

Exportable Surplus and Domestic Consumption: A Case of Tea

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Introduction

A country's export performance may be explained by several factors associated with demand and supply forces. The existing literature has mainly focussed attention on two factors, namely external demand and relative export prices. The export supply which seems to be the major determinant of export performance in many developing countries, especially of densely populated countries with rapid growth of population, has been relatively neglected.

It appears that in India, rapidly increasing population and the consequently rising domestic demand for tea along with the slowly increasing production have been responsible for poor export performance of tea. In view of this, the present study is carried out with the following specific objectives :

1. to examine India's export performance of tea.
2. to identify the factors responsible for increasing domestic consumption of tea

India's export performance in respect of tea can be examined by looking at India's share in world tea exports over the past two decades. The poor export performance is evident from the fact that India's share in world tea exports declined from 36.6 percent in 1960-61 to 23.0 percent in 1978-79, while East Africa's share in world tea exports increased from 5.7 percent in 1960-61 to 18.2 percent in 1978-79 (see Table 1).

One of the major factors responsible for poor export performance of Indian tea may be the lack of export supplies. Export production ratio indicates the proportion of output which is exported. Table 1 (column 4) presents the export / production ratio of tea over the past two decades. It is clear from the table that export production ratio declined from 60.13 percent in 1960-61 to 30.11 percent in 1978-79. The declining export / production

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TABLE 1
India and East Africa's Share in World Tea Exports and Export
Production Ratio and Consumption of Tea

Year	India's share in World Tea Exports (%)	East Africa's share in World Tea Exports (%)	Export / Production ratio of Indian Tea	Consumption of Tea in India in '000' Metric Tonnes
1	2	3	4	5
1960-61	36.6	5.7	60.13	126.8
1965-66	33.2	6.9	54.42	162.8
1970-71	31.4	11.6	47.84	213.0
1971-72	32.1	11.7	44.22	222.0
1972-73	30.5	14.1	46.21	236.9
1973-74	27.0	14.7	40.06	260.0
1974-75	29.1	13.8	43.00	260.0
1975-76	29.3	14.0	44.78	272.0
1976-77	29.8	15.0	45.64	286.0
1977-78	28.8	15.9	41.27	300.0
1978-79	23.0	18.2	30.11	314.0

Source : Calculated from (A) *Tea Statistics*, Various Issues published by Tea Board of India (B) *Annual Bulletin of Tea Statistics*, Various Issues published by International Tea Committee.

ratio signifies that more of production is being diverted towards domestic consumption. This in turn shows high domestic demand pressure (see column 5, Table 1).

In order to examine the trend in export / output ratio for tea, in better way, a trend function has been fitted to the data from 1960-61 to 1978-79. The trend function is of the type :

$$X = A + Bt$$

where, X stands for export / output ratio for tea
t signifies the time variables

The estimated equation is as follows:

$$X = .624 - .0140t \quad R^2 = .7853$$

(-7.6521)

(Figures within bracket signify t value)

It is found that there is negative trend in export / output ratio for tea and it is statistically significant at 1 percent level of significance. R^2 is also significant at 1 percent level of significance.

It is obvious from export / output ratio of tea and trend fitted to it that less of production of tea is being exported and more of it is retained at home. In 1977-78 domestic consumption appropriated about 53.96 percent of domestic production whereas in 1960-61 consumption took only 39.53 percent of domestic production. Thus, in case of tea, India's capacity to export seemed to be greatly weakened by increase in domestic demand.

Supply Function of Tea

In some cases domestic consumption as well as production may operate as effective constraint on the supply of exports. To examine the joint effect of production and consumption on exports the following equation has been tried for the period from 1960-61 to 1978-79.

$$X = a + b(O + M + S - C) + C(E)$$

$$\text{or } X = a + b(q) + C(E)$$

where, X = quantum of exports of tea

O = output of tea

M = imports of tea

S = opening stocks of tea

C = consumption of tea

E = private final consumption expenditure of tea

Data on private final consumption expenditure at 1970-71 prices has been collected from *National Accounts Statistics* published by C.S.O. For all other variable information has been obtained from *Tea Statistics* published by Tea Board of India. The estimated equation is as follows:

$$X = 181.44 + .4238(q) - .0004(E)$$

$$(4.161) \quad (-2.927)$$

$$R^2 = .5744$$

As is obvious from the t values given in the brackets, that the estimated coefficient of exportable surplus (O + M + S - C) and private final consumption expenditure are significant at 1 percent level of significance.

It implies that if exportable surplus increases by one unit, quantum of tea exports will rise by .4238 units. And one unit increase in private final consumption expenditure will cause .0004 units reduction in tea exports. It signifies that exportable surplus is an effective constraint on tea exports and private final consumption expenditure adversely affects tea exports.

Domestic Consumption

In order to examine the influence of income, relative prices, population on consumption of tea in India, the following models have been used.

MODEL (1)

$$Y = a + b(p_1/p_2) + CX \quad \dots (1)$$

where, Y = aggregate consumption of tea in India
 P_1 = domestic price index
 P_2 = export price index
 X = national income of India at constant prices

MODEL (2)

$$Y = a + b(p) + CX \quad \dots (2)$$

Model (2) is similar to model (1) with one exception that price variable refers to domestic price of tea deflated by index of wholesale food prices.

Here p represents the domestic price of tea deflated by the index of wholesale food prices. Other variables are similar to those of model (1).

MODEL (3)

$$Y = a + b(p) + CX \quad \dots (3)$$

Y = per capita consumption of tea in India

X = per capita real income of India

p is as explained for model 2

Annual data has been used, for the period 1960-61 to 1977-78, both years inclusive. Data for exports of tea, consumption of tea, its domestic price is obtained from *Tea Statistics* published by Tea Board of India. Data regarding national income and wholesale price index of food articles has been collected from *Statistical Abstract* published by Central Statistical Organization and *Coffee Statistics* published by Coffee Board of India respectively. Information for export price index has been obtained from RBI's publication, *Report on Currency and Finance*. All the three models are in linear form.

Results (1), (2) and (3) are presented below:

$$Y = 104.7205 + .0009^* (P_1/P_2) + .0009^* X \quad \dots (1)$$

(18.5) (16.68)

$$R^2 = .9587$$

$$Y = -58.916 - .2352(p) + .0009^* X \quad \dots (2)$$

(-1.945) (15.929)

$$R^2 = .9559$$

$$Y = -.2164 - .0007(p) + .0011^* X \quad \dots (3)$$

(-2.367) (5.96)

$$R^2 = .9598$$

Figures in parentheses indicate t values.

* Signifies that coefficient is significant at 1 percent level of significance.

In model (1) R^2 is significant at 1 percent level of significance. Both income coefficient and relative price coefficient are also significant at 1 percent level of significance. It implies that both relative prices and real income affect significantly the consumption of tea in India but the values of estimated coefficients are very small.

In case of model (2) and (3) R^2 is significant at 1 percent level of significance. Income coefficient is also significant in both at 1 percent level of significance. Price coefficient is insignificant in model (2) and (3). It shows that real income affects the consumption of tea more than the domestic price variable.

In order to estimate income and price elasticities and to examine the influence of real income, prices and population on consumption of tea in India, models (1), (2) and (3) have been estimated in double log forms. The estimated models are as follows:

$$\log Y = -4.9720 + .8292^* \log (p_1/p_2) + .8057^* \log X \quad \dots (1')$$

(4.825) (4.633)

$$R^2 = .6181$$

$$\log Y = -11.877 - .1769 \log (p) + 1.0209^* \log X \quad \dots (2')$$

(-2.043) (12.584)

$$R^2 = .9350$$

$$\log Y = -9.7012 - .2472 \log (p) + 1.5464^* \log X \quad \dots (3')$$

(-2.35) (4.2955)

$$R^2 = .6406$$

Figures within the brackets indicate t values

* signify that estimated coefficients are significant at 1 percent level of significance.

In all of the three models R^2 is significant at 1 percent level of significance. Income coefficient is also significant in all at 1 percent level of significance. But price coefficient is significant only in case of model (1). This again signifies that income affects consumption of tea significantly.

Model (1) yields the income elasticity of demand equal to .8057, which implies that 1 percent increase in real income will cause .8057 percent increase in consumption of tea, keeping the effect of other variables constant. In case of models (2) and (3) this income elasticity has increased to 1.0209 and 1.5464 respectively. The high income elasticity of demand clearly indicates the strong pull exerted by domestic market on tea output. Moreover elasticity of demand with respect to per capita real income is higher than with respect to aggregate real income. This underlines the role of population in the rapidly increasing consumption of tea.

Conclusions

The study shows that India's share in world tea exports declined rapidly during the period 1960-61 to 1978-79. Export / production ratio for tea also declined sharply during the same period. The declining export / production ratio signifies that more of production is being diverted towards domestic consumption. The trend function analysis of export / output ratio revealed that in case of tea, India's capacity to export has been greatly weakened by increased domestic demand.

In order to examine the joint effect of production and consumption on exports, the supply function was estimated. The estimated coefficient of exportable surplus has been found to be statistically significant. This signifies that exportable surplus is an effective constraint on India's tea exports.

It is also found that domestic price of tea does not significantly affect consumption of tea in India. It is further revealed that increase in real income of the people results in significantly higher consumption of tea. Since elasticity of demand with respect to per capita real income is higher than with respect to aggregate real income, this underlines the role of population in the rapidly increasing consumption of tea. Thus the rapid growth of population and increase in real income are mainly responsible for increased domestic consumption of tea.

The policy implications which can be derived from this study are as follows :

1. If the Government of India wishes to increase tea exports, it must increase the exportable surplus of tea; and

2. Since population and real income have been found to be mainly responsible for increasing domestic consumption of tea in India, the growth rate of population must be slowed down in order to increase exportable surplus of tea.

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