IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 1, August 2024

Comparative Analysis of Stock Performance of Major IT Companies: Insights from RSI and ROC Oscillators

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Abstract: *This study provides a detailed comparative analysis of the stock performance of major Indian IT companies—Infosys, Wipro, Tech Mahindra, HCL, and TCS—using technical analysis tools: the Relative Strength Index (RSI) and Rate of Change (ROC) oscillators. By evaluating historical stock prices, the research aims to quantify stock returns and assess price momentum. The RSI values indicate that Infosys and Wipro are nearing oversold conditions, suggesting potential for price reversals or weakness. In contrast, Tech Mahindra's higher RSI reflects stronger recent performance but also potential for future corrections. ROC analysis corroborates these findings, showing Tech Mahindra with the highest momentum, while Infosys and Wipro exhibit declining trends. The study highlights Tech Mahindra's superior short-term performance, while Infosys and Wipro face challenges, advising caution in the current market conditions.*

Keywords: Stock Performance, Technical Analysis, Relative Strength Index (RSI), Rate of Change (ROC), IT Companies, Momentum Analysis, Financial Indicators.

I. INTRODUCTION

Shares represent ownership in businesses and are traded in stock exchanges, automated centers where buying and selling of shares and other securities like bonds occur. In India, the two primary stock exchanges are the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE). These platforms are crucial for companies to raise capital by issuing shares, enabling investors to purchase ownership stakes.

The functions of a stock exchange in the economy include financing for companies, mobilizing savings for investment, enhancing corporate governance, fundraising for government projects, and serving as economic indicators through stock price variations.

Stock exchanges perform central functions such as creating accessible trading platforms, bundling liquidity, ensuring the interchangeability of securities, providing transparency, and offering cost and quantity details to investors.

Investment strategies in the stock market broadly fall into technical and fundamental analysis categories. Fundamental analysis evaluates a company's intrinsic value by examining financial statements, business trends, and economic conditions. In contrast, technical analysis studies market price movements and trading volumes to predict future trends.

Technical Analysis Overview:

Technical analysis studies and forecasts price movements based on market actions. The core principles are that prices reflect all market-impacting factors, prices move in trends, and history repeats itself. Analysts use various market indicators, such as volume trends and advance/decline data, to assess whether an asset is growing or declining.

Popular Technical Indicators:

- **Rate of Change (ROC):** Measures momentum by comparing the current price with the price from a specific number of days in the past. ROC helps identify overbought or oversold conditions and potential turning points in the market.

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- **Relative Strength Index (RSI):** A momentum oscillator that ranges from 0 to 100, indicating the speed and change of price movements over a period (commonly 14 days). RSI values above 70 suggest an overbought condition (sell signal), while values below 30 indicate an oversold condition (buy signal). RSI is effective for volatile stocks but can produce false signals during abrupt price changes.

II. REVIEW OF LITERATURE

Sulek J. (2022), In the paper, long-term investment opportunities are analyzed based on stock value screening technique In terms of Intel Corporation. It provides the base for screening the stock values and technical analysis. Single parameters of screening and various technical coefficients are described in full detail, and the results of the screening are provided for two good fit companies. Advisory suggestion for Intel based on the technical analysis The share price signal for Intel is positive as seen from the technical analysis chart.

Agrawal, J. G. , Chourasia, V. , & Mittra, A. (2013), For achieving a successful stock market forecasting, least input data is required whereas, varies with economic & political factors. Any analysis, therefore, needs to be frequent for the purpose of identifying the right factors to use in arriving at the right predictions. Analyzing the movements of the market helps the investors to determine the best time and opportunity to purchase and or sell securities, to achieve the maximum profitable gains. Based on the various resources used in this paper, it consolidates major findings from research, Web sources, and company reports to help in making good investment decisions.

BR, Vladimira, Opreana, Cosmin, Bucur, Alexandru. Self equally as well as by using stochastic methods, market efficiency, and technical analysis, the paper determines the stock quote of Electrica SA. It uses the stock quote as a continuous random variable as modern theories reflect it. The notes are complemented with the purely technical analysis, though a preliminary market efficiency in the weak form is derived from the stochastic calculations.

Wang, Y. C. , Yu, J. , & Wen S. Y. (2014) In this paper we employ convergence and analysis technique integrated with fundamental and technical analysis for increasing trader's profit through Taipei Exchange using data received from Taiwan Economic Journal Database (TEJ) from the period of 1991 to 2009. Hazard management enhances the pace of returns of the Italian momentum portfolio. It focuses on the examination of firm standards including profitability and solvency ratios. Volume data, which other people neglect, play an important role in the timing factor. The buying signals can be based on covariance of price with volume, this results in the selected portfolios earning substantial excess returns over the long-run market.

Agrawal, M. , Khan, A. U. , & Shukla, P. K. 2019 This present study uses only optimal Long Short Term Memory (O-LSTM) deep learning carrying out stock prices and trends forecast with added Correlation-Tensors and Stock Technical Indicators (STIs). The result is better than two ML classifiers and a new DL-based classifier with an average prediction accuracy of 59. 25 %, which is relatively higher than existing basic standard classifiers.

Ijegwa, A. D. ; Rebecca, V. O. ; Olusegun; Isaac, O. O. ; (2014). This research applies fuzzy inference to stock trading using four technical indicators: are presented in the following sections: Moving Average Convergence/Divergence (MACD), Relative Strength Index (RSI), Stochastic Oscillator (SO) and On Balance Volume (OBV). Therefore, the six indicators above used in the formulation of fuzzy rules generate either buy, sell, or hold advice. The performance of the system was demonstrated on data from the Nigerian banks and essentially illustrated how it can predict the market actions while supporting traders.

A Gamil, R S Elfouly, and N M Darwish (2007) This paper presents a multi-agent, fuzzy logic DSS for the stock market. To support investors with the buy/sell/hold recommendation actions. Some accuracy from the initial outcome of the fuzzy logic model was achieved but not very reliable. Therefore, a tuning methodology based on genetic algorithms is developed to enhance the accuracy of decisions made. The system employs multi-agent framework and is tested and verified through simulation employing NASDAQ's index data.

Amini, A. , Rahnama, G. & Alinezhad, A. , (2015) This paper aims to design a model for selecting the portfolio of the stocks on the basis of financial and technical evaluation. Method also sorts the stocks depending on the evaluation of the financial industry and the company. Technical analysis is used to find out the right time of buying and selling. They examined the model based on Tehran Stock Exchange and showed that this method of fundamental and technical analyses improve the rate of return of stock investments in addition to the issue of time in conjunction with the issue of selection of stocks.

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Drakopoulou, V. (2015)."Never fall in love with a stock, as it won't love you back." This paper highlights key fundamental analysis and stock valuation techniques used by daily equity traders, who often rely on technical charts for pattern recognition. It argues that combining fundamental and technical analysis can enhance trading decisions, emphasizing the stock's intrinsic value over market price.

Pramudya, R., & Ichsani, S. (2020).This study evaluates which indicators—MACD, Bollinger Bands, and RSI—best signal buy and sell points on the LQ45 index. It finds Bollinger Bands and MACD effective for sell signals, while MACD lags for buy signals compared to Bollinger Bands and RSI. Combining indicators yields better accuracy than using single indicators, despite no significant statistical differences.

Ijegwa, A. D., Rebecca, V. O., Olusegun, F., & Isaac, O. O. (2014). Stock trading decision-making is complex, using various technical indicators. This research applies fuzzy inference with four indicators—MACD, RSI, Stochastic Oscillator, and OBV—to aid decisions. Fuzzy rules combine these indicators, generating buy, sell, or hold recommendations. Tested on two Nigerian banks, the system produced satisfactory results, proving effective when combined with traders' skills.

Need of the Study

The study aims to assess the historical performance of Infosys,Wipro,Tech Mahendra, through the lens of technical analysis using RSI and ROC oscillators. By analyzing historical stock prices, the study intends to quantify stock returns and evaluate the momentum of these companies' stock price movements. The ROC oscillator will be employed to identify periods of strong price momentum, crucial for understanding the timing and intensity of price movements. Additionly, the RSI oscillator will help in identifying overbought and oversold conditions, offering insights into potential reversal points in stock prices. By comparing the performance of these companies using RSI and ROC indicators, the study seeks to highlight relative strengths and weaknesses across the selected stocks, providing valuable insights for investors and analysts alike.

Scope of the Study

This study aims to analyze the performance of Infosys, Wipro, Tech Mahindra, using technical analysis tools such as the Relative Strength Index (RSI) and Rate of Change (ROC) oscillator. The primary objectives include assessing historical stock returns based on past price data, evaluating momentum through the ROC oscillator to identify periods of strong price movement, and determining overbought and oversold conditions using the RSI oscillator to anticipate potential reversals. By comparing the effectiveness of RSI and ROC indicators across these stocks, this study seeks to uncover insights into their relative strengths and weaknesses in terms of price performance and momentum dynamics.

Objectives of the Study:

- To find stock returns of Infosys, Wipro, Tech Mahindra based on the historical stock price.
- To evaluate the momentum of stock price movements for Infosys, Wipro, Tech Mahindra, using the ROC oscillator, identifying periods of strong price momentum.
- To determine the overbought and oversold conditions of these selected stocks using the RSI oscillator, providing insights into potential reversal points.
- To compare the performance of Infosys, Wipro, Tech Mahindra, using both RSI and ROC indicators, highlighting relative strengths and weaknesses.

III. RESEARCH METHODOLOGY

Analytical Research:

Research Design was analytical research, However for the researcher to use the fact or information in doing analytical research, the facts or information must be available/ The researcher makes critical evaluation of the material.

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Methods of Data Collection:

Sources of Data:

The primary sources of data collection consist of the websites, various books, magazines, newspapers, and the reports that are prepared by the research scholars and so on.

Secondary Data:

However, it has to be observed that in the context of the present study, no primary data has been collected; all data collected are secondary data. These one's are the already collected data by someone else and the one that has already gone through the statistical analysis. Published data is the first method of gathering secondary data while, unpublished data is also another method of getting secondary data. Fast timeliness and low cost is the key advantage, which is the main reason why such a strategy is effective. Chosen by me is the market leaders and other Giants are the companies that are selected by me is

- Infosys
- Wipro
- Tech Mahendra

Statistical Tools Applied:

The method used to analyze secondary data is as follows: The data collected is analyzed depending on the research question and objectives.

- Relative Strength Index (RSI)
- Rate of change (ROC)

IV. DATA ANALYSIS AND INTERPRETATION

Table 1: RSI Calculation of Infosys

Date	**Price**	Change	Gain	Loss
Dec-23	1542.9			
Nov-23	1455.15	87.75	87.75	
Oct-23	1368.4	86.75	86.75	
Sep-23	1435.45	-67.05		67.05
Aug-23	1435.45	0	0	
Jul-23	1355.7	79.75	79.75	
Jun-23	1335.5	20.2	20.2	
May-23	1318.3	17.2	17.2	
Apr-23	1252.75	65.55	65.55	
Mar-23	1427.95	-175.2		175.2
Feb-23	1487.55	-59.6		59.6
Jan-23	1533.75	-46.2		46.2
Dec-22	1508.2	25.55	25.55	
Nov-22	1634.95	-126.75		126.75
Oct-22	1537.65	97.3	97.3	
Sep-22	1413.45	124.2	124.2	
Aug-22	1492.95	-79.5		79.5
Jul-22	1549.7	-56.75		56.75
Jun-22	1461.9	87.8	87.8	
May-22	1503.6	-41.7		41.7

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Apr-22	1567.55	-63.95		63.95
Mar-22	1906.85	-339.3		339.3
Feb-22	1715.6	191.25		
Jan-22	1736.2	-20.6		20.6
			883.3	1076.6

Calculation

FORMULA FOR CALCULATING RSI: RSI = 100 – (100/ 1+ Rs)

Average gain = Total Gains / n= 883.3/23=38.4043

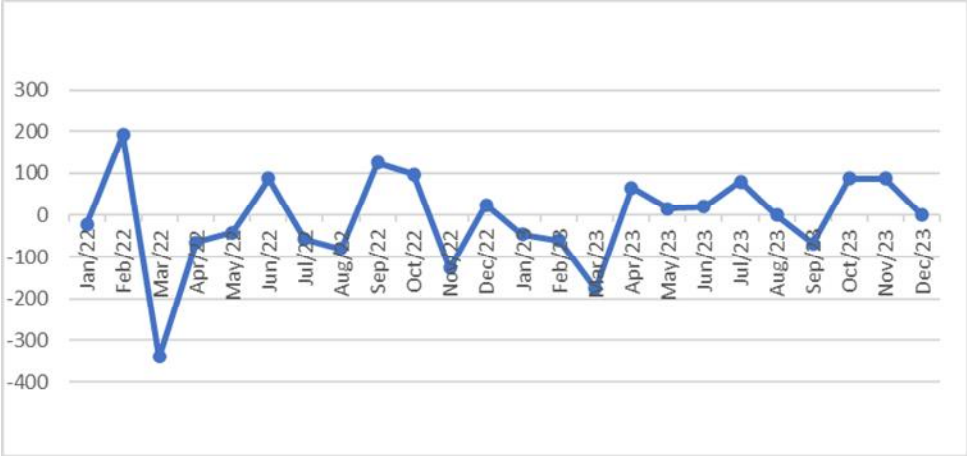
Average loss = Total Loss / n=1076.6/23=46.8086

$RS = \frac{\text{Average GAIN}}{\text{Average Loss}}$=38.4043/46.8086=0.8204

RSI = 100 – (100 / 1+ RS) = 100 – (100 / 1+0.8204)

RSI=100-54.9329 =45.0671

Chart 1: Infosys RSI



INTERPRETATION

The table below highlights relative strength index changes for Infosys for the period from January 2022 to December 2023. The RSI works on the principle of speed and change of the price; it gives an indication about the price being overbought or oversold. Large negative correlation coefficients point to oversold conditions reflecting in lower stock prices, large positive correlation coefficients show signs of overbought condition or recovery in stock prices. The foregoing RSI trends depict signs of over selling pressure and over buying pressure. It is concluded that these insights should be used together with other technical and fundamental analyses to make decisions since the stock has high sensitivity to changes.

Formula for calculation of ROC

ROC= (today's closing price ÷ closing price at [period number of days ago]) x 100

Table 2: ROC Calculation of Infosys

Date	**Price**	ROC -1 Method (%)	ROC -2 Method (%)
Dec-23	1542.9		
Nov-23	1455.15		
Oct-23	1368.4		
Sep-23	1435.45		
Aug-23	1435.45		

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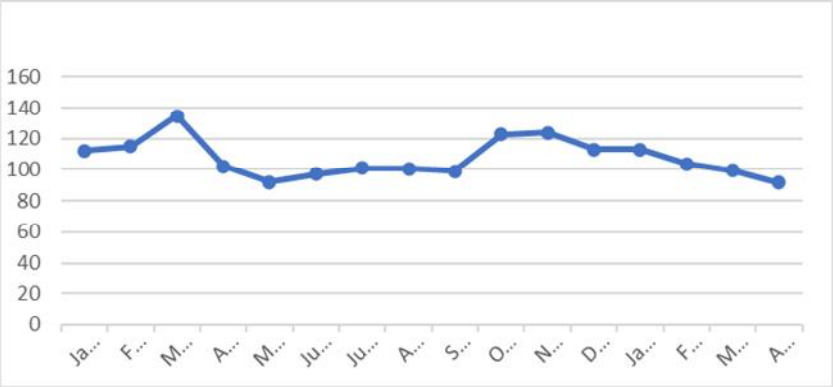
Jul-23	1355.7		
Jun-23	1335.5	86.55778	-13.4422
May-23	1318.3	90.59547	-9.40453
Apr-23	1252.75	91.54852	-8.45148
Mar-23	1427.95	99.47752	-0.52248
Feb-23	1487.55	103.6295	3.629524
Jan-23	1533.75	113.1334	13.13344
Dec-22	1508.2	112.9315	12.93149
Nov-22	1634.95	124.0196	24.01957
Oct-22	1537.65	122.742	22.74197
Sep-22	1413.45	98.98456	-1.01544
Aug-22	1492.95	100.363	0.363013
Jul-22	1549.7	101.0399	1.039935
Jun-22	1461.9	96.93012	-3.06988
May-22	1503.6	91.96612	-8.03388
Apr-22	1567.55	101.9445	1.944526
Mar-22	1906.85	134.9075	34.9075
Feb-22	1715.6	114.9134	14.91343
Jan-22	1736.2	112.0346	12.03459

Chart 2: Infosys ROC



Interpretation

The ROC values for Infosys stock depicts high momentum that is later followed by a rapid decline in the momentum starting from as early as March 2022. This could possibly mean that the rate of increase price for the Infosys stock has been on the declining trend for the past one year, which may be information of change of sentiments of investors in the stock or one or the other fundamental factors that dominates the market forces.

Table 3: RSI Calculation of Wipro

Date	Price	Change	Gain	Loss
Dec-23	471.3			
Nov-23	413.05	58.25	58.25	
Oct-23	381.8	31.25	31.25	
Sep-23	406.05	-24.25		24.25
Aug-23	408.4	-2.35		2.35

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Jul-23	405.05	3.35	3.35	
Jun-23	389.15	15.9	15.9	
May-23	403.65	-14.5		14.5
Apr-23	385	18.65	18.65	
Mar-23	365.25	19.75	19.75	
Feb-23	387.05	-21.8		21.8
Jan-23	398.85	-11.8		11.8
Dec-22	392.75	6.1	6.1	
Nov-22	406.9	-14.15		14.15
Oct-22	386.55	20.35	20.35	
Sep-22	394.25	-7.7		7.7
Aug-22	413.55	-19.3		19.3
Jul-22	423.7	-10.15		10.15
Jun-22	416.05	7.65	7.65	
May-22	478.05	-62		62
Apr-22	508.8	-30.75		30.75
Mar-22	591.9	-83.1		83.1
Feb-22	555.8	36.1	36.1	
Jan-22	572.6	-16.8		16.8
			217.35	318.65

Calculation

FORMULA FOR CALCULATING RSI: RSI = 100 – (100/ 1+ Rs)

Average gain = Total Gains / n= 217.35/23=9.45

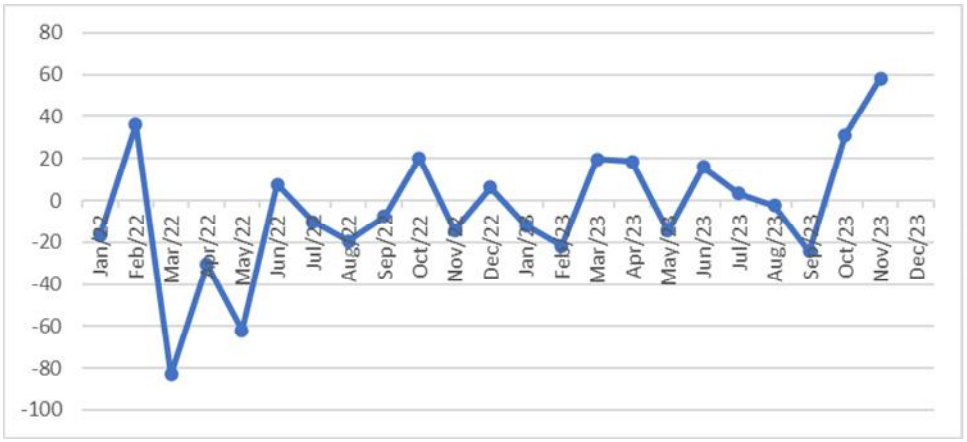
Average loss = Total Loss / n=318.65/23=13.85

$RS = \frac{\text{Average GAIN}}{\text{Average Loss}}$=9.45/13.85=0.6823

RSI = 100 – (100 / 1+ RS) = 100 – (100 / 1+0.6823)

RSI=100-59.4424 =40.5576

Chart 3: Wipro RSI



INTERPRETATION

The figure below presents the fluctuations of the Relative Strength Index (RSI) for Wipro in January 2022 to December 2023, which is the tool designed to calculate the rate of stock's price movements and determine the overbought/oversold zones. This shows extremely oversold conditions correlating to financial shocks in early 2022 and

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mid 2023 with a corresponding dip in the RSI. On the other hand, larger values in the later part of the year 2023 may be the sign of overbought or strong recovery. Therefore, investors need to combine these RSI trends, with other technical and fundamentals tests in making decisions during volatile market period.

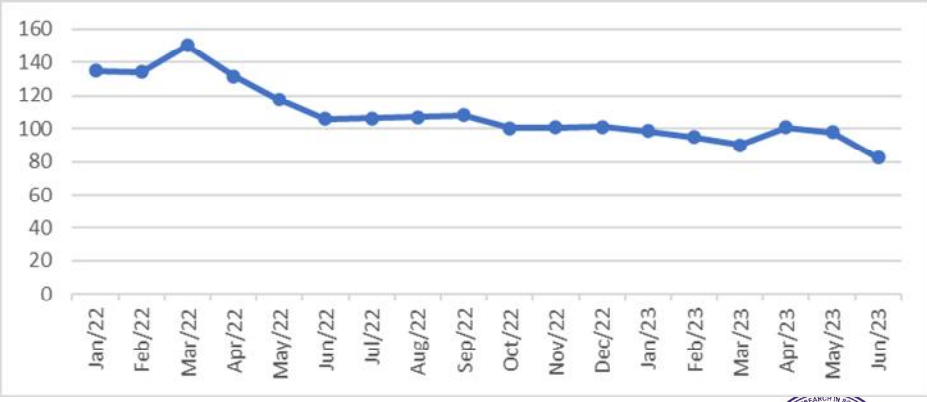
Formula for calculation of ROC

ROC= (today's closing price ÷ closing price at [period number of days ago]) x 100

Table 4: ROC Calculations of Wipro

Date	**price**	ROC-1 Method (%)	ROC-2 Method (%)
Dec-23	471.3		
Nov-23	413.05		
Oct-23	381.8		
Sep-23	406.05		
Aug-23	408.4		
Jul-23	405.05		
Jun-23	389.15	82.56949	-17.4305
May-23	403.65	97.72425	-2.27575
Apr-23	385	100.8381	0.838135
Mar-23	365.25	89.95198	-10.048
Feb-23	387.05	94.77228	-5.22772
Jan-23	398.85	98.46932	-1.53068
Dec-22	392.75	100.9251	0.925093
Nov-22	406.9	100.8052	0.805153
Oct-22	386.55	100.4026	0.402597
Sep-22	394.25	107.9398	7.939767
Aug-22	413.55	106.8467	6.846661
Jul-22	423.7	106.2304	6.230412
Jun-22	416.05	105.9325	5.932527
May-22	478.05	117.4859	17.48587
Apr-22	508.8	131.6259	31.62592
Mar-22	591.9	150.1332	50.13316
Feb-22	555.8	134.3973	34.39729
Jan-22	572.6	135.1428	35.14279

Chart 4: Wipro ROC



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INTERPRETATION

The ROC Wipro stocks had sharp ups and downs over the given period of observation and they reached their highest point in early 2022 and then started to declined gradually. The general downward trend of stock prices up to the middle of the year 2023 may indicate problems in the company or in the environment that hinder the firm's performance. Such trends can probably be taken into consideration by investors as some of them may need to contemplate indicators behind the declines in question in the process of formulating the further, prospective investment strategies.

Table 5: RSI Calculation of Tech Mahendra

Date	Price	Change	Gain	Loss
Dec-23	1272.6			
Nov-23	1220.6	-52		52
Oct-23	1133.15	-87.45		87.45
Sep-23	1223.1	89.95	89.95	
Aug-23	1201.75	-21.35		21.35
Jul-23	1115.65	-86.1		86.1
Jun-23	1130.55	14.9	14.9	
May-23	1117.75	-12.8		12.8
Apr-23	1023.75	-94		94
Mar-23	1101.85	78.1	78.1	
Feb-23	1101.65	-0.2		0.2
Jan-23	1015.3	-86.35		86.35
Dec-22	1016.5	1.2	1.2	
Nov-22	1077.3	60.8	60.8	
Oct-22	1063.5	-13.8		13.8
Sep-22	1008.2	-55.3		55.3
Aug-22	1076.7	68.5	68.5	
Jul-22	1048.9	-27.8		27.8
Jun-22	999.7	-49.2		49.2
May-22	1180.85	181.15	181.15	
Apr-22	1256.55	75.7	75.7	
Mar-22	1499.3	242.75	242.75	
Feb-22	1411	-88.3		88.3
Jan-22	1479.35	68.35	68.35	
			881.4	622.65

Calculation

FORMULA FOR CALCULATING RSI:

RSI = 100 – (100/ 1+ Rs)

Average gain = Total Gains / n= 881.4/23=38.3217

Average loss = Total Loss / n=622.65/23=27.0717

$RS = \frac{\text{Average GAIN}}{\text{Average Loss}}$=38.3217/27.0717=1.4155

RSI = 100 – (100 / 1+ RS)

= 100 – (100 / 1+1.4155)

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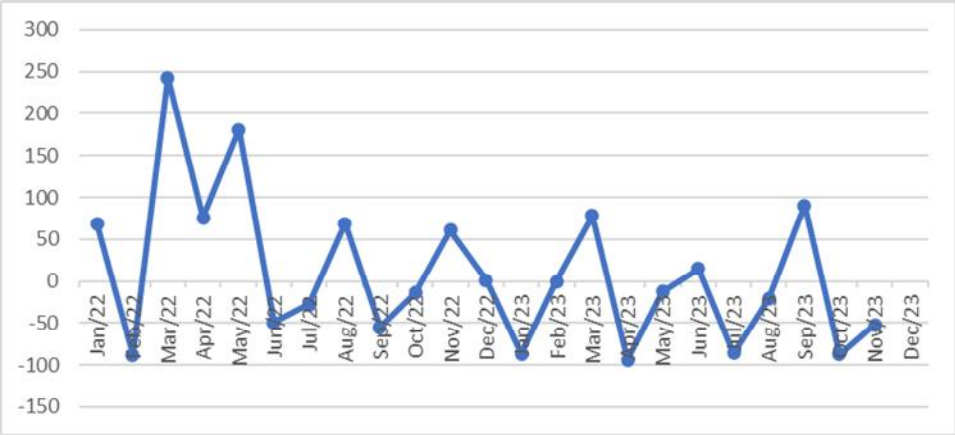
RSI=100-41.3992
RSI=58.6008

Chart 5: Tech Mahendra RSI



INTERPRETATION

The table provides an analysis of RSI of Tech Mahindra on a monthly basis starting from January of 2022 till December of 2023, which is used as an indicator for measuring the overbought or oversold levels of a stock. For the actual semiconductor stocks, sharp decline in RSI points to oversold status, accompanied by the actual price drop of the stock. On the other hand, higher values of RSI suggest that the asset is overbought or the market is recovering strongly. Thus, for sound decision making, it is wise to combine these RSI trends with other technical and fundamental reports that investors use while sourcing for stock.

Formula for calculation of ROC

ROC= (today's closing price ÷ closing price at [period number of days ago]) x 100

Table 6: ROC Calculations of Tech Mahendra

Date	**Price**	ROC -1 Method (%)	ROC -2 Method (%)
Dec-23	1272.6		
Nov-23	1220.6		
Oct-23	1133.15		
Sep-23	1223.1		
Aug-23	1201.75		
Jul-23	1115.65		
Jun-23	1130.55	88.83781	-11.1622
May-23	1117.75	91.57382	-8.42618
Apr-23	1023.75	90.3455	-9.6545
Mar-23	1101.85	90.08667	-9.91333
Feb-23	1101.65	91.67048	-8.32952
Jan-23	1015.3	91.00524	-8.99476
Dec-22	1016.5	89.91199	-10.088
Nov-22	1077.3	96.38112	-3.61888
Oct-22	1063.5	103.8828	3.882784
Sep-22	1008.2	91.50066	-8.49934

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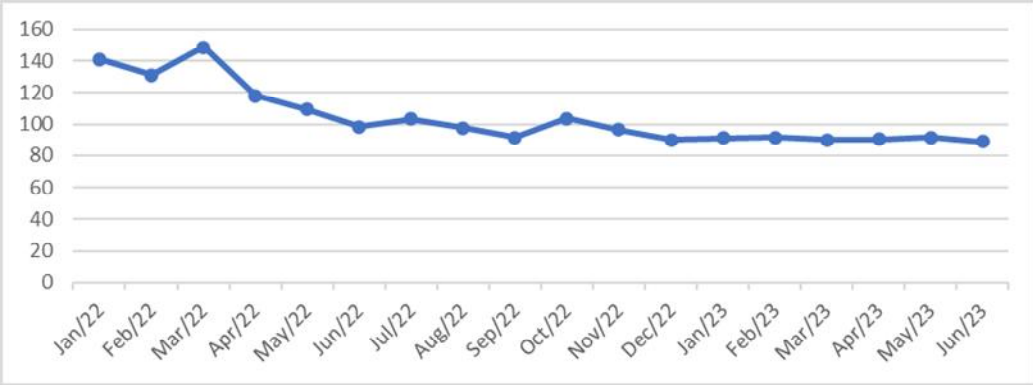
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 1, August 2024

Aug-22	1076.7	97.73522	-2.26478
Jul-22	1048.9	103.3094	3.309367
Jun-22	999.7	98.34727	-1.65273
May-22	1180.85	109.612	9.611993
Apr-22	1256.55	118.1523	18.15233
Mar-22	1499.3	148.7106	48.71057
Feb-22	1411	131.0486	31.04857
Jan-22	1479.35	141.0382	41.03823

Chart 6: Tech Mahendra ROC



INTERPRETATION

The ROC Tech Mahindra stocks trends were rather volatile during the considered time frame with the maximum in early 2022 and overall decrease. The oscillating movement depicted by the stock prices at the beginning of the year, through the middle of 2023 implies vulnerability of the business or volatility of the operating context. Perhaps the investors would require these trends when making future investment decisions and may require information on causes of the fluctuating movements.

Table 7: Comparison of RSI and ROC Calculations

	INFOSYS	WIPRO	TECH MAHENDRA
RSI	45.0671	40.5576	58.6008
ROC	86.55778	82.56949	88.83781

V. FINDINGS

The RSI for Infosys stands at 45.0671, indicating that the stock is currently in a relatively neutral zone with a slight tendency towards oversold conditions. The ROC value of 86.55778 reveals high momentum, but it is showing a declining trend over the past year, suggesting a reduction in the rate of price increase.

With an RSI of 40.5576, Wipro is also in the oversold territory, suggesting potential for future price reversals or recovery. The ROC value of 82.56949 shows a similar pattern of high momentum with a gradual decline, reflecting a potential slowdown in price gains.

Tech Mahindra's RSI of 58.6008 indicates a stronger position compared to Infosys and Wipro, suggesting that the stock might be overbought or in a stronger recovery phase. The ROC value of 88.83781 points to high momentum, with fluctuating trends showing some vulnerability but still significant price momentum.

Among the three companies analyzed, Tech Mahindra exhibits the highest RSI and ROC values, indicating stronger momentum and a more favorable position relative to the other stocks. Infosys and Wipro both have lower RSI values, reflecting weaker relative performance and potential oversold conditions. The ROC values for Infosys and Wipro suggest declining momentum, which could be a concern for future performance.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
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The historical performance of these stocks highlights a need for caution in the current market conditions. Infosys and Wipro show signs of potential price declines or consolidation, while Tech Mahindra, despite its higher momentum, also exhibits volatility that investors should consider.

VI. CONCLUSION

The study evaluating Infosys, Wipro, Tech Mahindra, HCL, and TCS using RSI and ROC oscillators provides key insights into their stock performance. Infosys has an RSI of 45.07, near the oversold region, indicating potential selling pressure or a forthcoming reversal. Wipro's RSI at 40.56 also suggests possible weakness or an upcoming rebound, reflecting recent financial volatility. In contrast, Tech Mahindra, with the highest RSI of 58.60, indicates strong momentum but may face a future correction if it continues rising. ROC values further highlight Tech Mahindra's strong recent momentum at 88.84%, whereas Infosys and Wipro show declining momentum, with ROC values of 86.56% and 82.57%, respectively, signaling potential volatility or weakening performance. Overall, Tech Mahindra's stronger indicators suggest better short-term performance, while Infosys and Wipro may be experiencing significant challenges.

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