

Question Paper

Security Analysis - II (212) : January 2007

Section D : Case Study (50 Marks)

- This section consists of questions with serial number 1 - 4.
- Answer all questions.
- Marks are indicated against each question.
- Do not spend more than 80 - 90 minutes on Section D.

Case Study

Read the case carefully and answer the following questions:

Perform the Michael Porter analysis of the Indian Tea Industry.

(10 marks) [< Answer](#)

Perform SWOT analysis of Tata Tea Ltd.

(8 marks) [< Answer](#)

Mr. Resham, a Chartered Financial Analyst, has opined that the company can be valued using the following two approaches.

Approach-I : Dividend Discount Model.

Approach-II: Relative Valuation Model based on the following parameters:

Parameters	Weight
Price to Sales Ratio	0.30
Price to Earning Ratio	0.35
Price to Total Assets Ratio	0.35

Calculate the value per share of Tata Tea Ltd. based on both the approaches given by Mr. Resham and comment on the same.

(22 marks) [< Answer](#)

Being a technical Analyst, analyse the points A, B, C, D and E given in the charts and suggest the strategy to be adopted along with the comments for each point.

(10 marks) [< Answer](#)

History of Tea in India

Early 19th century saw the discovery of tea in India and hence the birth of the tea industry.

The Singpo tribals in Assam made a drink from a wild bush that was later discovered as tea plants. Tea in those days was brewed by the Burmese method that involved pickling of leaves. Robert Bruce, a Scot who was commissioned in the Rangpur district of Assam by the British army noticed this popular drink among the Singpo tribals. Events took a turn when the Burmese war broke out. Subsequently, Robert Bruce also died. His mission to popularise the drink remained incomplete. His brother Charles Bruce managed to get some seeds of the tea plant from the Singpo chief. He sowed them at his home garden in Assam. Samples of this tea plant were sent to the Botanical Garden in Kolkata. Research showed that this plant was from the same family as the tea plants in China. Chinese tea was a popular beverage by this period as China was an established tea grower. So long experiments were on in India with seeds from Chinese tea plants. But they were not successful in Assam or other parts of North East India. However, these seeds subsequently grew well in Darjeeling.

In 1834, a committee was appointed by Lord Bentinck, the then Governor General of India. He wanted to introduce tea culture in India. Based on the report of this committee, the British government sent a scientific commission to Assam to study more on this indigenous plant and also find out the most suitable place for growing it. The first sample of manufactured tea in Assam was ready in 1837. The next year, the first shipment of 8 chests of Indian tea was sent to England. When Sibsagar and Lakhimpur districts came under the British administration in 1839, it paved way for private enterprises to get into the tea industry.

business. A number of private entrepreneurs approached the British government both in London and Kolkata for transfer of plantation to them. In fact, the first attempt to compete with the British was made by Maniram Dewan. The world's first tea company was formed in 1839 with Dwarakanath Tagore and grandfather of Nobel Laureate Rabindranath Tagore as one of its directors.

Companies formed in Kolkata and London in 1839 were brought under a common umbrella called the Assam Company. The Jorhat tea company was incorporated in June 29, 1859, which had its garden in Assam. In the early 1860s, Rameswar Barua started 6 gardens in Sibsagar district of Assam, which were subsequently sold off to the British during the economic recession in 1866.

In 1856, tea plantations had started in Darjeeling and Cachar, along with gardens in Terai in 1862 and in the Dooars in 1874. However before 1856, cultivation of tea was started at the foot of Western Himalayas in Dehra Dun and Kangra. Tea was also reported to be growing in Nilgiri Hills in South India. This plant was found similar to the ones growing in Assam. However, tea was made to grow on a commercial scale only in 1854. The tea plant was found in the Carnat and Travancore areas too. Statistics have shown that in 1893 the area under tea was estimated around 1200 hectares in Nilgiris, 100 hectares in Coimbatore, 130 hectares in high range Kerala and 2000 hectares in the rest of Travancore. Today, India has 39,700 tea estates (32,000 in the south and 6,700 in the north) and a tea-producing workforce of more than a million people. Little did the Singpo tribals know that the plant that was wildly growing in Assam would play a major role in the economy of India today with India being the largest producer of tea globally.

Source: Tea Board of India

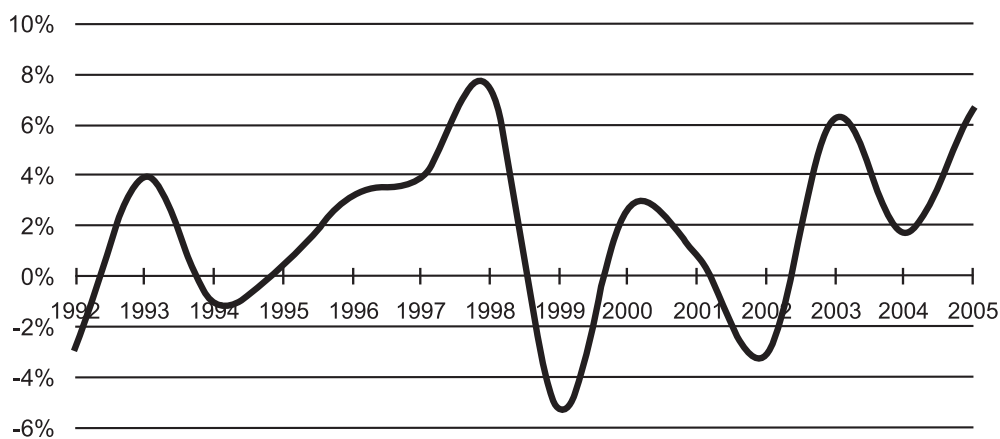
Indian Tea Industry

The tea industry has an important and special place in the Indian economy. Tea is the country's primary beverage (almost 85% of total households in the country buy tea), which makes India the largest consumer of tea in the world accounting for 27% of the world tea consumption. India's expenditure on beverages and processed foods accounts for 8% of food expenditure in rural areas, and 15% in urban areas. India is also the largest manufacturer of tea in the world (28% of world production) and an important exporter (13% of world exports). The industry's exports contributed approximately Rs.17.84 billion to the country's foreign exchange kitty in FY2005, accounting for 0.5% of India's exports. In terms of employment, it is the second largest industry by employing more than a million people directly and 2 million people indirectly, of which 50% are women. The last fact is particularly important when we consider that the tea industry, to a large extent, drives the economies of the regions where the tea gardens are concentrated, for example Assam.

Volatility

The industry's output is affected by the variables that affect all agri-commodities i.e. rainfall and temperature. These can cause the quality of the raw material, the green leaf, to change from season to season. Although the industry has processes aimed at reducing the element of variability and can to a significant extent control the quality of the final product, it cannot exercise complete control over the same. Despite being exposed to vagaries of nature, the industry seems to have stabilized in terms of production (see chart below), and minor year to year changes notwithstanding.

Growth in India's Tea Production



Source: www.icra

unlike other commodities, tea price cycles have no linkage with the general economic cycles, but with agroclimatic conditions. A recent study by The Food and Agriculture Organisation (FAO) indicated that, of the 27 agricultural commodities studied, tea showed the second lowest variability in prices. Consistent increase in tea production has led to a global oversupply position, which had caused the prices to decline. However, in 2004 and 2005, prices have improved. The FAO Composite price, as a world price indicator for tea, increased by 2% in 2004, reflecting the significant gains in the Calcutta and Mombasa auctions. Prices in 2004 opened at US\$1.56 per kg in January and after increasing to US\$1.65 per kg in April declined to US\$1.56 per kg in June, before surging to US\$1.77 per kg in September and closing at US \$1.73 per kg in December. This volatility reflected fluctuations in tea output in major producing countries in 2004 and improvement on the demand side which eased the supply pressure on prices. The increases were quite significant in local currencies as local

currencies of major tea producing countries have depreciated against the US dollar. During 2005, FAO Tea Composite Price increased slightly by about 0.3% during January-September 2005, compared to the same period in 2004, despite a reported rise in output in major producing countries. The slow increase in prices was mainly because of an expected increase in world tea production, which is estimated to have reached an all-time high. Slightly higher tea prices are also due to steady demand in major importing countries, such as Pakistan, Russia, Ukraine, South Africa, and Turkey. In India, average tea prices increased during December 2005, before declining in January-March 2006.

Tea Production during June 2005 and June 2006 (In million kg)

States	During June			January - June		
	2006	2005	(+) or (-)	2006	2005	(+) or (-)
Assam	57.89	50.86	7.03	150.00	146.70	3.3
West Bengal	22.77	23.22	(-) 0.45	63.62	68.66	(-) 5.04
Others	0.82	0.76	0.06	1.76	1.67	0.09
Total North India	81.48	74.84	6.64	215.38	217.03	(-) 1.65
Tamil Nadu	15.98	18.39	(-) 2.41	74.82	82.27	(-) 7.45
Kerala	6.36	5.49	0.87	35.54	36.54	(-) 1
Karnataka	0.51	0.49	0.02	2.48	2.67	(-) 0.19
Total South India	22.85	24.37	(-) 1.52	112.84	121.48	(-) 8.64
All India	104.33	99.21	5.12	328.22	338.51	(-) 10.29

Source: Tea Board of India

Exports from January to June (Qty in million kg, value in Rs. Crores)

Particulars	Quantity		Value		Unit price (Rs/kg)	
	2006	2005	2006	2005	2006	2005
North India	26.34	35.04	322.14	430.47	122.31	122.85
South India	52.73	45.54	343.21	325.31	65.09	71.44
All India	79.07	80.58	665.35	755.78	84.15	93.80

Source: Tea Board of India

Tea Price Situation:

The average price of tea sold at Indian auctions during January to June 2006 was higher by 8.26 % as compared to the same period in 2005. The average price in North and South Indian auction centers was higher by 10.28 % and 7.57 % respectively during January - June 2006 as compared to the corresponding period in 2005.

Prices of all tea at different Indian auctions

(Quantity in '000 Kg, Price in Rs/ kg)

Auction centers	January to June				Increase (+) or decrease (-) 2006 over 2005
	2006		2005		
	Quantity	Price	Quantity	Price	Price
Kolkata	42513	74.58	53393	68.12	6.46
Guwahati	36345	67.26	43815	60.70	6.56
Siliguri	27525	65.93	33377	59.17	6.76
Jalpaiguri	73	65.03	333	58.54	6.49
North India	106456	69.84	130918	63.33	6.51
Cochin	29751	52.48	31772	50.76	1.72
Coonoor	17619	46.72	19367	40.55	6.17
Coimbatore	10580	47.58	9421	45.30	2.28

Tea serve	6043	44.47	6660	38.68	5.79
South India	63993	49.33	67220	45.86	3.47
All India	170449	62.14	198138	57.40	4.74

Source: Tea Board of India

Sensitivity of Industry to Government Policies

The tea industry in India is highly regulated. While The Tea Act, 1953 controls production and distribution activities, the Tea (Marketing) Control Order, 2003 regulates tea sales and stipulates that a defined percentage of tea produced from each garden be sold through the auction system. Tea (Distribution and Export) Control Order, 2005 provides that no distributor shall carry on the business of distributing imported tea and no exporter shall export tea or export tea except under a business licence obtained in accordance with the provisions of the Order. Excise duty at 16% has also been levied on tea, though not consistently. In addition to this central cess, States also levy sales tax on sale of tea. Profits from production and sale of tea are subject to agricultural income tax by the states. Thus, the residual income after paying corporate tax is taxed again. This tax is levied on profits accruing to gardeners in respective states. 100% foreign direct investment (FDI) in tea industry is permitted subject to compulsory divestment of 26% equity of the company in favour of an Indian partner/Indian public within five years from the date of investment. Overall, excise and sales tax continue to be the main areas where the government has been most active in recent years.

Tata Tea Ltd.

Profile

Set up in 1964 as a joint venture with UK-based James Finlay and Company to develop value-added tea, the Tata Tea Group of Companies, which includes Tata Tea and the UK-based Tetley Group, today represent the world's second largest global branded tea operation with product and brand presence in 100 countries. Among India's first multinational companies, the operations of Tata Tea and its subsidiaries focus on branded product offerings in tea but with a significant presence in plantation activity in India and Sri Lanka.

The consolidated worldwide branded tea business of the Tata Tea Group contributes to around 86 per cent of its consolidated turnover with the remaining 14 per cent coming from Bulk Tea, Coffee, and Investment Income. The Company is headquartered in Kolkata and owns 27 tea estates in the states of Assam and West Bengal in eastern India, and Kerala in the south.

Products and Brands

The company has five major brands in the Indian market - Tata Tea, Tetley, Kanan Devan, Chakra Gold and Gemini -- catering to all major consumer segments for tea. The Tata Tea brand leads market share in terms of value and volume in India and the Tata Tea brand is accorded "Super Brand" recognition in the country. Tata Tea's distribution network in the country with 38 C&F agents and 2500 stockists caters to over 1.7 million retail outlets (ORG Market Audit) in India.

The company has a 100% export-oriented unit (KOSHER & HACCP certified) manufacturing Instant Tea in Munnar, Kerala, which is the largest such facility outside the United States. The unit's product is made from a unique process, developed in-house, of extraction from tea leaves, giving it a distinctive flavouring and taste profile. Instant Tea is used for light density 100% Teas, Iced Tea Mixes and in the preparation of Ready-to- drink (RTD) beverages.

With an area of approx 15,900 hectares under tea cultivation, Tata Tea produces around 30 million kg of Black Tea annually.

Research and Development

Tata Tea and the Tetley Group have full-fledged R&D Centres that focus on the branded business. In addition, Tata Tea has an R&D Centre at Teok (Assam) and a product development centre at Bangalore focused on the entire gamut of tea operations.

Overseas Business

The Tata Tea and Tetley portfolios of branded offerings caters specifically to the Australian, Middle East, West Asia, North Africa, Poland, Russia and Kazakhstan markets. This is independent of the manufacturing and supply operations of its Tetley and other subsidiary companies.

Subsidiaries

Tata Tea has subsidiaries in Great Britain, United States and India. The Tetley Group has been a member of the Tata Group since March 2000 and now contributes around two thirds of the total turnover of Tata Tea Ltd. Headquartered in Great Britain, its footprint is global: Tetley has offices in Australia, Canada, Poland, Russia, South Africa and the US, as well as joint ventures in Pakistan and Bangladesh. Today, Tetley is the second largest tea bag brand in the world, and Tetley products are on sale in over 40 countries. Tetley is the no.1 tea bag brand in Great Britain and Canada and has significant market share in the United States, Australia, Poland and France. Beyond these markets Tetley is steadily growing its presence in Eastern Europe, Russia, through Bangladesh and Pakistan, and recently launched in South Africa. Tetley has a customised portfolio of offerings for each country, ranging from Black, Green, Fruit & Herbal Teas, Iced Ready-to-drink Teas and an extensive range of exotic Speciality Tea. Established in 1837, Tetley was the first British tea company.

introduce the tea bag to the UK in 1953, and the company continues this tradition of innovation. The tea bag was followed by the first round tea bag in 1959, and the 'no drip, no mess' Drawstring bag in 1997. A stream of successful packaging formats include the resealable 'soft pack' format for Tetley teas in the UK, and a unique 'stay fresh' round canister for green, fruit and herbal and speciality tea ranges in Canada, the UK and Australia. It's fully-owned manufacturing facility is based at Eaglescliffe, in the North East of England. Established since 1969, it currently occupies 220,000 square feet and is believed to be the largest tea bag factory in the world.

Tata Coffee with Instant Coffee manufacturing facilities, R&D capability and plantation assets of around 8000 hectares, producing over 9000 MT of Coffee annually, is the largest coffee plantation company in Asia. The company grows both the Robusta and Arabica varieties of coffee and markets both instant and "ground" coffee. Its curing facility has the Certificate of Approval for Quality Standards ISO 9002, the first curing unit in Asia to receive this certification. The Company's operations also have the SA:8000 & UTZ KAPEH accreditation/certification with effect from January 1st, 2006, the company has taken over 10 tea estates and one coffee estate of Tata Tea in the Annamalai tea growing region of Tamil Nadu.

Tata Tea Inc. in the United States processes and markets Instant Tea from its facility in Florida, based on sourcing of Instant Tea products out of Munnar, Kerala.

Associate Companies

Tata Tea has a substantial interest in the Sri Lankan tea industry through Watawala Plantations Limited, Sri Lanka, where it focuses on production and marketing of Tea, Rubber and Palm Oil.

Man Devan Hills Plantation Company Pvt. Ltd., established at the close of business on 31st March 2005, has major interests in production and manufacturing of black tea at its 17 estates in Kerala. Tata Tea has a minority stake in the entity.

Tata Tea - Historical Milestones

1963 James Finlay

1964 Tata Finlay establishes to develop value added Tea

1976 Tata Finlay takes over tea production and marketing operations of James Finlay

1983 James Finlay sell their shareholdings to Tatas heralding the "Dawn of a new Era." Tata Tea is born

1987 A wholly owned subsidiary, Tata Tea Inc, set up in the U.S.A.

1991 Acquisition of 52.5% shareholding in Consolidated Coffee Ltd (Tata Coffee Ltd.)

1992 Joint Venture in Sri Lanka, Estate Management Services (P) Ltd. formed.

1993 Joint Venture alliance with Allied Lyons plc - Tata Tetley established.

1995-96 65% share Lankan JVC acquires 51% shareholding in Watawala Plantations Ltd.

1996 Sri Lankan JVC acquires 51% shareholding in Watawala Plantations Ltd.

2000 Tata Tea acquires The Tetley Group Ltd., UK.

Income statement of Tata Tea Ltd. for the year ended

(Rs. crore)

	31-03- 2006	31-03- 2005	31-03- 2004
Income:			
Operating Income	970.76	887.58	771.51
Expenses:			
Material Consumed	362.46	251.67	195.19
Manufacturing Expenses	129.33	173.15	170.85
Personnel Expenses	121.57	163.74	160.97
Selling Expenses	126.86	103.41	98.16
Administrative Expenses	64.34	62.86	59.37
Expenses Capitalized	0.00	0.00	0.00
Cost Of Sales	804.56	754.83	684.54
Operating Profit	166.20	132.75	86.97
Other Recurring Income	73.24	67.04	69.52
Adjusted PBDIT	239.44	199.79	156.49

Financial Expenses	17.57	14.04	18.18
Depreciation	19.43	21.99	22.04
Other Write offs	0.00	0.00	0.00
Adjusted PBT	202.44	163.76	116.27
Tax Charges	43.59	33.23	28.70
Adjusted PAT	158.85	130.53	87.57
Non Recurring Items	25.74	-2.64	-1.70
Other Non Cash adjustments	2.34	1.02	5.66
Reported Net Profit	186.93	128.91	91.53
Earnings Before Appropriation	289.49	225.34	198.33
Equity Dividend	67.46	56.22	47.79
Preference Dividend	0.00	0.00	0.00
Dividend Tax	9.46	8.01	6.12
Retained Earnings	212.57	161.11	144.42

Balance sheet of Tata Tea Ltd. as on

(Rs. crore)

	31-03- 2006	31-03- 2005	31-03- 2004
SOURCES OF FUNDS			
Owner's Fund			
Equity Share Capital	56.22	56.22	56.22
Share Application Money	0.00	0.00	0.00
Preference Share Capital	0.00	0.00	0.00
Reserves & Surplus	1,083.18	970.89	897.17
Loan Funds			
Secured Loans	234.51	179.38	179.21
Unsecured Loans	6.84	11.99	16.50
Total	1,380.75	1,218.48	1,149.10
USES OF FUNDS			
Fixed Assets			
Gross Block	423.68	521.73	517.09
Less : Revaluation Reserve	21.86	21.86	21.86
Less : Accumulated Depreciation	178.59	225.47	205.86
Net Block	223.23	274.40	289.37
Capital Work-in-progress	5.22	6.42	1.65
Investments	1,106.83	865.87	835.45
Net Current Assets			
Current Assets, Loans & Advances	312.74	337.13	286.04
Less : Current Liabilities & Provisions	300.93	299.86	263.41
Total Net Current Assets	11.81	37.28	22.63
Miscellaneous expenses not written	33.66	34.52	0.00
Total	1,380.75	1,218.48	1,149.10
Note :			
Book Value of Unquoted Investments	714.66	617.96	606.78
Market Value of Quoted Investments	1,227.31	712.89	444.79
Contingent liabilities	24.30	38.49	19.44
Number of Equity shares outstanding (in Lakh)	562.20	562.20	562.20

Performance of the competitors:

Company Name	Last Traded Price (Rs.)	Net Profit (Rs. cr)	Market Capitalization (Rs. cr)	Total Assets (Rs. cr)	Sales (Rs. cr)
Harrisons Mala yala m	83.00	70.01	153.22	399.44	146.20
Parry Agro Ind	1,335.00	39.42	501.96	183.59	83.34
CCL Prod ucts	473.00	35.56	629.09	203.47	149.58
Tata Coff ee	308.35	22.32	384.08	324.89	185.57
Jayshree Tea	132.95	10.65	141.86	267.86	214.22
Bombay Bur mah	388.70	9.16	542.63	300.09	170.12
Gillanders Arbu	105.90	3.90	115.22	177.9	230.85
Goodricke Grou p	82.70	3.76	178.63	105.49	209.21
Dhunseri Tea	80.50	3.48	56.35	105.7	56.62
Assam Com pany	24.50	3.37	552.29	401.34	131.59

her information:

The growth rate in earnings of the company for the year 2007 is expected to be 36%. After that the growth rate will increase linearly for next 3 years and will reach 42% for the year 2010. Thereafter it will decline linearly for next 4 years and will reach a stable rate of 30% for the year 2014.

The company is expected to pay dividends in the following manner for different years in future:

Year	2007	2008	2009	2010	2011	2012	2013	2014
Payout Ratio (%)	35	34	33	32	33	34	35	36

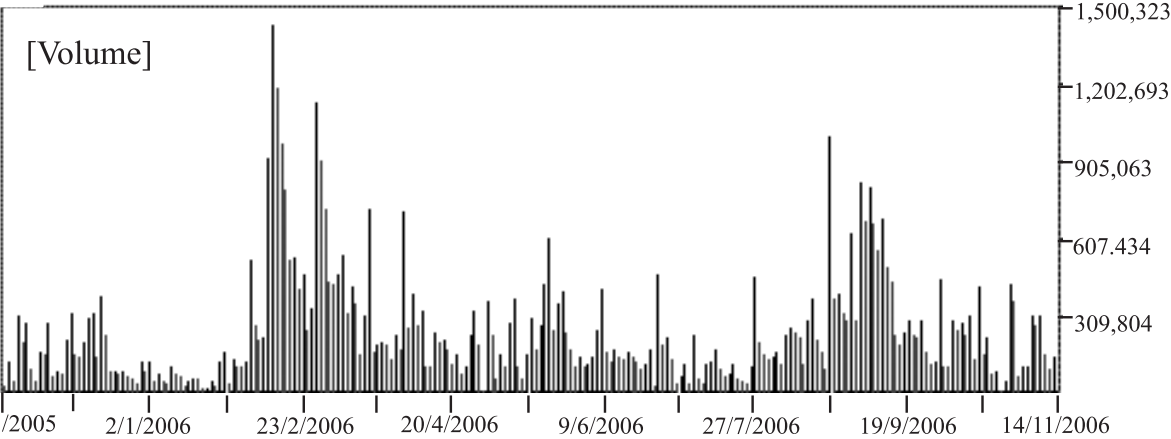
Presently the beta of the company is 0.55. It is expected to remain same for the next three years and after that it is expected to increase linearly to 1.05 the end of the year 2014.

Currently the yield on 91 day T-bill is 6.5% p.a. and is expected to remain same in the future.

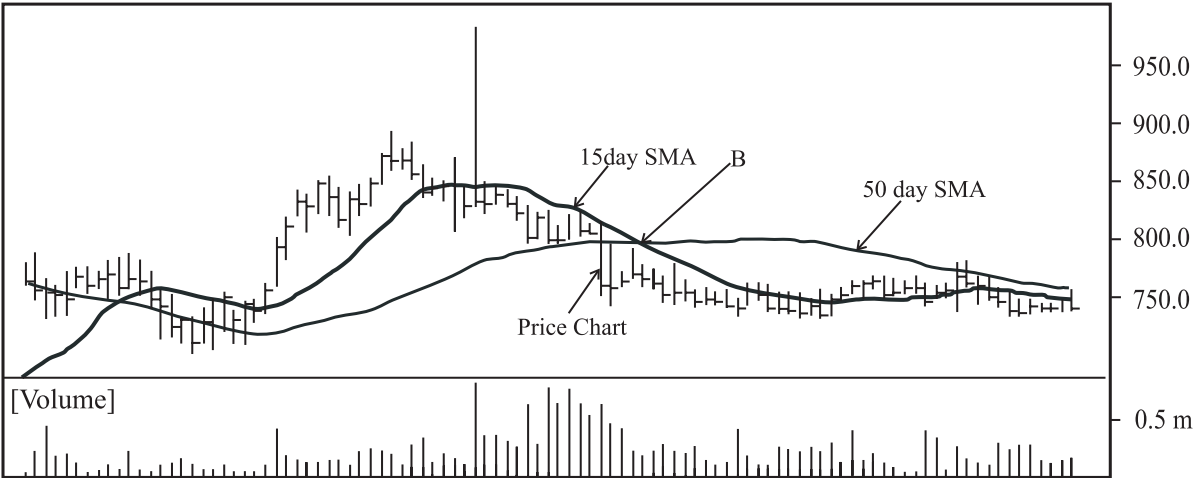
Currently return on S&P CNX NIFTY is 33.50% p.a. and is expected to remain same in the future.

The last traded price of Tata Tea Ltd. is Rs.734.20.

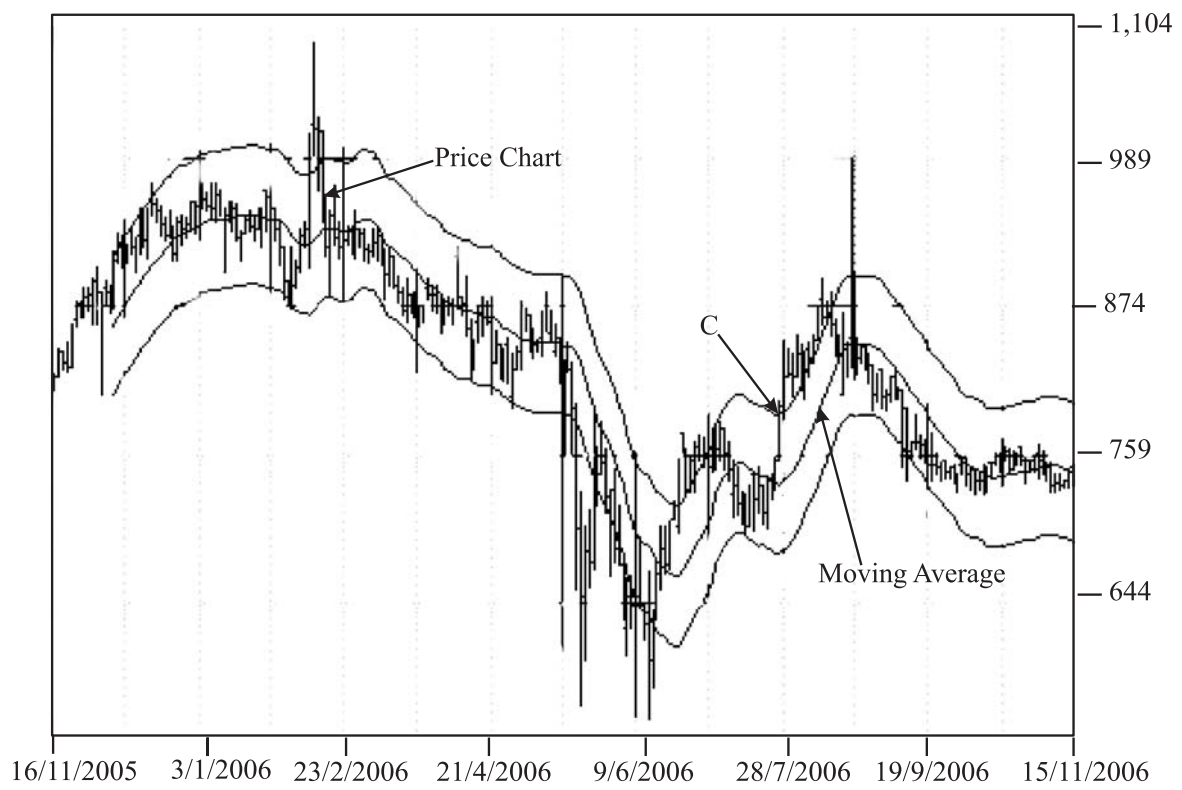
Simple Moving Average Chart



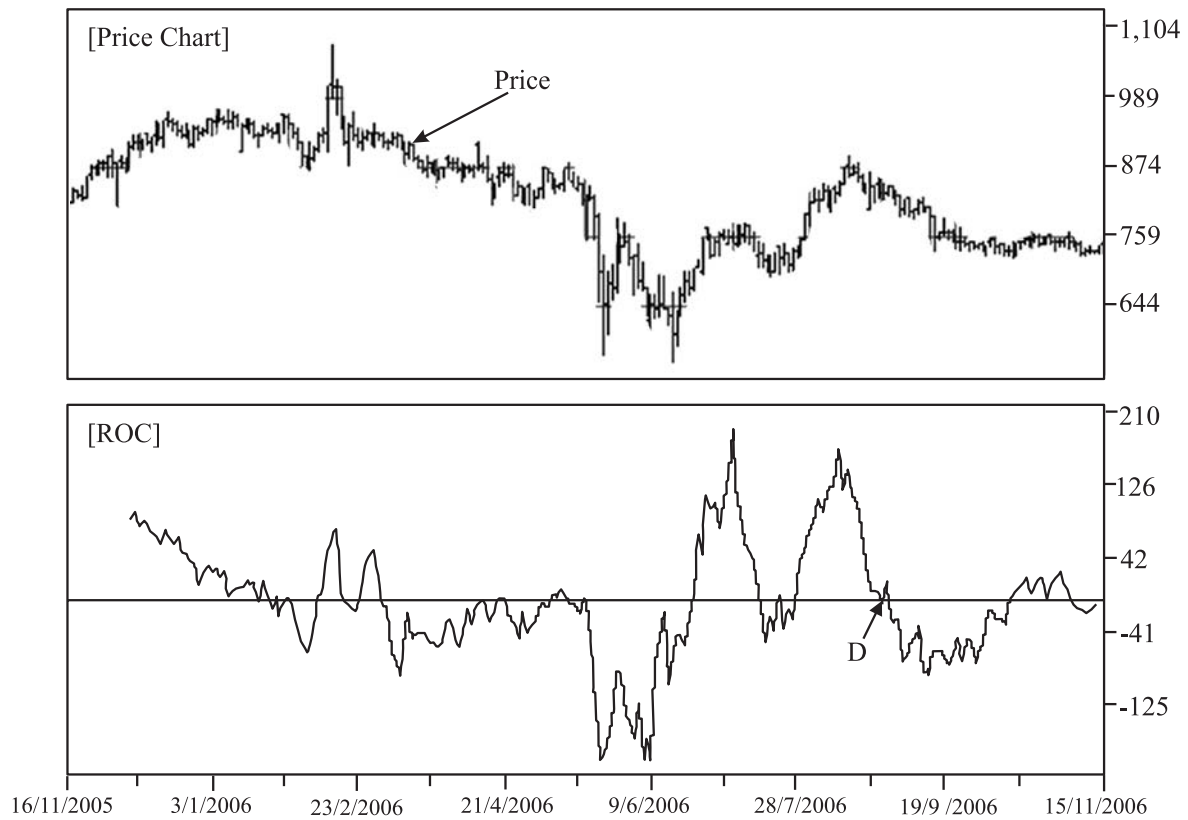
Moving Average Crossover Chart



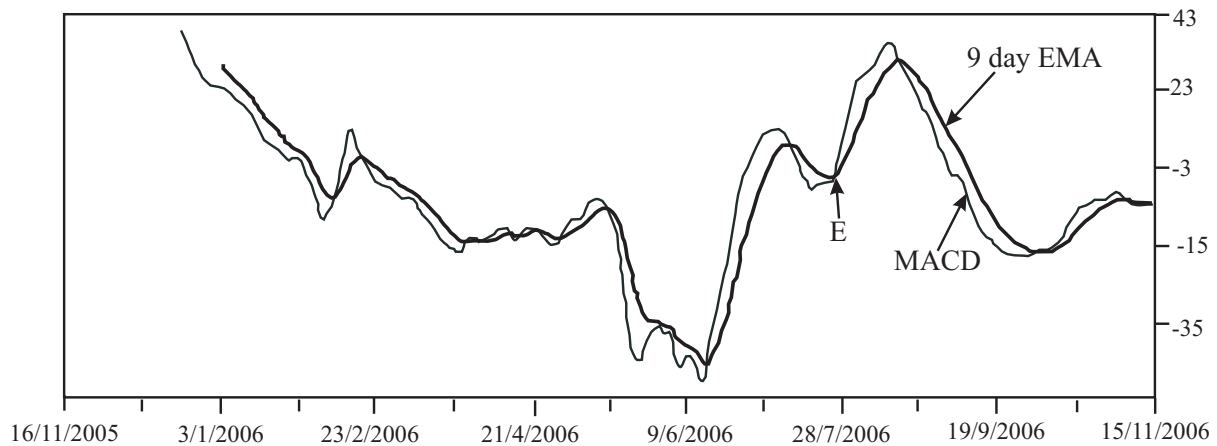
Envelope Chart



Rate of Change Chart



Moving Average Convergence and Divergence Chart



END OF SECTION D

Section E : Caselets (50 Marks)

- This section consists of questions with serial number 5 - 10.
- Answer **all** questions.
- Marks are indicated against each question.
- Do not spend more than 80 - 90 minutes on Section E.

Caselet 1

Read the caselet carefully and answer the following questions:

The phenomenon of intermarket analysis revolves around simultaneous analysis of the four financial markets. Their interaction with each other gives predictive values of intermarket dynamics. Explain how these markets are interrelated with each other?

(8 marks) < Answer

There are certain factors that are fundamentally important to the study of various interrelated markets. Explain the important factors to be born in mind while doing intermarket analysis.

(8 marks) < Answer

Single-market analysis is the study of one asset class or market in a single country. Intermarket analysis, on the other hand, is the study of multiple asset classes in a variety of markets in nations around the globe. Do investors and traders using the second technique have a significant advantage over those using the first when it comes to returns? We have all heard financial experts sing the praises of the diversified portfolio. "It is never a good idea to put all your eggs in one basket," they say. What they mean is that limiting your investments to just a few companies greatly increases your risk, especially if one or two of your major holdings experience a meltdown. Investors who heed this conventional wisdom own a number of stocks in different companies, and maybe also some mutual funds to increase their diversification. If this describes you, congratulations! But before you pat yourself on the back, consider this question: Are you truly diversified if you're invested in just stocks and bonds and the majority of your holdings are in one national market?

According to John Murphy, author of a book entitled "Intermarket Analysis", a truly diversified investment approach should include investments in all four major asset classes: bond markets (by that definition it has long-term interest rates), equity markets, commodities markets and currency markets. Going one step further, intermarket analysis tells us that a truly diversified portfolio should not limit its holdings to one country, but include holdings in a number of markets around the world. By following multiple markets, an investor gets the big picture and is able to see significant market and economic changes earlier than investors with a single market focus gets. The multiple-market investor can then move portfolio holdings from one sector or market to another - a practice known as sector rotation - with greater ease as conditions change. An investor or trader with an intermarket strategy has holdings in a number of countries and watches a number of international indexes in various asset classes, such as bonds, commodities and currencies. Such a portfolio might hold, say, 60% (rather than 100%) U.S. securities, and the remaining percentage might consist of securities from markets that are the top performers (i.e. showing strong relative strength) from both a sector and country perspective. Furthermore, the intermarket strategy means using market analysis, including both technical analysis techniques, to determine and adjust asset allocation according to changing market conditions.

In broadening investing outlooks, intermarket analysis can also provide more opportunity for the investor or trader to protect his or her investments with a protective currency hedge. Quite simply, this means selling stocks or bonds denominated in weaker currencies and buying them in the strongest currency wherever possible. Intermarket analysis can also teach us the important historic relationship between bonds, stocks and commodities in the business cycle. Bond prices generally lead stock prices in a recovery, with commodity prices confirming that a period of economic expansion has begun. As the expansion matures and begins to slow down, intermarket analysis teaches traders to watch for bonds to turn down first (as interest rates rise), followed by stocks. Finally, when commodity prices turn down, there is a pretty good chance that economic expansion has come to an end. The next phase is a slowdown and possibly a recession.

Caselet 2

Read the caselet carefully and answer the following questions:

With respect to the caselet, discuss the advantages and disadvantages associated with the mechanical trading system.

(10 marks) < Answer

While a number of mechanical trading systems are in existence, simple trend following systems have been found very useful especially for beginners. In this context, discuss various characteristics and components of an ideal mechanical trading system.

(8 marks) < Answer

Automatic pre-programmed computerized trading, abstracted away from human sentiments is what mechanical trading systems are all about. Trading recommendations and directions to buy, sell or hold are self generated and the trader has to keep trading.

Mechanical trading systems are techniques that make trading decisions for an individual investor. Once the trading data is fed, the system generates a response that indicates the appropriate action. A trader may buy, sell, or do nothing depending upon the program or formulae that the system uses. The real computer version of these mechanical systems updates the investor's database, and generates trading recommendations, and places his orders directly to the brokers. Speed is naturally a key factor involved in these hectic trading operations. To hedge portfolio risks, mechanical trading systems also require trading opportunities in many markets. Therefore such systems have been developed for various markets like stocks, commodities, forex, etc.

Basic mechanical trading systems rely on moving averages. The more advanced systems use combinations of moving averages of both price and volume. The higher end are systems that incorporate stochastics, which are the mathematical techniques for a non-linear science. Mechanical systems are reactive systems. If a stock or a commodity acts in a certain way, the system assumes that the stock or a commodity will continue to act that way. It generates trading signals based on the formulae programmed into the system. Some also compute a large array of indicators in an attempt to increase confidence of trading recommendation. The foundation of mechanical trading lies in technical analysis, which rests on the theory that price behavior repeats in the future. With the advent of random walk efficient market hypothesis, this theoretical basis stands severely questioned, nevertheless, the various limiting assumptions made in price movements. The utility of mechanical trading has been observed more in the commodities market as compared to the stock market.

While a number of mechanical trading systems are in existence, simple trend following systems have been found very useful especially for beginners. A strategy for trading would include designing and putting in place appropriate entry and exit strategy. For durable benefits, trading rules once laid down are required to be followed with lot of rigor and discipline and carried on over an extended period irrespective of intermediate result.

Mechanical trading systems are rapidly gaining popularity in India, Thanks to its strong information technology base. Notwithstanding the hype, mechanical trading systems have a significant place especially in a sentiment driven emerging market like India with higher volatility than the developed markets.

Caselet 3

Read the caselet carefully and answer the following questions:

In perfect capital market, a firm's economic value should remain unchanged because stock split simply divides the 'corporate pie' into more pieces. Yet many empirical studies show that stock splits are associated with real economic effects. In this context, discuss various reasons behind stock split and its implications.

(8 marks) < Answer

A lot of misuse of stock splits has been seen in the past. Apart from misuse, a stock split may have certain effects that may not be investor friendly and also may be adverse to shareholders' value creation. In this context, explain the limitations of stock split.

(8 marks) < Answer

A stock split simply involves a company altering the number of its shares outstanding and proportionately adjusting the face value of each share. The balance sheet items remain same except that the total number of outstanding shares of the company increases proportionately to the ratio of split. After a two for one split, each shareholder has twice as many shares, but each represents a claim on only half as much of the corporation's assets and earnings.

Splits can occur at any ratio. The most commonly used ratios are 2:1, 3:2, 5:4 and 4:3. But they can happen in any way-5:1, 10:9 etc. Also they can happen in reverse i.e., 1:10 which is called Reverse Split.

A stock split does not affect the intrinsic value or total funds of shareholders. Theoretically, it is a non-event. That is because the company's net assets do not increase; only the amount of its outstanding shares goes up. The fraction of the company that each share represents is reduced, but each stockholder is given enough shares so that his/her total share of the cake remains the same. It is like giving one the same amount of cake but in smaller pieces. We can rephrase this in pure financial terms as, 'A stock split should not affect market capitalization'.

After the declaration date of a stock split, the next relevant date occurring several days later is the record date. The record date of a stock split occurs after the declaration date. The record date is the payable date, on which the corporation distributes the new shares. On the ex-date the new stock replaces the unsplit stock. Trading. On the ex-date and thereafter, the only market is in the post-split shares. Generally, there is no delivery: period for a few days after the ex-date to allow the shareholders to get shares post-split.

The opposite phenomenon of stock split is reverse stock split. Consolidation of face value through a reverse split is also possible-the face value of shares is increased and the number of shares is reduced proportionately. The announcement of a reverse split has been found to elicit a negative stock market response. Possible motives behind the adoption of reverse splits are: 1) a desire to move the share price to an optimal trading range, 2) a reduction in shareholder servicing cost, and 3) improvement of the stock's image among the investors.

There is a stigma attached to doing this, so it is not initiated unless there is a very good reason. A reverse split can boost the share prices of companies that are trading below a minimum rate, but the effect is temporary as the fundamental factors that trashed these stocks still apply. A notable difference between stock split and reverse split is that, while regular splits may be ends in themselves as vehicles to correct stock undervaluation, reverse splits do not aim at signaling firm value, but moving share prices to a more attractive trading range. The information quality of reverse split is likely inadvertent and only a by-product of their original purpose. This point may explain why firms voluntarily send a negative signal about firm value to the market through a reverse split. Moreover, with fewer shares outstanding, unscrupulous managements will find it easier to manipulate the share prices.

It is possible that a reverse stock split could be used as the tactic to reduce the number of shareholders. Hypothetically, in a one for hundred reverse split, an investor holding less than hundred shares will simply receive a cash payment and no shares of stock. If the resulting number of shareholders dropped below the minimum threshold, it may be placed into a different regulatory category. Reverse split is not common among Indian companies.

END OF SECTION E

Suggested Answers
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Section D : Case Study

1. Threat of entry:

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1. While tea cultivation poses a significant barrier to entry in terms of regulations, limited availability of suitable cultivable area, large investment requirement and a steep learning curve, tea export and marketing of tea in domestic market are relatively low entry barrier areas. It is not surprising therefore that tea cultivation is dominated by the organised corporate sector
2. Tea retailing is also complicated. Availability of stockists, dealers is very important and sound distribution channel is required for the retailing of the tea products. Therefore the new entrant may face a lot of difficulty in establishing such channels.
3. Product differentiation also plays an important role to attract new customers. Now a days we can see so many variants in tea with various standards of quality. New entrants are also required to ensure such differentiation to survive in such industry where large players are already established.

Bargaining power of buyers:

Raw material for this industry comes from the tea gardens, which are scarce in nature. Production of tea is completely dependent on natural vagaries. Therefore buyers are not completely enjoying the bargaining power.

Bargaining power of suppliers:

1. The bargaining power of suppliers is very less in tea industry. The reason behind is forward integration is difficult for the suppliers of raw material.
2. In India there are various qualities of tea is produced which is sold by auction. There are various auction centers in India. Here we can say that suppliers are having a bit bargaining power but this power is dependent on amount and quality of production.
3. The world tea industry has been in an over supply position for over a decade which may lead to reduction in prices of tea.

Competitive Rivalry:

1. India's international competitiveness has been on a decline. From being a pre-eminent supplier of the world's tea, India has lost ground in virtually every export market.
2. Competitive intensity in the Indian tea industry is on the increase as the sheer number of players has increased. Many erstwhile tea exporters, because of difficult conditions in the export market and also because packet tea offers higher realization, have entered the domestic market.

Threats of substitutes:

The biggest substitute of tea is coffee. But coffee is costlier than tea. Therefore it is not the perfect substitute of tea. But now a days cheap coffee is also gaining the share which may become the substitute. But as a whole tea is not having high amount of threat of substitutes.

2. Strength

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1. Tata Tea group of companies is having the presence in 40 countries.
2. It is world's second largest player in branded tea market.
3. It is the market leader in India with 38 C&F agents and 2500 stockists caters to over 1.7 million retail outlets.
4. The company is also having a 100% export oriented unit in Kerala which is the largest such facility outside the US.

5. The company has its own 27 tea estates.
6. The company has its own R&D center.
7. The company is involved in the manufacturing and sell of all different types of tea.

Weakness:

1. The consolidated world wide branded tea business of the company contributes around 86% of its consolidated turnover with remaining 14% coming from bulk tea, coffee and investment income. This shows that the company has very less diversification.
2. Prices and production of tea has significant impact on the profit of the company.

Opportunities:

1. 100% foreign direct investment (FDI) in tea industry is permitted. Thus, the company has opportunity to increase its worldwide operation.
2. Coffee is the next popular hot beverage after tea. So the company has an opportunity to diversify its business by increasing its production and sell of coffee.

Threats:

1. Company belongs to agricultural industry. The industry output is affected by rainfall, temperature etc. The quality of raw material used also changes from season to season depending on climatic condition.
2. Excise duty at 16% has also been levied on tea, although not consistently. In addition to this central cess, States also levy sales tax on sale of tea. Profits from production and sale of tea are subject to agricultural income tax by the states. Thus, the residual income after paying corporate tax is taxed again. Therefore, changes in the taxation policy is having significant impact on the profitability of the company.
3. Even though the company is the market leader, competitors are also the threats for the company.

3. DDM

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Year	Growth rate	DPR	EPS	DPS	Beta	Rm	Ke
1	36	35	45.22	15.83	0.55	33.5	21.35
2	38	34	62.40	21.22	0.55	33.5	21.35
3	40	33	87.37	28.83	0.55	33.5	21.35
4	42	32	124.06	39.70	0.65	33.5	24.05
5	39	33	172.44	56.91	0.75	33.5	26.75
6	36	34	234.52	79.74	0.85	33.5	29.45
7	33	35	311.91	109.17	0.95	33.5	32.15
8	30	36	405.48	145.97	1.05	33.5	34.85

Terminal value at the end of 7th year = $145.97 / (0.3485 - 0.3) = 3009.69$

Value of share at time '0' =

$$\frac{15.83}{1.2135} + \frac{21.22}{1.2135^2} + \frac{28.83}{1.2135^3} + \frac{39.70}{1.2135^3 \times 1.2405} + \frac{56.91}{1.2135^3 \times 1.2405 \times 1.2675} + \frac{79.74}{1.2135^3 \times 1.2405 \times 1.2675 \times 1.2945} + \frac{109.17 + 3009.69}{1.2135^3 \times 1.2405 \times 1.2675 \times 1.2945 \times 1.3215} = 752.56$$

Relative valuation

Company Name	Last Traded Price	Net Profit (Rs. cr)	MCAP (Rs. cr)	T.A. (Rs. cr)	SALES (Rs. cr)
Harrisons Malay	83.00	70.01	153.22	399.44	146.26
Parry Agro Ind	1,335.00	39.42	501.96	183.59	83.34
CCL Products	473.00	35.56	629.09	203.47	149.58
Tata Coffee	308.35	22.32	384.08	324.89	185.57

Jayshree Tea	132.95	10.65	141.86	267.86	214.22
Bombay Burmah	388.70	9.16	542.63	300.09	170.12
Gillanders Arbu	105.90	3.90	115.22	177.90	230.85
Goodricke Group	82.70	3.76	178.63	105.49	209.21
Dhunseri Tea	80.50	3.48	56.35	105.70	56.62
Assam Company	24.50	3.37	552.29	401.34	131.59

COMPANY	NO OF SHARES	EPS	TA/SHARE	SALES/SHARE
Harrisons Malay	18460241	37.92	216.38	79.23
Parry Agro Ind	3760000	104.84	488.27	221.65
CCL Products	13300000	26.74	152.98	112.47
Tata Coffee	12455975	17.92	260.83	148.98
Jayshree Tea	10670177	9.98	251.04	200.77
Bombay Burmah	13960123	6.56	214.96	121.86
Gillanders Arbu	10880076	3.58	163.51	212.18
Goodricke Group	21599758	1.74	48.84	96.86
Dhunseri Tea	7000000	4.97	151.00	80.89
Assam Company	225424490	0.15	17.80	5.84

COMPANY	Last Traded Price	P/E	P/TA	P/SALES
Harrisons Malay	83.00	2.19	0.38	1.05
Parry Agro Ind	1,335.00	12.73	2.73	6.02
CCL Products	473.00	17.69	3.09	4.21
Tata Coffee	308.35	17.21	1.18	2.07
Jayshree Tea	132.95	13.32	0.53	0.66
Bombay Burmah	388.70	59.25	1.81	3.19
Gillanders Arbu	105.90	29.58	0.65	0.50
Goodricke Group	82.70	47.53	1.69	0.85
Dhunseri Tea	80.50	16.20	0.53	1.00
Assam Company	24.50	163.33	1.38	4.20
TOTAL		379.03	13.97	23.75
AVERAGE (I)		37.90	1.40	2.38
TATA TEA (II)		33.25	299.12	172.67
(I*II)		1260.18	418.77	410.95
WEIGHT (W)		0.35	0.35	0.3
(I*II)*W		441.05	146.57	123.29

Price = 441.05+146.57+123.29 = **710.91**.

As per DDM the intrinsic value of the share of Tata Tea is Rs.751.65 which is Rs.18.36 higher than the current market price of the company. If the analyst advises to invest in the company, the investment will give the return of 2.38% when the price reaches to the value calculated above.

As per relative valuation the company is overvalued.

Considering both the approaches the analyst may suggest for not to purchase the shares of Tata Tea at current level.

4. Point A:

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When the price of the security that was in down trend moves above 30 day moving average, it is a sign that down trend may be reversing. Therefore it is an indication to buy.

Point B:

15 day moving average is crossing 50 day moving average from above this indicates that price may go down further. Hence, this may be an indication to sell.

Point C:

Envelopes assume that the price movement that has started from one of the band's line usually reaches the opposite one. Therefore, the analyst at this point assumes that price may go down and reach to the lower band. Hence, this may be an indication to sell.

Point D:

Price is breaking the uptrend after a considerable fall in ROC. Therefore this is the sell alert.

Point E:

A bullish moving average crossover occurs when MACD moves above its 9 day EMA. Hence, this is an Indication to buy.

Section E: Caselets

Caselet 1

5. As the phenomenon of intermarket analysis revolves around simultaneous analysis of the four financial markets, it is how they interact with each other gives the intermarket dynamics its predictive value. This is how they inter relate: [< TOP >](#)

- The US Dollar usually trends in the opposite direction of commodities and gold.
- Commodities usually trend in the same direction as interest rates.
- Bond prices normally trend in the same direction as stock prices.
- The bond market however normally changes its direction ahead of stocks.
- A falling currency coupled with rising commodity prices is a bearish signal for stocks in the long-term.
- The above is however not true for commodity stocks because in the short-term they drive the equity markets up as a whole due to rising commodity prices. However, in the longer term, rising commodity prices means an increase in input costs for manufacturing companies, which leads to a slowdown in earnings growth and hence a negative impact on their stock prices.

The list sums up the key intermarket relationships between the four market groups in a normal inflationary or deflationary environment. Of course, grouping market movements into such watertight compartments may not always be the best way forward, but if studied it can be strangely noticed that in the modern capital market history how many times this very pattern has repeated itself.

6. There are certain factors that are fundamentally important to the study of related markets. These must be elaborated at the outset: [< TOP >](#)

1. Note that it is the long-term interest rates that are an important element of intermarket study and not the short-term rates. By this we basically aim to study the longer end of the yield curve and its movements in relation to the movements in other asset classes. We will also come to know how the bond market prices the long-term debt as opposed to the short-term debt, which is basically by the central bankers and politicians.
2. It is also important that we do not view commodity market per se as a monolith. The experience with the commodities has shown us that there are various commodities that peak much ahead of the "commodity cycle" and some that pick up much later. Industrial commodities usually have the tendency of peaking out before the agricultural commodities.
3. Studying the interaction of currency markets with the other three asset classes can be complicated if the basics are not kept in mind. While people do invest, trade and also speculate on currencies in general, the

large flow of currency is more as a result of the activities in other asset classes, which are dominated in a particular currency as opposed to the fundamental strength in that currency. Currencies are hence used as vehicles for other assets. One may also get extremely confused with the range of different currencies and characteristics exhibited by them based on their core fabrics that may be fixed or floating.

4. Another important relationship is the nexus between the US dollar and interest rates. In the modern financial age, there seems to be a perceived wisdom around the world that the raising interest rates would result in a strong currency. Nothing, of course, could be farther from the truth. One has only to look at history to come to this conclusion. The experience of the pound sterling, during the 1980s and more recently, the Eurodollar, over the past three years have been the prime examples of this phenomenon. Not too long ago in 2003, when the fed funds rate was languishing at 1%, we saw the Euro barely crossing the \$ 1 barrier. Today after a series of 14 consecutive rate hikes over three years, when the Fed funds rates stands at 5%, the Euro stands at nearly 1.3% to the US dollar.
5. One of the most interesting aspects of intermarket study is the characterization of gold. It is interesting to note that the gold may actually qualify in two asset classes, one is that of a commodity and the other is that of currency. While we all know that gold being a precious metal and a physical commodity, it does qualify as such, gold also exhibits certain unique currency characteristics. Some would argue that it is infact, the ultimate currency. Therefore, one of the surest litmus tests for watching the fortunes of other currencies and more specifically the US dollar, is to study them in relation to the movements in the price of gold.

The value of the US dollar, in relation to the currencies like the Euro, seems to have depreciated in the last three years, as gold seems to be set to make yet another upward move in the recent past. Bull markets in gold, traditionally last long, while they do not augur well with the US Dollar.

6. It is also imperative, that we do not confuse the intermarket cycle or related movements as such, with the general business economic cycle. While the general business cycle takes place in the real world, the intermarket cycle takes place in the secondary markets, which have time and again shown the tendency to discount impending events in the real world, often mistakenly so. Intermarket cycle hence purely analyze the dynamics out of price movements in other secondary markets only.

Caselet 2

7. Advantages of Mechanical Trading System

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A good mechanical trading system automates the entire process of trading. In spite of the remarkable success of some discretionary traders, trading based on “gut feel” carries with it a number of pitfalls. All traders inevitably experience losing periods. Under a system of discretionary trading where the human sentiment is involved, there is a risk of becoming overcautious and not trading at all when the need of the hour is to be bold (before a recovery opportunity) or alternatively becoming reckless when the need is caution (period of reversal of trend). By trading a mechanical system where a computer is responsible for all decisions, including entry, exit, position, size and diversification, these pitfalls of discretionary trading are avoided. Systems trading keeps up the activity of trading consistently, removing human emotions. Market timing offers a fundamental technique that can add enormous value to investment portfolios over long periods of time. The confidence, consistency, and discipline that a thoroughly tested system affords is the key to the success of many of the most profitable traders.

Disadvantages of Mechanical Trading System

The thought of having mechanical trading systems generate automatic profits is obviously attractive, but has its flip side as well, Firstly, conclusions drawn from past performance may not hold good for the future and the actual performance may well fall short of expectations.

Secondly, the vendor does not reveal the logic of the system. Ignorance of the system logic may lead to diffidence on the part of the investor to continue with the system during losing periods. The rigor and discipline that is part and parcel of mechanical trading may be compromised and with it the possibility of long-term profits.

Finally, it should be remembered that prices being a function of human expectations and emotions do not constitute a logical entity. Often the software may lull a trader into believing that markets are as logical and predictable as the computer they use to analyze them.

8. Approaches to Having a Good Mechanical Trading System

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A good mechanical trading system should be simple and have its rules and logic fully explained, so that the traders or investors have confidence in the system even when it suffers a string of consecutive losses. Evidence of

a real-time track record is essential. As far as possible, systems that have a proven track record of working on broad spectrum of financial instruments should be chosen instead of an optimized trading system that uses unique rules or different parameters to trade specific financial markets.

The system should be compatible with money available for trade, as many systems specify large draw downs beyond the means of many ordinary traders. It is also desirable for the traders to build their own trading systems tailored to their specific personality. If the traders have some human input, it would be easier to implement the trading system with rigid discipline, which is the key to building consistent profits.

Strategy for Building a System

Entry and exit are the key components of a good strategy for building a mechanical trading system. Each part can then be individually developed and tested. A trend following system lends itself easily to such a separation.

The Entry Strategy

The point of entry is crucial to get the trade started in the right direction. An effective method for testing the entry is to exit the trade after a fixed number of bars and record the winning percentage. The trading costs and profits are ignored. The only criterion for evaluation is the winning percentage, which is defined as :

Winning percent = (number of winning traders) / (total number of traders)

A good entry strategy must have a winning percent greater than 50, failing which it is no better than random entry. The higher the winning percentages, the better is the entry. After an acceptable entry has been proven through the above test, the entry can be tested for robustness. A robust mechanical trading system should permit input variation without significantly affecting the output.

Generally speaking, a system with fewer input parameters is usually more robust than a system with many input parameters. Therefore, the input parameters should be optimized.

For example, an entry which uses a ten-period moving average as an input parameter may be tested using a five-period moving average and then a 20-period moving average. If the winning percent is still acceptable, the entry is probably robust.

The Exit Strategy

While it is important to enter correctly, it is even more important to exit correctly and actually make a profit. Traders normally decide beforehand what they consider as the worst case scenario (say preservation of capital) for them. In addition, they should have some idea about the plan to take profits and a strategy for letting the profits run. An exit strategy can be based on a technical indicator, a time factor, and of course a price-level. These might include exits that produce a loss, but reduce the initial risk, exits that maximize profits, and exits that keep the trader from giving back too much money and psychological exits.

In order to test an exit objectively, the entry must remain constant. With a constant entry, each exit strategy can be tested and the results can be compared and evaluated.

Caselet 3

9. Reasons behind Stock Split and Its Implications

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- **Makes Shares More Affordable to Individual Investors**

The main advantage is that a stock split helps to broaden the shareholder base by making the shares more affordable. This tends to increase demand for the stock, which results in a slightly higher share price. It often improves sentiment for the stock. It drives the new share price up as more of the investing public is attracted by the new share price.

A company might split its stock when it feels that its share price has risen beyond what an individual investor is willing to pay, especially when the shares are bought and sold in marketable lots. Even when the shares are traded in demat mode, where even one share may be traded, the price may be high enough to discourage the small investors.

- **Increases Depth**

A stock split increases the number of shares outstanding, so the depth in the stock increases. Large block holders, in addition to being efficient monitors also facilitate takeover activities. By increasing the dispersion in the share base, it secures the company from the threat of potential takeover.

- **Increases Liquidity**

Another reason frequently offered for a stock split is that it increases liquidity. It is an important motivation for the decision to lower share prices. Firms split shares to improve their liquidity. Because the number of shares increases, the amount that the investors are willing to buy or sell also goes up.

- **Reduction in Institutional Ownership**

Companies sometimes want to attract individuals to stabilize the price, as institutional investors buy and sell more frequently than individuals. By reducing the fraction of shares owned by institutional investors, the firms will lower the incentive of these investors to monitor management. That's yet another reason for split. However, it remains an issue, whether reduction in institutional ownership would enhance shareholder's value.

- **Information content:**

Stock split has a positive effect on the price. Over the long-term, stock splits seem to have a considerable effect on the company's stock price. Stock splits reveal information about future dividend and earnings changes. It is found that analysts use the split factor to revise their estimates of the firm's earnings. These results coupled with the findings of a positive relation between the split announcement period returns and future earnings changes indicate that investors view stock split announcements as containing valuable information. However, this signaling hypothesis can only be valid if false signaling incurs a cost. A split imposes costs on current shareholders of the firm since each old share is not replaced with an integral number of new shares. Thus, the investors who previously owned round lots find themselves with more expense to sell odd lots. But odd lot problem would not arise when shares are traded in demat mode and no lot size is specified.

- **Optimal Price Range**

Companies try to keep their stocks within an optimal price range. Stocks traded in this range are presumed to have lower brokerage fees and appear to be more liquid as the number of shareholders might increase. As the share price overflows this trading range, the trading cost, price stability, and the liquidity of the stock change, so the marketability of the stock can deteriorate. Moreover, there could also be behavioral and cognitive factors according to which managers expect the marketability of their shares to reduce as the stock price is set far away from the industry average. Therefore when the stock hits the company's price targets, the company upon approval of the Board of Directors and the shareholders will announce a stock split.

- **Tax-shield**

Capital market players who want to book capital losses for tax purposes, trigger 'buy' orders after the split. During boom time, brokers and investors make sizeable profits. If they want to avoid paying taxes on these gains then the stock split is a good opportunity to show losses in the books. The practice is to sell the original shares and keep the new shares with them. The empirical evidence that supports an increase in volatility following splits does not reject this tax-option hypothesis. But in India, there are no such tax implications for stock split and it would be tax neutral.

- **Increased Trading**

Apart from providing brokers and investors an opportunity to manage their tax liabilities, stock splits also spark off increased trading in scrips. Noise traders prefer low-priced stocks to high-priced stocks.

- **Better Deal to Investors**

Analysts say that stock split are generally resorted to by the companies in order to give its investors a better deal in terms of easier exit and entry, good valuations, returns and more over a protection from volatile swings in prices. More floating stock help iron out volatilities within a larger number of investors as the market price reduces. Infusion of higher liquidity attracts the attention of institutional investors as they are provided with better entry and exit opportunities.

10. Limitations of stock splits:

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- **Confusion Among Investors Regarding Dividends**

Indian companies generally express dividends as a percentage of the face value, rather than as a fixed sum per share--the practice in developed markets. Investors would have to keep track on the face value to check what their dividends really are as well as to make comparisons between different stocks.

- **Reduction of Institutional Ownership**

Many institutional investors or mutual funds have rules against purchasing a stock whose price is below

some minimum, say Rs.2. A stock split, particularly for small companies may thus reduce the holding of institutional investors or fund houses:

- **Wide Dispersion in Shareholder Base**

As the shareholders' base increases, the number of investor holding a negligible portion of share in the company also increases.

- **Cost of split:**

The transaction costs is an inverse function of stock price. The danger of being de-listed from its stock exchange is also an added cost of stock split. Such de-listing may happen when share price drops below a minimum.

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