A Study on Technical Indicators for Prediction of Select Indices Listed on NSE

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ABSTRACT
"A Study on technical indicator for prediction of selected indices listed on NSE". This study attempts to apply technical analysis on all the sectors listed in NSE from April 2016 to March 2021. The study is based purely on secondary data. The most preferred technical tools such as Simple Moving Average, Exponential moving average, Moving Average Convergence and Divergence, Rate of Change, Williams % R, Bollinger Bands, Relative Strength Index, Stochastic Oscillator, Directional Movement Index and Commodity Channel Index were used to take a decision on investment and Market Efficiency as well as to know the Sensitivity, Reliability, Correlation of each Technical indicators used in the study. This research on Technical analysis is more useful for the people who wants to buy or invest in sectors which is more efficient in the future market, and to whether investment decision can rely only on technical analysis.

Key words: Technical analysis, Sectoral analysis

1. INTRODUCTION

Normally, investors classify the most promising sectors and analyze the output of companies within those sectors to assess which individual stocks can offer better returns and buy those stocks. The definition of sectoral efficiency is critical in understanding how capital markets function. Market efficiency is a concept that describes the relationship between knowledge and share prices. Investor's investment strategies are influenced by Market Efficiency since there are no undervalued or overvalued stocks in an efficient market. This means that the stocks will not provide higher returns than anticipated at a given risk. If, on the other hand, the market is inefficient, excess returns can be earned by choosing the right stocks. A method of technical analysis is used for sector evaluation that involves analyzing statistics provided by market behaviour, such as past prices and volume. It is the practice of studying prior price fluctuations and searching for trends and relationships in price history to predict changes in the prices of a financial instrument or market as a whole. It is the art of determining the patterns, momentum, and general sentiment underlying a sector's price action in order to make an investment decision before the sector becomes overvalued or undervalued. Technical research does not guarantee that investment forecasts will succeed 100 percent of the time. The technical approach to investing is a critical reflection of developments in price movements, which are influenced by market participants' shifting attitudes toward various technological, industrial, fiscal, political, and psychological influences.
The field of technical analysis is based on three assumptions

1. The market discounts everything
2. Price moves in trends
3. History tends to repeat itself

II RESEARCH METHODOLOGY

2.1 Objective of the Study

- The main aim of the study is to examine the sectoral indices listed in NSE India.
- To analyse the market efficiency.
- To find out the Buy signal to invest in best sectors.
- To identify the high probability indicator.
- To find the sensitivity, reliability and correlation of the selected indicators in the study.

2.2 Scope of the Study

The above study mostly keep eye on investment decisions by analyzing movement of various sectoral indices using Technical tools. It is the study which is based on sixteen indices technical analysis of Nifty indices.

2.3 Need of the Study

- Investor can make a clever decision by identifying the market efficiency and to know which sector is performed well in past and present and to predict future performance using technical analysis to invest in the best sector in future.
- Technical Analysis helps us to know the best time to invest.
- It is the platform were an increasing number of investors and trader with different aspects, so technical analysis is used to reduce a risk of an investor.
- To know the high probability technical indicator.

2.4 Research Design

This is an analytical study based on secondary data obtained from NSE India. The research focuses on the use of best indicator to predict the direction of price movement. For the analysis, non-probability sampling was used and the chosen sample was for the convenience of the investor.

2.5 Data Collection

Data is taken or the period of five years from 1st April 2016 to 31st March 2021. Data was collected for the last 5 years given on the website through the historical prices of the Sectoral indices.

Sectors used for analysis

Sl. no	SECTOR
1	Nifty Auto
2	Nifty Bank
3	Nifty Commodities
4	Nifty Energy
5	Nifty Financial Service
6	Nifty FMCG
7	Nifty India Consumption
8	Nifty Infrastructure
9	Nifty IT
10	Nifty Metal
11	Nifty Media
12	Nifty MNC
13	Nifty Pharma
14	Nifty PSU Banks
15	Nifty Realty
16	Nifty Service Sector

Technical indicators used for analysis

Sl.No	INDICATORS
1	Simple Moving Average (SMA)
2	Exponential Moving Average (EMA)
3	Moving Average Convergence and Divergence (MACD)
4	Rate of Change (ROC)
5	Williams % R (W%R)
6	Bollinger Band (BB)
7	Relative Strength Index (RSI)
8	Stochastic Oscillator (SO)
9	Directional Movement Index (DMI)
10	Commodity Channel Index (CCI)

III DATA ANALYSIS AND INTERPRETATION

In this study, the following sectors such as Nifty Auto, Nifty Bank, Nifty Commodities, Nifty Energy, Nifty Financial Service, Nifty FMCG, Nifty India Consumption, Nifty IT, Nifty Infrastructure, Nifty Media, Nifty MNC, Nifty Metal, Nifty Pharma, Nifty PSU Bank, Nifty Realty and Nifty Service Sector from 01/04/2016 to 31/03/2021. The efficiency test is runs to identify the normal distribution in the returns of NSE sectoral indices. Out of 16 indices 11 indices does not follow normal distribution. The various technical indicators were used to analyse to generate the buy/sell signal to know the right time to invest in the sectors.

All the technical indicators were back tested to identify the reliability, sensitivity and correlation among them. Here sensitivity is considered as total number of signals generated by the indicator and reliability is considered as success percentage of signals given by the indicators. And the correlation is used to identify the relationship between sensitivity and reliability.

TABLE-1

TABLE SHOWING RUNS TEST OF ALL THE SECTORS

SECTOR	Z - SCORE	SIG
Auto	**-2.187**	**.029**
Bank	-1.433	.152
Commodities	**-2.230**	**.026**
Energy	**-2.327**	**.020**
FinancialService	-1.537	.124
FMCG	1.096	.273
IndiaConsumption	-1.365	.172
Infrastructure	-.964	.335
IT	1.315	.188
Metal	-.999	.318
Media	-1.022	.307
MNC	-1.275	.202
Pharma	**-1.991**	**.046**
PSUbanks	.606	.545
Realty	**-2.618**	**.009**
ServiceSector	-1.365	.172

INTERPRETATON

The results of Runs Test by considering mean value as the base for NSE Sectoral Indices. From the above Table, it is clearly understood that out of 16 Indices, only Five Indices in the NSE Sectoral Indices, namely, Nifty Auto, Nifty commodities, Nifty Pharma, Nifty Realty, Nifty Energy, respectively followed the normal distribution. The high Z values are Nifty Realty (-2.618), Nifty Energy (-2.327), Nifty Commodities (-2.230), Nifty Auto (-2.187) and Nifty Pharma (-1.991). It is to be noted that the Z values of these Indices were significant under normal distribution at 5% level. The remaining 11 Indices earned low Z value and those indices are Nifty Bank, Nifty Metal, Nifty PSU banks, Nifty Financial Service, Nifty MNC, Nifty Media, Nifty IT, Nifty India consumption, Nifty Service sector, Nifty Infrastructure, and Nifty FMCG. The retails investors should note these facts and keep them in mind before investing their money in these indices.

TABLE-2
TABLE SHOWING SPEARMAN'S rho

Correlations

			SENSITIVITY. RANK	RELIANILITY. RANK
Spearman's rho	SENSITIVITY.RANK	Correlation Coefficient	1.000	-.212
		Sig. (2-tailed)	.	.556
		N	10	10
	RELIANILITY.RANK	Correlation Coefficient	-.212	1.000
		Sig. (2-tailed)	.556	.
		N	10	10

INTERPRETATION

From the above table we an clearly understand that the spearman's rho is negative. So, there is a negative coefficient of rank correlation between sensitivity and reliability. It is important to have both sensitivity and reliability in order acquire adequate profit.

TABLE SHOWING OVERALL RELIABILITY OF INDICATORS IN ALL THE SECTORS

INDICATORS	SUCCCESS %	RANKING
SMA CROSSOVER	49.5	3
EMA CROSSOVER	49.4	4
MACD	44.4	5
ROC	55.2	2
W-R	40.2	8
BB	70.2	1
RSI	40.7	7
STOCH	38.6	9
ADX	38.5	10
CCI	41.9	6

INTERPRETATION

The above table shows the overall ranking of indicators in all sectors. And it is validated by the total number of signals generated by the indicator and filter only the signals which made profit, that is the close price

on sell signal should be higher than the close price of the buy signal. And the sum of those signals used to find the success percentage.

FINDINGS AND SUGGESTIONS

From the analysis of efficiency test we found that the best sectors to invest is, Nifty Auto, Nifty Commodities, Nifty Energy, Nifty Pharma and Nifty Realty. And the success percentage ranking gives the Bollinger Bands as a high probability indicator with 70.2% of success rate. The Rate of Change indicator gives the maximum number of signals. The strength of the indicator is depending on the market situation. So, the combination of indicators can be used according to the market condition can be back tested to get a maximum profit. Moving average crossover gives only a few signals but the percentage of profit is high. So, the investor should create a strategy and invest or trade automatically and not by emotionally to multiply their investment.

CONCLUSION

The research focuses on technical review of selected National Stock Exchange sectors. In the majority of cases, the buy/sell signals produced by this study using the selected technical indicators reflected the correct timing of buying and selling of scrips. For each sector, a ranking of high likelihood technical indicators was done based on their success ratio. Bollinger Bands with 70%, are also reaching a record measures that are ranked by sector. Hence people who like to invest in sectors should make use of these technical indicators for the right timing to buy and sell in those sectors. which leads to better multiplication of their investments because emerging countries like India is subject to volatility as Indian economy is coupled with other nations and having ripple impact and the change of volumes in F&O data which will lead to volatility on the Indian market.

ANNEXURE -I

TABLE SHOWING SUCCESS PERCENTAGE OF TECHNICAL INDICATORS SECTOR WISE

	SMA CROSSOVER		
SECTOR	BUY SIGNALS	PROFITS	SUCCESS %
Auto	10	4	40.0
Bank	10	7	70.0
Commodities	13	6	46.2
Energy	12	6	50.0
FinancialService	10	8	80.0
FMCG	10	8	80.0
IndiaConsumption	11	6	54.5
Infrastructure	14	5	35.7
IT	16	5	31.3
Metal	14	5	35.7
Media	11	5	45.5
MNC	12	4	33.3
Pharma	14	4	28.6
PSUbanks	14	3	21.4
Realty	14	7	50.0
ServiceSector	10	9	90.0
	12.1875	**ACCURACY**	**49.5**

	EMA CROSSOVER		
SECTOR	BUY SIGNALS	PROFITS	SUCCESS %
Auto	10	4	40.0
Bank	11	8	72.7
Commodities	13	6	46.2
Energy	12	6	50.0
FinancialService	10	8	80.0
FMCG	10	8	80.0
IndiaConsumption	12	6	50.0
Infrastructure	14	5	35.7
IT	16	5	31.3
Metal	14	5	35.7
Media	11	5	45.5
MNC	12	4	33.3
Pharma	14	4	28.6
PSUbanks	14	3	21.4
Realty	14	7	50.0
ServiceSector	10	9	90.0
	12.3125	**ACCURACY**	**49.4**

	MACD		
SECTOR	BUY SIGNALS	PROFITS	SUCCESS %
Auto	44	20	45.5
Bank	48	21	43.8
Commodities	45	24	53.3
Energy	45	19	42.2
FinancialService	49	22	44.9
FMCG	49	22	44.9
IndiaConsumption	48	21	43.8
Infrastructure	48	23	47.9
IT	47	29	61.7
Metal	43	14	32.6
Media	50	19	38.0
MNC	52	22	42.3
Pharma	50	16	32.0
PSUbanks	48	24	50.0
Realty	46	23	50.0
ServiceSector	54	20	37.0
	47.875	**ACCURACY**	**44.4**

	ROC		
SECTOR	BUY SIGNALS	PROFITS	SUCCESS %
Auto	97	69	71.1
Bank	101	74	73.3
Commodities	99	58	58.6
Energy	103	52	50.5
FinancialService	101	48	47.5
FMCG	101	48	47.5
IndiaConsumption	91	44	48.4
Infrastructure	90	51	56.7
IT	106	99	93.4
Metal	95	42	44.2
Media	128	62	48.4
MNC	86	44	51.2
Pharma	81	32	39.5
PSUbanks	104	47	45.2
Realty	123	63	51.2
ServiceSector	84	47	56.0
	99.375	**ACCURACY**	**55.2**

	WILLIAMS % R		
SECTOR	BUY SIGNALS	PROFITS	SUCCESS %
Auto	77	22	28.6
Bank	78	35	44.9
Commodities	73	32	43.8
Energy	77	31	40.3
FinancialService	70	34	48.6
FMCG	70	34	48.6
IndiaConsumption	68	30	44.1
Infrastructure	80	31	38.8
IT	72	33	45.8
Metal	82	31	37.8
Media	80	30	37.5
MNC	70	31	44.3
Pharma	90	33	36.7
PSUbanks	107	29	27.1
Realty	73	24	32.9
ServiceSector	68	30	44.1
	77.1875	**ACCURACY**	**40.2**

	BOLLINGER BAND		
SECTOR	BUY SIGNALS	PROFITS	SUCCESS %
Auto	70	48	68.6
Bank	68	48	70.6
Commodities	70	48	68.6
Energy	70	54	77.1
FinancialService	76	59	77.6
FMCG	76	59	77.6
IndiaConsumption	67	54	80.6
Infrastructure	73	49	67.1
IT	71	50	70.4
Metal	96	40	41.7
Media	71	49	69.0
MNC	69	52	75.4
Pharma	82	59	72.0
PSUbanks	96	47	49.0
Realty	68	49	72.1
ServiceSector	77	66	85.7
	75	**ACCURACY**	**70.2**

	RSI		
SECTOR	BUY SIGNALS	PROFITS	SUCCESS %
Auto	32	13	40.6
Bank	24	12	50.0
Commodities	35	17	48.6
Energy	21	12	57.1
FinancialService	26	11	42.3
FMCG	26	11	42.3
IndiaConsumption	29	12	41.4
Infrastructure	34	13	38.2
IT	31	14	45.2
Metal	37	11	29.7
Media	35	12	34.3
MNC	29	10	34.5
Pharma	37	14	37.8
PSUbanks	56	14	25.0
Realty	29	13	44.8
ServiceSector	23	9	39.1
	31.5	**ACCURACY**	**40.7**

	STOCH		
SECTOR	BUY SIGNALS	PROFITS	SUCCESS %
Auto	26	11	42.3
Bank	63	29	46.0
Commodities	70	32	45.7
Energy	71	29	40.8
FinancialService	65	29	44.6
FMCG	65	29	44.6
IndiaConsumption	65	30	46.2
Infrastructure	76	25	32.9
IT	71	25	35.2
Metal	72	32	44.4
Media	73	31	42.5
MNC	71	29	40.8
Pharma	83	32	38.6
PSUbanks	98	28	28.6
Realty	68	23	33.8
ServiceSector	62	26	41.9
	68.6875	**ACCURACY**	**40.6**

	ADX-DMI		
SECTOR	BUY SIGNALS	PROFITS	SUCCESS %
Auto	71	37	52.1
Bank	71	32	45.1
Commodities	78	27	34.6
Energy	75	32	42.7
FinancialService	101	33	32.7
FMCG	101	33	32.7
IndiaConsumption	68	29	42.6
Infrastructure	74	27	36.5
IT	72	28	38.9
Metal	80	26	32.5
Media	77	30	39.0
MNC	78	36	46.2
Pharma	87	25	28.7
PSUbanks	65	24	36.9
Realty	77	25	32.5
ServiceSector	86	37	43.0
	78.8125	**ACCURACY**	**38.5**

TABLE SHOWING THE OVERALL SUCCESS RANKING OF ALL INDICATORS

INDICATORS	SUCCCESS %	RANKING
SMA CROSSOVER	49.5	3
EMA CROSSOVER	49.4	4
MACD	44.4	5
ROC	55.2	2
W-R	40.2	9
BB	70.2	1
RSI	40.7	7
STOCH	40.6	8
DMI	38.5	10
CCI	41.9	6

TABLE SHOWING THE OVERALL SENSITIVITY RANKING

INDICATORS	SENCITIVITY	RANKING
SMA	12	10
EMA	12	9
MACD	48	8
ROC	99	1
WILLIAMS R	77	3
BOLLINGER BAND	75	4
RSI	32	6
STOCH	69	5
DMI	79	2
CCI	48	7

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