qualified specialists are to be employed in the field and in the factory, if the available land is to be used in the best possible manner, and if market opportunities are to be exploited more skilfully, it is essential that the size of the unit be large.

DOMESTIC DEMAND FUNCTION FOR TEA IN INDIA

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Although tea is a minor item in the diet of Indian consumer, it is the second most important commodity from the view-point of earning foreign exchange. Various kinds of efforts are being made by the Government to promote the export of tea. The amount of tea available for export depends upon the extent of its production and domestic consumption and availability of foreign market. Therefore, in order to increase the export of tea it is not only necessary to enhance its production and explore foreign market but also to have a sizable amount of exportable surplus by way of curbing down domestic consumption. And for adopting an effective policy to achieve increased amounts of exportable surplus of tea it is necessary to have reliable empirical knowledge about the economic determinants of domestic consumption of the commodity. An attempt has been made in this article to (i) analyse the relationship between consumption of tea, price of tea and per capita income to determine as precisely as possible the effects of these factors on domestic consumption of tea and (ii) to estimate the trends in the future per capita consumption of tea in the country.

DATA AND METHODOLOGY

Regression analysis based on time-series data (1950-51 to 1967-68)¹ was used to analyse the effects of various factors on consumption of tea. Many factors cause variation in consumption of tea such as changes in income, prices of tea and its substitutes and complements, population, change in consumer tastes and preferences, social stratification, etc. All of these variables cannot be quantified and even those which can be quantified, time-series data are not available. Above all, it is difficult to isolate the effect of each variable it too many variables are used in the function. Therefore, the per capita consumption of tea has been related only with the retail price of tea and real per capita income.

¹. Time series data on per capita consumption of tea were obtained from the publication Record and Statistics, Vol. 18 to 20, 1967 to 1969.
². Time series data on price of tea were computed from Production Year Book, Vol. 19 to 21, F.A.O., Rome, 1965 to 1967.
³. Time series data on per capita real income was obtained from Eastern Economist Annual Number, 1969, p. 1302.
Many functional forms may be used for the estimation of demand functions—
double log, semi-log, log inverse, etc. In this article, however, double log function
of the following form has been used:

\[ \log (Y) = a + b_1 \left( \log X_1 \right) + b_2 \left( \log X_2 \right) + U \]  

(1)

where \( Y \) is per capita consumption of tea in kilogrammes, \( X_1 \) is per capita real
income in rupees, \( X_2 \) is price of tea per kg. in rupees; \( a, b_1 \) and \( b_2 \) are constants
and \( U \) is the error term.

The parameters were estimated by the ordinary least squares method.\(^2\) One
may of course note that the reliability of the estimates of the parameters may be
limited because of unknown errors of observation and measurement, multi-collinearity,
auto-correlation and heteroscedasticity.

RESULTS AND INTERPRETATION

The estimates of coefficients of the demand function of tea are given in equation (2). The standard error associated with each coefficient is indicated in parenthesis below the coefficient.

\[
Y = 0.06289X_1^{1.0908} \quad X_2^{-0.0472} \quad \begin{array}{c}
(1.345) \\
(0.471)
\end{array}
\]

\[ R^2 = 0.437^3 \]

Thus income and price together explain about 44 per cent of the variation in
the consumption of tea. The value of the regression coefficient associated with
income is in accordance with a priori expectation and is significant at 5 per cent
probability level. The income elasticity of demand for tea is about 1.0208 which
indicates that one per cent increase in per capita income would bring about 1.0208
per cent increase in the per capita consumption of tea measured in terms of quantity.
The coefficient associated with \( X_2 \) has a negative sign which is consistent
with the underlying economic theory but it is not significant at the accepted
probability level. The high standard error associated with this coefficient indicates
that less confidence is placed on its value. The value of this coefficient is \( -0.095 \)
which would mean that one per cent increase in price of tea would decrease its
consumption by .095 per cent. The low value of the price elasticity of demand
for tea is probably due to the fact that during 1951-68 a small proportion of
consumer’s income was spent on tea.

PAST AND FUTURE TRENDS IN PER CAPITA TEA CONSUMPTION

On a priori basis both income and price are equally important in determining
the future trend of consumption of tea. But the results of regression analysis

2. For assumptions underlying the theory of least squares, see J. Johnston: Econometric

3. Because of small number of observations, \( R^2 \) tends to over-estimate the true correlation.
In order to minimize this bias, the value of \( R^2 \) was adjusted and computed according to formula:

\[ \bar{R}^2 = 1 - (1 - R^2) \frac{n-1}{n-m} \]

where \( \bar{R}^2 \) is adjusted value of \( R^2 \), \( n \) is the number of observations, and \( m \) is the number of con-
stants in the estimated equation.
demonstrated that consumption responds significantly to changes in per capita real income alone. Therefore, the future trend of tea consumption in India will largely depend on real income which in turn would depend on the general economic development of the country. To estimate future tea consumption in India, the per capita income in the years 1971, 1976, 1981 has been taken as Rs. 328, Rs. 355 and Rs. 381 respectively.¹⁴

The results of the estimates in Table I indicate that the per capita consumption of tea in the country is likely to increase from 0.351 kg. in 1967 to 0.525 kg. in 1971 and from 0.57 kg. in 1976 to 0.615 kg. in 1981. This indicates that the per capita tea consumption in India would increase substantially in 1981 as compared to 1968.

**Table I—Per Capita Consumption of Tea During 1950-51 to 1967-68 and Projections for 1970-71, 1975-76 and 1980-81**

<table>
<thead>
<tr>
<th>Year</th>
<th>Per capita consumption of tea (kg.)</th>
<th>Year</th>
<th>Per capita consumption of tea (kg.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950-51</td>
<td>0.238</td>
<td>1961-62</td>
<td>0.1313</td>
</tr>
<tr>
<td>1951-52</td>
<td>0.263</td>
<td>1962-63</td>
<td>0.2650</td>
</tr>
<tr>
<td>1952-53</td>
<td>0.142</td>
<td>1963-64</td>
<td>0.2860</td>
</tr>
<tr>
<td>1953-54</td>
<td>0.216</td>
<td>1964-65</td>
<td>0.3570</td>
</tr>
<tr>
<td>1954-55</td>
<td>0.329</td>
<td>1965-66</td>
<td>0.3750</td>
</tr>
<tr>
<td>1955-56</td>
<td>0.176</td>
<td>1966-67</td>
<td>0.3170</td>
</tr>
<tr>
<td>1956-57</td>
<td>0.265</td>
<td>1967-68</td>
<td>0.3510</td>
</tr>
<tr>
<td>1957-58</td>
<td>0.195</td>
<td>1970-71</td>
<td>0.5254*</td>
</tr>
<tr>
<td>1958-59</td>
<td>0.262</td>
<td>1975-76</td>
<td>0.5707*</td>
</tr>
<tr>
<td>1959-60</td>
<td>0.302</td>
<td>1980-81</td>
<td>0.6155*</td>
</tr>
<tr>
<td>1960-61</td>
<td>0.262</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Projected figures.

**Conclusion**

Empirical evidence in this article reveals that income is a more important economic determinant of per capita tea consumption than its price. Further, consumption of tea on the basis of time-series data showed that it is likely to increase at a higher rate in future than in the past because of substantial increase in per capita income as a result of general economic development.