Exploring the Impact of Momentum Indicators on Stock Performance: A Comprehensive Analysis

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I.ABSTRACT

This study investigates the efficacy of prominent momentum indicators, namely Relative Strength Index (RSI), Average Directional Index (ADX), Bollinger Bands, and the Stochastic Oscillator, across four distinct sectors in the stock market: Pharmacy, Banking, Automobile, and Information Technology. The research comprises a comprehensive analysis of these indicators, involving four representative stocks from each sector: Lupin, Cipla, Sun Pharma, and Apollo Hospitals from the Pharmacy sector; Infosys, TCS, HCL Tech, and Tech Mahindra from the IT sector; Ashok Leyland, Bajaj Auto, Tata Motors, and Maruti Suzuki from the Automobile sector; and ICICI, SBI, Axis, and Kotak Mahindra from the Banking sector.

The core of this research revolves around back testing, a rigorous empirical methodology employed to evaluate the performance of these momentum indicators. The back testing process assesses their ability to generate trading signals, manage risk, and optimize returns within each sector. The results not only provide insights into the performance of these indicators across different sectors but also emphasize the importance of adapting strategies to sector-specific dynamics. Historical stock data is employed to evaluate the indicators' performance, including the identification of buying and selling signals, risk management, and returns.

The study further highlights the importance of understanding the limitations and challenges associated with these indicators, including the potential for false signals in various market conditions. By shedding light on the efficiency of these momentum indicators in diverse sectors, this research equips investors, traders, and financial professionals with valuable insights to optimize their stock market strategies and make informed decisions. The outcomes of this study provide a foundation for refining trading techniques and risk management practices tailored to each sector's characteristics.

KEY WORDS: Momentum Indicators, Back Testing, Trading Signals, Risk Management, Sector analysis

JEL Codes: G10,G11, G24

II.INTRODUCTION

The world of stock trading and investment is a dynamic and ever-evolving landscape, where informed decisions are the key to success. Amidst the complexity of the financial markets, momentum indicators have emerged as indispensable tools for traders and investors seeking to gauge the potential of stocks. These indicators, encompassing a wide range of metrics, offer valuable insights into the strength and direction of price movements, aiding market participants in their quest for profitable strategies. This study embarks on a comprehensive exploration of the influence of momentum indicators on stock performance.

Momentum indicators are pivotal components of technical analysis, a field of study that scrutinizes historical price data and trading volumes to anticipate future price movements. These indicators allow traders and investors to identify trends, potential reversals, and market sentiment, thereby providing a foundation for well-informed decisions.

The four selected sectors, Pharmacy, Banking, Automobile, and IT, represent varied dimensions of the stock market, each subject to its unique market dynamics, trends, and external factors. Within these sectors, four representative stocks have been chosen, ensuring a diverse and comprehensive analysis. In the Pharmacy sector, we consider Lupin, Cipla, Sun Pharma, and Apollo Hospitals. In the IT sector, our focus extends to Infosys, TCS, HCL Tech, and Tech Mahindra. The Automobile sector is represented by Ashok Leyland, Bajaj Auto, Tata Motors, and Maruti Suzuki, while the Banking sector includes ICICI, SBI, Axis, and Kotak Mahindra.
The core of this research lies in the rigorous back testing of these momentum indicators. Back testing, a historical analysis of trading strategies using past data, provides a tangible platform for evaluating the effectiveness of these indicators. It serves as a testbed for various momentum indicators, revealing their capacity to generate buy and sell signals, manage risks, and ultimately enhance returns. Our investigation seeks to uncover the specific nuances of these indicators within each sector, recognizing that what works well for one may not necessarily
apply to another.

Through this research, we aim to shed light on the efficiency of momentum indicators within distinct market segments. By assessing their impact on stock performance, we endeavor to equip investors, traders, and financial professionals with a comprehensive understanding of how to leverage these tools effectively. The outcomes of this study will not only contribute to the body of knowledge in the realm of technical analysis but will also serve as a practical guide for optimizing trading strategies and risk management, tailored to the nuances of sector-specific dynamics.

In the subsequent sections of this paper, we will delve deeper into the methodologies employed, the analysis of historical data, and the results of our back testing, offering valuable insights into the relationship between momentum indicators and stock performance across the Pharmacy, Banking, Automobile, and IT sectors.

III.REVIEW OF LITERATURE

Deep learning in the stock market—a systematic survey of practice, back testing, and applications by Kenniy Olorunnimbe, Herna Victor (2019, 2023). This systematic survey explores various scenarios using deep learning in financial markets, focusing on back testing research papers. Most studies focus on trade strategy, price prediction, and portfolio management, with a few considering market simulation, stock selection, hedging strategy, and risk management. The study suggests future directions to improve trust and emphasize longer-term horizon prediction.

Robust Testing for Bollinger Band, Moving Average and Relative Strength Index by Matthew Lutey (2020). Lutey's study assesses the profitability of moving averages, RSI, and Bollinger Bands in trend following. All indicators outperform Buy and Hold, with moving averages showing the strongest returns, followed by RSI and Bollinger Bands. These findings are consistent across different portfolios, providing valuable insights for market analysis.

Ghazali Syamni, Wardhiah, Devi Permata Sari and Badratun Nafis paper on the momentum strategy in the capital market (2019) explores the practice of buying stocks with strong historical performance, expecting this trend to continue. The strategy's popularity is acknowledged, but its inconsistent implementation hints at market inefficiency. This well-documented financial phenomenon provides valuable insights for investors and further research opportunities.

Deep Leaming for Stock Market Prediction Using Technical Indicators and Financial News Articles by Manuel R Vargas, Carlos EM Dos Anjos, Gustavo LG Bichara, Alexandre G Evsukoff (2018) This study uses deep learning models to predict stock price movements using financial news titles and technical indicators. Two models are compared: a hybrid model (SI-RCNN) combining CNN for financial news and LSTM for technical indicators, and an LSTM network only for technical indicators (I-RNN). The results are used by a trading agent to buy and sell stocks based on the model's predictions. The study reveals that financial news significantly stabilizes results, with minimal improvement when comparing different technical indicators.

The study by **Cenesizoglu (2017**) investigates the profitability of momentum strategies in European markets. It highlights variations in momentum performance among different European countries, shedding light on how regional factors can affect stock performance and momentum indicators.

Masoud Movaffaghi, Reza Tehrani (2015) This study explores the impact of information uncertainty on investor decision-making in the uncertain financial environment. It aims to determine this uncertainty based on firm-specific factors. Results show that this method of momentum portfolio construction leads to more return compared to older methods using other criteria for measuring information uncertainty.

Asness, Moskowitz, and Pedersen (2013) analyze the profitability of momentum strategies across countries and time periods. They provide insights into how momentum can be used as an investment strategy.

IV. Methodology

The study mainly evaluates the effectiveness of different momentum indicators in predicting stock price movements. It also assesses the reliability of back testing as a method for validating trading strategies based on these momentum indicators, while analysing the relationship between momentum indicator signals and actual stock price performance over a specific time period. The study also attempts to provide practical recommendations for investors or traders based on the findings, aiming to enhance their stock trading strategies deploying momentum indicators.

V. Data Collection

Data for this study was collected over a period of five years from historical price records of a selected set of stocks across select sectors. The data source utilized was Yahoo Finance, which provides a reliable and comprehensive dataset for financial market analysis.

A. Indicator Selection and Calculation

The technical indicators chosen for this study were selected based on their established significance in technical analysis. The formulas and methods used for their calculation were as follows:

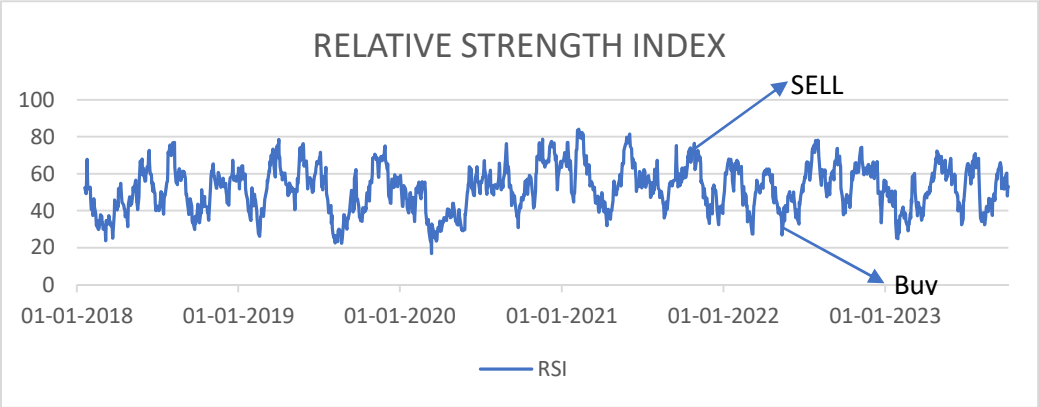
Relative Strength Index (RSI): Calculated over a 14-day period using the classic formula [(100 - (100 / (1 + RS))], where RS represents the average of up-days divided by the average of down-days.

Average Directional Index (ADX): Computed as the 14-day Exponential Moving Average (EMA) of the true range, which is derived from the highest, lowest, and closing prices.

Bollinger Bands: Comprised of a middle band (SMA), an upper band (SMA + 2 standard deviations), and a lower band (SMA - 2 standard deviations) based on a 20-day simple moving average.

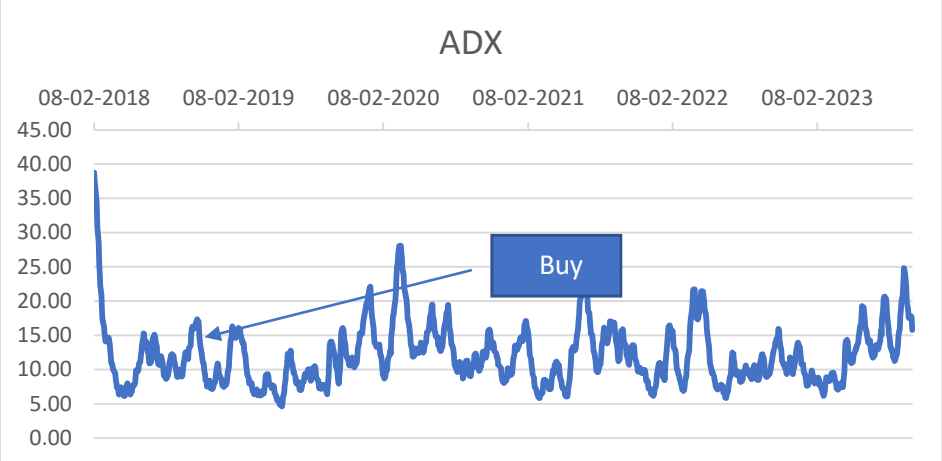
Stochastic Oscillator: Calculated using %K and %D values. %K was derived as [(Current Close - Lowest Low) / (Highest High - Lowest Low)] × 100, while %D is the 3-day EMA of %K.

Graph No 1.1 Showing the RSI Analysis for SBI Stock: Trend and Signal Movements



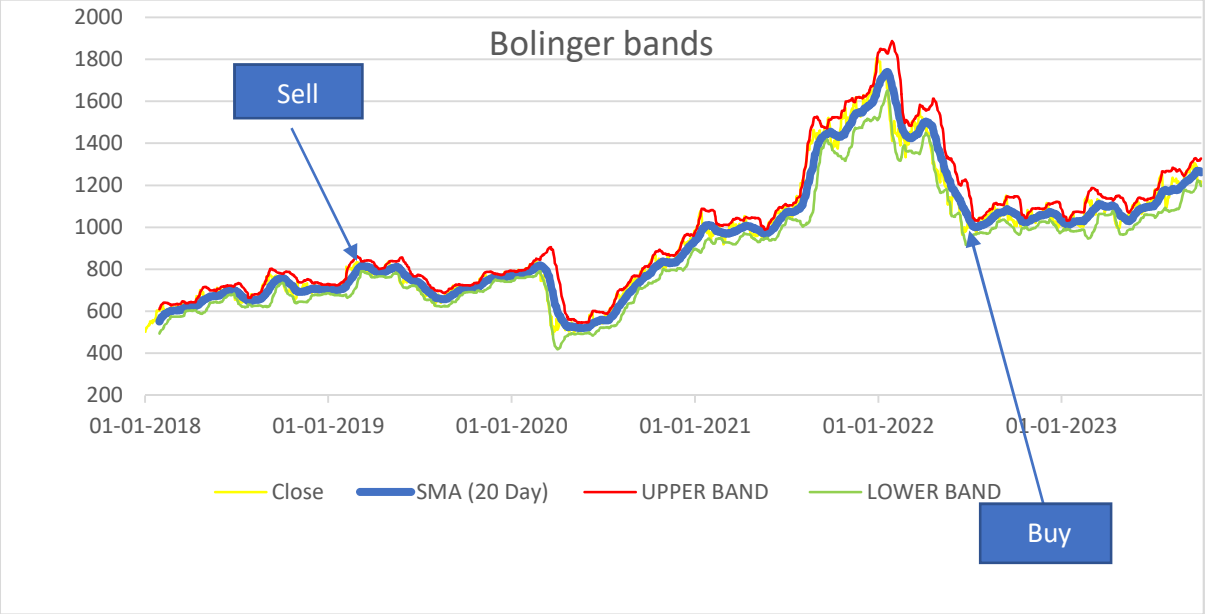
Source: Calculations

Graph No 1.2 Showing the ADX Analysis for Infosys Stock: Trend and Signal Movements



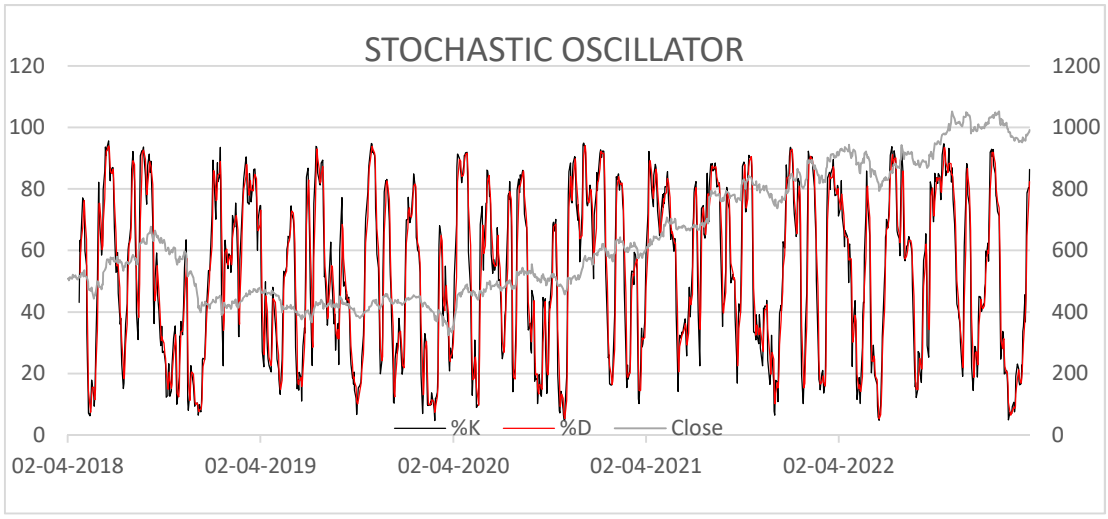
Source: Calculations

Graph No 1.3 Showing the Bolinger Band Analysis for Tech Mahindra Stock: Trend and Signal Movements



Source: Calculations

Graph No 1.4 Showing the Stochastic oscillator Analysis for Lupin Stock: Trend and Signal Movements



Source: Calculations

B. Trading Strategy Formulation

Trading strategies were developed based on signals generated by the selected technical indicators back tested in the study. These strategies included:

RSI-based strategy: Buy when RSI crosses below 30 and sell when RSI crosses above 70. ADX-based strategy: Enter long positions when ADX is above a specified threshold (e.g., 25) and exit when it falls

below. Bollinger Bands strategy: Buy when prices touch the lower band and sell when they touch the upper band. Stochastic Oscillator strategy: Buy when %K crosses above %D and sell when it crosses below.

1) Net Profit: Net profit is a fundamental metric that reflects the actual financial gain or loss from trading. It's a critical measure of an indicator's effectiveness in generating profits.

2) Percent Profitable: This metric represents the percentage of profitable trades out of the total number of trades. A higher percentage suggests a more consistent indicator.

3) Max Drawdown: Max drawdown quantifies the largest peak-to-trough decline in the trading account. Lower drawdowns are generally preferred as they indicate lower risk.

4) Profit Factor: The profit factor is the ratio of gross profits to gross losses. A higher profit factor indicates that profitable trades outweigh losing ones.

Table I : Company-wise Back Testing Results

Stock	Effective Indicator	Discussion
LUPIN	BOLINGER BANDS	The Bollinger Bands indicator stands out as the best performer among the four. It achieved a modest net profit, had the highest percentage of profitability (66.92%), a relatively lower max drawdown compared to some others, and a profit factor slightly above 1
APOLLO HOSPITAL	STOCHASTIC OSCILLATOR	The Stochastic Oscillator stands out as the most favourable indicator among the four. It achieved the highest net profit and the highest percentage of profitable trades, indicating strong potential for generating profits. Additionally, it exhibited a relatively low max drawdown and a solid profit factor, highlighting its consistency in producing favourable trading results.
CIPLA	BOLINGER BANDS	The Bollinger Bands indicator emerges as a strong choice. It consistently delivered a high percentage of profitable trades (67.18%) with a respectable net profit of 390.05 INR (0.04%). Additionally, it demonstrated effective risk management, boasting a relatively low max drawdown (407.55, 0.04%) and a solid profit factor of 1.225
SUNPHARMA	RSI	The Relative Strength Index (RSI) seems to be the best indicator among the ones listed. It has the highest net profit, the highest percent profitable trades (66%), and the highest profit factor (1.653).
INFOSYS	ADX	Based on the performance metrics provided Average Directional Index (ADX) has a higher net profit and a better profit factor, indicating stronger overall performance.

TCS	BOLINGER BANDS	Bollinger Bands stands out as the best performer with a net profit of 701.10 INR (0.07%) and a profit factor of 1.135. It also demonstrates a relatively high percent profitable (60.47%) while maintaining a lower drawdown, indicating better risk-adjusted returns.
HCL TECH	STOCHASTIC OSCILLATOR	Stochastic Oscillator appears to be the most promising, as it has the highest percent profitable, the lowest max drawdown, the best average trade result, and the highest profit factor. It may be a suitable choice for trading strategies.
TECH MAHINDRA	STOCHASTIC OSCILLATOR	Stochastic Oscillator appears to be the best-performing strategy with a positive net profit, a relatively high percent profitable, and a profit factor above 1.
KOTAK MAHINDRA	RSI	The Relative Strength Index (RSI) strategy appears to be the most promising option among the four, showing a substantial net profit, the highest percentage of profitable trades (73.68%), and a competitive profit factor (0.37)
SBI	BOLINGER BANDS	The Bollinger Bands strategy stands out as the best option among the four, showing a positive net profit, a relatively high percentage of profitable trades (60.34%), and the highest profit factor (0.73)
AXIS BANK	BOLINGER BANDS	The Bollinger Bands strategy has shown the highest net profit, a relatively high percentage of profitable trades (63.57%), and a positive profit factor (0.55), making it the most favourable choice among the four
ICICI BANK	STOCHASTIC OSCILLATOR	The Stochastic Oscillator strategy appears to be the most favourable among the four, with a higher net profit, a relatively high percentage of profitable trades (65.49%), and the highest profit factor (0.22)
ASHOK LEYLAND	RSI	The Relative Strength Index (RSI) strategy appears to be the most favourable option among the four, with a positive net profit, a relatively high percentage of profitable trades (63.49%), and a reasonable profit factor (2.63).
TATA MOTORS	ADX	Average Directional Index (ADX) strategy appears to be the most effective option among the four, with a positive net profit, a relatively high percentage of profitable trades (50.65%), and a strong profit factor (2.44).
MARUTI SUZUKI	STOCHASTIC OSCILLATOR	Stochastic Oscillator strategy stands out as the best option among the four, with a solid net profit, a relatively high percentage of profitable trades (66.43%), and a strong profit factor (0.19).
BAJAJ AUTO	STOCHASTIC OSCILLATOR	Stochastic Oscillator strategy seems to be the best option among the four, with a positive net profit, a relatively high percentage of profitable trades (67.72%), and a reasonable profit factor (0.09)

Source: https://in.tradingview.com/

There were six instances where the stochastic oscillator has proven to be an effective technical indicator across various key metrics, while for five companies, Bollinger bands were effective in predicting the stock price movements across metrics.

C. Sector-wise Back Testing Results

A sector-wise analysis of the technical indicators and its effectiveness would enable investors with an understanding of likely indicators that can be useful in predicting the stock price movements. From the back testing metric values it can be concluded that the results cannot be generalised as it can be observed that each company has a unique indicator that is effective. In case of technology stocks, Bollinger bands and stochastic oscillator can serve to be effective indicators, while for banking stocks, Bollinger bands were effective indicators. The results for automobile stocks stochastic oscillator seems to be an effective indicator. However, it is always better to select an appropriate to select an indicator specifically for each stock.

D. Overall Back testing discussion

Back testing was conducted using Trading View software. Historical price data was imported, and the trading strategies were programmed. Back tests were executed over a period of 5 years, recording the number of trades executed, profitability, and risk metrics.

Table II Back testing results for each indicator across different stocks

Stock	Indicator	Net profit	Total closed trade	Percent profitable	Max drawdown	Average trade	Profit factor
LUPIN	ADX	89.90 INR 0.01%	78	47.44%	876.00 (0.09 %)	1.15 (0.09%)	1.062
	RSI	507.40 INR -0.05%	44	47.73%	753.45 (0.08%)	-11.53 (-1.69%)	0.669
	BOLINGER BANDS	127.20 INR 0.01%	133	66.92%	605.20 (0.06%)	0.96 (0.15%)	1.051
	STOCHASTIC OSCILLATOR	-166.90 INR 0.02%	128	64.06%	679.90 (0.07%)	-1.30 (-0.33%)	0.931
APOLLO HOSPITAL	ADX	3198.45 INR -0.32%	65	35.38%	3761.15 (0.38%)	-49.21 (-1.94)	0.589
	RSI	(-2106.50 INR) (-0.21%)	47	55.32%	3237.35 (0.32%)	-44.82 (-1.63%)	0.621
	BOLINGER BANDS	137.80 INR 0.01%	125	62.40%	2296.50 (0.23%)	1.10 (-0.18%)	1.017
	STOCHASTIC OSCILLATOR	1076.50 INR 0.11%	159	64.78%	2990.85 (0.3%)	6.77 (0.33)	1.114
CIPLA	ADX	522.80 INR 0.05%	69	36.23%	356.90 (0.04%)	7.58 (1.3%)	1.574
	RSI	(-172.60) INR (-0.02%)	46	60.87%	638.20 (0.06%)	-3.75 (-0.82%)	0.868
	BOLINGER BANDS	390.05 INR 0.04%	131	67.18%	407.55 (0.04%)	2.98 (0.15%)	1.225

	STOCHASTIC OSCILLATOR	379.80 INR 0.4%	108	58.33%	537.50 (0.05%)	-3.52 (-0.59%)	0.796
SUNPHARMA	ADX	(-247.75 INR) (-0.02%)	70	40%	437.05 (0.04%)	-3.54 (0.37%)	0.786
	RSI	463.50 INR 0.05%	50	66%	201.70 (0.02%)	9.27 (1.51%)	1.653
	BOLINGER BANDS	278.10 INR 0.03%	123	63.49%	484.10 (0.05%)	2.21 (0.6%)	1.185
	STOCHASTIC OSCILLATOR	431.50 INR 0.04%	120	67.50%	334.15 (0.03%)	3.60 (0.7%)	1.323
INFOSYS	ADX	488.55 INR 0.05%	85	41.18%	531.10 (0.05%)	5.75 (0.68%)	1.311
	RSI	145.05 INR 0.01%	60	66.67%	765.40 (0.08%)	2.42 (0.02%)	1.068
	BOLINGER BANDS	(-451.80 INR) (-0.05%)	123	62.60%	1036.50 (0.1%)	-3.67 (0.23%)	0.842
	STOCHASTIC OSCILLATOR	199.45 INR 0.02%	135	66.67%	650.30 (0.07%)	1.48 (-0.06%)	1.073
TCS	ADX	(-1287.55 INR)(-0.13%)	78	34.62%	2718.10 (0.27%)	-16.51 (-1.13%)	0.712
	RSI	(-682.30 INR) (-0.07%)	48	56.25%	1557.50 (0.16%)	-14.21 (-0.97%)	0.777
	BOLINGER BANDS	701.10 INR 0.07%	129	60.47%	966.95 (0.1%)	5.43 (0.11%)	1.135
	STOCHASTIC OSCILLATOR	281.25 INR 0.03%	137	57.66%	1316.20 (0.13%)	2.05 (0.02%)	1.049
HCL TECH	ADX	-805.80 INR -0.08%	73	42.47%	1044.45 (0.1%)	-11.04 (-1.37%)	0.575
	RSI	-653.85 INR -0.07%	45	62.22%	1102.25 (0.11%)	-14.53 (-1.13%)	0.522
	BOLINGER BANDS	-627.20 INR -0.06%	115	61.74%	875.90 (0.09%)	-5.45 (-0.75%)	0.728
	STOCHASTIC OSCILLATOR	-173.25 INR -0.02%	120	65%	686.80 (0.07%)	-1.44 (-0.13%)	0.916
TECH MAHINDRA	ADX	-1154.30 INR -0.12%	67	32.84%	1340.60 (0.13%)	-17.23 (-1.99%)	0.554

	RSI	-364.80 INR -0.04%	51	72.55%	1336.65 (0.13%)	-7.15 (-0.82%)	0.824
	BOLINGER BANDS	-88.10 INR -0.01%	121	66.12%	854 (0.09%)	-0.73 (0.05%)	0.966
	STOCHASTIC OSCILLATOR	164.30 INR 0.02%	135	67.41%	867.25 (0.09%)	1.22 (0.28%)	1.065
KOTAK MAHINDRA	ADX	835.30 INR 0.08%	65	43.08%	443.1 (0.04%)	12.85 (0.72%)	1.459
	RSI	603.80 INR 0.06%	57	73.68%	924.15 (0.09%)	10.59 (0.37%)	1.261
	BOLINGER BANDS	761.45 INR 0.08%	130	64.62%	673.95 (0.07%)	5.86 (0.37%)	1.22
	STOCHASTIC OSCILLATOR	533.20 INR 0.05%	136	64.71%	1025.95 (0.07%)	3.92 (0.25%)	1.148
SBI	ADX	-303.35 INR -0.03%	77	32.47%	509.65 (0.05%)	-3.94 (-1.17%)	0.646
	RSI	-353.25 INR -0.04%	53	45.28%	483.0 (0.05%)	-6.67 (-1.91%)	0.59
	BOLINGER BANDS	-342.4 INR -0.03%	116	60.34%	663.7 (0.07%)	-2.95 (0.73%)	0.74
	STOCHASTIC OSCILLATOR	-426.95 INR -0.04%	132	58.33%	522.6 (0.04)	-3.23 (-0.93%)	0.676
AXIS BANK	ADX	495.7 INR -0.05%	78	41.03%	782.35 (0.08%)	-6.36 (-0.93%)	0.722
	RSI	420.0 INR -0.04%	53	50.94%	597.8 (0.06%)	-7.92 (-1.19%)	0.697
	BOLINGER BANDS	360.0 INR 0.04%	140	63.57%	438.0 (0.04%)	2.57 (0.55%)	1.196
	STOCHASTIC OSCILLATOR	48.75 INR 0%	140	64.29%	490.2 (0.05%)	0.35 (0.07%)	1.026
ICICI BANK	ADX	125.20 INR -0.01%	53	39.62%	419.0 (0.04%)	2.26 (-1.03%)	1.162
	RSI	17.0 INR 0%	43	58.14%	348.90 (0.03%)	0.4 (0.11%)	1.019
	BOLINGER BANDS	-224.25 INR 0%	121	59.50%	450.85 (0.05%)	-1.85 (0.02%)	0.851
	STOCHASTIC OSCILLATOR	48.75 INR 0%	142	65.49%	353.6 (0.04%)	0.34 (0.22%)	1.034
ASHOK	ADX	-39.9 INR	104	40.38%	115.6	-0.38	0.881

LEYLAND		0%			(0.01%)	(-0.55%)	
	RSI	112.2 INR 0.01%	63	63.49%	62.95 (0.01%)	1.78 (2.63%)	1.559
	BOLINGER BANDS	-31.7 INR 0.08%	116	62.07%	99.8 (0.01%)	-0.27 (-0.25%)	0.919
	STOCHASTIC OSCILLATOR	-25.3 INR 0%	134	66.42%	107.3 (0.01%)	-0.19 (0.17%)	0.938
TATA MOTORS	ADX	499.8 INR 0.05%	77	50.65%	191.7 (0.02%)	6.49 (2.44%)	1.785
	RSI	-404.55 INR -1.04%	57	52.63%	499.6 (0.05%)	-7.1 (-2.97%)	0.612
	BOLINGER BANDS	-221.0 INR 0.02%	122	63.93%	420.35 (0.04%)	-1.81 (-0.92%)	0.828
	STOCHASTIC OSCILLATOR	-16.2 INR 0%	147	60.54%	410.4 (0.04%)	-0.11 (-0.47%)	0.987
MARUTI SUZUKI	ADX	8856.4 INR 0.89%	74	56.76%	2920.0 (0.02%)	119.68 (1.39%)	1.93
	RSI	3266.55 INR -1.04%	60	61.67%	3573.5 (0.36%)	54.44 (1.05%)	1.305
	BOLINGER BANDS	846.6 INR 0.08%	136	61.03%	3731.15 (0.37%)	6.22 (0.1%)	1.048
	STOCHASTIC OSCILLATOR	2103.5 INR 0.21%	143	66.43%	4951.3 (0.49%)	14.71 (0.19%)	1.107
BAJAJ AUTO	ADX	-761.55 INR -0.08%	66	36.36%	2325.6 (0.02%)	-11.54 (-0.15%)	0.869
	RSI	-30.15 INR 0%	55	69.09%	3357.3 (0.34%)	-0.55 (0.06%)	0.994
	BOLINGER BANDS	-1785.1 INR 0.08%	116	61.21%	2354.9 (0.37%)	-15.39 (-0.47%)	0.8
	STOCHASTIC OSCILLATOR	178.2 INR 0.02%	127	67.72%	2672.0 (0.27%)	1.4 (0.09%)	1.022

Source: https://in.tradingview.com

The back testing results reveal the performance of each indicator across all stocks and sectors. These results are essential for assessing the indicators' consistency and effectiveness in real-world trading scenarios.

1) **Relative Strength Index (RSI):** RSI demonstrated a balanced performance across the metrics, with moderate net profits, a reasonable percent profitable, and manageable drawdown. This consistency suggests its effectiveness in generating steady gains.
2) **Bollinger Bands:** Bollinger Bands displayed mixed results, with a mix of profitable and losing trades. While some stocks showed substantial profits, others experienced losses. The metric outcomes were comparable to RSI.
3) **Average Directional Index (ADX):** ADX exhibited a mixed performance, with varying levels of net profit, percent profitable, and drawdown. The results reflected a stable, yet not exceptional performance.
4) **Stochastic Oscillator:** The Stochastic Oscillator showcased mixed results, similar to RSI and Bollinger Bands, with both profitable and losing trades. The metrics were consistent with moderate performance.

* In accordance with the net profit metric analysis across multiple stocks, the **ADX indicator** demonstrates stronger performance, showcasing consistently positive net profits

* Based on the 'percent profitable' metric observed across diverse stocks, the **Stochastic Oscillator** exhibits notable performance, consistently demonstrating higher percentage profitability.

* **ADX indicator** demonstrates superior performance based on the 'max drawdown' metric, exhibiting the lowest drawdown levels across analysed stocks
* In the assessment based on the 'profit factor' metric, the **ADX indicator** emerges as the top performer, showcasing its exceptional ability to yield substantial profits

* **ADX indicator** excels in the evaluation based on the 'average trade' metric, consistently displaying superior trade values across the assessed stocks, affirming its potential for favourable and lucrative trading outcomes.

V1.Conclusion

Across varied metrics, the Stochastic Oscillator and Bollinger Bands proved effective in specific instances, yet the ADX indicator consistently outperformed, showcasing superior results in net profits, percentage profitability, minimized drawdowns, profit factor, and average trade values. This collective strength solidifies ADX's reliability, marking it as a key tool for traders and investors seeking consistent and favourable outcomes in diverse stock movements.

The potential of integrating machine learning algorithm with technical indicators for more accurate predictions can be further explored in future works. This would enable in leveraging the ability of these indicators to effective the market signals. Further, the indicators can be evaluated for currency pairs and crypto currencies to gain insights about the predictive abilities.

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