



## Relevance of Technical Analysis with Reference to Market Price Behaviour of Select IT Scrips-A Study

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### ABSTRACT

*Technical analysis is a method of predicting the future stock prices by using historical price information and volume data with the help of statistical techniques. Technical analysis makes use of wide variety of graphic tools for constructing meaning full charts. It is based on the assumption that collective wisdom is much rational than individual judgement and certain chart patterns tend to repeat. The fundamental premise of technical analysis is that market behaviour is predictable and hence market price of the share may not reflect the company fundamentals always. That's why Technicians (aka quantitative analysts or chartists) make their decisions on the basis of the predictable trend (direction) of the market (analyzing previous data). IT companies brought massive rallies in Indian stock market taking BSE Index to new heights several times from early 90s. In this backdrop an empirical study is made to examine the relevance of technical analysis with reference to select IT Scrips. The purpose of the study is twofold. Firstly to draw some generalisations based on the Technical Analysis. Secondly, to test the validity of the generalisations to the market price behaviour in the subsequent period. In order to keep the study in manageable limits the study is confined to the market price behaviour observed during November 2010 to June 2011.*

### Keywords :

Technical analysis is a method of predicting the future stock prices by using historical price information and volume data with the help of statistical techniques. Technical analysis makes use of wide variety of graphic tools for constructing meaning full charts. It is based on the assumption that collective wisdom is much rational than individual judgement and certain chart patterns tend to repeat. Historical price and current price of a stock are the bases for predicting future price by a technical analyst apart from the Company information. The fundamental premise of technical analysis is that market behaviour is predictable and hence market price of the share may not reflect the company fundamentals always. That's why Technicians (aka quantitative analysts or chartists) make their decisions on the basis of the predictable trend (direction) of the market (analyzing previous data). IT companies brought massive rallies in Indian stock market taking BSE Index to new heights several times from early 90s. In this backdrop an empirical study is made to examine the relevance of technical analysis with reference to select IT Scrips. The purpose of the study is twofold. Firstly to draw some generalisations based on the Technical Analysis. Secondly, to test the validity of the generalisations to the market price behaviour in the subsequent period. In order to keep the study in manageable limits the study is confined to the market price behaviour observed during November 2010 to June 2011.

Tata Consultancy Services Limited, founded in 1968, is the country's largest software exporter. It provides information technology (IT) services, business solutions, and outsourcing services primarily in the Americas, Europe, and

India. The company generated consolidated revenues of US \$6 billion for fiscal year ended 31 March 2010.

Infosys Ltd., founded in 1981, is the country's second largest exporter IT exporter. It provides information technology (IT) and consulting services worldwide. The company achieved consolidated revenues of US \$4.80 billion for fiscal 2010.

### Analysis of the Changes Using Exponential Moving Average

In order to reduce the lag in simple moving averages, technicians often use exponential moving averages (aka EMA or exponentially weighted moving averages). EMAs reduce the lag by applying more weight to recent prices relative to older prices. The weight 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 ex. 10 period exponential moving average weights the most recent price (18.18%), while a 20 period EMA weighs the most recent price at 9.52%.

The formula for an exponential moving average is

$$\text{EMA (Current)} = ((\text{Price Current}) \text{EMV (Previous)}) * \text{Multiplier} + \text{EMA (Previous)}$$

For Ex, a 10 period EMA's multiplier is calculated as  $(2 / (\text{Time Periods} + 1)) = (2 / (10 + 1)) = 0.1818$  (18.18%)

This means a 10 period EMA is Equivalent to an 18.18% EMA.

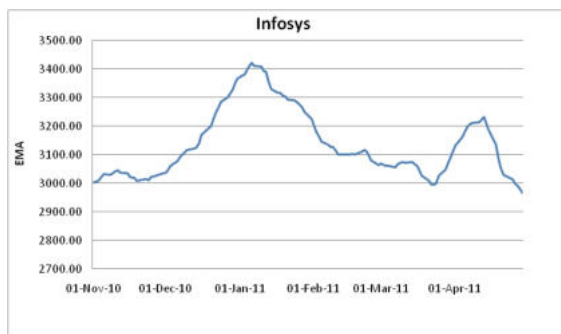
Table 1.1 Calculation Of Ema Of Infosys From Nov 2010 To Apr 2011

Date	Close Price	Prev. Period EMA	10 DAY EMA	Date	Close Price	Prev. Period EMA	10 DAY EMA	Date	Close Price	Prev. Period EMA	10 DAY EMA
01-Nov-10	2994.85		3004.88	01-Dec-10	3440.50	3331.81	3351.57	28-Feb-11	3003.05	3080.16	3065.14
02-Nov-10	3019.80	3004.86	3007.54	01-Dec-10	3445.00	3351.57	3368.56	01-Mar-11	3088.00	3066.14	3070.11
03-Nov-10	3024.05	3007.54	3010.54	03-Jan-11	3452.90	3388.56	3383.89	03-Mar-11	3025.70	3070.11	3062.04
04-Nov-10	3076.55	3010.54	3022.54	04-Jan-11	3468.00	3383.89	3399.18	04-Mar-11	3062.90	3062.04	3062.20
05-Nov-10	3079.80	3022.54	3032.95	05-Jan-11	3467.65	3399.18	3413.63	07-Mar-11	3037.70	3062.20	3057.74
06-Nov-10	3023.65	3032.95	3031.26	06-Jan-11	3475.85	3411.63	3423.30	08-Mar-11	3114.65	3057.74	3068.09
08-Nov-10	3052.10	3031.26	3036.05	07-Jan-11	3368.50	3423.30	3412.98	09-Mar-11	3095.25	3068.09	3073.03
09-Nov-10	3082.90	3036.05	3048.75	08-Jan-11	3398.65	3412.98	3430.71	10-Mar-11	3087.45	3073.03	3075.65
11-Nov-10	3055.15	3043.75	3045.82	11-Jan-11	3329.25	3410.01	3365.33	11-Mar-11	3054.45	3075.65	3071.79
12-Nov-10	2999.25	3045.82	3037.35	12-Jan-11	3374.95	3395.33	3391.62	14-Mar-11	3099.25	3071.79	3076.79
15-Nov-10	3024.25	3037.35	3034.97	13-Jan-11	3312.30	3391.62	3356.02	15-Mar-11	3029.70	3076.79	3068.23
16-Nov-10	2972.30	3034.97	3023.58	14-Jan-11	3201.95	3359.02	3330.47	16-Mar-11	3035.50	3068.23	3062.28
18-Nov-10	3004.15	3023.58	3020.05	17-Jan-11	3267.95	3330.47	3319.10	17-Mar-11	2981.25	3062.28	3047.55
19-Nov-10	2965.45	3020.05	3016.30	18-Jan-11	3139.15	3319.10	3310.63	18-Mar-11	2944.55	3047.55	3026.28
22-Nov-10	3042.10	3016.30	3019.08	19-Jan-11	3252.00	3318.93	3305.76	21-Mar-11	2922.15	3028.28	3008.98
23-Nov-10	3013.30	3019.08	3015.58	20-Jan-11	3289.10	3306.76	3303.55	22-Mar-11	2943.40	3008.98	2997.06
24-Nov-10	3001.00	3015.58	3012.83	21-Jan-11	3248.75	3303.55	3284.59	23-Mar-11	2993.60	2997.06	2996.43
25-Nov-10	3063.70	3012.83	3022.16	24-Jan-11	3278.20	3293.59	3290.79	24-Mar-11	3004.90	2996.43	2997.97
26-Nov-10	3040.55	3022.16	3025.50	25-Jan-11	3254.10	3290.79	3284.12	25-Mar-11	3162.00	2997.97	3027.79
29-Nov-10	3084.85	3025.50	3032.85	27-Jan-11	3195.20	3284.12	3267.95	28-Mar-11	3139.55	3027.79	3046.11
30-Nov-10	3091.00	3032.85	3035.71	31-Jan-11	3116.30	3250.76	3226.33	30-Mar-11	3170.15	3046.11	3070.64
01-Dec-10	3054.55	3035.71	3039.13	01-Feb-11	3098.20	3226.33	3200.86	01-Apr-11	3236.75	3088.73	3115.64
02-Dec-10	3123.00	3039.13	3049.37	01-Feb-11	3086.20	3226.33	3200.86	01-Apr-11	3236.75	3088.73	3115.64
03-Dec-10	3145.45	3049.37	3062.76	02-Feb-11	3115.85	3179.91	3168.27	04-Apr-11	3283.85	3124.29	3161.48
07-Dec-10	3167.75	3077.99	3084.15	04-Feb-11	3046.35	3168.27	3146.10	05-Apr-11	3279.50	3161.48	3162.93
08-Dec-10	3134.60	3101.50	3110.60	08-Feb-11	3096.60	3135.73	3128.62	07-Apr-11	3247.45	3159.87	3207.70
09-Dec-10	3151.55	3101.50	3110.60	08-Feb-11	3127.00	3128.62	3128.62	08-Apr-11	3226.95	3207.70	3211.20
10-Dec-10	3147.55	3110.60	3117.32	08-Feb-11	3127.00	3128.62	3128.62	08-Apr-11	3226.95	3207.70	3211.20
13-Dec-10	3148.50	3122.99	3129.09	11-Feb-11	3128.62	3128.62	3128.62	11-Apr-11	3211.20	3211.20	3216.35
14-Dec-10	3151.05	3122.99	3128.09	11-Feb-11	3128.62	3128.62	3128.62	11-Apr-11	3211.20	3211.20	3216.35
15-Dec-10	3203.65	3128.09	3141.83	14-Feb-11	3104.55	3101.62	3102.16	15-Apr-11	2988.90	3232.65	3188.31
16-Dec-10	3232.30	3141.83	3165.18	14-Feb-11	3101.62	3101.62	3101.62	15-Apr-11	2988.90	3232.65	3188.31
20-Dec-10	3350.90	3165.18	3202.22	16-Feb-11	3100.95	3101.95	3101.76	15-Apr-11	2988.90	3232.65	3188.31
21-Dec-10	3329.25	3202.22	3225.31	17-Feb-11	3111.20	3101.76	3103.48	20-Apr-11	2905.50	3091.37	3057.38
22-Dec-10	3338.90	3225.31	3240.90	17-Feb-11	3101.76	3103.48	3105.20	20-Apr-11	2905.50	3091.37	3057.38
23-Dec-10	3382.50	3240.90	3265.85	21-Feb-11	3161.20	3102.19	3112.92	25-Apr-11	2842.15	3081.04	3014.53
24-Dec-10	3368.50	3265.85	3285.33	22-Feb-11	3143.30	3112.92	3116.44	26-Apr-11	2938.45	3014.53	3000.70
27-Dec-10	3378.75	3285.33	3302.31	23-Feb-11	3082.20	3116.44	3115.85	27-Apr-11	2938.45	3014.53	3000.70
28-Dec-10	3381.85	3302.31	3316.77	24-Feb-11	3025.40	3111.95	3096.14	28-Apr-11	2938.45	3014.53	3000.70
29-Dec-10	3399.50	3316.77	3331.81	25-Feb-11	3008.25	3096.14	3080.16	29-Apr-11	2905.95	2981.14	2967.47

Table 1.2 Calculation Of Ema Of Infosys From May 2011 To Jun 2011

Date	Close Price	Prev. Period EMA	10 DAY EMA	Date	Close Price	Prev. Period EMA	10 DAY EMA
02-May-11	2923.35		2918.20	01-Jun-11	2812.00	2800.09	2808.22
03-May-11	2910.75	2918.20	2893.06	02-Jun-11	2802.75	2808.22	2807.15
04-May-11	2867.50	2893.06	2857.52	03-Jun-11	2813.50	2807.15	2823.71
05-May-11	2843.10	2857.52	2861.02	06-Jun-11	2838.45	2823.71	2860.66
06-May-11	2886.90	2861.02	2893.77	07-Jun-11	2892.75	2860.66	2884.34
09-May-11	2903.77	2893.77	2894.17	08-Jun-11	2872.20	2884.34	2867.82
10-May-11	2880.40	2894.17	2890.14	09-Jun-11	2861.50	2867.82	2861.54
11-May-11	2904.20	2890.14	2895.28	10-Jun-11	2861.60	2861.54	2868.13
12-May-11	2882.40	2895.28	2881.44	13-Jun-11	2877.55	2868.13	2875.87
13-May-11	2880.05	2881.44	2867.65	14-Jun-11	2873.45	2867.82	2857.27
16-May-11	2849.75	2867.65	2847.38	15-Jun-11	2833.90	2857.27	2820.26
17-May-11	2843.95	2847.38	2842.64	16-Jun-11	2800.55	2820.26	2785.76
18-May-11	2840.75	2842.64	2843.04	17-Jun-11	2764.40	2785.76	2741.69
19-May-11	2846.35	2843.04	2848.07	20-Jun-11	2708.90	2741.69	2716.08
20-May-11	2850.55	2848.07	2844.47	21-Jun-11	2726.45	2716.08	2735.27
23-May-11	2835.70	2844.47	2839.53	22-Jun-11	2748.00	2735.27	2758.70
24-May-11	2845.05	2839.53	2824.57	23-Jun-11	2774.15	2758.70	2810.13
25-May-11	2795.00	2824.57	2788.58	24-Jun-11	2862.10	2810.13	2864.45
26-May-11	2779.30	2788.58	2782.84	27-Jun-11	2867.85	2864.45	2866.21
27-May-11	2787.95	2782.84	2784.78	28-Jun-11	2863.85	2866.21	2871.17
30-May-11	2780.20	2784.78	2784.97	29-Jun-11	2881.75	2871.17	2892.24
31-May-11	2781.85	2784.97	2800.09	30-Jun-11	2907.40	2892.24	2918.40

Chart 1: Ema Of Infosys For Nov 10 To April 11



Interpretation

EMA-Price movements of Infosys were somewhat consistent or rather there were no wide fluctuations from 2nd November, 2010 to till 6th January, 2011. The 6th Jan price (3423) of Infosys was the all time high among the prices of the considered time period. On 7th, there was a fall and Infosys retreated from record high indicating the start of a new trend. If we dig the market for the primary cause for this downfall, on the said date, the key benchmark indices suffered a severe setback on rising fears of an interest rate hike by the RBI at a policy review scheduled to cool inflation. The BSE 30-share SENSEX was down 492.93 points and fell below the psychological 20,000.

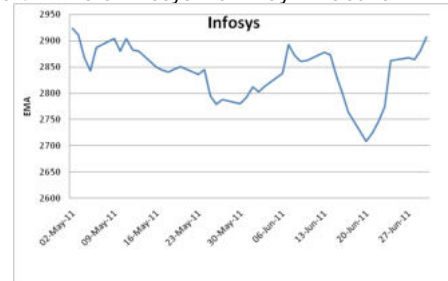
The trend continued till 23rd March 2011, and on 24th, there was an increase in price which continued till 13th April. A more insight into March 24th reveals that for the first time since the Lehman crisis that forced customers to shelve projects and bargain for lower billing rates, all the Indian software giants, including but not limited to, Infosys, Tata Consultancy Services (TCS), Wipro, and HCL began to see an uptick of up to 5% in pricing, driven by higher salary costs and improved business environment.

The correction in the price movements continued, and again there was a steep decrease in the price on April 15th which became the origin of new declining trend. This is the day on which Infosys Technologies reported lower-than-expected fourth quarter net profit dragging the broader market down.

Forecast

This Downtrend seems to be persistent till the end of the June 2011 with little ups and downs unless there are some positive signals from global markets. A new trend may setup by the end of July 2011 by which RBI would come up with its reviewed monetary and credit policy. If the policy is favourable, we may expect an Uptrend in Infosys stock.

Chart 2: Ema Of Infosys From May 11 To June 11



Analysis of Forecasted Trend with Actual Data:

An analysis of Price data of Infosys Ltd during the forecasted period of May to July 2011, revealed expected results.

Price: In the Downtrend, especially from June 13th-23rd, there was a continuous fall in the price. Shares of IT companies traded low during this period on concerns of slowdown in the U.S. economy and Greek debt crisis. On June 23rd Infosys announced its name change that "Infosys Technologies Limited shall be changed to Infosys Limited w.e.f. June 29, 2011, as well as the stock started recovering from June 24th on Accenture's strong Q3 May 2011 results. Stock continued with the strength previously persisting in the Downtrend.

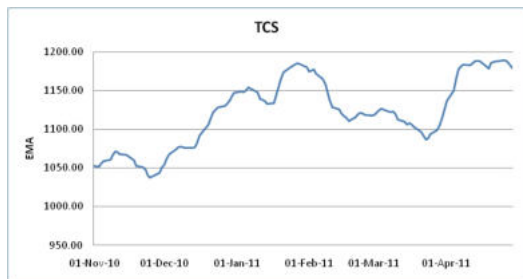
Table 1.3 Calculation Of Ema Of Tcs From Nov 2010 To Apr 2011

Date	Close Price	Prev. Period EMA	10 DAY EMA	Date	Close Price	Prev. Period EMA	10 DAY EMA	Date	Close Price	Prev. Period EMA	10 DAY EMA
01-Nov-10	1054.05		1051.98	30-Dec-10	1167.85	1136.67	1142.34	28-Feb-11	1112.95	1118.23	1117.23
02-Nov-10	1049.00	1051.98	1051.44	31-Dec-10	1165.05	1142.34	1146.47	01-Mar-11	1124.70	1117.23	1118.59
03-Nov-10	1052.95	1051.44	1051.72	03-Jan-11	1159.55	1146.47	1148.85	03-Mar-11	1150.30	1118.59	1124.35
04-Nov-10	1069.50	1051.72	1054.95	04-Jan-11	1143.75	1148.85	1147.92	04-Mar-11	1134.50	1124.35	1126.20
05-Nov-10	1077.40	1054.95	1062.65	05-Jan-11	1158.45	1147.92	1148.73	07-Mar-11	1108.75	1126.20	1127.30
08-Nov-10	1068.35	1062.65	1060.74	06-Jan-11	1174.20	1149.76	1154.20	08-Mar-11	1118.85	1123.02	1122.27
09-Nov-10	1092.40	1060.74	1066.50	07-Jan-11	1141.60	1154.20	1151.91	09-Mar-11	1125.35	1122.27	1122.83
10-Nov-10	1092.20	1066.50	1071.17	10-Jan-11	1128.50	1151.91	1147.66	10-Mar-11	1108.30	1122.83	1120.19
11-Nov-10	1084.95	1071.17	1070.04	11-Jan-11	1099.40	1147.66	1136.85	11-Mar-11	1076.25	1120.19	1112.20
12-Nov-10	1057.35	1070.04	1067.73	12-Jan-11	1135.50	1136.85	1138.27	14-Mar-11	1096.65	1112.20	1109.37
15-Nov-10	1063.50	1067.73	1066.96	13-Jan-11	1124.20	1138.27	1135.71	15-Mar-11	1089.80	1109.37	1105.81
16-Nov-10	1049.55	1066.96	1063.80	14-Jan-11	1138.70	1135.71	1132.62	16-Mar-11	1115.50	1105.81	1107.57
18-Nov-10	1042.35	1063.80	1059.90	17-Jan-11	1138.15	1132.62	1133.62	17-Mar-11	1099.55	1107.57	1106.12
19-Nov-10	1018.15	1059.90	1052.31	18-Jan-11	1200.55	1133.62	1145.79	18-Mar-11	1082.40	1106.12	1101.80
22-Nov-10	1041.00	1052.31	1050.25	19-Jan-11	1193.55	1145.79	1154.47	21-Mar-11	1071.95	1101.80	1096.38
23-Nov-10	1032.20	1050.25	1046.97	20-Jan-11	1211.85	1154.47	1164.90	22-Mar-11	1068.95	1096.38	1091.38
24-Nov-10	1010.										

Table 1.4 Calculation Of Ema Of Tcs From May 2011 To Jun 2011

Date	Close Price	Prev. Period EMA	10 DAY EMA	Date	Close Price	Prev. Period EMA	10 DAY EMA
02-May-11	1158.40		1149.77	01-Jun-11	1175.30	1165.55	1170.44
03-May-11	1137.3	1149.77	1136.75	02-Jun-11	1163.43	1170.44	1162.93
04-May-11	1135.95	1136.75	1127.17	03-Jun-11	1162.20	1162.93	1159.81
05-May-11	1114.50	1127.17	1126.79	06-Jun-11	1156.35	1159.81	1164.20
06-May-11	1144.55	1126.79	1140.30	07-Jun-11	1175.53	1164.20	1175.71
09-May-11	1134.15	1140.30	1135.34	08-Jun-11	1175.96	1175.71	1180.77
10-May-11	1137.05	1135.34	1137.60	09-Jun-11	1187.71	1180.77	1189.38
11-May-11	1138.40	1137.60	1127.66	10-Jun-11	1191.79	1189.38	1187.00
12-May-11	1112.15	1127.66	1118.51	13-Jun-11	1180.07	1187.00	1182.92
13-May-11	1127.70	1118.51	1127.76	14-Jun-11	1187.03	1182.92	1188.30
16-May-11	1127.85	1127.76	1133.84	15-Jun-11	1190.13	1188.30	1179.08
17-May-11	1142.50	1133.84	1146.22	16-Jun-11	1163.13	1179.08	1146.29
18-May-11	1151.60	1146.22	1156.96	17-Jun-11	1121.97	1146.29	1104.76
19-May-11	1164.70	1156.96	1169.49	20-Jun-11	1079.90	1104.76	1084.47
20-May-11	1176.40	1169.49	1171.37	21-Jun-11	1091.07	1084.47	1090.95
23-May-11	1164.10	1171.37	1158.99	22-Jun-11	1090.78	1090.95	1090.88
24-May-11	1151.60	1158.99	1141.76	23-Jun-11	1091.03	1090.88	1106.38
25-May-11	1127.55	1141.76	1129.55	24-Jun-11	1128.56	1106.38	1134.73
26-May-11	1132.45	1129.55	1136.13	27-Jun-11	1143.64	1134.73	1145.68
27-May-11	1141.45	1136.13	1146.28	28-Jun-11	1148.62	1145.68	1157.67
30-May-11	1153.25	1146.28	1155.52	29-Jun-11	1170.75	1157.67	1172.73
31-May-11	1158.80	1155.52	1165.55	30-Jun-11	1175.58	1172.73	1179.99

Chart 3: Ema Of Tcs From Nov 10 To April 11



Interpretation

Tata Consultancy Services' EMA - Price movements were somewhat consistent when compared with that of Infosys during the same time period. Stock price, having little fluctuation, demonstrated a growing trend from November 2010 to the end of January 2011. A decreasing trend observed particularly from January 28th, 2011 which continued till March 23rd, 2011. From March 24th, 2011, corrections in the price can be observed which continued till the end of the time period.

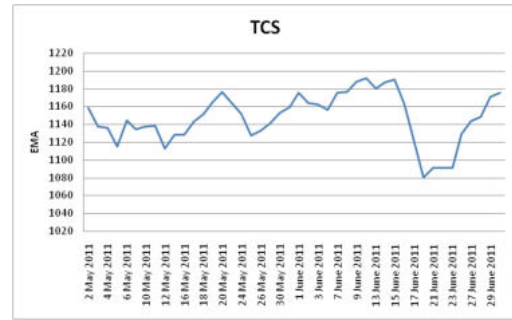
Unlike Infosys Technologies stock that started falling along with the indices from the January 7th, 2011 severe setback explained earlier, TCS stock demonstrated a good resistance and started an uptick within 10 days i.e. from January 17th. But from January 28th, the stock could not be that much stubborn and started falling as the two principal concerns, inflation and profit booking by FII's, that were drifting the market lower, also hit TCS. This was also the Record Date for the purpose of payment of Interim Dividend by TCS to its stockholders. The stock market plunged to its lowest level on this day in nearly five months.

The trend continued with less volatility compared to its peers. March 24th, the day of uptick for the Indian software giants after the Lehman crisis that forced customers to shelve projects and bargain for lower billing rates, became the origin of new upward trend. Remember this March 24th is also the origin of corrections in the Infosys stock price.

Forecast:

The Uptrend is expected to continue till the end of June 2011 with little downside fluctuations, as the stock is showing considerable strength against volatility. Unless there are any negative signals from international markets, TCS stock would be in the current trend. A new Downtrend may originate by the end of July if the expected monetary and credit policy by RBI is unfavourable to the market. Else, the current Uptrend may strengthen more.

Chart 4: Ema Of Tcs From May 11 To June 11



Analysis of Forecasted Trend with Actual Data:

The Uptrend continued till the end of June 2011 with little downside fluctuations as expected.

Price: In the Uptrend, especially from June 13th-23rd, there was a continuous fall in the price. Shares of IT companies traded low during this period on concerns of slowdown in the U.S. economy and Greek debt crisis. The stock started recovering from June 24th on Accenture's strong Q3 May 2011 results and after the IT firm raised full-year outlook. All the major IT companies, including TCS gained between 1.3% to 3.5%. Stock continued in the same Uptrend with the strength previously persisting till the end of July as expected.

Relative Strength Index of Infosys and TCS

The Relative Strength Index (RSI) is an oscillator that measures current price strength in relation to previous prices. RSI helps to signal overbought and oversold conditions in a security. The indicator is plotted in a range between 0 and 100. A reading above 70 is used to suggest that a security is overbought, while a reading below 30 is used to suggest that it is oversold. This indicator helps traders to identify whether a security's price has been unreasonably pushed to current levels and whether a reversal may be on the way. When Wilder introduced the RSI, he recommended using a 14-day RSI. Since then, the 9-day and 25-day RSI indicators have also gained popularity.

- Sell when RSI crosses below overbought Line (70)
- Buy when RSI crosses over Oversold Line (30)

RSI of Infosys

Table 1.5 Calculation Of Rsi For Infosys Limited For The Month Of Nov 2010

Date	Close Price	Gain	Loss	Avg. Gain	Avg. Loss	RS	RSI
01-Nov-10	2994.65						
02-Nov-10	3019.6	24.95					
03-Nov-10	3024.05	4.45					
04-Nov-10	3076.55	52.50					
05-Nov-10	3079.8	3.25					
08-Nov-10	3023.65		56.15				
09-Nov-10	3052.1	28.45					
10-Nov-10	3082.9	30.80					
11-Nov-10	3055.15		27.75				
12-Nov-10	2999.25		55.90				
15-Nov-10	3024.25	25.00					
16-Nov-10	2972.3		51.95				
18-Nov-10	3004.15	31.85					
19-Nov-10	2966.45		37.70				
22-Nov-10	3042.1	75.65					
23-Nov-10	3013.3		28.80				
24-Nov-10	3001		12.30				
25-Nov-10	3063.7	62.70					
26-Nov-10	3040.55		23.15				
29-Nov-10	3064.85	24.30					
30-Nov-10	3049.45		15.40	33.08	34.34	0.96	49.06

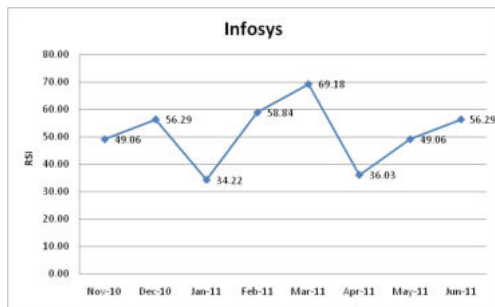
Calculation:

Average Gain = Total Gains/n = 33.08  
 Average Loss = Total Loss/n = 34.34  
 RS = Average Gain/Average Loss = 0.96  
 RSI = 100-[100/1+RS] = 100-[100/1 + 0.96] = 49.06

Table 1.6 Calculation Of Rsi For Infosys From Nov 2010 To Jun 2011

Month	RSI
Nov-10	49.06
Dec-10	56.29
Jan-11	34.22
Feb-11	58.84
Mar-11	69.18
Apr-11	36.03
May-11	49.06
Jun-11	56.29

Chart 5: Rsi Of Infosys From Nov 10 To June 11



Interpretation:

RSI crossed the Overbought Line at 69.18 (March 2011) which indicates the best Sell price; and it twice crossed the Oversold Line i.e. at 34.22 and 36.03 (January & April 2011 respectively) which are the best Buy prices. Other points, including 49.06 (Nov 10), 56.29 (Dec 10), 58.84 (Feb 11), 49.06 (May 11), and 56.29 (June 11) are the Hold positions.

RSI of TCS

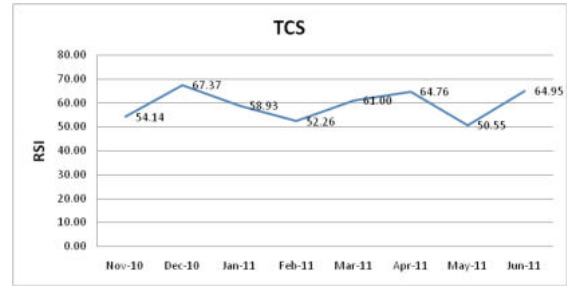
Table 1.7 Calculation Of Rsi For Tcs For Nov 2010

Date	Close Price	Gain	Loss	Avg. Gain	Avg. Loss	RS	RSI
01-Nov-10	1054.05						
02-Nov-10	1049		5.05				
03-Nov-10	1052.95	3.95					
04-Nov-10	1069.5	16.55					
05-Nov-10	1077.5	8					
08-Nov-10	1068.35		9.15				
09-Nov-10	1092.4	24.05					
10-Nov-10	1092.2		0.2				
11-Nov-10	1064.95		27.25				
12-Nov-10	1057.35		7.6				
15-Nov-10	1063.5	6.15					
16-Nov-10	1049.55		13.95				
18-Nov-10	1042.35		7.2				
19-Nov-10	1018.15		24.2				
22-Nov-10	1041	22.85					
23-Nov-10	1032.2		8.8				
24-Nov-10	1010.3		21.9				
25-Nov-10	1023.6	13.3					
26-Nov-10	1045.5	21.9					
29-Nov-10	1067.15	21.65					
30-Nov-10	1076.7	9.55		14.795	12.53	1.180	54.144

Table 1.8 Calculation Of Rsi For Tcs From Nov 2010 To Jun 2011

Month	RSI
Nov-10	54.14
Dec-10	67.37
Jan-11	58.93
Feb-11	52.26
Mar-11	61.00
Apr-11	64.76
May-11	50.55
Jun-11	64.95

Chart 6: Rsi Of Tcs From Nov 2010 To June 2011



Interpretation:

RSI crossed the Overbought Line at 67.37 (Dec 10) and it was nearer at 64.76 (Apr 11), which indicate best Sell prices. RSI never crossed the Oversold Line in the time period considered. So there were no Buy recommendations instead all are the Hold positions: 54.14 (Nov 10), 58.93 (Jan 11), 52.26 (Feb 11), 61 (March 11) 50.55 (May 11), and 64.95 (June 11).

Aroon Indicator

Developed by Tushar Chande in 1995, Aroon is an indicator system that determines whether a stock is trending or not and how strong the trend is. The Aroon indicators are designed to reveal the beginning of a new trend. Indicators measure the number of periods since price recorded an x-day high or low. There are two separate indicators: Aroon-Up and Aroon-Down. A 25-day Aroon-Up measures the number of days since a 25-day high. A 25-day Aroon-Down measures the number of days since a 25-day low. Aroon focuses on time relative to price rather than price relative to time. Aroon indicators are used to spot emerging trends, identify consolidations, define correction periods, and anticipate reversals.

The Aroon indicators are shown in percentage terms and fluctuate between 0 and 100. Aroon-Up is based on price highs, while Aroon-Down is based on price lows. These two indicators are plotted side-by-side for easy comparison.

$$\text{Aroon-Up} = ((25 - \text{Days Since 25-day High})/25) \times 100$$

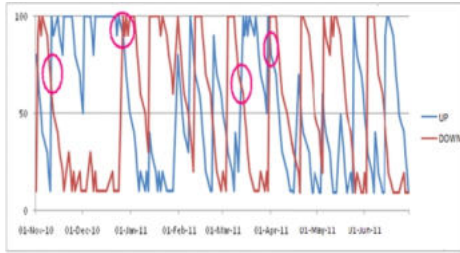
$$\text{Aroon-Down} = ((25 - \text{Days Since 25-day Low})/25) \times 100$$

Infosys Aroon Indicators

Table 1.9 Calculation Of Aroon For Infosys Nov 2010

Date	Close Price	10 Max	Periods To Max	UP	10 Min	Periods To Min	DOWN
01-Nov-10	2994.65	3082.9	2	80	2994.65	9	10
02-Nov-10	3019.6	3082.9	3	70	2999.25	1	90
03-Nov-10	3024.05	3082.9	4	60	2972.3	0	100
04-Nov-10	3076.55	3082.9	5	50	2972.3	1	90
05-Nov-10	3079.8	3082.9	6	40	2966.45	0	100
08-Nov-10	3023.65	3082.9	7	30	2966.45	1	90
09-Nov-10	3052.1	3082.9	8	20	2966.45	2	80
10-Nov-10	3082.9	3082.9	9	10	2966.45	3	70
11-Nov-10	3055.15	3063.7	0	100	2966.45	4	60
12-Nov-10	2999.25	3063.7	1	90	2966.45	5	50
15-Nov-10	3024.25	3064.85	0	100	2966.45	6	40
16-Nov-10	2972.3	3064.85	1	90	2966.45	7	30
18-Nov-10	3004.15	3064.85	2	80	2966.45	8	20
19-Nov-10	2966.45	3095.45	0	100	2966.45	9	10
22-Nov-10	3042.1	3123	0	100	3001	7	30
23-Nov-10	3013.3	3145.45	0	100	3001	8	20
24-Nov-10	3001	3167.75	0	100	3001	9	10
25-Nov-10	3063.7	3167.75	1	90	3040.55	8	20
26-Nov-10	3040.55	3167.75	2	80	3040.55	9	10
29-Nov-10	3064.85	3167.75	3	70	3049.45	8	20
30-Nov-10	3049.45	3167.75	4	60	3049.45	9	10

Chart 7: Aroon Indicators Of Infosys From Nov 2010 To June 2011



**Interpretation**

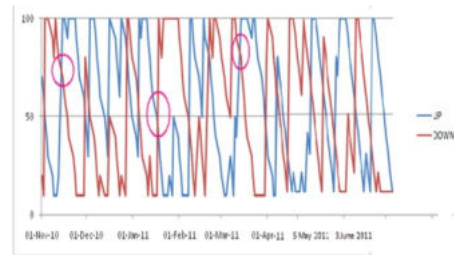
The Infosys Aroon shows that Aroon-Up crossed Aroon-Down in November 2010 (first Pink Circle (PC1)) and continued above 50 for most of the time and hit 100 as Aroon-Down remained at relatively low levels till early January 2011. During the above period, Aroon-Up and Aroon-Down stayed near by 100 & 10 respectively depicting no wide fluctuations. Notice that in this interval both the indicators never crossed each other. Then notice that at PC2, Aroon-Down crossed Aroon-Up and touched 100. The PC2 signals a new Downtrend where Aroon-Up declined below 50 and remained at 10. Most of the times till the end of the March 2011, Aroon-Down stayed above 50 and also touched 100. At PC3, Aroon-Up again crossed Aroon-Down signalling an Uptrend which lasted till the mid of April 2011 and again at PC4, Aroon-Down crossed Aroon-Up indicating a Downtrend which persisted till June 2011 as expected in EMA forecast and interpretation. The trend also expected to continue till the end of July 2011 unless there are any positive signals in domestic and /or global business environments. By the time RBI reveals its reviewed monetary policy and if it is favourable to markets, Infosys stock may see an upward trend.

**TCS Aroon Indicators**

Table 1.10 Calculation Of Aroon For Tcs Nov 2010

Date	Close Price	10 Max	Periods To Max	UP	10 Min	Periods To Min	DOWN
01-Nov-10	1054.05	1092.4	3	70	1049	8	20
02-Nov-10	1049	1092.4	4	60	1049	9	10
03-Nov-10	1052.95	1092.4	5	50	1049.55	0	100
04-Nov-10	1069.5	1092.4	6	40	1042.35	0	100
05-Nov-10	1077.5	1092.4	7	30	1018.15	0	100
08-Nov-10	1068.35	1092.4	8	20	1018.15	1	90
09-Nov-10	1092.4	1092.4	9	10	1018.15	2	80
10-Nov-10	1092.2	1092.2	9	10	1010.3	0	100
11-Nov-10	1064.95	1064.95	9	10	1010.3	1	90
12-Nov-10	1057.35	1063.5	8	20	1010.3	2	80
15-Nov-10	1063.5	1067.15	0	100	1010.3	3	70
16-Nov-10	1049.55	1076.7	0	100	1010.3	4	60
18-Nov-10	1042.35	1076.7	1	90	1010.3	5	50
19-Nov-10	1018.15	1091.9	0	100	1010.3	6	40
22-Nov-10	1041	1095.45	0	100	1010.3	7	30
23-Nov-10	1032.2	1101.35	0	100	1010.3	8	20
24-Nov-10	1010.3	1101.35	1	90	1010.3	9	10
25-Nov-10	1023.6	1101.35	2	80	1023.6	9	10
26-Nov-10	1045.5	1101.35	3	70	1045.5	9	10
29-Nov-10	1067.15	1101.35	4	60	1067.15	9	10
30-Nov-10	1076.7	1101.35	5	50	1072.6	2	80

Chart 8: Aroon Indicators Of Tcs From Nov 2010 To June 2011



**Interpretation**

The TCS Aroon shows that Aroon-Up crossed Aroon-Down in November 2010 (first Pink Circle (PC1)) and continued above 50 for most of the time and hit 100 as Aroon-Down remained down the 50 till early January 2011 signalling an Uptrend. Notice that in this interval Aroon-Up and Aroon-Down stayed near by 100 & 10 respectively and sometimes crossed 50. At PC2, the end of January, Aroon-Down crossed Aroon-Up and touched 100 signalling a new Downtrend where Aroon-Up declined below 50 and remained at lower levels. Again at PC3, end of March, Aroon-Up crossed Aroon-Down depicting an Uptrend which lasted till the end of June 2011 with a small correction on June 20th and recovered back. The Uptrend persisted through the end of July 2011 as forecasted in EMA analysis. By the time RBI comes with revised credit policy, and if the Policy is favourable, TCS stock continues with the same Uptrend else a new Downtrend may originate.

**Conclusion**

Technical Analysis Indicators and/or Tools help investors to determine the movements of the market and produce technical reports. However, investors should not be completely complacent on them. When using methods of technical analysis, most believe that fundamental factors are already reflected in the price. They are not much concerned by the fact what exactly caused the recent high/down of the price (raising interest rates or improved business environment). Users of Technical Analysis tools are much concerned about how this trend can be used for the forecast of the future prices.

The study revealed that the Downtrend persisted in Infosys Stock through April 2011 also continued till the end of July 2011. The price and volume analysis charts tried to justify the trend. In the same lines, the study also revealed that the Uptrend persisted in TCS stock through April 2011 also continued till the end of July 2011. The price and volume analysis charts tried to justify the trend.

It is clearly evident from the statistical tools applied in this study: Exponential Moving Average, Relative Strength Index, and Aroon Indicator that technical analysis tools quickly analyze the flow of numerical data and give the direction of the supposed market movement with the help of graphic symbols. But, in any case, it's impossible to trade successfully only with the help of indicators. One can be lucky in some cases, but not in a long-time perspective. A deep interpretation and conclusion are always required. In an efficient market without significant information asymmetry, the movement of company's share price would depend on its fundamentals. While share price could deviate from the fundamentals momentarily, but in the long run it is the fundamentals that will drive the valuation.

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