



India's reform period and organised auctioning of Tea in Assam

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ABSTRACT

Perishability, nature of different variety of tea urges proper and timely marketing for minimizing the loss in producer's side and maximizing the benefit in consumer's side. Over the century, auction has served as a better price discovery mechanisms as well as media for marketing of bulk tea shrouded with transparency. However, significant change has emerged in the auction system in recent years when compared with the earlier century. The period of India's economic reform has brought changes in marketing of tea through GTAC but such changes has been less successful in revival of its performance in terms of price and quantity of tea sold their compared with earlier decade.

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INTRODUCTION

Substantial part of global trade has been shared by tropical plantation crop (tea, coffee, rubber) since past century. Countries cultivating such crops have enjoyed the advantage of large scale employment of labour force, foreign exchange earnings, widespread use of unproductive land, industrial raw materials, export etc. Most tea consumed outside East Asia nations is produced on large plantations in India or Sri Lanka, and is destined to be sold to large businesses. Tea production involves both agricultural and manufacturing stages. There are three general types of tea. Green or unfermented teas, black or fermented teas gain their robust color, semi-fermented or oolong brews tea's. It is essential that green and oolong teas be consumed young, as they eventually lose their clear, refreshing qualities. Black teas' shelf life proves considerably longer than that of green teas; stored in an airtight container, preferably in a cool, dark place (and away from foodstuffs possessing powerful aromas), a robust black tea can last up to a year (Etcheverry, 2011). Perish ability, nature of different varieties of tea urges proper and timely marketing for minimizing the loss in producer's side and maximizing the benefit in consumer's side. Over the century, auction has served as a better price discovery mechanisms as well as media for marketing of bulk tea shrouded with transparency. The public auction of tea in India have played key role in the primary marketing of tea ever since first auction in Calcutta in 1861. Further establishment of 6 major¹ auction centre and 1 minor² centre has strengthened the marketing channel. The auction system received a regulatory support in early 80s when Tea Marketing Control Order (TMCO) came into effect. Auction remained the primary channel for marketing of about 55 to 60 per cent of tea output as clause 17 of TMCO made it compulsory for

Indian tea producer to surrender 75 per cent of their output via auction centre. But marketing of tea via auction has declined substantially from the early part of present century. The withdrawal of 75 per cent of compulsion of tea marketing via auction in 2001 by amendment of clause 17 of TMCO has resulted sharp decline in the sale of tea via auction and rise in private sale of tea. The private sale of tea rose to 38 per cent during post 2001 which ranged between 15 to 20 per cent of Assam production prior to 2001 (Gogoi, 2007). However, the auction price remained a barometer for all private sale transactions. The removal of compulsion on enrooting of tea output via auction by amendment of Cause 17 of Tea Marketing Control Order (TMCO) has resulted significant decline in tea sold via Indian auctions. A study by F.A. Ferguson and Company identified the deficiency of Indian auction. The study stresses on reforming the auction system and liberalization of auction measures.

Rationale of the Study

The public auction system have played key role in the primary marketing of tea ever since its inception. Auction remained the primary channel for marketing of bulk tea shrouded with transparency. However, significant change has emerged in the auction system in recent years when compared with the earlier century. Several studies on marketing of tea have become available by now. However, there are very few attempts initiated in understanding the trends in the marketing of tea in Assam in general and GTAC in particular during India's economic reform period. Present study has made an attempt to highlight that area.

Review of Early Studies

Phukan (2007) outlined that over the century the public tea auction in India have played key role in the primary marketing of tea ever since first auction in Calcutta was done in 1861. Establishment of 6 major auction centres and 1 minor centre have strengthened the marketing channel. The auction system received a regulatory support in the early 1980s when Tea Marketing Control Order (TMCO) came into effect. Auction remained the primary channel for marketing of about

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¹ Kolkata, Guwahati, Siliguri, Cochin, Coonoor, Coimbatore. During 2004 Guwahati Tea Auction Centre (GTAC) ranked 3rd largest in the world and largest in India (Phukan, 2007).

² Amritsar where only green tea leaf are sold.

55 to 60 per cent of tea output as clause 17 of TMCO made it compulsory for Indian tea producer to surrender 75 per cent of their output via auction centre. But marketing of tea via auction has declined substantially in recent years. Withdrawal of 75 per cent compulsion of tea marketing via auction in 2001 by amendment of clause 17 of TMCO has resulted sharp decline in the sale of tea via auction and rise in private sale of tea. The private sale of tea rose to 38 per cent after 2001 which use to be 15-20 per cent of tea production in Assam before 2001. The auction price remained a barometer for all private sale transactions. Post-liberalisation period has registered a decrease in tea sold via auction centre compared with pre-liberalisation period. Baruah (2008) made an attempt to identify some internal problems associated with tea sector in the country. The sale of Assam tea through auction made an improvement in the pre reform period but registered a fall during reform period. Opening up of the Guwahati Tea Auction Centre (GTAC) in 1970 resulted impressive growth of auction sale of Assam tea through GTAC as Assam tea was diverted from Kolkata to Guwahati for sale. The sale of Assam tea through GTAC recorded positive growth during 1971-80 and 1981-90 has fallen significantly during 1991-2000. The study suggested that GTAC should implement measure to attract teas of Assam and neighbouring states which are sold through Siliguri and Kolkata auction, emphasis on e-auction can help attract South Indian tea in GTAC. Aggressive marketing of Indian (Assam) tea is necessary while establishment of a second auction centre either at Dibrugarh or at Jorhat could help better marketing of Assam tea.

Objectives of the Study

The present study has been undertaken with following objectives in mind;

- To study the growth of price and quantity of tea sold via auction centre at global, national and state level.
- To examine the supply response to price of tea sold via GTAC.
- To understand trends in the marketing of tea via GTAC during India's reform period.

Hypotheses

The hypotheses that have been formed for the proposed objectives are;

- Sale of tea via global, national and state level auctions has registered uneven growth during the study period.
- Supply of tea through GTAC is inelastic to the current price during the overall study period.
- Period of India's economic reform has favoured improved marketing of tea via GTAC.

2006-07. Selection of the period at global level has been constrained by non availability of reliable data on sale of tea via auctions of the world prior to 1980s. Macro data on quantity and price of tea sold via all the auctions of the India in total for the period 1970-2005 has been collected from Tea Digest, 2006-07 and Tea Statistics, 2004-05. Secondary data on quantity and price of tea sold via GTAC for the period 1971-2005 were collected from GTAC Year Book 2006-07 & various issues of Statistical Handbook of Assam. Besides obtaining the compound annual growth rate for the whole period (1970-2005), growth rates has been calculated for two sub-periods as pre reform period (1970-1991) and reform period (1992-2005) to understand the trend indicators of sale of tea via GTAC in Assam. To examine the influence of price on sale of tea through Indian auction and GTAC a lagged supply model has been estimated. Test of parametric instability has been applied for understanding the change in marketing behaviour during India's economic reform. The study also tested the significance of the improvement in quantity of tea sold through GTAC, average price of tea sold via GTAC during economic reform. The test statistic applied for measuring the improvement in average was *t* statistic for the difference of means.

Growth of Tea Sold via Auction Centre

Refer to table 1.1 reveals that quantity of tea sold via all the auctions of the world in total has increased from 696.46 million kg in 1980 to 1193.18 million kg in 2005 with a CAGR of 2 per cent annually during the 25 years period under observation. The quantity of tea sold via auction centre in Assam⁴ has increased at the rate of 5 per cent annually during the 35 years of study period (Table 1.3). There has been significant decline in the quantity of tea sold through GTAC since the last decade of past century compared with pre 90s. The CAGR⁵ of quantity of tea sold via auction centre in Assam has declined from 13 per cent per annum during 1971-91 to -2.19 per cent per annum during 1992-2005. Withdrawal of 75 per cent compulsion of tea marketing via auction in 2001 by amendment of clause 17 of Tea Marketing Control Order (TMCO) has resulted sharp decline in the sale of tea via auction and rise in private sale of tea (Phukan, 2007). The average price of tea sold via GTAC has grown at 8 per cent annually during the overall study period. The CAGR of average price of tea sold via GTAC which grown at 10.2 per cent annually during 1970-91 has registered a fall in growth rate of 3.14 per cent annually during 1992-2005. The low rate of increase in price of tea since the end of past century may be attributed to the competition in market. Recessionary trend in the price of tea globally due to availability of tea at competitive rate from emerging players such as Sri Lanka, Kenya, Indonesia, and Vietnam has also influenced Indian price to certain extent. In addition the growth rate of Indian tea consumption registered a fall in recent years which has compelled the producers to bring down the price level.

Table 1.1 Growth of Sale of Tea via Auctions of the World (1980-2005)

Year	Sale of Tea in Auctions of the World in Total (Million Kg)
1980	696.46
1990	964.571
2000	1096.4
2005	1193.18
CAGR (%)	2

Source: Authors own estimation based on the data's of Tea Digest 2006 – 2007, Tea Board of India

METHODOLOGY OF THE STUDY

Present study is based on macro information on time series data. Macro level data on quantity of tea sold in all the auctions of the world³ for the period 1980-2005 has been collected from Tea Digest,

³ The figures were arrived at post summation of the macro figures of sale of tea in Indian, Bangladesh, Sri Lanka, Indonesia, Kenya,

Limbe, London and Singapore auctions.

⁴ Guwahati Tea Auction Centre (GTAC) is the only auction centre of the state functioning since 1970.

⁵ Compound Annual Growth Rate (CAGR) estimated with $Y_t = Y_0 (1 + r)^t e^{u_t}$ (Gujarati et al., 2007)

Table 1.2. Growth of Tea Marketing in India

Year	Quantity sold in Auction (000' Kg)	Average Auction Price (Rupees/kg)
1970	241311	6.47
1980	306959	13.6
1990	482251	43.23
1991	501585	40.31
1992	448061	38.88
2000	507527	61.71
2005	510234	58.05
CAGR (%) (1970-1991)	3.87	9.23
CAGR (%) (1992-2005)	1	2.92
CAGR (%) (1970-2005)	1.97	7.49

Source: Authors own estimation based on the data's of Tea digest 2006 & 2007 & Tea Statistics 2004-2005, Tea Board of India.

Table 1.3. Growth of Marketing of Tea in Assam via GTAC

Year	Total Quantity of tea sold in GTAC (in Million Kg)	Average Price of tea sold through GTAC (Rupees/Kg)
CAGR (%) (1970-1991)	13	10.19
CAGR (%) (1992-2005)	-2.19	3.14
CAGR (%) (1971-2005)	5	8

Source: Authors own estimation based on the data's of GTAC Year Book 2006-07 & Various issues of Statistical Handbook of Assam.

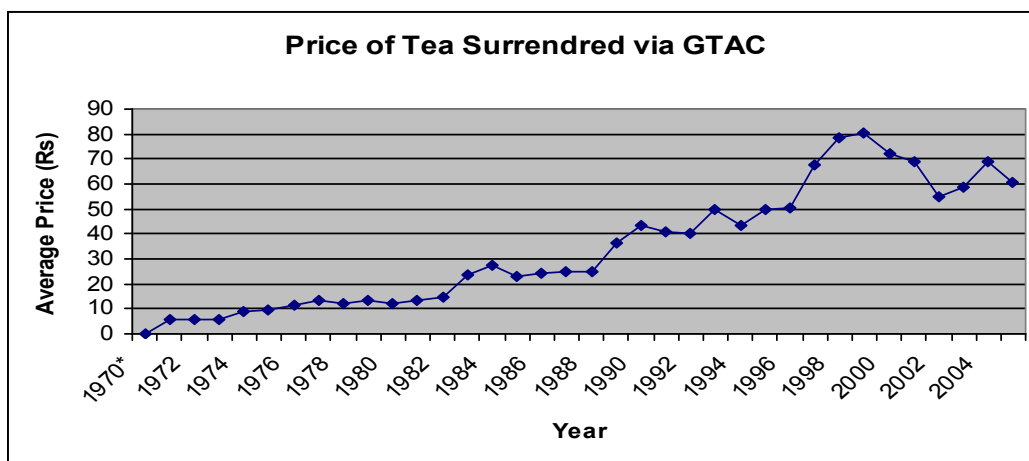


Figure 1.1

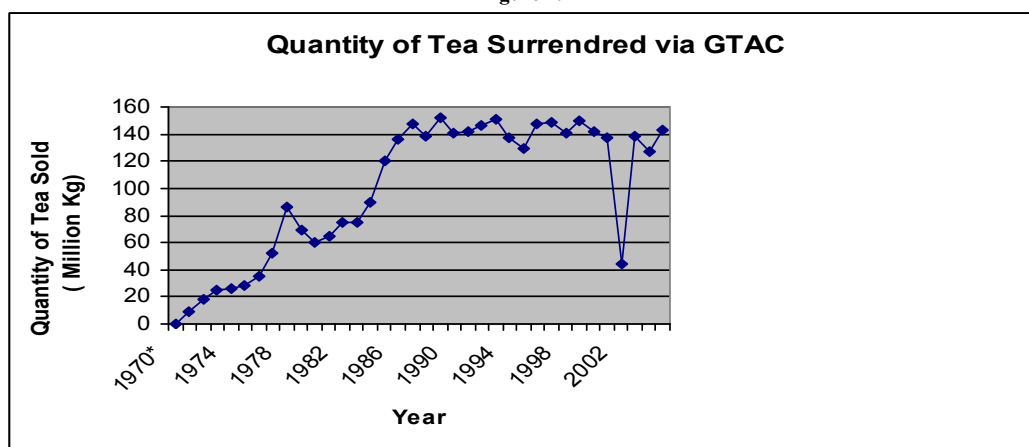


Figure 1.2

Decline in tea consumption in recent years may be attributed to increasing preference for soft drinks, other health drink amongst youth and young generations. The trends in price and quantity of tea sold via GTAC can be observed in Figure 1.1 and 1.2 respectively. It is doubtless that price of tea sold via GTAC has maintained a rising trend during 1970s till early 90s. But price of tea surrendered via GTAC experienced fluctuations in the late 90s with boom in business during the beginning of present century. However, the depressionary trend in the price of tea sold via GTAC began immediately after the boom period that is early 2000.

Thus considering the 35 years of study under observation it can be understood that for the 30 years of last century it made recovery in price level before enjoying boom in the business for a short span of time with depressionary trend beginning immediately at the post peak as reflected in Figure 1.1.

Auction centre has remained an attractive destination for the individuals undertaking business in tea in Assam for surrendering their output ever since the inception of GTAC in 1970. The quantity of tea sold via GTAC has maintained a continuously rising trend during 1970 till early 2000 before shrinkage during 2002 with an immediate recovery thereafter as observed in Figure 1.2.

Supply Response to Price of Tea Marketing through GTAC

To examine the influence of price on sale of tea through auction centre in Assam following distributed lag model has been fitted as in equation (1.1).

$$y_t = \alpha + \beta P_t + \gamma P_{t-1} + u_t \quad (1.1)$$

Where, y_t is the quantity of tea (Million Kg) sold through GTAC, α is constant intercept term, β is slope of current price (impact multiplier), γ is slope coefficient of previous period price, P_t is current price (Rupees) per Kg., P_{t-1} is price of previous period (Rupees) per Kg., u_t and is well behaved error term which accounted for other factors that influenced supply. Based on the data published by GTAC, 2006-2007 and figures of Directorate of Economics and Statistics, Government of Assam in Statistical Hand Book, various issues the results estimated for the equation (1.1) is presented in Table 1.4.

Table 1.4 Estimated Regression to Determine the Supply Response to Price

Period	Estimated Coefficient			R^2	Adjusted R^2	RSS	F statistic
	Constant	Current Price	Previous Year's Price				
1971-2005	52.6 (5.04)*	2.27 (2.48)**	-0.87 (-0.95)	0.54	0.51	33240	17.81*
1971-1991	11.85 -1.14	1.48 -1.07	2.46 -0.12	0.79	0.77	8650.5	31.85*
1992-2005	118.92 (2.91)**	1.62 -1.73	-1.41 (-1.69)	0.25	0.1	6881.7	1.69

F statistic underlying Chow Test : 11.02*

Figures in the parenthesis are the respective t values

* Significant at .01 per cent level, ** significant at .05 per cent level

$F_{3,29}$ critical at .01 per cent level is 4.56

Source: Authors own estimation based on the data's of GTAC Year Book 2006-07 & various issues of Statistical Handbook of Assam.

The results shows that coefficient of current year's price is statistically significant while lagged price has not been observed to be significant. So it may be understood that that current year's price adopted by GTAC is the significant factor that determine sale of tea in GTAC. Supply of tea via GTAC is elastic to the change in the current price of tea sold. Thus an unit change in current price of tea sold through GTAC increased the quantity sold via GTAC by 2.27 per cent during the study period 1971-2005. The result has been observed to be statistically significant at .05 per cent level. Thus it is a clear that the producers of tea in Assam decided to sell their output

only on the basis of current price. Judging from R^2 it can be observed that about 54 per cent variation in quantity of tea sold through GTAC is explained by the prices of current and previous period. The overall regression has been found to be highly significant for pre reform period and the overall study period. In order to examine if India's economic reform period affect supply behaviour of tea in Assam in response to price of tea sold via GTAC, two supply functions were estimated separately for the period before and after reforms. The estimated parameters have not been observed to be significant in each of the periods. One of the reasons may be the excessive dependence of Assam tea growers on GTAC for surrendering their output. As such GTAC has been flooded with supply of tea. In such situation price could not play a significant role on marketing decision due to the fear on the part of tea growers, of not selling their output. Another factor may be due to loss of degrees of freedom as we had used multiple regression models to determine the difference. However, the F statistic to test the significance of the regression is still significant in sub-periods. Such result enables us to adopt some suitable statistic to test the difference of their two regression equation. The test statistic adopted to test this difference is called the test of parameter instability (*Chow test*) which is defined as in equation 1.2.

$$F = \frac{(RSS_R - RSS_{UR}) \div k}{RSS_{UR} \div (n_1 + n_2 - 2k)} \quad (1.2)$$

Where,

RSS_R is restricted residual sum of squares.

RSS_{UR} is unrestricted residual sum of square.

n_1 is the 22 years pre reform period (1970-1991).

n_2 is the 14 years of reform period (1992-2005).

k is the number of independent observation or parameter in the equation. The F statistic underlying *Chow test* follows Sceneder's F statistic with $k, (n_1 + n_2 - 2k)$ degrees of freedom.

It can be observed from Table 1.4 that the F statistic underlying Chow test is significant at .01 per cent level. So, we may conclude that seller's behaviour of Assam tea sector significantly changed during India's economic reform period though we cannot say whether it has improved or not, which is discussed in the next section.

This is in line with the observations on price fluctuations as seen in figure 1.1 which revealed that there is more fluctuation during reform period compared with pre reform period.

Period of Economic Reform and marketing of tea via GTAC

To study the impact of economic reform on average annual quantity of tea sold through GTAC, average price of tea sold via GTAC a test statistic called t statistic to test the difference of means have been applied. The test statistic for measuring the significance of difference of means is defined as in equation 1.3.

$$t = \{ \bar{X}_1 - \bar{X}_2 \} \div \sqrt{s^2 \left(\frac{1}{n_1} + \frac{1}{n_2} \right)} \quad (1.3)$$

where,

$$\bar{X}_1 = 1/n_1 (\sum_i X_{1i})$$

$$\bar{X}_2 = 1/n_2 (\sum_j X_{2j})$$

$$s^2 = \{ \sum_i (X_{1i} - \bar{X}_1)^2 + \sum_j (X_{2j} - \bar{X}_2)^2 \} \div \{ n_1 + n_2 - 2 \}$$

s^2 is unbiased estimator of population variance.

\bar{X}_1 is the mean value of the variable for pre reform period.

\bar{X}_2 is the mean value of the variable for reform period.

n_1 is the 22 years pre reform period (1970-1991)

n_2 is the 14 years of reform period (1992-2005)

This statistic follows student t distribution with $(n_1 + n_2 - 2)$ degree of freedom. Using the data published by Directorate of Economics and Statistics, Government of Assam on various performance indicator of Assam tea industry are calculated by using t test of difference of means. The results of t statistic are reported in Table 1.5.

Table 1.5. Analysis of the Differences in Averages of Pre Reform and Reform Period

Time Period	Parameters	Quantity Sold through GTAC ('000 Kg)	Variables	
			Average Price Tea sold through GTAC (Rupees/Kg)	
Pre Reform Period (1970-1991)	Mean	80.54	18.786	
	Sum Sq. Dev.	46420	2536.4	
	Observations	21	21	
Reform Period (1992-2005)	Mean	134.6	60.294	
	Sum Sq. Dev.	9365	2129.8	
	Observations	14	14	
Overall Period (1970-2005)	Mean	102.2	35.389	
	Sum Sq. Dev.	80349	19138	
	Observations	35	35	
t statistic for difference of means		0.66	1.76**	

**Significant at .05 per cent level.

Source: Authors own estimation based on the data's of GTAC Year Book, 2006-2007 & various issues of Statistical Handbook of Assam.

The average quantity of tea sold through GTAC increased from 80.54 thousand kg in pre reform period to 134.6 thousand kg during reform period. The average price of tea sold through GTAC increased from Rs 18.79 per kg in pre reform period to Rs 60.29 per kg during the reform period. Therefore the result presented in table 1.5 revealed that there is an improvement in the averages quantity of tea sold through GTAC, average price of tea sold via GTAC during India's reform period compared with pre reform period. But such improvements has not been observed to be statistically significant except for average price of tea sold via GTAC as evident from the estimated t statistic underlying test of difference of means. Such increase is only due to trend variable not due to India's economic reform. So, it may be understood that period of India's economic reform has brought changes in marketing of tea through GTAC but such changes has been less successful in revival of its performance. Other studies have also claimed that the growth and performance of Indian agriculture has not shown any improvement during the reform period compared with pre reform period. Findings of [Bhalla and Singh \(2009-2010\)](#), [Parthasarathy \(2004\)](#) revealed that performance of Indian agriculture in terms of productivity, production and export has not shown any improvement during the reform period compared with pre reform period.

Conclusion

From the present study it can be inferred that from the last decade of the past century the price fluctuations in GTAC has increased compared with earlier decade's under observation. The economic set up of India has changed from planned economy to market controlled economy after initiation of structural adjustment process since early 90s which has paved the way for opening up of Indian economy. Under such a situation, price fluctuation has become natural due to

the operation of market forces which had been controlled by the Government in the decade before 90s. The quantity of tea sold via auction has maintained steady surge till early 90s before it dips during the beginning of the present century. However, the average price and quantity of tea sold via GTAC has not shown any improvement during the period of India's economic reform. The popularity of auction centre has declined in recent years due to powerful lobbies controlling marketing of tea, developing non transparency and hiding price fixation concept. The E-auction⁶ as introduced by Ministry of Commerce during December 2008 is expected to help the country in general and Assam in particular in better discovery of price by improving efficiency of auction in terms of transparency, time and cost saving between buyers and sellers, reducing problem of geographical barrier, increased participation and timely delivery.

The GTAC should implement measure to attract teas of Assam and neighbouring states which are sold through Siliguri and Kolkata auction; emphasis on e-auction can help in attracting South Indian tea in GTAC.

Aggressive marketing of Indian (Assam) tea is necessary while establishment of a second auction centre either at Dibrugarh or at Jorhat may be helpful in better marketing of Assam tea.

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