



ISSN 2278 – 0211 (Online)

ISSN 2278 – 7631 (Print)

Measuring Degree of Global Competitiveness: A Case on World Tea Industry

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Abstract:

Globalization and competitiveness, compressed the world in a borderless society. Degree of competitiveness helps to examine the present status and future prospects of an industry. This article is an attempt to measure the extent of global competitiveness in

world tea industry. Roy (2006) the formula $(1 - \sqrt{\sum M_i^2})$ for degree of competition is applied where M_i is the market share of each individual nation in global tea production, i ranging from 1 to k . For each year we can calculate one such measure, generating there by a time series ata . Based on time series analysis one can indicate the past trend and future direction. The position of India has also been indicted along with top ten nations.

Key words: *Global competitiveness, world tea production, market share, trend analysis, degree of competitiveness*

1. Introduction

Globalization is the word that has come to dominate the world since the nineties of the last century. It has brought in new opportunities to developing countries through greater access to developed country markets and technology transfer, hold out promise improved productivity and higher living standard. But globalization has also thrown up new challenges like growing inequality across and within nations, volatility in financial market and environmental deteriorations. Globalization and trade liberalization coupled with easy flow of information and advancement in communications technology have resulted in an unprecedented intensification of market competition worldwide. With this backdrop, Porter (1998) has commented that competitiveness has become a “central preoccupation of both developed and developing countries in an increasingly open and integrated world economy”. He stressed upon the nations, countries and firms to urgency of strengthening competence of handle the resultant threats. According to (Haider, 2007), meaning, implication, adaptation and achievement of competitiveness may vary from firm to firm, industry to industry and nation to nation across the world. According to Global Competitiveness Report 2010-2012, there are multiple challenges to the global economy and a continuing shift in the balance of economic activity away from advanced economies toward emerging markets. Policymakers are struggling to find ways to manage the present economic challenges and preparing their economies to perform well in an increasingly complex global landscape. Switzerland is the leading country and is followed by Singapore, Sweden, Finland, United States, Germany, Netherland, Denmark, Japan and United Kingdom. Japan remains the second-ranked Asian economy at 9th place, despite falling three places since last year.

According to the Global Competitive Index (GCI), India’s rank falls from (48th - 59th) position from the year 2007-2008 to 2012-13. GCI is constructed based on 12 sub measures of competitiveness. It provides with a comprehensive portray of the competitiveness landscape for countries around the world at all stages of development. The sub measures are institution, infrastructure, macroeconomic stability, health and primary education, higher education and training; goods market efficiency, labour market efficiency, financial market sophistication, technological readiness, market size, business sophistication and innovation.

In this article we have selected tea industry to analyze its global competitiveness.

Tea was discovered by one of Chinese emperor in 2737 B.C. He had a habit of drinking boil water. So, one day when he was drinking boil water in his garden, a tea leaves fell in to his cup. After drinking the boil water with the tea leaves, he found himself energetic. Then he gave ordered to plant more tea trees in his garden. And this tradition of drinking boil water with fresh tea leaves spread quickly in china. In 6th century AD Chinese called tea as “Kia”, then it changed in to “Cha”. When it arrived in the west, it becomes Tea, which is still the name for tea in many countries.

How tea is prepared also varies by market and region. The tea industry has a small number of products that compete with “cold and sweet” and “ready-to-drink” beverages. In the United States, companies offer bottled and canned iced tea, usually sweetened and flavored. In East Asia, both hot and cold tea is available from vending machines that mix a tea essence with water. In both cases, marketers are targeting young adults, many of whose parents do not drink infusions and who must be introduced to tea for the first time. Rising health consciousness is also conditioning the market for tea. Tea preparation involves boiling water and so purges pathogens normal to tap water in many countries, and antioxidants in tea (flavonoids) might play a role in cancer prevention. In addition, the recent “Rotterdam Study” found that drinking tea may reduce the risk of arteriosclerosis and another study by Boston University School of Medicine concluded that drinking up to four cups of black tea per day improved blood vessel function in those suffering from coronary artery disease

1.1. Global Tea Scenario

Tea is the most popular beverage throughout the world. More than 30 countries are now involved in the production of tea. Among them India , China ,Indonesia ,Sri Lanka and Kenya are the five major player producing more than 75% of total world production and around 80% of global export. The estimated global tea production is around 3800 million kg and global consumption is around 3700 million kg. On average, human beings consume about 176 liters per year of purchased beverages; in the United States annual per capita consumption is climbing to 650 liters. Tea represents 21 percent of worldwide human consumption of purchased beverages. The remaining 78 percent consist of milk (20 percent), carbonated beverages (17 percent), beer (14 percent), and coffee (11 percent) with bottled water, juices, sports and energy drinks, wine, and spirits making up the balance. Tea being an agricultural product there is always fluctuation in its production.

Tea is the principal beverage in Asia, the Commonwealth of Independent States (CIS), the Middle East, North Africa, and is also drunk widely in developed British Commonwealth countries—Australia, New Zealand, the United Kingdom, and, to a lesser extent, Canada. Coffee is preferred in the United States, Western Europe, and Latin America. Teas and coffees in these markets vary widely in price and quality, with some used as a quick, inexpensive stimulus and others as premium brew for special occasions.

Across various countries the per capita consumption of tea is different. In Ireland it is more than 2 kg, around 1 kg in Sri Lanka and it is 800gm (approx.) in India. The per capita consumption in India is less but due to high population, the total consumption is largest. From year 1998 to 2007 the production of black tea declined but the production of green tea increased because of huge expansion in China because drinking green tea can reduce the risk of cancer.

1.2. India Tea Scenario

In India the commercial cultivation of tea started in year 1839 in Assam then it was extended in to other parts of the country in 50s and 60s of the 19th century. Tea industry has a significant role in the economy of India. It employing more than 3.5 million people across the country. Indian tea industry produces 30% of world’s annual output. Domestic demand is estimated at over 850 million kgs in 2011. 85% of the country’s output consumed within the country. Tea is produced in 14 states in India ,among them Assam and west Bengal in north India and Tamil Nadu , Kerala, Karnataka in south India produce over 98% of total India’s tea production .

In India, plantations account for 0.8 per cent of the total cultivable land. They also contribute 5 per cent to the national income in agriculture. Besides they provide more employment per rupee of investment in the country than either agriculture or in industry. Plantation industry employs a large amount of labour force especially women workers which are highest compared to any industry. Moreover, this industry helps in the development of other industries. Among the different plantation crops, tea is considered to be the most important crop in our country. It is the second biggest foreign exchange earner and is exported to about 80 countries. It also contributes a sizeable amount to the national income. Moreover, it provides direct gainful employment to a large number of people and helps in providing indirect employment in various sectors like road construction, transportation, building of warehouses, manufacture of plywood tea chest, aluminium foil, tinsplate, metal fittings, paper, card board, fertilizers, insecticides, pesticides, coal, iron, steel, etc. Apart from its contribution to the economy of India, tea today provides to the common man a pleasant and stimulating non-alcoholic beverage.

2. The Objective of the Study

The global picture of tea industry can help us to know the position of Indian tea industry with respect to its global competitors. The objective of this paper is therefore to measure the global competition among the tea producing countries from 2002 to 2011 and to know the position and performance of India on global platform. This will also help to analyze whether it maintains the same trend or not.

3. Methodology of the Study

The methodology adopted for carrying out the present study divided in to broad headings like period of the study, scope of the study and techniques used for the study.

3.1. Period of the Study

The period from 2002- 2011 has been selected depending on the availability of secondary data, information.

3.2. Scope of the Study

This study will help students, researchers, economists and other company planner to carry out their research work. It will also help them to know about global competitiveness and to calculate global competitiveness in their respective field.

3.3. Techniques Used For Analysis

The analysis deals with descriptive analysis and statistical analysis. The statistical analysis is to find out the trend in degree of competition among the global competing countries in the production of tea. The corresponding hypothesis follows the null hypothesis H_0 that there is no increase in the global competition in the production of tea against the alternative hypothesis H_a that there is increase or decrease in the same.

To find out the global competitiveness, we have calculate market share of each country every year. Then Roy (2006), the formula for degree of competition $(1 - \sqrt{\sum M_i^2})$ applied. Where M_i is the market share of each country in global tea production.

We have taken the data from year 2002 to 2011 of top ten countries. They are China, India, Kenya, Sri Lanka, Indonesia, Turkey, Vietnam, Bangladesh, Malawi, Uganda and Tanzania, then we have proceeded by calculating their market share. Next calculated squares of these individual market shares for a particular year and then added those squares to get $\sum m_i^2$ for that year. The entire process can be repeated for obtaining $\sum m_i^2$ for all the years. Next, we have calculated the value of $(1 - \sqrt{\sum m_i^2})$ to obtain the degree of competition for all the years. At last trend line is drawn by taking the competitiveness index of every year.

4. Descriptive Analysis

- **India:** The production of India increased from 848.2 M kgs. In 2002 to 988.33 M kgs in 2011 but the market share of India is decreasing. In 2002 it was 0.3111, but in 2011 it was 0.23.
- **China:** The production of China increased from 605.7 M kgs in 2002 to 1623.21 M kgs in 2011. The market share of China is in an increasing trend, from 0.2221 in 2002 to 0.378 in 2011.
- **Kenya:** Production of Kenya was 293.4 M kgs in 2002 and it increased to 377.91 M kgs in 2011 but the market share is decreasing.
- **Sri Lanka:** The production of Sri Lanka is increasing from 303.9 M kgs unit in 2002 to 328.63 M kgs in 2011 but its market share is decreasing.
- **Indonesia:** The production of Indonesia is in an increasing trend from 169.6 M kg to 178 M kgs from 2002 to 2011 but the market share is decreasing from 0.0622 to 0.041.
- **Turkey:** The production of Turkey is decreasing from 149.3 M kgs to 145 M kgs in 2002 to 2011. The market share is also decreasing.
- **Vietnam:** The production of Vietnam is increasing from 83.7 M kgs in 2002 to 119.65 M kgs in 2011 but the market share is decreasing.
- **Bangladesh:** The production of Bangladesh is increasing from 55.8 M kgs in 2002 to 59.32 M kgs in 2011. Market share is also decreasing from 0.025 to 0.014.
- **Malawi:** The production unit of Malawi is increasing from 40.8 M kgs in 2002 to 47.06 in 2011 but the market share is decreasing from 0.015 to 0.011.
- **Uganda and Tanzania:** The production of both Uganda and Tanzania are increasing from 2002 to 2011. There is a little increase in market share of Uganda from 2002 to 2011 but the market share of Tanzania is decreasing.

Production in M Kgms	Year	Rank	Year	Rank	Year	Rank	Year	Rank	Year	Rank	Year	Rank	Year	Rank	Year	Rank	Year	Rank	Year	Rank
COUNTRY	2002		2003		2004		2005		2006		2007		2008		2009		2010		2011	
China	605.7	2	631	2	854	2	956.3	1	1047.4	1	1140	1	1257.6	1	1358	1	1475.06	1	1623.21	1
India	848.2	1	839.5	1	895.9	1	919.4	2	954.3	2	986	2	980.82	2	979	2	966.4	2	988.33	2
Kenya	293.4	4	295.9	4	328.8	3	332.7	3	313	3	369.61	3	345.82	3	314	3	399.01	3	377.91	3
Sri Lanka	303.9	3	304.8	3	309.1	4	317.2	4	312	4	304.61	4	318.7	4	289.78	4	331.43	4	328.63	4
Indonesia	169.6	5	163	5	139	6	165.9	6	187.9	6	148.27	6	166.38	5	175	5	170	5	178	5
Turkey	149.3	6	155	6	205	5	205.6	5	200.1	5	178	5	155	6	153	6	148	6	145	6
Vietnam	83.7	7	90	7	93.9	7	104	7	133	7	137.25	7	137.5	7	136.48	7	129.2	7	119.65	7
Bangladesh	55.8	8	88.6	8	55.6	8	56	8	53.4	8	58.42	8	58.66	8	60	8	59.27	8	59.32	8
Malawi	40.8	9	41.7	9	50.1	9	46.9	9	45	9	48.14	9	41.64	9	52.56	9	51.59	9	47.06	9
Uganda	34.5	10	36.5	10	37	10	37.7	10	36.7	10	44.91	10	42.75	10	50.58	10	59.14	10	54.18	10
Tanzania	27.2	11	29.5	11	30.7	11	30.4	11	31.4	11	34.86	11	31.61	11	32.69	11	31.65	11	32.78	11
Others	114.7		115.1		120.8		118.9		113.4		345.58		328.31		342.65		349.45		345.15	
World	2726.8		2790.6		3119.9		3291		3427.6		3795.65		3864.79		3943.74		4170.2		4299.22	

Table 1: Production of Tea from Year 2002 to 2011-Unit-In M Kgs.

Source: Tea Board

COUNTRY	2002		2003		2004		2005		2006		2007		2008		2009		2010		2011		
	Mi2002	M20022	M2003	M20032	Mi2004	M20042	Mi2005	M20052	Mi2006	M20062	Mi2007	M20072	Mi2008	M20082	Mi2009	M20092	Mi2010	M20102	Mi2011	M20112	
China	0.22	0.049	0.226	0.051	0.274	0.075	0.290	0.084	0.310	0.096	0.300	0.090	0.325	0.106	0.344	0.118	0.350	0.123	0.378	0.143	
India	0.311	0.097	0.301	0.091	0.287	0.082	0.280	0.078	0.280	0.078	0.260	0.068	0.254	0.065	0.248	0.062	0.230	0.053	0.230	0.053	
Kenya	0.108	0.012	0.106	0.011	0.105	0.011	0.100	0.010	0.090	0.008	0.097	0.009	0.089	0.008	0.080	0.006	0.100	0.010	0.088	0.008	
Sri Lanka	0.111	0.012	0.109	0.012	0.099	0.010	0.100	0.010	0.090	0.008	0.080	0.006	0.082	0.007	0.073	0.005	0.080	0.006	0.076	0.006	
Indonesia	0.062	0.004	0.058	0.003	0.045	0.002	0.050	0.003	0.050	0.003	0.039	0.002	0.043	0.002	0.040	0.002	0.040	0.002	0.041	0.002	
Turkey	0.055	0.003	0.056	0.003	0.066	0.004	0.060	0.004	0.060	0.004	0.047	0.002	0.040	0.002	0.039	0.002	0.040	0.002	0.034	0.001	
Vietnam	0.031	0.001	0.032	0.001	0.030	0.001	0.030	0.001	0.040	0.002	0.036	0.001	0.036	0.001	0.035	0.001	0.030	0.001	0.028	0.001	
Bangladesh	0.021	0.000	0.032	0.001	0.018	0.000	0.020	0.000	0.020	0.000	0.015	0.000	0.015	0.000	0.005	0.000	0.000	0.000	0.004	0.000	
Malawi	0.015	0.000	0.015	0.000	0.016	0.000	0.010	0.000	0.010	0.000	0.013	0.000	0.011	0.000	0.003	0.000	0.000	0.000	0.001	0.000	
Uganda	0.013	0.000	0.013	0.000	0.012	0.000	0.010	0.000	0.010	0.000	0.012	0.000	0.012	0.000	0.003	0.000	0.000	0.000	0.003	0.000	
Tanzania	0.010	0.000	0.011	0.000	0.010	0.000	0.010	0.000	0.010	0.000	0.009	0.000	0.008	0.000	0.008	0.000	0.000	0.000	0.007	0.000	
Others	0.042	0.002	0.041	0.002	0.039	0.002	0.030	0.001	0.030	0.001	0.029	0.0008	0.0285	0.0007	0.0288	0.0008	0.0280	0.0008	0.0280	0.0006	
World	1	0.575	1	0.581	1	0.5665	1	0.5629	1	0.5528	1	0.567	1	0.5558	1	0.5476	1	0.548	1	0.5311	

Table 2: Showing the Market Share and Square Of Market Share

Year	Degree of Global Competitiveness of Tea production
	$1 - \sqrt{\sum M_i^2}$
2002	0.575
2003	0.581
2004	0.5665
2005	0.5629
2006	0.5528
2007	0.567
2008	0.5558
2009	0.5476
2010	0.548
2011	0.5311

Table 3: The Degree of Global Competitiveness ($1 - \sqrt{\sum M_i^2}$), In The Global Tea Production from Year 2002 To 2011

The above figures is plotted below and shown in the graph 1

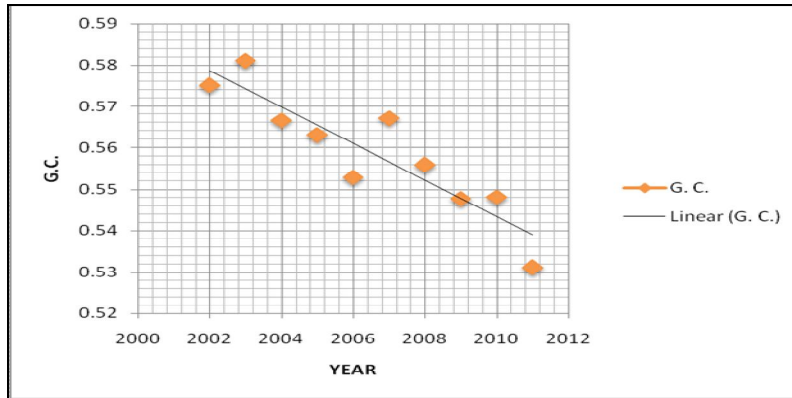


Figure 1: Graph for the Degree of Global Competition Along With the Trend Line

5. Statistical Analysis

The original time series data set on global tea production have used to study the time series analysis from 2002 to 2011. In Table 2 we have calculated the M_i^2 where i varies from 2002 to 2011. To examine the trend of competition over the years for detecting any change in the degree of competition in global tea production, we would like to plot the values of $(1-\sqrt{\sum M_i^2})$ over the years, which can be observed in Table 3.

In view of Figure 1, we propose to go for linear regression analysis. We shall consider the hypothesis H_0 as null hypothesis that there is no change in the degree of global competition in steel production over the years against H_a as alternative hypothesis that there is an increase or decrease in the same over the years.

Let the linear trend equation of Global Competitiveness of tea producing countries be represented by

$$G_t = a + b t + \epsilon_t \tag{1}$$

Where G_t is the global competitiveness during the period t , a and b are the regression parameters, t is the time variable, and ϵ_t is the error term. Using the least square method one can estimate a and b using time series data from Table 3.

The corresponding analysis is presented below

Model Summary			
R	R Square	Adjusted R Square	Std. Error of the Estimate
.906	.822	.799	.007

Table 4

ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Regression	.002	1	.002	36.858	.000
Residual	.000	8	.000		
Total	.002	9			

Table 5

Coefficients					
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Case Sequence	-.004	.001	-.906	-6.071	.000
(Constant)	.583	.005		129.348	.000

Table 6

The estimated value of a and b are \hat{a} and \hat{b} . Here \hat{a} is .583 and \hat{b} is -.004. Therefore the estimated regression line observed is

$$G_t = .583 - .004 t + \varepsilon_t, \quad (2)$$

To examine the significance of b value, the regression coefficient of this linear regression curve, we like to test the null hypothesis, $h_0: b = 0$ against the alternative hypothesis that b is greater or lesser than zero, i.e. $h_a: b > 0$ or $h_a: b < 0$. The observed value of t is -6.071 , with a tail probability of .000, which is less than .05. Hence rejecting the null hypothesis at 5% level of significance i.e. the global competitiveness of world tea production is "significantly decreasing over time" as the coefficient of time is negative. The multiple correlation coefficient, i.e. r value, is 0.906 which is also on the higher side. The corresponding analysis of variance table provides with f ratio as 36.858 for which the upper tail probability is 0.000, which is less than 5% level of significance. So, we conclude that, the linearly decreasing trend equation is a good fit for the said problem.

6. Conclusion

Thus, we finally conclude that the global competition for tea production is decreasing over the years, whereas, the market share of India is also decreasing. This indicates an threat for Indian Tea Estates.

Among the top ten producing countries of global tea production the market shares of only China is favorable compared to other nine countries. India is one of those countries whose market share is decreasing. The performance of India is also is not upto the mark in the years 2002, 2003, and in 2004.

Though India in 2005, as a part of turnaround strategy has started promoting and re-positioning the product by promoting "Made In India" tag in the world tea market as a part of initiatives to augment the Indian tea exports. Chai Piyo, Mast Jiyo (drink tea, enjoy life) is the new USP to hold back the declining home consumption highlighting tea as healthy refreshing drink. Unlike now, a decade back tea exports from India were doing fairly well in the world tea market, with India as the largest producer and exporter of tea. But the last two years output declined drastically, and the exports dropped. Indeed, the situation is appalling.

While the world tea output & trade has grown multifold, the Indian production and exports have been experiencing the spectral downfall. There have been falling prices, reduced exports and sluggish consumption growth at home. Long gestation period and ROI spread over a time of minimum 5 years, high labour costs accounting for nearly 60% of tea production and, climatic changes critically affecting demand-supply imbalances, have led to these causes.

The problem just does not end here. Surging competition from countries like Kenya, Indonesia, Vietnam & Turkey is also on all time high, which has further weakened Indian exports without affecting much the world tea market, or missing out on India as a leading source for quality tea. Primarily, the cause which is making dent in Rs. 10,000 crore-tea industry of India has deep roots in its micro-environment.

So, overall it is a great threat to Indian tea industry as China is doing well and degree of competition is decreasing over the years. It is now the responsibility of government to take more steps to increase the production.

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