Relative Strength Index (RSI) Application in Identifying Trading Movements of Selected IT Sector Companies in India

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Abstract

The stock market has been an integral part of the economy of any country. The stock market plays a pivotal role in the growth of the industry and commerce of the country that would subsequently affect the economy of the country to a great extent. In the recent past, share market investment has become one of the predominant investment avenues for investors. Hence, investors wishing to make an investment in share market are required to be conversant with share market trading practices, price fluctuations and appropriate time for buying and selling securities. This article is proposed to apply the momentum oscillator by the name "Relative Strength Index – (RSI)" for figuring out an overbought and oversold condition of a script based on which investors can take prudent stock market investment decision.

Keywords

Price Fluctuations, Momentum Oscillator and Stock Market

I. Introduction

The relative strength index was first introduced by Welles Wilder in an article in the "Commodities" magazine in June 1978. Subsequently, calculations and analysis of the RSI had been provided in his book "New concepts in Technical Trading Systems". The RSI is a price-following momentum indicator that moves between 0 and 100. It measures the internal strength of a share by monitoring and analyzing changes in the closing prices. The RSI usually tops above 80 or 70 and bottom below 40 or 30. Wide-used method of analyzing the RSI is to look for divergence in which the security in making a new high, but the RSI could fall to suppress its previous high. This divergence acts as an indication of an impending reversal. When the RSI then turns down and falls below its most recent through, it is said to have completed a "failure swing". The failure swing is considered a confirmation of the impending reversal. Divergences occur when the price of script make new high (or low), but this is not confirmed by a new high (or low) in the RSI. Price mostly correct and above in the direction of RSI. The most significant signal is generated on "Bullish" or "bearish" divergences between the RSI and the price of the share. The RSI is a simple formula. Copious variations of the same formula have been used in the computations of the RSI.

The basic formula calculating RSI is as follows:
$$RSI = 100 - (100 / (1+RS))$$
Where
RS = average of upward price change (increase price level change) over a selected number of days / average of downward (decrease price level change) price change over the same number of days. Wilder recommended using a 14-day RSI. Since then, the 9-day and 25-day RSIs have also been used. When smaller number of days is taken fr calculating the RSI, the indicator is subject to more volatility.

The other variation of computing RSI:
$$RSI = 100 \times (1/(D/D+U)) \ RSI – 100 \ ((100/U) / (1+U/D))$$
Where,
D = an average of downward price change
U = an average of upward price change
As mentioned early, RSI usually makes fluctuation between 0 to 100. RSI peaks are an indication of overbought levels and suggest price tops, while RSI troughs are an indication of oversold levels and share price bottoms. Two horizontal lines are normally drawn at 30 (indicating an oversold area) and 70 (indicating an overbought area). These two RSI lines can be adjusted depending on the market environment. Sometimes these lines can be moved to 40 and 80 in bullish markets and be lowered to 20 and 60 in bearish markets. The RSI can stay overbought in bullish markets and oversold in bearish markets for long periods with which market movements can be understood.

II. Literature Review

A. Falbo and Pelizzari (2011)

It is mentioned that there are many different methods of technical analysis, or different technical indicators. Not surprisingly, the profitability of technical indicators has long been subject to debate in the academic literature. It is likely also true that the profitability of technical indicators actually changes over time, as suggested by Lim and Brooks (2011).

B. Mitra (2011)

It is suggested that moving average based technical trading rules are profitable in the stock market of India. Analyzing a survey of 692 fund managers in five countries, Menkhoff (2010) finds that the vast majority of them do use technical analysis, which is indirect evidence that technical analysis is useful in actual trading and.investment. Szakmary.

C. Shen and Sharma (2010)

It is suggested that trend-following technical trading strategies are profitable in the commodity futures market. And, Menkhoff and Taylor (2007) try to explain why technical analysis could be profitable.

III. Objectives

A. To Figure Out the Appropriate Time for Buying or Selling Scripts

Being an astute player (investor) in the stock market, one must have clear ideas in identifying an appropriate time to buy or sell the shares. Because failing to have these ideas will lead to doomed failure in investment which will subsequently cause great loss. Therefore, this paper helps investors mapping out their investment by using Relative Strength Index application.

B. To Identify the Overbought and Oversold Condition

Identifying overbought and oversold status of script is imperative and it helps investors know whether to buy or sell or retains the shares. Hence, if shares have been overbought, it is an indication to sell the shares and vice versa.

IV. Data Collection

Secondary Data obtained for this study is mostly from the website of National Stock Exchange and Bombay Stock Exchange. Historical data (share price) of 3 Informational Technology companies have been obtained for 2 months (20th December to 31st January) and analysis has been done using "7 days RSI" application

V. Application Tool

Relative Strength Index (RSI)

Relative Strength = Average gain / Loss

RSI = 100 - (100/1+RS)

Rule of thumb: RSI over 70 suggests overvaluation and hence selling where as value around 30 suggest undervaluation or buying. In other words, the lower RSI is, the more people have sold which can be a good time to get in. Buy around 30, sell after 65
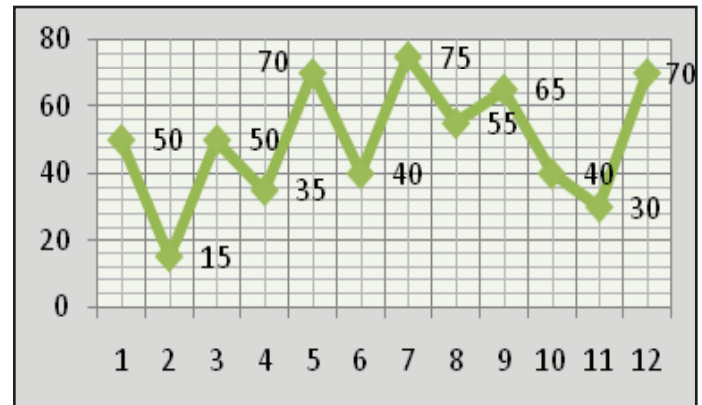
Interpretation of Relative Strength Index:

Below 50   :   Bearish
Above 50   :   Bullish
Between 50 and 70 :   Bullish
Between 70 and 100 :   Overbought
Below 30   :   Oversold

RSI indicates the overbought (70) and oversold levels (30) to traders. RSI signals help professional traders make the right trading decisions and allow them to quickly exit and enter the financial market. The signal tells traders to buy when the value crosses above the oversold line and sell when the signal crosses below the overbought line. The RSI is, thus, a stylish indicator that generates buy and sell signals, illustrates overbought and oversold conditions, confirms price trend and movement, and can show potential price reversals through divergence. The RSI offers smooth movements which conveniently fit into an orderly package between 0 and 100.

VI (Data Analysis) Relative Strength Index of HCL Technologies Ltd.

Table 1: Results Obtained by Applying RSI

Date	Price	Gain / Loss	Gain	Loss	Average Gain	Average Loss	RS	RSI
20-Dec-16	830	Nil	Nil	Nil	Nil	Nil	Nil	Nil
21-Dec-16	821	-9.35	0	9.35	Nil	Nil	Nil	Nil
22-Dec-16	817	-3.7	0	3.7	Nil	Nil	Nil	Nil
23-Dec-16	794	-23.35	0	23.35	Nil	Nil	Nil	Nil
26-Dec-16	790	-3.35	0	3.35	Nil	Nil	Nil	Nil
27-Dec-16	805	14.45	14.45	0	Nil	Nil	Nil	Nil
28-Dec-16	803	-1.85	0	1.85	Nil	Nil	Nil	Nil
29-Dec-16	819	16.35	16.35	0	2.06	5.94	0.35	25.78
30-Dec-16	828	8.6	8.6	0	4.40	5.94	0.74	42.54
2-Jan-17	829	0.55	0.55	0	5.63	4.61	1.22	54.99
3-Jan-17	835	6.65	6.65	0	5.71	4.08	1.40	58.32
4-Jan-17	857	21.8	21.8	0	6.66	0.74	8.96	89.96
5-Jan-17	845	-12.3	0	12.3	9.77	0.26	36.97	97.37
6-Jan-17	814	-30.25	0	30.25	7.71	2.02	3.81	79.22
9-Jan-17	838	23.9	23.9	0	7.71	6.08	1.27	55.91
10-Jan-17	838	-0.45	0	0.45	8.79	6.08	1.45	59.11
11-Jan-17	833	-4.6	0	4.6	7.56	6.14	1.23	55.16
12-Jan-17	848	14.45	14.45	0	7.48	6.80	1.10	52.38
13-Jan-17	850	2.55	2.55	0	8.59	6.80	1.26	55.82
16-Jan-17	831	-19.7	0	19.7	5.84	6.80	0.86	46.21
17-Jan-17	838	7.2	7.2	0	5.84	7.86	0.74	42.65
18-Jan-17	844	6.3	6.3	0	6.87	3.54	1.94	66.03
19-Jan-17	844	0.1	0.1	0	4.36	3.54	1.23	55.20
20-Jan-17	839	-5.4	0	5.4	4.37	3.47	1.26	55.74
23-Jan-17	857	18.55	18.55	0	4.37	3.59	1.22	54.94
24-Jan-17	849	-8.5	0	8.5	4.96	3.59	1.38	58.03

25-Jan-17	841	-7.55	0	7.55	4.59	4.80	0.96	48.90
27-Jan-17	844	2.95	2.95	0	4.59	3.06	1.50	59.98
30-Jan-17	840	-3.95	0	3.95	3.99	3.06	1.30	56.53
31-Jan-17	811	-29.1	0	29.1	3.09	3.63	0.85	45.96

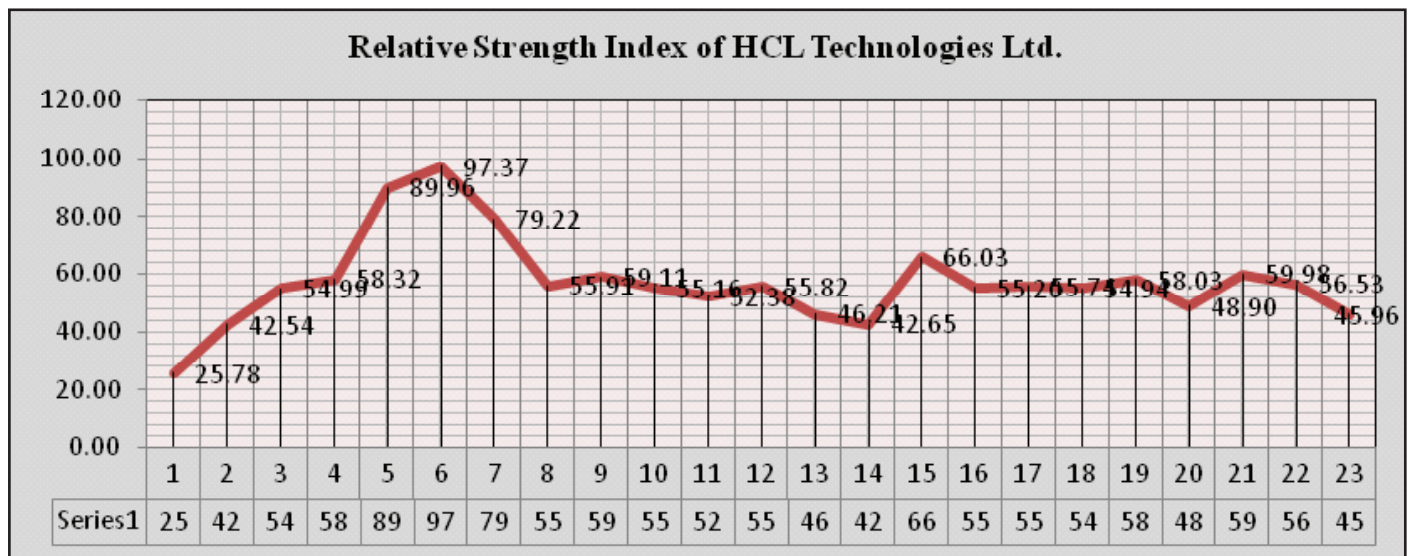Source: Calculations by authors. Closing price: NSE's website

Fig. 1: Source: Based on RSI Calculated

Interpretation: Fig. 1 has the share price movement of 7-days RSI of HCL. RSI curve below 30 in the chart indicates oversold region and above 70 indicates overbought region and it also indicates a fall in prices. During this period, no buying signal is indicated because the RSI does not fall below 30. However; clear selling signal was indicated during 1st week of January as prices were falling.

A. Relative Strength Index of Wipro Technologies Ltd.
Table 2: Results Obtained by Applying RSI

Date	Price	Gain / Loss	Gain	Loss	Average Gain	Average Loss	RS	RSI
20-Dec-16	467	Nil	Nil	Nil	Nil	Nil	Nil	Nil
21-Dec-16	462	-4.2	0	4.2	Nil	Nil	Nil	Nil
22-Dec-16	462	-0.75	0	0.75	Nil	Nil	Nil	Nil
23-Dec-16	459	-2.95	0	2.95	Nil	Nil	Nil	Nil
26-Dec-16	456	-2.65	0	2.65	Nil	Nil	Nil	Nil
27-Dec-16	465	9.1	9.1	0	Nil	Nil	Nil	Nil
28-Dec-16	469	4.15	4.15	0	Nil	Nil	Nil	Nil
29-Dec-16	472	3	3	0	1.89	1.51	1.26	55.67
30-Dec-16	474	2.1	2.1	0	2.32	1.51	1.54	60.63
2-Jan-17	472	-2.9	0	2.9	2.62	0.91	2.89	74.29
3-Jan-17	467	-4.55	0	4.55	2.62	1.21	2.16	68.34
4-Jan-17	476	8.6	8.6	0	2.62	1.44	1.82	64.50
5-Jan-17	480	4.8	4.8	0	3.85	1.06	3.62	78.34
6-Jan-17	470	-10.45	0	10.45	3.24	1.06	3.04	75.25
9-Jan-17	472	2.05	2.05	0	2.64	2.56	1.03	50.82
10-Jan-17	477	4.5	4.5	0	2.51	2.56	0.98	49.51
11-Jan-17	476	-0.3	0	0.3	2.85	2.56	1.11	52.71
12-Jan-17	483	7	7	0	2.85	2.19	1.30	56.60
13-Jan-17	485	1.45	1.45	0	3.85	1.54	2.51	71.49
16-Jan-17	485	0.1	0.1	0	2.83	1.54	1.84	64.81
17-Jan-17	482	-2.35	0	2.35	2.16	1.54	1.40	58.41
18-Jan-17	483	0.55	0.55	0	2.16	0.38	5.70	85.07
19-Jan-17	479	-3.95	0	3.95	1.94	0.38	5.13	83.69
20-Jan-17	478	-1.1	0	1.1	1.30	0.94	1.38	57.96
23-Jan-17	480	1.85	1.85	0	1.30	1.06	1.23	55.15

24-Jan-17	482	1.75	1.75	0	0.56	1.06	0.53	34.80
25-Jan-17	474	-7.8	0	7.8	0.61	1.06	0.57	36.48
27-Jan-17	466	-8.15	0	8.15	0.59	2.17	0.27	21.45
30-Jan-17	466	0.2	0.2	0	0.59	3.00	0.20	16.50
31-Jan-17	458	-7.75	0	7.75	0.54	3.00	0.18	15.32

Source: Calculations by authors. Closing price: NSE's website
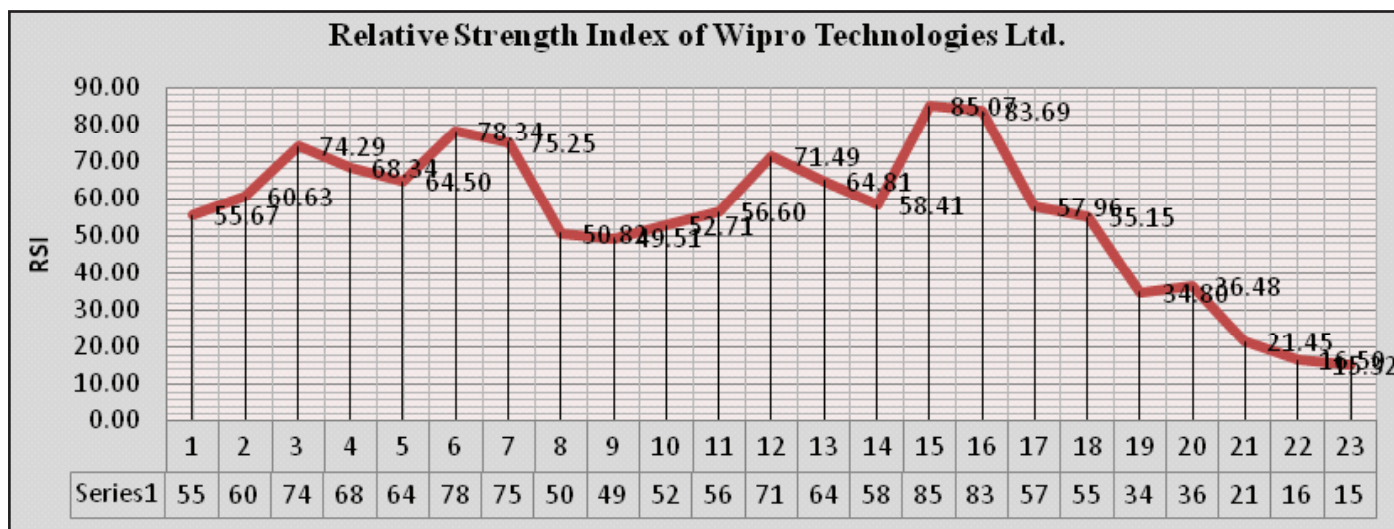
Fig. 2: Source: Based on RSI calculated

Interpretation: Fig. 2 has the share price movement of 7-days RSI of Wipro. Between 19th January and 31st January, The RSI gradually moved downwards from (85 – 15) which is due to hike in price of Wipro from (Rs.470 to Rs.785) from 6th to 16th January. This has subsequently indicated buying signal as the RSI curve falls in oversold region.

B. Relative Strength Index of TCS Technologies Ltd.

Table 3: Results Obtained by Applying RSI

Date	Price	Gain / Loss	Gain	Loss	Average Gain	Average Loss	RS	RSI
20-Dec-16	2339	Nil	Nil	Nil	Nil	Nil	Nil	Nil
21-Dec-16	2314	-25.7	0	25.7	Nil	Nil	Nil	Nil
22-Dec-16	2308	-5.9	0	5.9	Nil	Nil	Nil	Nil
23-Dec-16	2288	-19.6	0	19.6	Nil	Nil	Nil	Nil
26-Dec-16	2293	5	5	0	Nil	Nil	Nil	Nil
27-Dec-16	2323	30.3	30.3	0	Nil	Nil	Nil	Nil
28-Dec-16	2313	-10	0	10	Nil	Nil	Nil	Nil
29-Dec-16	2352	38.3	38.3	0	5.04	8.74	0.58	36.58
30-Dec-16	2366	13.85	13.85	0	10.51	8.74	1.20	54.60
2-Jan-17	2361	-4.2	0	4.2	12.49	5.07	2.46	71.13
3-Jan-17	2368	6.9	6.9	0	12.49	4.83	2.59	72.12
4-Jan-17	2380	11.25	11.25	0	13.48	2.03	6.64	86.92
5-Jan-17	2334	-45.1	0	45.1	14.37	2.03	7.08	87.63
6-Jan-17	2281	-53	0	53	10.04	8.47	1.19	54.24
9-Jan-17	2304	22.3	22.3	0	10.04	14.61	0.69	40.73
10-Jan-17	2315	11.65	11.65	0	7.76	14.61	0.53	34.67
11-Jan-17	2324	9.05	9.05	0	7.44	14.61	0.51	33.74
12-Jan-17	2344	19.95	19.95	0	8.74	14.01	0.62	38.40
13-Jan-17	2249	-95.05	0	95.05	10.60	14.01	0.76	43.06
16-Jan-17	2259	9.25	9.25	0	8.99	27.59	0.33	24.58
17-Jan-17	2279	20.2	20.2	0	10.31	21.15	0.49	32.78
18-Jan-17	2295	16.35	16.35	0	13.20	13.58	0.97	49.29
19-Jan-17	2291	-4.1	0	4.1	12.35	13.58	0.91	47.63
20-Jan-17	2285	-5.65	0	5.65	10.69	14.16	0.75	43.00

23-Jan-17	2307	21.35	21.35	0	9.39	14.97	0.63	38.55
24-Jan-17	2318	11.65	11.65	0	9.59	14.97	0.64	39.05
25-Jan-17	2353	34.65	34.65	0	11.26	1.39	8.08	88.99
27-Jan-17	2358	4.8	4.8	0	14.89	1.39	10.69	91.44
30-Jan-17	2333	-24.9	0	24.9	12.69	1.39	9.11	90.11
31-Jan-17	2230	-103.1	0	103.1	10.35	4.95	2.09	67.65

Source: Calculations by authors. Closing price: NSE's website
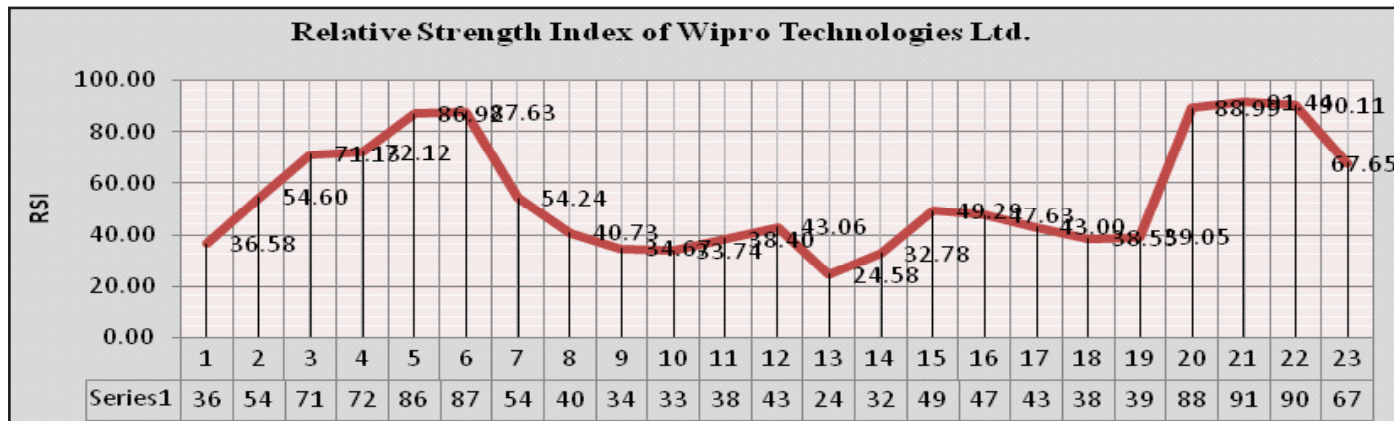
Fig. 3: Source: Based on RSI calculated

Interpretation: Fig. 3 has the share price movement of 7-days RSI of TCS. The RSI curve sloped downwards from 87-24 and it formed "V" shape movement. Because of quick change in price level, a sudden bullish divergence occurred during 25th & 27th January which was also an indication of selling signal for stock market investors.

C. Closing share price comparison of HCL, Wipro and TCL technologies Ltd.
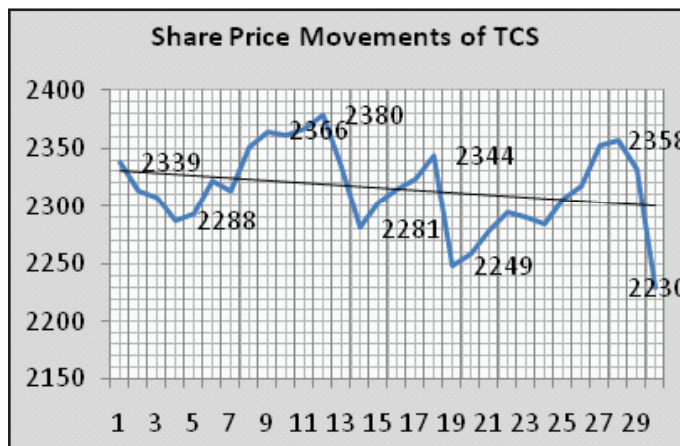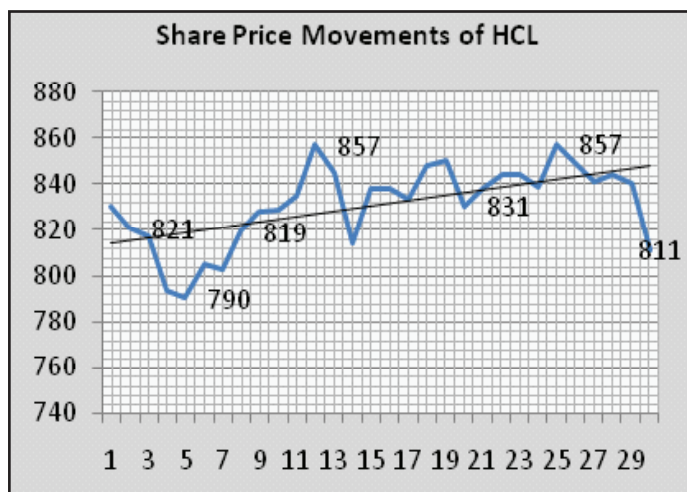
Date	HCL	Wipro	TCS
20-Dec-16	830	467	2339
21-Dec-16	821	462	2314
22-Dec-16	817	462	2308
23-Dec-16	794	459	2288
26-Dec-16	790	456	2293
27-Dec-16	805	465	2323
28-Dec-16	803	469	2313
29-Dec-16	819	472	2352
30-Dec-16	828	474	2366
2-Jan-17	829	472	2361
3-Jan-17	835	467	2368
4-Jan-17	857	476	2380
5-Jan-17	845	480	2334
6-Jan-17	814	470	2281
9-Jan-17	838	472	2304
10-Jan-17	838	477	2315
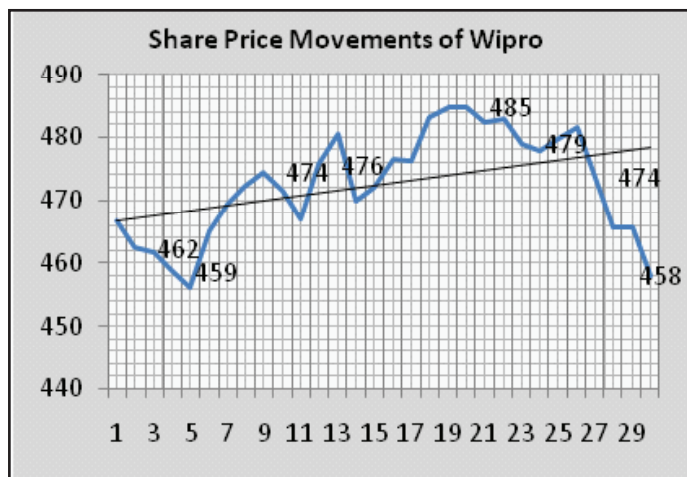
11-Jan-17	833	476	2324
12-Jan-17	848	483	2344
13-Jan-17	850	485	2249
16-Jan-17	831	485	2259
17-Jan-17	838	482	2279
18-Jan-17	844	483	2295
19-Jan-17	844	479	2291
20-Jan-17	839	478	2285
23-Jan-17	857	480	2307
24-Jan-17	849	482	2318
25-Jan-17	841	474	2353
27-Jan-17	844	466	2358
30-Jan-17	840	466	2333
31-Jan-17	811	458	2230

Interpretation: It can be observed that closing price trend of both HCL and Wipro moved upward while TCS's moved downwards gradually from 20th Dec to 31st Jan. From 20th Dec to 26th Dec, Hindustan Computers Ltd's share price declined from Rs. 830 to Rs.790. Similarly, Western Indian Products Ltd's and TATA Consultancy Services Ltd's share price declined from Rs. 480 to Rs 458 and Rs. 2307 to Rs 2230 during 23rd Jan to 31st Jan respectively. In addition, Share price fluctuation of TCS was found to be higher than TCS's and WIPRO's. This could be due to demand and supply factor within the market. Comparison of the closing price of shares is an analysis through which volatility of shares can be measured. The volatility level of TCS was found to be higher than those of HCL and Wipro. In TCS, movement of share price formed both "V" shape, "Double Top" and "Double Bottom". Trend movement of HCL & Wipro remained moving upward while TCS' moving downwards.

VII. Conclusion

The Relative Strength Index of HCL was above 70 during 4th, 5th and 6th of January. This was the clear indication that shares of HCL have been overbought. As rule of thumb, if shares have been overbought, investors tend to sell their shares to make the profit out of price fluctuations. However, the RSI ranged from 55 to 42 from 9th January to 17th January, hence, investors were suggested retaining their shares.

Wipro's RSI gradually moved downwards from 85 to 15 from 18th January to 31st January. Hike in share price had led to declining in RSI. This recommends investors buying the shares of Wipro Ltd. It was also found that the shares of Wipro have been overbought and it subsequently indicated selling signal during 18th and 19th of January. Wipro's RSI reached rock bottom level (15.32) on 31st January.

Of 3 IT companies' RSI, the RSI of TCS has reached the maximum of 91.44 on 27th January. Investors are recommended making use of this opportunity to sell their shares for getting adequate return. There were two good opportunities on 5th January and 27th January for stock market players to make use of high level of RSI.

As far as "Comparison of closing price" is concerned, share price movement of both HCL and Wipro gained momentum while TCS's moved slightly downwards notwithstanding its share price is higher than those of HCL and Wipro.

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L.Rakesh is energetic professional with a Management ideas currently working for banking sector of Royal Bank of Scotland and has been serving for its upcoming. He has a passion on analyzing more on financial and economical market and happenings. Hope this article gives a deep insight of RSI application and its wide uses.