

A Study On Technical Analysis Of Equity Shares Of Tata Motors For The Period From November 2008 To April 2009

** M. Venkatalakshmi*

*** C. M. Sindhu*

INTRODUCTION

A stock market is a public market for the trading of a company's stocks and derivatives at an agreed price; these are securities listed on a stock exchange as well as those only traded privately. Tata Motors, the first company from India's engineering sector to be listed in the New York stock exchange, (September 2004) has also emerged as an international automobile company. The study is concerned with the technical analysis of equity shares of Tata Motors for the period from November 2008 to April 2009 with a view to analyze and understand the equity shares of the Tata Motors. The study is fully based on the secondary data which have been collected from the company reports and websites.

The objective of the study is to analyze the price movements of shares, to compare the stock price movements with the market and to discover the trend in the future. The data were analyzed with the help of Simple moving average, Exponential moving average, Rate of Change, Relative Strength Index, Bollinger Bands and Dow Theory which gives valid results about the share price of the company. Trend analysis was also used to spot out the percentage change in the market price of the share during the period of the study.

OBJECTIVES OF THE STUDY

To analyze the price movements of shares of Tata Motors and to interpret the corrections and trends by using technical analysis tools and to forecast the future trends and provide suitable suggestions to the investors.

METHODOLOGY

The research design was based on analytical research. In analytical research, the researcher has to use facts or information already available, and analyze these to make a critical evaluation of the material.

(i) Time period of analysis: Time period of analysis is from November'08 to April'09.

(ii) Sources of data: The main sources of data are websites, various books, magazines, newspapers and reports prepared by research scholars etc.

(iii) Methods of data collection: The study is purely based on secondary data. The secondary data are those which have already been collected by someone else and which have already been passed through the statistical process. The methods of collecting secondary data are published data or unpublished data. It takes less time to collect the data and the cost of obtaining the data is also low.

(iv) Statistical tools applied: The analysis of data is carried out for secondary data by the following method. Simple Moving Average, Exponential Moving Average, Rate of Change, Relative Strength Index, Bollinger Bands, Dow Theory.

ANALYSIS AND INTERPRETATION

SIMPLE MOVING AVERAGE (SMA)

A simple moving average is formed by computing the average (mean) price of a security over a specified number of periods. While it is possible to create moving averages from the Open, the High, and the Low data points, most

* *Lecturer*, Department of MBA, Vivekanandha Institute of Information and Management Studies, Elayampalayam, Tiruchengode, Namakkal Dt-637 205, Tamil Nadu. E-mail: gm_laxmi@rediffmail.com

** *Student*, Vivekanandha Institute of Information and Management Studies, Elayampalayam, Tiruchengode, Namakkal, Dt-637 205, Tamil Nadu.

moving averages are created using the closing price. For example: a 5-day simple moving average is calculated by adding the closing prices for the last 5 days and dividing the total by 5.

$$10 + 11 + 12 + 13 + 14 = 60$$

$$(60 / 5) = 12$$

The calculation is repeated for each price bar on the chart. The averages are then joined to form a smooth curving line - the moving average line. Continuing our example, if the next closing price in the average is 15, then this new period would be added and the oldest day, which is 10, would be dropped. The new 5-day simple moving average would be calculated as follows:

$$11 + 12 + 13 + 14 + 15 = 65$$

$$(65 / 5) = 13$$

TABLE 1.1: CALCULATIONS OF SIMPLE MOVING AVERAGE OF TATA MOTORS FROM NOV'08 TO APRIL '09

DATE	PRICE	5-DAY SMA	10-Dec-08	163.45	150.58
3-Nov-08	190.45	-	11-Dec-08	160.65	156.06
4-Nov-08	193.95	-	12-Dec-08	153.35	156.54
5-Nov-08	182.20	-	15-Dec-08	158.15	157.54
6-Nov-08	157.50	-	16-Dec-08	164.95	160.11
7-Nov-08	157.75	176.37	17-Dec-08	162.25	159.87
10-Nov-08	170.50	172.38	18-Dec-08	173.65	162.47
11-Nov-08	154.40	164.47	19-Dec-08	178.95	167.59
12-Nov-08	150.45	158.12	22-Dec-08	187.85	173.53
14-Nov-08	137.20	154.06	23-Dec-08	174.40	175.42
17-Nov-08	140.95	150.70	24-Dec-08	159.60	174.89
18-Nov-08	138.70	144.37	26-Dec-08	155.70	171.30
19-Nov-08	134.45	140.35	29-Dec-08	148.95	165.30
20-Nov-08	126.20	135.50	30-Dec-08	156.30	158.99
21-Nov-08	133.00	134.66	31-Dec-08	159.85	156.08
24-Nov-08	133.30	133.13	1-Jan-09	170.50	158.26
25-Nov-08	135.85	132.56	2-Jan-09	176.05	162.33
26-Nov-08	140.40	133.75	5-Jan-09	178.45	168.23
28-Nov-08	136.90	135.89	6-Jan-09	186.45	174.26
1-Dec-08	132.65	135.82	7-Jan-09	174.15	177.12
2-Dec-08	128.60	134.88	9-Jan-09	165.75	176.17
3-Dec-08	133.25	134.86	12-Jan-09	161.50	173.26
4-Dec-08	150.95	136.47	13-Jan-09	155.10	168.59
5-Dec-08	153.15	139.72	14-Jan-09	156.35	162.57
8-Dec-08	152.10	143.61	15-Jan-09	150.65	157.87
16-Jan-09	152.95	155.31	6-Mar-09	138.65	141.70
19-Jan-09	150.10	153.03	9-Mar-09	136.65	139.92
20-Jan-09	145.75	151.16	12-Mar-09	146.05	140.76
21-Jan-09	139.90	147.87	13-Mar-09	161.70	144.48
22-Jan-09	132.90	144.32	16-Mar-09	166.70	149.95
23-Jan-09	135.05	140.74	17-Mar-09	171.90	156.60
27-Jan-09	140.35	138.79	18-Mar-09	176.40	164.55
28-Jan-09	146.65	138.97	19-Mar-09	171.70	169.68
29-Jan-09	152.05	141.40	20-Mar-09	160.90	169.52
30-Jan-09	149.65	144.75	23-Mar-09	166.15	169.41
2-Feb-09	143.75	146.49	24-Mar-09	162.45	167.52
3-Feb-09	133.20	145.06	25-Mar-09	160.35	164.31
4-Feb-09	135.45	142.82	26-Mar-09	175.90	165.15
5-Feb-09	131.10	138.63	27-Mar-09	188.90	170.75
6-Feb-09	137.50	136.20	30-Mar-09	172.00	171.92
9-Feb-09	141.60	135.77	31-Mar-09	180.30	175.49
10-Feb-09	138.20	136.77	1-Apr-09	180.00	179.42
11-Feb-09	136.10	136.90	2-Apr-09	203.65	184.97
12-Feb-09	136.30	137.94	6-Apr-09	210.05	189.20
13-Feb-09	137.75	137.99	8-Apr-09	223.55	199.51
16-Feb-09	136.25	136.92	9-Apr-09	226.80	208.81
17-Feb-09	130.80	135.44	13-Apr-09	252.15	223.24
18-Feb-09	133.30	134.88	15-Apr-09	281.50	238.81
19-Feb-09	134.55	134.53	16-Apr-09	241.45	245.09

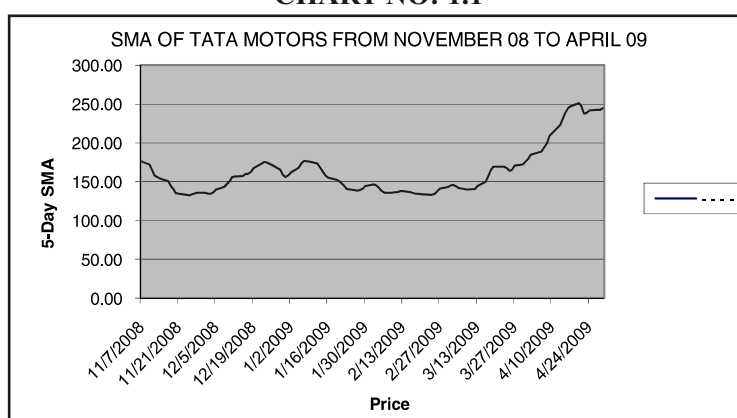
20-Feb-09	133.75	133.73	17-Apr-09	235.80	247.54
24-Feb-09	132.10	132.90	20-Apr-09	245.90	251.36
25-Feb-09	140.10	134.76	21-Apr-09	233.30	247.59
26-Feb-09	149.95	138.09	22-Apr-09	232.65	237.82
27-Feb-09	149.30	141.04	23-Apr-09	245.40	238.61
2-Mar-09	145.55	143.40	24-Apr-09	253.55	242.16
3-Mar-09	141.85	145.35	27-Apr-09	249.05	242.79
4-Mar-09	143.10	145.95	28-Apr-09	232.50	242.63
5-Mar-09	139.35	143.83	29-Apr-09	243.80	244.86

Sources: www.nseindia.com

INTERPRETATION

On 7th November'08, the simple moving average was 176.37, then it moved down to 154.06 on 14th November'08 and it further decreased to 132.56. The corrections started in December'08 and the simple moving average moved upwards to 175.42 and afterwards, it again decreased.

CHART NO: 1.1



EXPONENTIAL MOVING AVERAGE (EMA)

In order to reduce the lag in simple moving averages, technicians often use exponential moving averages (also called exponentially weighted moving averages). EMA's reduce the lag by applying more weight to recent prices relative to older prices. The weighting applied to the most recent price depends on the specified period of the moving average. The shorter is the EMA's period, the more weight will be applied to the most recent price. For example: a 10-period exponential moving average weighs the most recent price (18.18%), while a 20-period EMA weighs the most recent price-9.52%.

The formula for an exponential moving average is:

$$\text{EMA}(\text{current}) = ((\text{Price}(\text{current}) - \text{EMA}(\text{prev})) * \text{Multiplier}) + \text{EMA}(\text{prev}))$$

For example, a 10-period EMA's Multiplier is calculated like this:

$$(2 / (\text{Time periods} + 1)) = (2 / (10 + 1)) = 0.1818 (18.18\%)$$

This means that a 10-period EMA is equivalent to an 18.18% EMA.

TABLE 1.2: CALCULATION OF EXPONENTIAL MOVING AVERAGE FROM NOVEMBER 08 TO JANUARY 09

DATE	PRICE	PREVIOUS PERIOD EMA	10-DAY EMA	17-Dec-08	162.25	154.12	155.60
3-Nov-08	190.45	-	193.28	18-Dec-08	173.65	155.60	158.88
4-Nov-08	193.95	193.28	193.40	19-Dec-08	178.95	158.88	162.53
5-Nov-08	182.20	193.40	191.36	22-Dec-08	187.85	162.53	167.13
6-Nov-08	157.50	191.36	185.20	23-Dec-08	174.40	167.13	168.45
7-Nov-08	157.75	185.20	180.21	24-Dec-08	159.60	168.45	166.84
10-Nov-08	170.50	180.21	178.44	26-Dec-08	155.70	166.84	164.81
11-Nov-08	154.40	178.44	174.07	29-Dec-08	148.95	164.81	161.93
12-Nov-08	150.45	174.07	169.77	30-Dec-08	156.30	161.93	160.91

14-Nov-08	137.20	169.77	163.85	31-Dec-08	159.85	160.91	160.72
17-Nov-08	140.95	163.85	159.69	1-Jan-09	170.50	160.72	162.50
18-Nov-08	138.70	159.69	155.87	2-Jan-09	176.05	162.50	164.96
19-Nov-08	134.45	155.87	151.97	5-Jan-09	178.45	164.96	167.41
20-Nov-08	126.20	151.97	147.28	6-Jan-09	186.45	167.41	170.87
21-Nov-08	133.00	147.28	144.68	7-Jan-09	174.15	170.87	171.47
24-Nov-08	133.30	144.68	142.61	9-Jan-09	165.75	171.47	170.43
25-Nov-08	135.85	142.61	141.38	12-Jan-09	161.50	170.43	168.81
26-Nov-08	140.40	141.38	141.20	13-Jan-09	155.10	168.81	166.32
28-Nov-08	136.90	141.20	140.42	14-Jan-09	156.35	166.32	164.51
1-Dec-08	132.65	140.42	139.01	15-Jan-09	150.65	164.51	161.99
2-Dec-08	128.60	139.01	137.12	16-Jan-09	152.95	161.99	160.35
3-Dec-08	133.25	137.12	136.42	19-Jan-09	150.10	160.35	158.49
4-Dec-08	150.95	136.42	139.06	20-Jan-09	145.75	158.49	156.17
5-Dec-08	153.15	139.06	141.62	21-Jan-09	139.90	156.17	153.21
8-Dec-08	152.10	141.62	143.52	22-Jan-09	132.90	153.21	149.52
10-Dec-08	163.45	143.52	147.14	23-Jan-09	135.05	149.52	146.89
11-Dec-08	160.65	147.14	149.60	27-Jan-09	140.35	146.89	145.70
12-Dec-08	153.35	149.60	150.28	28-Jan-09	146.65	145.70	145.87
15-Dec-08	158.15	150.28	151.71	29-Jan-09	152.05	145.87	146.99
16-Dec-08	164.95	151.71	154.12	30-Jan-09	149.65	146.99	147.47

Sources: www.nseindia.com

INTERPRETATION

On 3rd November'08, the Exponential moving average was 193.28, then it suddenly reduced to 185.20 on 6th November'08 and further decreased on the next day and reached 180.21. Then it fell and reached 162.53 on 19th December'08. The corrections started in January'09. It followed an upward trend and reached up to 171.47 but after reaching this level, it again decreased.

CHART NO: 1.2

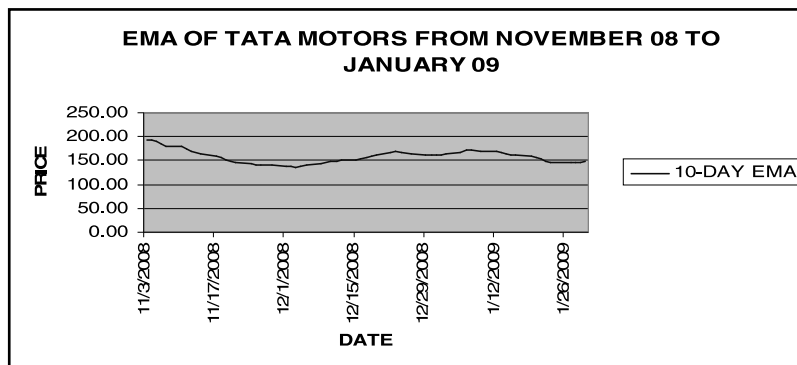


TABLE 1.3: CALCULATION OF EXPONENTIAL MOVING AVERAGE FROM FEBRUARY 09 TO APRIL 09

2-Feb-09	143.75	147.47	146.79	17-Mar-09	171.90	148.85	153.04
3-Feb-09	133.20	146.79	144.32	18-Mar-09	176.40	153.04	157.29
4-Feb-09	135.45	144.32	142.71	19-Mar-09	171.70	157.29	159.91
5-Feb-09	131.10	142.71	140.60	20-Mar-09	160.90	159.91	160.09
6-Feb-09	137.50	140.60	140.04	23-Mar-09	166.15	160.09	161.19
9-Feb-09	141.60	140.04	140.32	24-Mar-09	162.45	161.19	161.42
10-Feb-09	138.20	140.32	139.93	25-Mar-09	160.35	161.42	161.23
11-Feb-09	136.10	139.93	139.23	26-Mar-09	175.90	161.23	163.90
12-Feb-09	136.30	139.23	138.70	27-Mar-09	188.90	163.90	168.45
13-Feb-09	137.75	138.70	138.53	30-Mar-09	172.00	168.45	169.09
16-Feb-09	136.25	138.53	138.12	31-Mar-09	180.30	169.09	171.13
17-Feb-09	130.80	138.12	136.79	1-Apr-09	180.00	171.13	172.74
18-Feb-09	133.30	136.79	136.16	2-Apr-09	203.65	172.74	178.36
19-Feb-09	134.55	136.16	135.87	6-Apr-09	210.05	178.36	184.12
20-Feb-09	133.75	135.87	135.48	8-Apr-09	223.55	184.12	191.29

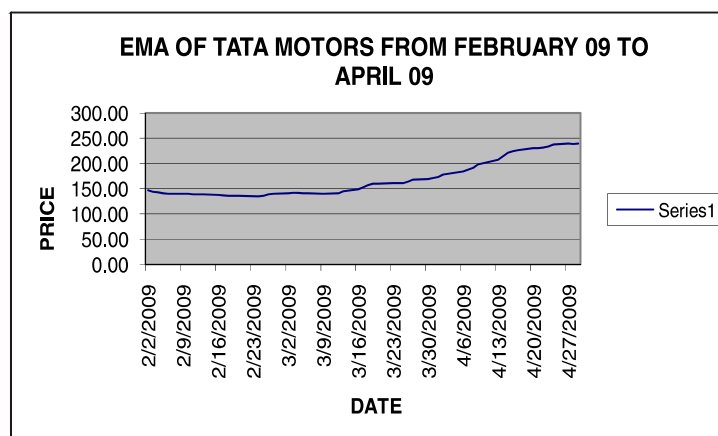
24-Feb-09	132.10	135.48	134.87	9-Apr-09	226.80	191.29	197.75
25-Feb-09	140.10	134.87	135.82	13-Apr-09	252.15	197.75	207.64
26-Feb-09	149.95	135.82	138.39	15-Apr-09	281.50	207.64	221.07
27-Feb-09	149.30	138.39	140.37	16-Apr-09	241.45	221.07	224.78
2-Mar-09	145.55	140.37	141.31	17-Apr-09	235.80	224.78	226.78
3-Mar-09	141.85	141.31	141.41	20-Apr-09	245.90	226.78	230.26
4-Mar-09	143.10	141.41	141.72	21-Apr-09	233.30	230.26	230.81
5-Mar-09	139.35	141.72	141.29	22-Apr-09	232.65	230.81	231.14
6-Mar-09	138.65	141.29	140.81	23-Apr-09	245.40	231.14	233.73
9-Mar-09	136.65	140.81	140.05	24-Apr-09	253.55	233.73	237.33
12-Mar-09	146.05	140.05	141.14	27-Apr-09	249.05	237.33	239.46
13-Mar-09	161.70	141.14	144.88	28-Apr-09	232.50	239.46	238.19
16-Mar-09	166.70	144.88	148.85	29-Apr-09	243.80	238.19	239.21

Sources: www.nseindia.com

INTERPRETATION

On 2nd February'09, the Exponential moving average was 146.79, then it moved down to 138.39 on 26th February'09. It then increased and reached 148.85. After this period, the prices saw an upward trend till the end of the Exponential moving average.

CHART NO: 1.3



RATE OF CHANGE

Rate of change indicator or the ROC measures the rate of change between the current price and the price 'n' number of days in the past. ROC helps to find out the overbought and oversold positions in a scrip. It is also useful in identifying the trend reversal. Closing prices are used to calculate the ROC. Daily closing prices are used for the daily ROC and weekly closing prices are used for calculating the weekly ROC. Calculation of ROC for 12 weeks or 12 months is the most popular.

TABLE 1.4: CALCULATIONS OF ROC OF TATA MOTORS FROM NOVEMBER 2008 TO APRIL 2009

DATE	PRICE	ROC (IN PERCENT)	6-Jan-09	186.45	119.29
3-Nov-08	190.45	-	7-Jan-09	174.15	108.94
4-Nov-08	193.95	-	9-Jan-09	165.75	97.21
5-Nov-08	182.20	-	12-Jan-09	161.50	91.73
6-Nov-08	157.50	-	13-Jan-09	155.10	86.91
7-Nov-08	157.75	-	14-Jan-09	156.35	83.86
10-Nov-08	170.50	89.52	15-Jan-09	150.65	86.50
11-Nov-08	154.40	79.61	16-Jan-09	152.95	92.28
12-Nov-08	150.45	82.57	19-Jan-09	150.10	92.94
14-Nov-08	137.20	87.11	20-Jan-09	145.75	93.97
17-Nov-08	140.95	89.35	21-Jan-09	139.90	89.48
18-Nov-08	138.70	81.35	22-Jan-09	132.90	88.22
19-Nov-08	134.45	87.08	23-Jan-09	135.05	88.29

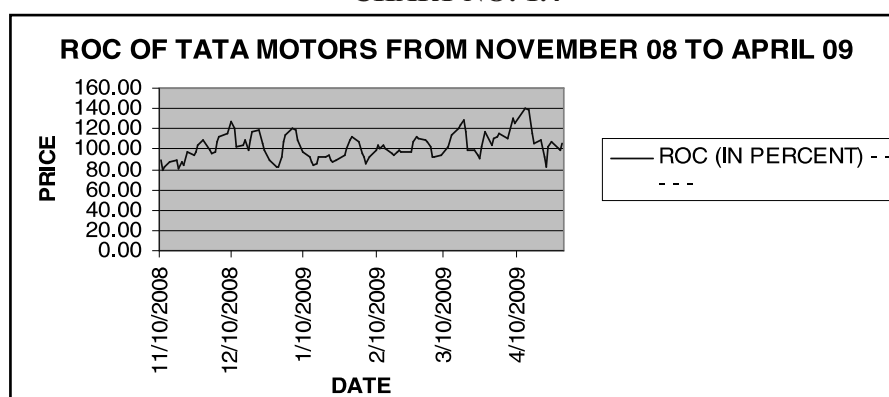
20-Nov-08	126.20	83.88	27-Jan-09	140.35	93.51
21-Nov-08	133.00	96.94	28-Jan-09	146.65	100.62
24-Nov-08	133.30	94.57	29-Jan-09	152.05	108.68
25-Nov-08	135.85	97.94	30-Jan-09	149.65	112.60
26-Nov-08	140.40	104.42	2-Feb-09	143.75	106.44
28-Nov-08	136.90	108.48	3-Feb-09	133.20	94.91
1-Dec-08	132.65	99.74	4-Feb-09	135.45	92.36
2-Dec-08	128.60	96.47	5-Feb-09	131.10	86.22
3-Dec-08	133.25	98.09	6-Feb-09	137.50	91.88
4-Dec-08	150.95	107.51	9-Feb-09	141.60	98.50
5-Dec-08	153.15	111.87	10-Feb-09	138.20	103.75
8-Dec-08	152.10	114.66	11-Feb-09	136.10	100.48
10-Dec-08	163.45	127.09	12-Feb-09	136.30	103.97
11-Dec-08	160.65	120.56	13-Feb-09	137.75	100.18
12-Dec-08	153.35	101.59	16-Feb-09	136.25	96.22
15-Dec-08	158.15	103.26	17-Feb-09	130.80	94.64
16-Dec-08	164.95	108.45	18-Feb-09	133.30	97.94
17-Dec-08	162.25	99.26	19-Feb-09	134.55	98.72
18-Dec-08	173.65	108.09	20-Feb-09	133.75	97.09
19-Dec-08	178.95	116.69	24-Feb-09	132.10	96.95
22-Dec-08	187.85	118.78	25-Feb-09	140.10	107.11
23-Dec-08	174.40	105.73	26-Feb-09	149.95	112.49
24-Dec-08	159.60	98.37	27-Feb-09	149.30	110.96
26-Dec-08	155.70	89.66	2-Mar-09	145.55	108.82
29-Dec-08	148.95	83.23	3-Mar-09	141.85	107.38
30-Dec-08	156.30	83.20	4-Mar-09	143.10	102.14
31-Dec-08	159.85	91.66	5-Mar-09	139.35	92.93
1-Jan-09	170.50	106.83	6-Mar-09	138.65	92.87
2-Jan-09	176.05	113.07	9-Mar-09	136.65	93.88
5-Jan-09	178.45	119.80	12-Mar-09	146.05	102.96

Sources: www.nseindia.com

INTERPRETATION

The above table depicts that Rate of Change crosses the over bought region on 18th March'09 at 129.09, 13th April'09 at 140.08. The investor can sell the scrip in this over bought region, since a fall can be anticipated. The Rate of Change reaches the oversold region on 11th November'08 at 79.61, so the investors can buy more shares during the period, they may expect a raise in the share value in the future.

CHART NO: 1.4



RELATIVE STRENGTH INDEX

The Relative Strength Index Technical Indicator (RSI) is a price-following oscillator that ranges between 0 and 100. When Wilder introduced the Relative Strength Index, he recommended using a 14-day RSI. Since then, the 9-day and 25-day Relative Strength Index indicators have also gained popularity. Ways to use Relative Strength Index for chart analysis: Tops and bottoms, Chart Formations, Failure swing (Support or Resistance penetrations or breakouts), Support and Resistance levels, Divergences.

TABLE 1.5: CALCULATIONS OF RSI OF TATA MOTORS FOR THE MONTH OF NOV'08

DATE	PRICE	GAIN	LOSS
3-Nov-08	190.45	-	-
4-Nov-08	193.95	3.50	-
5-Nov-08	182.20	-	11.75
6-Nov-08	157.50	-	24.70
7-Nov-08	157.75	0.25	-
10-Nov-08	170.50	12.75	-
11-Nov-08	154.40	-	16.10
12-Nov-08	150.45	-	3.95
14-Nov-08	137.20	-	13.25
17-Nov-08	140.95	3.75	-
18-Nov-08	138.70	-	2.25
19-Nov-08	134.45	-	4.25
20-Nov-08	126.20	-	8.25
21-Nov-08	133.00	6.80	-
24-Nov-08	133.30	0.30	-
25-Nov-08	135.85	2.55	-
26-Nov-08	140.40	4.55	-
28-Nov-08	136.90	-	3.50
	TOTAL	34.45	88.00

Sources: www.nseindia.com

$$RSI = 100 \left(\frac{100}{1 + R_s} \right)$$

Average Gain = Total Gains / n

Average Loss = Total Loss / n

$$RS = \frac{\text{Average Gain}}{\text{Average Loss}}$$

Average Gain = 34.45/8 = 4.31

Average Loss = 88/9 = 9.78

RS = 4.31

$$RSI = 100 \left(\frac{100}{1 + R_s} \right)$$

$$= 100 \left(\frac{100}{1 + 0.441} \right)$$

RSI = 30.604

TABLE 1.6: RSI OF TATA MOTORS FROM NOVEMBER 2008 TO APRIL 2009

MONTH	RSI
November '08	30.60
December '08	54.77
January '09	41.90
February '09	54.19
March '09	60.74
April '09	51.90

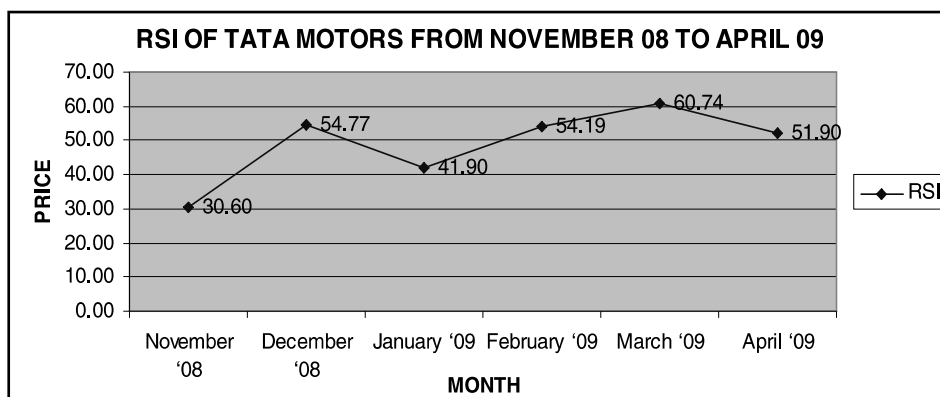
INTERPRETATION

The above table and chart depicts that from November'08 to April'09, Relative Strength Index has crossed 56 during March'09(RSI 60.74).

SELL: The investor can sell their shares only in March'09 (RSI 60.74).

HOLD: The investor can hold their shares in November'08(30.60), December'08(54.77), January'09 (41.90), February'09 (54.19), April'09 (51.9)

CHART NO: 1.5



BOLLINGER BANDS

Developed by John Bollinger, Bollinger Bands are an indicator that allows users to compare volatility and relative price levels over a period of time. The indicator consists of three bands designed to encompass the majority of a security's price action.

1. A simple moving average in the middle
2. An upper band (SMA plus 2 standard deviations)
3. A lower band (SMA minus 2 standard deviations)

Standard deviation is a statistical unit of measure that provides a good assessment of a price plot's volatility. Using the standard deviation ensures that the bands will react quickly to price movements and reflect periods of high and low volatility. Sharp price increases (or decreases), and hence volatility, will lead to a widening of the bands.

TABLE 1.7: CALCULATIONS OF BOLLINGER BANDS OF TATA MOTORS FOR THE MONTH OF NOVEMBER 08

DATE	PRICE	20-DAY SMA	SD	2SD	UPPER BAND	MIDDLE BAND	LOWER BAND
3-Nov-08	190.45	241.02	60.94	121.88	362.91	241.02	119.14
4-Nov-08	193.95	234.19	58.12	116.24	350.43	234.19	117.95
5-Nov-08	182.20	227.61	56.14	112.28	339.89	227.61	115.33
6-Nov-08	157.50	219.65	54.20	108.40	328.05	219.65	111.25
7-Nov-08	157.75	212.54	52.50	105.00	317.54	212.54	107.54
10-Nov-08	170.50	206.45	49.89	99.78	306.23	206.45	106.67
11-Nov-08	154.40	199.20	46.27	92.54	291.74	199.20	106.66
12-Nov-08	150.45	191.75	41.25	82.50	274.25	191.75	109.25
14-Nov-08	137.20	184.49	37.23	74.46	258.95	184.49	110.03
17-Nov-08	140.95	178.98	35.07	70.14	249.12	178.98	108.84
18-Nov-08	138.70	173.75	32.80	65.60	239.35	173.75	108.15
19-Nov-08	134.45	168.27	29.60	59.20	227.47	168.27	109.07
20-Nov-08	126.20	162.19	24.73	49.46	211.65	162.19	112.73
21-Nov-08	133.00	157.43	20.34	40.68	198.11	157.43	116.75
24-Nov-08	133.30	154.37	19.08	38.16	192.53	154.37	116.21
25-Nov-08	135.85	153.03	19.40	38.80	191.83	153.03	114.20
26-Nov-08	140.40	153.05	19.38	38.76	191.81	153.05	114.28
28-Nov-08	136.90	152.17	19.65	39.39	191.56	152.17	112.78

Sources: www.nseindia.com

INTERPRETATION

From the above table, on 3rd November'08, the upper band value is 362.91. Then it moved down to 191.56 on 28th November'08. On 3rd November'08, the middle band price was 241.02, and then it moved down at the end at 152.17. The lower band price was 119.14 on 3rd November'08, and then it suddenly reduced to 106.66 on 11th November'08 and moved upwards on 21st November'08.

CHART NO: 1.6

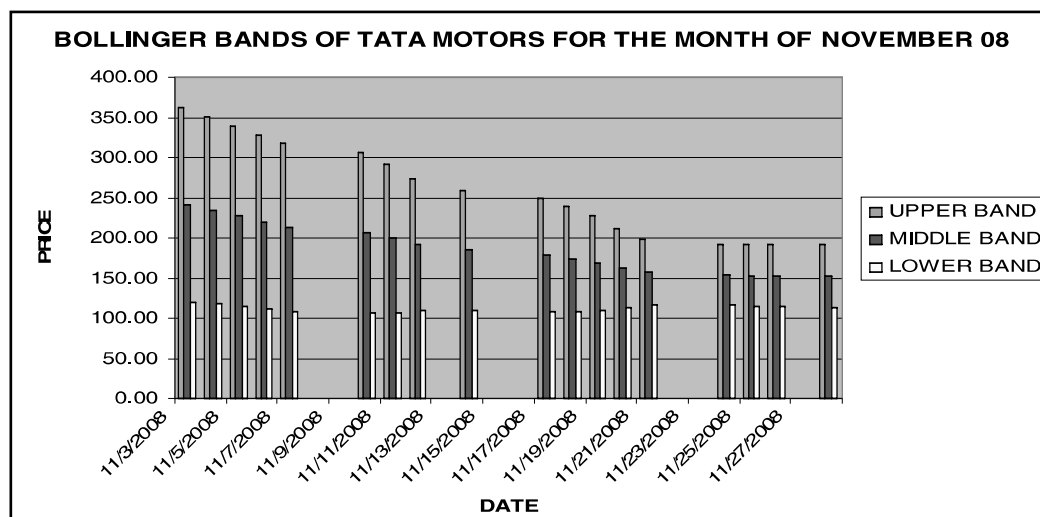


TABLE 1.8: CALCULATIONS OF BOLLINGER BANDS OF TATA MOTORS FOR THE MONTH OF DECEMBER 08

DATE	PRICE	20-DAY SMA	SD	2SD	UPPER BAND	MIDDLE BAND	LOWER BAND
1-Dec-08	132.65	150.82	20.05	40.10	190.92	150.82	110.72
2-Dec-08	128.60	148.77	20.13	40.26	189.03	148.77	108.51
3-Dec-08	133.25	145.91	17.95	35.90	181.81	145.91	110.01
4-Dec-08	150.95	143.76	14.26	28.52	172.28	143.76	115.24
5-Dec-08	153.15	142.31	11.48	22.96	165.27	142.31	119.35
8-Dec-08	152.10	142.04	11.18	22.36	164.40	142.04	119.68
10-Dec-08	163.45	142.32	11.64	23.28	165.60	142.32	119.04
11-Dec-08	160.65	141.83	10.60	21.20	163.03	141.83	120.63
12-Dec-08	153.35	141.78	10.54	21.08	162.86	141.78	120.70
15-Dec-08	158.15	142.16	10.98	21.96	164.12	142.16	120.20
16-Dec-08	164.95	143.55	11.97	23.94	167.49	143.55	119.61
17-Dec-08	162.25	144.61	12.62	25.24	169.85	144.61	119.37
18-Dec-08	173.65	146.36	14.03	28.06	174.42	146.36	118.30
19-Dec-08	178.95	148.59	15.42	30.84	179.43	148.59	117.75
22-Dec-08	187.85	151.67	16.74	33.48	185.15	151.67	118.19
23-Dec-08	174.40	153.74	16.87	33.73	187.47	153.74	120.01
24-Dec-08	159.60	155.06	16.23	32.47	187.53	155.06	122.59
26-Dec-08	155.70	156.05	15.62	31.25	187.30	156.05	124.80
29-Dec-08	148.95	156.48	15.30	30.61	187.09	156.48	125.87
30-Dec-08	156.30	157.45	14.63	29.27	186.72	157.45	128.18
31-Dec-08	159.85	158.81	13.48	26.97	185.78	158.81	131.84

Sources: www.nseindia.com

INTERPRETATION

From the above table, on 1st December'08, the upper band value is 190.92, then it has moved down to 174.42 on 18th December'08. On 1st December'08, the middle band price was 150.82, and then it has moved down to 141.83 on 11th December'08. The lower band price was 110.72 on 3rd December'08, then it has increased to 119.37 on 17th December'08 and moved upwards to 31st December'08.

**TABLE 1.9: CALCULATIONS OF BOLLINGER BANDS OF
TATA MOTORS FOR THE MONTH OF JANUARY 09**

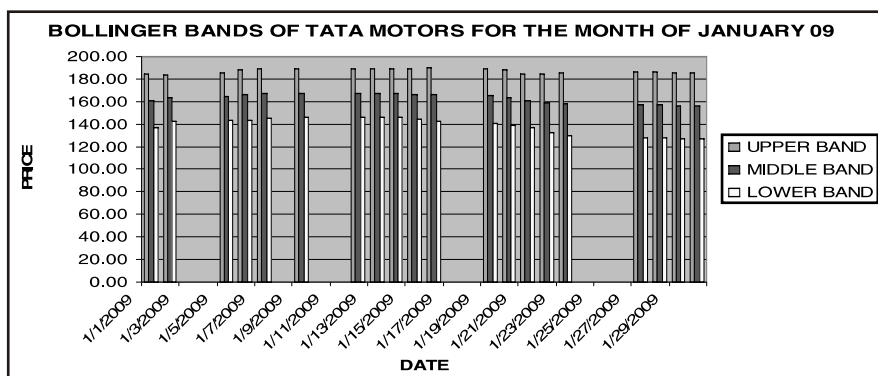
DATE	PRICE	20-DAY SMA	SD	2SD	UPPER BAND	MIDDLE BAND	LOWER BAND
1-Jan-09	170.50	160.90	11.78	23.55	184.45	160.90	137.35
2-Jan-09	176.05	163.04	10.36	20.72	183.76	163.04	142.32
5-Jan-09	178.45	164.42	10.49	20.98	185.40	164.42	143.44
6-Jan-09	186.45	166.08	11.19	22.38	188.46	166.08	143.70
7-Jan-09	174.15	167.18	10.84	21.67	188.85	167.18	145.51
9-Jan-09	165.75	167.30	10.81	21.62	188.92	167.30	145.68
12-Jan-09	161.50	167.34	10.78	21.57	188.91	167.34	145.77
13-Jan-09	155.10	167.43	10.68	21.35	188.78	167.43	146.08
14-Jan-09	156.35	167.34	10.76	21.52	188.86	167.34	145.82
15-Jan-09	150.65	166.62	11.36	22.71	189.33	166.62	143.91
16-Jan-09	152.95	166.16	11.71	23.42	189.58	166.16	142.74
19-Jan-09	150.10	164.98	12.08	24.15	189.13	164.98	140.83
20-Jan-09	145.75	163.32	12.32	24.64	187.96	163.32	138.68
21-Jan-09	139.90	160.92	11.97	23.95	184.87	160.92	136.97
22-Jan-09	132.90	158.85	13.01	26.02	184.87	158.85	132.83
23-Jan-09	135.05	157.62	14.00	28.00	185.62	157.62	129.62
27-Jan-09	140.35	156.85	14.50	29.00	185.85	156.85	127.85
28-Jan-09	146.65	156.74	14.57	29.14	185.88	156.74	127.60
29-Jan-09	152.05	156.53	14.60	29.21	185.74	156.53	127.32
30-Jan-09	149.65	156.02	14.66	29.32	185.34	156.02	126.70

Sources: www.nseindia.com

INTERPRETATION

From the above table, on 1st January'09, the upper band value is 184.45. Then it moved upward to 189.58 on 16th January '09 and reduced to 185.34 on 30th January'09. On 1st January'09, the middle band price was 160.92, then it has moved down at the end at 156.02 on 30th January'09. The lower band price was 137.35 on 3rd January'09, then it increased to 146.08 on 13th January'09 and moved downward to 126.70 on 30th January'08.

CHART NO: 1.7



**TABLE: 1.10: CALCULATIONS OF BOLLINGER BANDS OF
TATA MOTORS FOR THE MONTH OF FEBRUARY 09**

DATE	PRICE	20-DAY SMA	SD	2SD	UPPER BAND	MIDDLE BAND	LOWER BAND
2-Feb-09	143.75	154.68	14.49	28.99	183.67	154.68	125.69
3-Feb-09	133.20	152.54	14.34	28.69	181.23	152.54	123.85
4-Feb-09	135.45	150.39	13.50	26.99	177.38	150.39	123.40
5-Feb-09	131.10	147.62	11.31	22.63	170.25	147.62	124.99
6-Feb-09	137.50	145.79	9.73	19.45	165.24	145.79	126.34
9-Feb-09	141.60	144.58	8.61	17.21	161.79	144.58	127.37
10-Feb-09	138.20	143.41	7.77	15.55	158.96	143.41	127.86
11-Feb-09	136.10	142.46	7.44	14.88	157.34	142.46	127.58

12-Feb-09	136.30	141.46	6.83	13.66	155.12	141.46	127.80
13-Feb-09	137.75	140.82	6.53	13.06	153.88	140.82	127.76
16-Feb-09	136.25	139.98	5.97	11.94	151.92	139.98	128.04
17-Feb-09	130.80	139.02	5.81	11.63	150.65	139.02	127.39
18-Feb-09	133.30	138.39	5.73	11.45	149.84	138.39	126.94
19-Feb-09	134.55	138.13	5.77	11.55	149.68	138.13	126.58
20-Feb-09	133.75	138.17	5.74	11.48	149.65	138.17	126.69
24-Feb-09	132.10	138.02	5.85	11.71	149.73	138.02	126.31
25-Feb-09	140.10	138.01	5.85	11.70	149.71	138.01	126.31
26-Feb-09	149.95	138.17	6.13	12.26	150.43	138.17	125.91
27-Feb-09	149.30	138.04	5.84	11.68	149.72	138.04	126.36

Sources: www.nseindia.com

INTERPRETATION

From the above table, on 2nd February'09, the upper band value will be 183.67. Then it reduced to 149.72 on 27th February'09. On 2nd February'09, the middle band price was 154.68, then it moved down to 138.01 on 25th February'09. The lower band price was 125.69 on 2nd February'09, and then it increased to 128.04 on 16th February'09 and moved down to 125.91 on 26th February'09.

CHART NO: 1.8

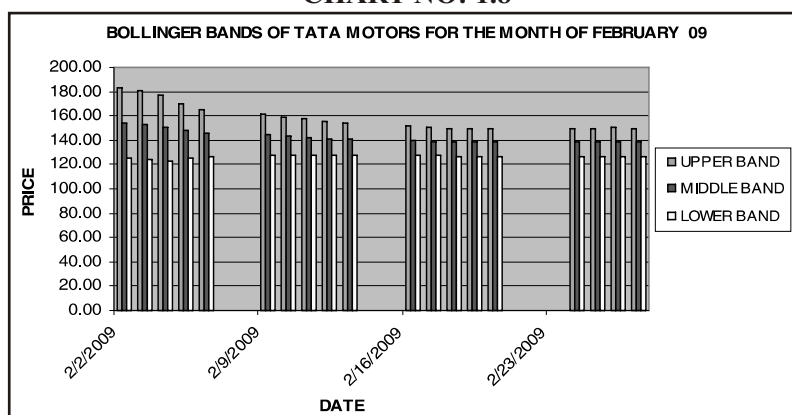


TABLE 1.11: CALCULATIONS OF BOLLINGER BANDS OF TATA MOTORS FOR THE MONTH OF MARCH 09

DATE	PRICE	20-DAY SMA	SD	2SD	UPPER BAND	MIDDLE BAND	LOWER BAND
2-Mar-09	145.55	137.83	5.49	10.98	148.81	137.83	126.85
3-Mar-09	141.85	137.74	5.40	10.81	148.55	137.74	126.93
4-Mar-09	143.10	138.23	5.42	10.84	149.07	138.23	127.39
5-Mar-09	139.35	138.43	5.39	10.77	149.20	138.43	127.66
6-Mar-09	138.65	138.80	5.12	10.23	149.03	138.80	128.57
9-Mar-09	136.65	138.76	5.13	10.26	149.02	138.76	128.50
12-Mar-09	146.05	138.98	5.34	10.68	149.66	138.98	128.30
13-Mar-09	161.70	140.16	7.28	14.55	154.71	140.16	125.61
16-Mar-09	166.70	141.69	9.22	18.44	160.13	141.69	123.25
17-Mar-09	171.90	143.47	11.23	22.45	165.92	143.47	121.02
18-Mar-09	176.40	145.40	13.22	26.45	171.85	145.40	118.95
19-Mar-09	171.70	147.17	14.22	28.43	175.60	147.17	118.74
20-Mar-09	160.90	148.68	14.00	27.99	176.67	148.68	120.69
23-Mar-09	166.15	150.32	14.02	28.04	178.36	150.32	122.28
24-Mar-09	162.45	151.72	13.77	27.54	179.26	151.72	124.18
25-Mar-09	160.35	153.05	13.24	26.49	179.54	153.05	126.56
26-Mar-09	175.90	155.24	13.22	26.44	181.68	155.24	128.80
27-Mar-09	188.90	157.68	14.63	29.26	186.94	157.68	128.42
30-Mar-09	172.00	158.78	14.84	29.67	188.45	158.78	129.11
31-Mar-09	180.30	160.33	15.38	30.75	191.08	160.33	129.58

Sources: www.nseindia.com

INTERPRETATION

From the above table, on 2nd March'09, the upper band value was 148.81. Then it increased to 191.08 on 31st March'09. On 2nd March'09, the middle band price was 137.83, then it has moved upward and was 160.33 on 31st March'09. The lower band price was 126.85 on 2nd March'09, then it decreased to 120.69 on 20th March'09 and moved upward to 129.58 on 31st March'09.

CHART NO: 1.9

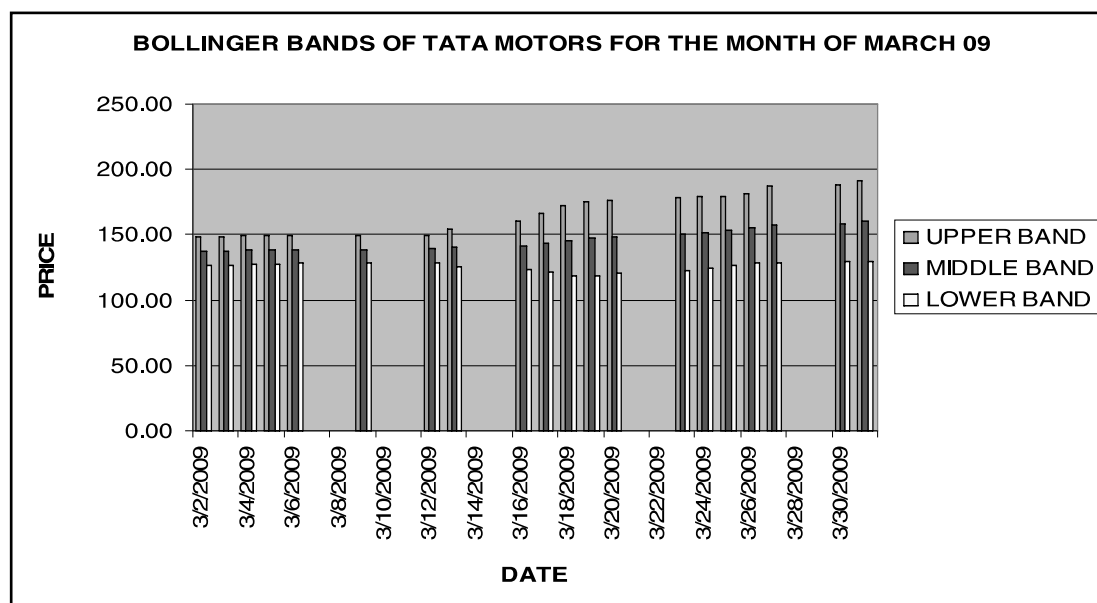


TABLE 1.12: CALCULATIONS OF BOLLINGER BANDS OF TATA MOTORS FOR THE MONTH OF APRIL 09

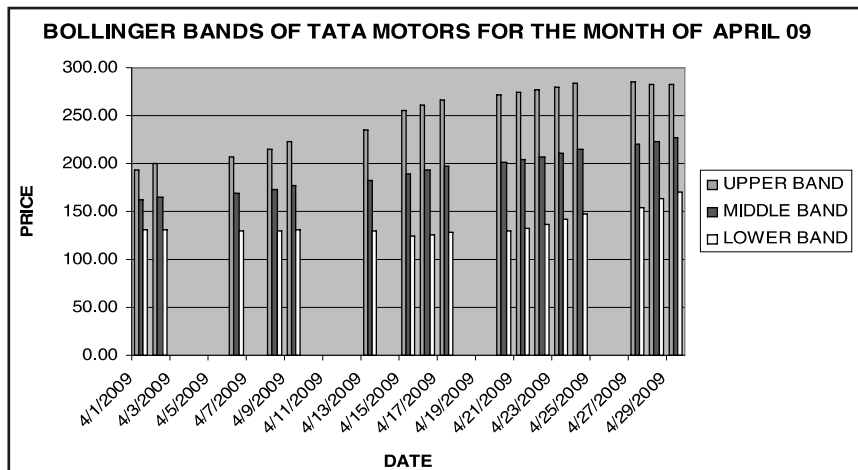
DATE	PRICE	20-DAY SMA	SD	2SD	UPPER BAND	MIDDLE BAND	LOWER BAND
1-Apr-09	180.00	162.05	15.55	31.10	193.15	162.05	130.95
2-Apr-09	203.65	165.14	17.28	34.55	199.69	165.14	130.59
6-Apr-09	210.05	168.49	19.07	38.15	206.64	168.49	130.34
8-Apr-09	223.55	172.70	21.34	42.67	215.37	172.70	130.03
9-Apr-09	226.80	177.11	22.89	45.79	222.90	177.11	131.32
13-Apr-09	252.15	182.88	26.28	52.56	235.44	182.88	130.32
15-Apr-09	281.50	189.65	32.61	65.21	254.86	189.65	124.44
16-Apr-09	241.45	193.64	33.80	67.60	261.24	193.64	126.04
17-Apr-09	235.80	197.10	34.40	68.79	265.89	197.10	128.31
20-Apr-09	245.90	200.80	35.45	70.90	271.70	200.80	129.90
21-Apr-09	233.30	203.64	35.66	71.32	274.96	203.64	132.32
22-Apr-09	232.65	206.69	35.40	70.81	277.50	206.69	135.88
23-Apr-09	245.40	210.91	34.72	69.45	280.36	210.91	141.46
24-Apr-09	253.55	215.28	34.31	68.62	283.90	215.28	146.66
27-Apr-09	249.05	219.61	32.80	65.61	285.22	219.61	154.00
28-Apr-09	232.50	223.22	29.93	59.86	283.08	223.22	163.36
29-Apr-09	243.80	226.62	28.17	56.33	282.95	226.62	170.29

Sources: www.nseindia.com

INTERPRETATION

From the above table, on 1st April'09, the upper band value is 193.15. Then it increased to 282.95 on 29th April'09. On 1st April'09, the middle band price was 162.05, then it moved upward and was 226.62 on 29th April'09. The lower band price was 130.95 on 1st April'09, and then it decreased to 124.44 on 15th April'09 and moved upward up to 170.29 on 29th April'09.

CHART NO: 1.10



DOW THEORY

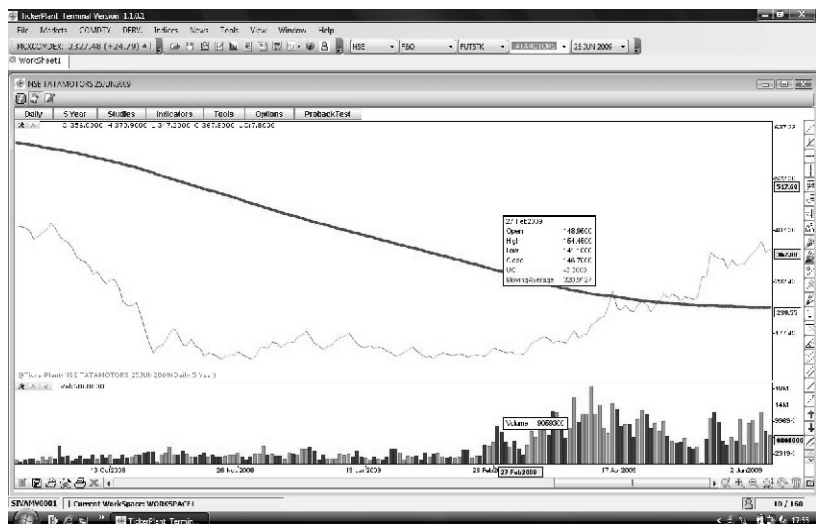
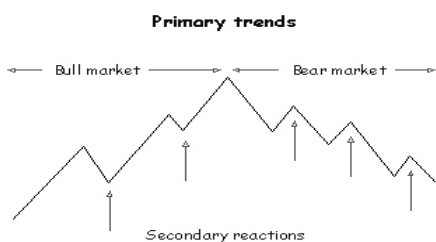
The ideas of Charles Dow, the first editor of the Wall Street Journal, forms the basis of technical analysis today. Dow created the Industrial Average of top blue chip stocks, and a second average of top railroad stocks (now the Transport Average). He believed that the behavior of the averages reflected the hopes and fears of the entire market. The behavior patterns that he observed apply to markets throughout the world.

THREE MOVEMENTS

Markets fluctuate in more than one time frame at the same time:

Nothing is more certain than that the market has three well defined movements which fit into each other.

- The first is the daily variation due to local causes and the balance of buying and selling at that particular time (Ripple).
- The secondary movement covers a period ranging from days to weeks, averaging probably between six to eight weeks (Wave).
- The third move is the great swing covering anything from months to years, averaging between 6 to 48 months. (Tide).



INTERPRETATION

From the above chart, on October'08 to end of January'09, the trend will reduce; hence it is a bearish trend. After

30 Indian Journal of Finance • May, 2010

that, from February'09 to June'09, the trend will go up, so it is a bullish trend.

FINDINGS

- ❖ It was found from the study that (simple moving average of Tata Motors) the investors can sell their shares on 3rd Dec'08, 31st Dec'08, 28th Jan'09, and 24th Feb'09. Since the stock prices fall below its moving average. The investor can buy more number of shares on 16th Dec'08, 7th Jan'09 and 17th Apr'09 since the stock prices rise above its moving average.
- ❖ Exponential Moving average of Tata Motors shows that the investors can sell their shares on 3rd Dec 08, 27th Jan 09 since stock prices falls below its EMA. The investors can buy more number of shares on 3rd Nov 08, 7th Jan 09.
- ❖ Exponential Moving Average of Tata Motors shows that the investors can sell their shares on 25th Feb 09 since stock prices falls below its EMA. The investors can buy more number of shares on 21st Apr 09 and 29th Apr 09.
- ❖ Rate of change of Tata Motors Crosses the over bought region on 13th Apr at (140.08). The investor can sell the scrip in this over bought region. Since a fall can be anticipated, the Rate of Change reaches the oversold region on 11th Nov. So, the investor can buy more shares during this period as they may expect a raise in the share value in the future.
- ❖ From the Relative Strength Index of Tata Motors, it was found that the investors can sell their shares only in Mar'09 (60.74). The investor can hold their shares of Nov'08(30.60), Dec'08(54.77), Jan'09(41.89), Feb'09(54.19), Apr'09(51.9)

SUGGESTIONS

- The investors should be trained to use the technical analysis tools since it will help them in their day to day investments to get more returns.
- Fundamental analysis can also be suggested to the investors together with the technical analysis in order to analyze the financial strength of corporates, growth of earnings and profitability.
- The company should orient the investors to mainly watch the business, economic, social and political factors that affect the supply and demand for securities.
- The investors can also use more number of charts which will depict a true picture on the movement of the securities.
- The investors should analyze market data in real time; plan their own market timing strategy to make money regardless of upward and downward trending markets.
- Minute by Minute trading volume shows the reversal points of the market, and therefore, when to buy and sell can be identified.
- “The trend is your Friend” is the motto of technical analysis. So, the investor has to monitor the trend of stocks before an investment.

CONCLUSION

Buying or selling of stocks is not an easy task if you want to make money doing it. Millions of investors have lost the money in the past trying guessing stock price movements. In order to consistently make money in the stock market, investors have to be right over 70% of the time.

In today's world, if you rely on fundamental analysis, broker's advice, newspaper articles or business channels for your investing or trading decisions, you are asking for a painful experience in the markets. So, this study on technical analysis in Tata Motors will help the investors in analyzing the scrip based on the technical tools and oscillators to earn fruitful investment.

Technical analysis is the art and science of chart patterns in order to better analyze and predict prices of a given security. It is also becoming popular with the younger generation. But further research has to be conducted to know whether the technical analysis alone will guarantee profits to the investors. Knowledge of the stock markets is the key to the success and emphasis should be on managing trading risk while technical analysis can help you to control them.

(Cont. on page 57)

CONCLUSIONS

Today, most of the trades in the Indian Stock Markets are conducted in BSE and NSE. Although, NSE was established only seventeen years ago, but growth in terms of value traded in NSE has increased by leaps and bounds.

In this paper, volatility of return series calculated from daily time series data of S&P CNX NIFTY have been analysed. The study reveals that the return series is mean reverting. Moreover, the return series is leptokurtic and returns are serially correlated. Furthermore, a modest attempt has also been made to fit the data into GARCH (1, 1) model to find conditional variances. The regression coefficients are highly significant and Q statistic indicates that the fitted equation is free from serial correlation. Therefore, GARCH (1, 1) model could be a good fit to explore the conditional variances. From the graphical representation (Fig.2) and large GARCH coefficient (0.8024), it appears that volatility persists over a long period of time in the said market. These findings are also at par with the existing literature. Joshi and Pandya (2008) report similar kind of results in their study conducted on BSE.

To conclude, while using GARCH model to explore the movements of volatility, no other variable except daily return has been applied. There may be some macroeconomic variables which could influence the market volatility. Hence, some macroeconomic variables could be used as exogenous variable in the model.

Finally, a scrip level analysis may be useful to capture the influence of company specific factors on scrip level volatility.

BIBLIOGRAPHY

1. Arestis, P, P.O. Demetriades and K.B. Luintel (2001), "Financial Development and Economic Growth: The Role of Stock Markets", *Journal of Money, Credit and Banking*, 33(2), 16-41.
2. Bekaert G. (1995), "Market Segmentation and Investment Barriers in Emerging Equity Markets". *The World Bank Economic Review*. 43. 29-77.
3. Bollerslev, Tim, 1986. "Generalized Autoregressive Conditional Heteroskedasticity," *Journal of Econometrics*, 31 (April): 307-327.
4. Brailsford, T. J. and R. W. Faff (1996), "An Evaluation of Volatility Forecasting Techniques", *Journal of Banking and Finance*, 20, 419-438.
5. Brooks, C. (1998), "Predicting Stock Market Volatility: Can Market Volume Help?", *Journal of Forecasting*, 17, 59-80.
6. Garner, A. (1988), "Has the Stock Market Crash Reduced Consumer Spending?", *Federal Reserve Bank of Kansas City Economic Review* (April), 3-16
7. Gertler, M and R. G. Hubbard (1989), "Factors in Business Fluctuations, Financial Market Volatility", *Federal Reserve Bank of Kansas City* 33-72
8. Harvey, C.R. (1995b), "Predictable Risk and Returns in Emerging Stock Markets", *Review of Financial Studies*, 8(3), 773-816.
9. Joshi, P and Kiran Pandya (2008), "Exploring Movements of Stock Market Volatility in India", *The Icfai Journal of Applied Finance*, 14(3), 5-32.
10. Levine, R. and Zervos, S (1998), "Stock Market Development and Long-Run Growth", *World Bank Policy Research, WPS No. 1582*.
11. Mandelbrot, Benoit (1963), "The Variation of Certain Speculative Prices", *Journal of Business* 36, 394-419.
12. McMillan, D., A. Speight, and O. Gwilym (2000), "Forecasting UK Stock Market Volatility", *Applied Financial Economics*, 10, 435-448.
13. Obaidullah, M (1991), "The Distribution of Stock Returns" *Chartered Financial Analyst*
14. Poon, S. and C. Granger (2003), "Forecasting Volatility in Financial Markets: A Review", *Journal of Economic Literature*, 41, 478-539.
15. Singh, Ajit, (1997), "Financial Liberalisation, Stock Markets and Economic Development," *The Economic Journal* 107(May): 771-782.
16. Wessels, D.R., (2006), "The Characteristics of Stock Market Volatility", www.indexinvestor.co.za

(Cont. from page 31)

BIBLIOGRAPHY

TEXT BOOKS

1. Donald E Ficher and Ronald J Jordan, Security analysis and portfolio Management, Prentice hall of india pvt ltd, new delhi, 6th edition 2002.
2. Preethi Singh Investment, Management Himalaya Publishing house, 14th Revised edition.
3. Punithavathy pandian, Security analysis and portfolio management, Vikas Publishing House Pvt. Ltd, new delhi-1100114, 2007.

WEBSITES

- 1) www.nseindia.com
- 2) www.bseindia.com
- 3) www.technicaltrends.com
- 4) www.stockcharts.com