
<td>0.09470</td>
<td>0.00000</td>
<td>0.15455</td>
<td>0.04752</td>
<td>-0.02225</td>
<td>-0.01900</td>
</tr>
<tr>
<td>2.</td>
<td>0.03448</td>
<td>0.12816</td>
<td>0.00000</td>
<td>-0.00492</td>
<td>0.06349</td>
<td>0.04354</td>
<td>0.13027</td>
</tr>
<tr>
<td>3.</td>
<td>0.05426</td>
<td>0.05033</td>
<td>0.00000</td>
<td>-0.05435</td>
<td>0.05523</td>
<td>0.07014</td>
<td>0.05567</td>
</tr>
<tr>
<td>4.</td>
<td>0.03560</td>
<td>0.00962</td>
<td>0.00000</td>
<td>0.03573</td>
<td>-0.04338</td>
<td>-0.10342</td>
<td>-0.11369</td>
</tr>
<tr>
<td>5.</td>
<td>0.12875</td>
<td>0.13599</td>
<td>0.00000</td>
<td>-0.04199</td>
<td>0.02050</td>
<td>0.01606</td>
<td>-0.05850</td>
</tr>
<tr>
<td>6.</td>
<td>0.08243</td>
<td>0.07539</td>
<td>0.00000</td>
<td>-0.05401</td>
<td>0.03339</td>
<td>0.06195</td>
<td>0.03703</td>
</tr>
<tr>
<td>7.</td>
<td>0.04459</td>
<td>0.04559</td>
<td>0.00000</td>
<td>0.05742</td>
<td>-0.56691</td>
<td>-0.39585</td>
<td>-0.05953</td>
</tr>
<tr>
<td>8.</td>
<td>0.46821</td>
<td>0.41193</td>
<td>-0.32343</td>
<td>-0.21326</td>
<td>0.36555</td>
<td>0.35555</td>
<td></td>
</tr>
</tbody>
</table>

Table 5.4.35: A Matrix in Triangular Form for 8 Groups of Commodities (Case 2)

$$
A = \begin{bmatrix}
0.23430 & -0.13695 & -0.13241 & -0.19370 & -0.15117 & -0.20349 & -0.16316 & -0.18638 \\
-0.45106 & -0.20586 & 0.05220 & -0.17603 & -0.11280 & -0.20047 & -0.19411 \\
-0.00861 & 0.72357 & -0.00549 & 0.05537 & -0.33399 & -0.19239 \\
-2.18686 & -0.23707 & -0.23935 & 0.42695 & -0.23927 \\
-0.42315 & -0.19367 & -0.01272 & -0.33593 \\
-0.54229 & -0.14939 & -0.13500 \\
-1.35401 & -0.17386 & -0.20993 \\
\end{bmatrix}
$$

Table 5.4.36: B Vector for 8 Groups of Commodities (Case 2)

$$
B' = (3.75456, 7.93797, 3.11594, 2.02876, 3.01311, 3.06370, 3.76632, 3.19727)
$$
### Table 5.4.37: Matrix in Triangular Form (1953-59) for 8 Groups of Commodities (Case 2)

\[
\mathbf{z} = 
\begin{bmatrix}
-9.01395 & 1.15331 & 0.27427 & 0.22471 & -0.33649 & 1.33552 & 0.09927 & 6.28736 & 0.15168 \\
-4.17226 & -0.33131 & -0.70349 & 0.33233 & -0.77124 & -0.28966 & 4.57852 & 0.09449 \\
-0.33550 & -0.49015 & -0.35141 & -0.47737 & -0.34246 & 2.40837 & 0.05420 \\
0.97756 & -0.14213 & -0.25342 & -0.45499 & 2.70691 & 0.02560 \\
-4.11267 & 0.23680 & -0.50320 & 4.78117 & 0.12875 \\
-5.09954 & -0.02993 & 5.04232 & 0.06243 \\
-1.09942 & 2.26699 & 0.04459 \\
26.15013 & 0.46921 & 0.19750 \\
\end{bmatrix}
\]

### Table 5.4.38: Matrix in Triangular Form (1963-64) for 8 Groups of Commodities (Case 2)

\[
\mathbf{z} = 
\begin{bmatrix}
-9.12791 & 1.07976 & 0.24504 & 0.20365 & -0.45148 & 1.25271 & 0.06193 & 5.35752 & -0.01916 \\
-4.12228 & -0.32922 & -0.71751 & 0.42129 & -0.76420 & -0.13103 & 4.78577 & 0.11115 \\
-0.36794 & -0.49292 & -0.35490 & -0.43156 & -0.16311 & 2.40834 & 0.02248 \\
0.98019 & -0.14990 & -0.28329 & -0.43996 & 2.76513 & 0.01061 \\
-4.09404 & 0.23314 & 0.51753 & 4.93530 & 0.12200 \\
-5.10571 & 0.03606 & 5.05888 & 0.04409 \\
-1.10570 & 2.24725 & 0.02344 \\
25.30889 & 0.53211 & 0.14511 \\
\end{bmatrix}
\]
Table 5.4.39: Structure of Consumption - 3 Groups of Commodities (1953-53) and Distance Δ, Separately for Each Decile Group and Overall (Case 2) \(^1\)

<table>
<thead>
<tr>
<th>No. of decile group</th>
<th>Commodities group no.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>(1) (2)</td>
<td>(3) (4) (5) (6) (7) (8) (9) (10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>56.619</td>
<td>15.234</td>
<td>15.124</td>
<td>4.276</td>
<td>4.157</td>
</tr>
<tr>
<td>3.</td>
<td>43.759</td>
<td>12.655</td>
<td>11.953</td>
<td>5.308</td>
<td>5.471</td>
</tr>
<tr>
<td>4.</td>
<td>43.096</td>
<td>10.654</td>
<td>11.070</td>
<td>3.041</td>
<td>2.993</td>
</tr>
<tr>
<td>5.</td>
<td>49.044</td>
<td>10.981</td>
<td>10.614</td>
<td>2.328</td>
<td>2.756</td>
</tr>
<tr>
<td>6.</td>
<td>50.445</td>
<td>10.458</td>
<td>10.072</td>
<td>2.537</td>
<td>2.434</td>
</tr>
<tr>
<td>7.</td>
<td>33.030</td>
<td>9.323</td>
<td>9.563</td>
<td>2.133</td>
<td>2.149</td>
</tr>
<tr>
<td>9.</td>
<td>25.005</td>
<td>7.705</td>
<td>8.409</td>
<td>1.617</td>
<td>1.533</td>
</tr>
<tr>
<td>10.</td>
<td>13.735</td>
<td>8.542</td>
<td>7.541</td>
<td>0.944</td>
<td>1.025</td>
</tr>
</tbody>
</table>

11. Over- 

| All | 42.039 | 15.317 | 15.317 | 2.305 | 2.305 | 1.795 | 1.795 | 1.301 | 1.301 |

<table>
<thead>
<tr>
<th>No. of commodity group</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>(\triangle)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>11.234</td>
<td>11.771</td>
<td>6.028</td>
<td>6.127</td>
<td>4.555</td>
<td>4.714</td>
<td>35.937</td>
</tr>
<tr>
<td>2.</td>
<td>5.944</td>
<td>7.142</td>
<td>4.577</td>
<td>4.221</td>
<td>3.056</td>
<td>5.356</td>
<td>17.417</td>
</tr>
<tr>
<td>4.</td>
<td>5.038</td>
<td>5.354</td>
<td>2.780</td>
<td>2.572</td>
<td>2.741</td>
<td>2.743</td>
<td>14.340</td>
</tr>
<tr>
<td>5.</td>
<td>4.519</td>
<td>5.008</td>
<td>3.442</td>
<td>3.135</td>
<td>2.754</td>
<td>2.614</td>
<td>11.618</td>
</tr>
<tr>
<td>6.</td>
<td>4.430</td>
<td>4.857</td>
<td>5.134</td>
<td>2.961</td>
<td>2.650</td>
<td>2.455</td>
<td>9.764</td>
</tr>
<tr>
<td>7.</td>
<td>5.378</td>
<td>4.115</td>
<td>2.646</td>
<td>2.730</td>
<td>2.129</td>
<td>2.304</td>
<td>9.355</td>
</tr>
<tr>
<td>8.</td>
<td>5.951</td>
<td>5.711</td>
<td>2.300</td>
<td>2.555</td>
<td>2.133</td>
<td>2.165</td>
<td>7.145</td>
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<tr>
<td>9.</td>
<td>5.542</td>
<td>5.156</td>
<td>2.282</td>
<td>2.276</td>
<td>1.807</td>
<td>1.966</td>
<td>6.022</td>
</tr>
<tr>
<td>10.</td>
<td>2.600</td>
<td>2.599</td>
<td>2.051</td>
<td>1.919</td>
<td>1.699</td>
<td>1.711</td>
<td>4.034</td>
</tr>
</tbody>
</table>

11. Over- 

| All | 5.285 | 5.285 | 3.570 | 3.510 | 2.725 | 2.708 | 15.244 | 15.244 | 0.00000 |

\(^1\) Same as for Table 5.4.21.
Table 5.4.40: Structure of Consumption - 3 Groups of Commodities - (1963-64) and Distance Δ, Separately for Each Decile Group and Overall (Case 2)

<table>
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<th>mean per capita income (total expenditure)</th>
<th>Commodities group no.</th>
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<th>E</th>
<th>0</th>
<th>E</th>
<th>0</th>
<th>E</th>
<th>0</th>
<th>E</th>
</tr>
</thead>
<tbody>
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<td>(3) (4) (5) (6) (7) (8) (9) (10)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. 108.727</td>
<td>17.492 9.676 8.856 9.712 5.081 5.165 2.982 2.543</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. 53.228</td>
<td>11.906 10.644 5.408 4.099 2.785 2.050 2.475 2.007</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>6. 54.927</td>
<td>11.564 10.707 5.918 3.753 2.709 1.955 2.450 1.972</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. 51.319</td>
<td>11.233 10.776 5.859 3.532 2.250 1.974 2.315 1.934</td>
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<tr>
<td>8. 47.314</td>
<td>12.568 10.853 5.009 2.886 2.190 1.784 2.259 1.892</td>
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<td></td>
</tr>
<tr>
<td>10. 40.277</td>
<td>11.484 10.987 2.381 2.164 1.714 1.626 2.759 1.817</td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S. commodities group no.</th>
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<th>E</th>
<th>0</th>
<th>E</th>
<th>0</th>
<th>E</th>
<th>0</th>
<th>E</th>
</tr>
</thead>
<tbody>
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<td>2. 11.503</td>
<td>9.178 4.693 4.718 5.017 5.447 20.717 50.350</td>
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<td></td>
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</tr>
<tr>
<td>4. 3.689</td>
<td>7.156 5.504 3.979 4.264 3.055 13.674 21.442</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5. 3.550</td>
<td>6.561 5.030 5.772 3.446 2.944 13.491 18.955</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. 7.057</td>
<td>5.718 2.476 3.467 3.325 2.782 12.651 15.259</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>8. 6.726</td>
<td>5.229 2.583 3.290 2.976 2.689 9.743 13.123</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10. 5.656</td>
<td>4.371 2.354 2.980 2.919 2.524 6.826 9.383</td>
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<td></td>
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<td></td>
<td></td>
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</tbody>
</table>

1. Same as for table 5.4.50.
Table 5.4.41: $\eta$ Matrix of Price Elasticities for 8 Groups of Commodities (1953-59)
at Overall Per Capita Mean Level of Consumption (Case 2)

<table>
<thead>
<tr>
<th>Row no.</th>
<th>Elements of $\eta$ matrix</th>
</tr>
</thead>
<tbody>
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<td></td>
<td>1</td>
</tr>
<tr>
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</tr>
<tr>
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<td>-1.49749</td>
</tr>
<tr>
<td>3</td>
<td>-0.42241</td>
</tr>
<tr>
<td>4</td>
<td>-0.18005</td>
</tr>
<tr>
<td>5</td>
<td>-0.23707</td>
</tr>
<tr>
<td>6</td>
<td>0.19675</td>
</tr>
<tr>
<td>7</td>
<td>-0.11315</td>
</tr>
<tr>
<td>8</td>
<td>0.70780</td>
</tr>
</tbody>
</table>

Table 5.4.42: $\eta$ Matrix of Price Elasticities for 8 Groups of Commodities (1963-64)
at Overall Per Capita Mean Level of Consumption (Case 2)

<table>
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<tr>
<th>Row no.</th>
<th>Elements of $\eta$ matrix</th>
</tr>
</thead>
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</tr>
<tr>
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<td>-1.48672</td>
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<tr>
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<td>-0.50566</td>
</tr>
<tr>
<td>4</td>
<td>-0.29707</td>
</tr>
<tr>
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</tr>
<tr>
<td>6</td>
<td>-0.50234</td>
</tr>
<tr>
<td>7</td>
<td>0.09908</td>
</tr>
<tr>
<td>8</td>
<td>-0.22108</td>
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</tbody>
</table>