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# An Empirical Analysis of Momentum and Trend Indicators in Predicting Price Movements of Selected Stocks on the National Stock Exchange

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**ABSTRACT**

This study evaluates the effectiveness of selected momentum and trend indicators in predicting stock price movements of five companies listed on the National Stock Exchange (NSE) of India — ITC Limited, Reliance Industries Limited, Infosys Limited, Tata Consultancy Services (TCS), and State Bank of India (SBI). Secondary monthly price data spanning March 2024 to February 2026 were sourced from Investing.com. The analytical tools applied include the Relative Strength Index (RSI), Rate of Change (ROC), Stochastic Oscillator, Simple Moving Average (SMA), and Exponential Moving Average (EMA). Findings indicate that momentum indicators are effective in capturing short-term price dynamics and identifying overbought or oversold conditions, whereas trend indicators provide reliable directional signals for medium-to-long-term analysis. No single indicator consistently outperforms across all market conditions; however, a combined approach enhances predictive reliability and supports informed investment decision-making.

**Keywords:** *Technical Analysis, RSI, Rate of Change, Stochastic Oscillator, Moving Average, NSE, Stock Price Prediction*

## 1. INTRODUCTION

The stock market is one of the most dynamic components of a modern economy, serving as a primary channel for capital formation and wealth creation. Despite its strategic importance, the inherent volatility of equity markets — driven by macroeconomic variables, geopolitical developments, and investor sentiment — renders precise price forecasting a formidable challenge. For investors and analysts, the ability to interpret price signals accurately is integral to managing risk and maximising returns.

Technical analysis has gained widespread acceptance as a systematic framework for examining stock price behaviour using historical data. Unlike fundamental analysis, which focuses on intrinsic value, technical analysis is premised on the notion that all market-relevant information is already embedded in price movements, and that these movements tend to repeat identifiable patterns over time. Within this framework, technical indicators serve as quantitative tools that help decode market momentum, trend direction, and potential reversal points.

The present study applies five widely-used technical indicators — RSI, ROC, Stochastic Oscillator, SMA, and EMA — to the monthly closing prices of five NSE-listed companies representing the FMCG, Energy, Information Technology, and Banking sectors. The study period extends from March 2024 to February 2026, capturing a range of bullish, bearish, and range-bound market phases. The primary aim is to assess the predictive accuracy and practical utility of these indicators under varying market conditions.

## 2. REVIEW OF LITERATURE

A growing body of research has examined the role of technical indicators in stock market forecasting. The following studies are directly relevant to the present analysis.

***Mostafavi et al. (2025)***. This study evaluated a broad range of technical indicators for their efficacy in stock market prediction using machine learning models, including XGBoost and Random Forest. The authors found that momentum-based indicators, particularly RSI and SMA, substantially improved forecasting accuracy. The study underscored the importance of selective indicator deployment and confirmed that not all indicators contribute equally to predictive performance. These findings offer a strong empirical basis for the targeted use of technical tools in the present study.

***Nayak et al. (2025)***. Nayak and colleagues proposed an algorithmic trading framework that integrated technical indicators — RSI, SMA, and EMA — with sentiment analysis derived from financial news. Their machine learning-driven approach demonstrated measurably improved prediction accuracy when both datasets were combined. The research affirms the continued relevance of classical technical indicators in contemporary data-driven trading environments and supports their combined application for robust investment signals.

***Kim et al. (2025)***. This study developed a rule-based stock trading recommendation system that integrated RSI with real-time news sentiment analysis. The authors demonstrated that RSI effectively identifies overbought and oversold market conditions, and that incorporating sentiment data further enhanced the precision of generated trading signals. The research reinforces the practical utility of RSI as a momentum indicator and highlights its relevance in active investment decision-making — a central concern of the present study.

***Tadas et al. (2023)***. Tadas and co-authors assessed the performance of technical trading strategies — specifically SMA and RSI — in the Indian equity market context. Their analysis revealed that indicator-based strategies outperformed conventional buy-and-hold approaches in several market scenarios. Given that the current study is also centred on NSE-listed equities, these findings provide especially pertinent contextual validation for the indicators employed herein.

***Phuoc et al. (2024)***. Conducted in an emerging market setting, this study applied machine learning techniques in conjunction with RSI and SMA to forecast stock price movements. The results demonstrated high predictive accuracy, establishing that technical indicators are reliable analytical tools even in less mature financial markets. The authors noted their particular utility for identifying price trends and momentum shifts — functions that are central to the methodology of the present investigation.

## 3. OBJECTIVES OF THE STUDY

The study is guided by the following objectives:

1. To examine the behaviour of stock prices in terms of overbought and oversold conditions using RSI, ROC, and the Stochastic Oscillator.

2. To identify the direction of price movements using SMA and EMA.

3. To evaluate the predictive accuracy of each selected indicator in forecasting stock price movements.

4. To provide practical investment suggestions based on the combined analysis of momentum and trend indicators.

## 4. RESEARCH METHODOLOGY

### *4.1 Research Design*

The study adopts a descriptive and analytical research design. The descriptive component involves the systematic collection and organisation of historical price data, while the analytical component applies quantitative technical tools to derive meaningful insights from that data.

### *4.2 Data Collection and Sample*

Secondary monthly price data — comprising opening price, closing price, high, and low — were collected from Investing.com for the period March 2024 to February 2026. The five companies selected represent major NSE-listed equities across distinct sectors: ITC Limited (FMCG), Reliance Industries Limited (Energy), Infosys Limited (IT), Tata Consultancy Services (IT), and State Bank of India (Banking). This cross-sectoral selection ensures analytical breadth.

### *4.3 Analytical Tools*

The following technical indicators were applied to the monthly closing price series of each company:

RSI (Relative Strength Index): Measures the speed and magnitude of price changes, ranging from 0 to 100. Values above 70 indicate overbought conditions; values below 30 indicate oversold conditions. Formula: RSI = 100 − [100 / (1 + RS)], where RS = Average Gain / Average Loss.

ROC (Rate of Change): Quantifies the percentage price change relative to a prior period, capturing momentum direction and strength. Formula: ROC = [(Current Price − Price n periods ago) / Price n periods ago] × 100.

Stochastic Oscillator: Compares the closing price to its trading range over a defined look-back period. %K above 80 signals overbought; below 20 signals oversold. Formula: %K = [(Close − Lowest Low) / (Highest High − Lowest Low)] × 100; %D = Moving Average of %K.

SMA (Simple Moving Average): Smooths short-term price fluctuations to reveal the prevailing trend direction. Formula: SMA = $(P_1 + P_2 + \ldots + P_n) / n$.

EMA (Exponential Moving Average): Assigns greater weight to recent observations, rendering it more responsive to current price dynamics. Formula: EMA = (Price − EMA_prev) × Multiplier + EMA_prev; Multiplier = 2 / (n + 1).

All calculations were performed in Microsoft Excel.

## 5. DATA ANALYSIS AND INTERPRETATION

### *5.1 RSI Analysis*

Table 1 presents RSI values across the five stocks for the study period. For ITC Limited, RSI values ranged from a high of 59.73 (September 2024) to a low of 20.40 (February 2026), reflecting a pronounced shift from neutral to deeply oversold conditions. Infosys and TCS both exhibited overbought conditions (RSI > 70) in mid-2024, followed by a sustained decline into oversold territory by late 2025 and early 2026. SBI was the outlier, maintaining consistently strong RSI values — including readings above 80 in May–July 2024 and again in February 2026 — indicative of persistent bullish momentum. Reliance Industries displayed a cyclical pattern, entering overbought conditions in mid-2024 before declining and subsequently recovering.

**Table 1: Summary of RSI Values — Selected Stocks (Study Period)**

| Stock | Peak RSI (Period) | Trough RSI (Period) | Condition |
|---|---|---|---|
| ITC Limited | 59.73 (Sep-24) | 20.40 (Feb-26) | Bearish — Oversold |
| Reliance Industries | 77.81 (Jun-24) | 38.65 (Aug-25) | Cyclical — Recovery |
| Infosys | 74.35 (Aug-24) | 25.46 (Feb-26) | Bearish — Oversold |
| TCS | 74.72 (Aug-24) | 21.70 (Feb-26) | Bearish — Oversold |
| SBI | 80.51 (Feb-26) | 45.06 (Aug-25) | Bullish — Overbought |

### *5.2 ROC Analysis*

The Rate of Change indicator effectively captured short-term momentum shifts. ITC demonstrated strong upward momentum in July–September 2024 (ROC: 16.60) before entering a prolonged negative phase, reaching −28.01 in January 2026. Reliance Industries showed the strongest initial momentum (ROC: 40.42 in March 2024) and was the only stock to achieve a clear recovery, with positive ROC values resuming from October 2025 onward. TCS and Infosys followed broadly similar patterns — positive momentum through mid-2024, followed by sustained negative values from mid-2025. SBI exhibited the most dynamic reversal, transitioning from strongly positive ROC values throughout 2024 to a brief negative phase in early 2025, before recovering sharply to 74.46 in February 2026.

### *5.3 Stochastic Oscillator Analysis*

The Stochastic Oscillator provided clear overbought and oversold signals across all five stocks. ITC's %K line peaked at

92.14 (August 2024) before declining sharply into oversold territory — with values of 3.68 and 6.84 in early 2026. Infosys and TCS exhibited near-identical patterns, with %K values above 95 in mid-2024 giving way to sub-10 readings by late 2025, clearly delineating overbought-to-oversold transitions. Reliance Industries showed a more cyclical pattern, with overbought signals in June 2024 (%K: 96.79) and again in November–December 2025 (%K: 97.04–97.66). SBI's oscillator reflected a gradual ascent from oversold conditions in 2023 to overbought levels by mid-2024, indicating sustained accumulation.

### *5.4 SMA and EMA Analysis*

SMA and EMA analyses were broadly consistent across stocks, with the EMA demonstrating greater responsiveness to recent price changes — a characteristic that proved particularly informative during trend reversals. For ITC, the closing price remained above the SMA through September 2024 (price: 518.15; SMA: 450.41) before falling sharply below in subsequent months, reaching 313.60 against an SMA of 396.39 in February 2026. SBI presented the contrasting case — the stock consistently traded above its SMA throughout the study period, culminating in a price of 1,201.70 against an SMA of 903.45 in February 2026, reflecting sustained structural growth. Reliance Industries showed a partial recovery in the later period, with price crossing back above the SMA from mid-2025. Infosys and TCS remained in bearish alignment, with prices substantially below their respective moving averages in early 2026.

## 6. PREDICTIVE ACCURACY OF INDICATORS

Table 2 presents a comparative summary of the predictive accuracy of each indicator across the five stocks. Accuracy was calculated as the proportion of months in which the indicator correctly anticipated the direction of subsequent price movement.

**Table 2: Predictive Accuracy of Technical Indicators (%)**

| Stock | RSI (%) | ROC (%) | Stochastic (%) | SMA (%) | EMA (%) |
|---|---|---|---|---|---|
| ITC Limited | 38.10 | 66.67 | 52.38 | 61.90 | 61.90 |
| Reliance Industries | 80.95 | 28.57 | 66.67 | 57.14 | 57.14 |
| Infosys | 52.38 | 47.62 | 61.90 | 52.38 | 52.38 |
| TCS | 47.62 | 52.38 | 52.38 | 52.38 | 52.38 |
| SBI | 38.10 | 47.62 | 57.14 | 61.90 | 52.38 |

The results reveal notable variation in indicator efficacy across stocks. RSI achieved its highest predictive accuracy for Reliance Industries (80.95%), yet performed poorly for ITC and SBI (38.10% each). ROC was most effective for ITC (66.67%) but weakest for Reliance Industries (28.57%), suggesting that the appropriateness of a given indicator is stock-specific. The Stochastic Oscillator delivered broadly consistent moderate-to-good accuracy across all stocks, with a peak of 66.67% for Reliance Industries and Infosys. SMA demonstrated the strongest performance for ITC and SBI (61.90%), while EMA recorded more uniform accuracy across most stocks. These findings confirm that no single indicator is universally superior; rather, the selection of appropriate indicators should be informed by the characteristics of the stock and prevailing market conditions.

## 7. KEY FINDINGS

• RSI and the Stochastic Oscillator effectively identified overbought and oversold conditions across all five stocks, with overbought signals predominating in mid-2024 and oversold signals intensifying through 2025 and early 2026 for most stocks.

• SBI was the only stock to maintain consistently bullish momentum throughout the study period, as evidenced by strong RSI readings, positive ROC, and a sustained price-above-SMA configuration.

• Momentum indicators (RSI, ROC, Stochastic Oscillator) demonstrated greater sensitivity to short-term price changes, while trend indicators (SMA and EMA) were more reliable for identifying medium-to-long-term directional movements.

• The EMA, owing to its recency weighting, provided earlier trend-change signals relative to the SMA, making it more actionable in dynamic market environments.

• No single indicator consistently delivered high predictive accuracy across all five stocks, underscoring the importance of multi-indicator approaches in technical analysis.

• Technical indicators performed with greater reliability during trending market phases; their accuracy was reduced during high-volatility and sideways market conditions.

• Combined use of momentum and trend indicators produced more comprehensive and reliable signals than relying on any individual tool in isolation.

## 8. SUGGESTIONS

• Investors should combine multiple indicators — both momentum and trend — rather than relying on any single metric for trading decisions.

• For long-term portfolio positioning, trend indicators (SMA and EMA) should be prioritised; for short-term entry and exit timing, momentum indicators (RSI, ROC, and Stochastic Oscillator) are more appropriate.

• Technical analysis should be complemented with fundamental analysis, as macroeconomic and company-specific developments can significantly alter price behaviour in ways that technical tools cannot anticipate.

• Investors should exercise heightened caution during periods of elevated volatility or range-bound markets, where indicator signals are more likely to be misleading or false.

• Sound risk management practices — including the use of stop-loss orders and portfolio diversification — should accompany any indicator-based investment strategy.

## 9. CONCLUSION

This study has empirically examined the effectiveness of five widely-used technical indicators — RSI, ROC, Stochastic Oscillator, SMA, and EMA — in analysing and predicting stock price movements for a cross-sectoral sample of NSE-listed companies over a two-year period. The findings confirm that technical analysis provides a systematic and practical framework for interpreting market behaviour. Momentum indicators proved effective in identifying short-term price dynamics and signalling extremes of buying or selling pressure, while trend indicators

offered more reliable guidance on prevailing market direction. EMA's superior responsiveness to recent data makes it particularly well-suited for timely decision-making in volatile markets.

The study also highlights an important limitation: the performance of technical indicators is context-dependent, varying across stocks, sectors, and market phases. Reliability tends to diminish during periods of high volatility or lateral price consolidation. These findings advocate strongly for a composite analytical approach — one that integrates multiple indicator types alongside sound market judgment — as the most effective strategy for improving investment outcomes. Future research could extend this framework by incorporating intraday data, additional sectors, or hybrid models that combine technical and fundamental signals.

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