

Making Money with Heiken-Ashi Charts and Stochastics RSI

An In-Depth Analysis on Nifty 50 Instrument

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Abstract - *To trade effectively and profitably, we must understand the trend in the market. While a plethora of popular technical analysis indicators attempt to provide a greater understanding of the trend in the market, they are limited in signaling both trend generation and momentum. Based on the Japanese Heiken Ashi (HA) candles we develop the Heiken Ashi stochastic RSI, which can reflect in a single number both the likelihood of trend generation and momentum in the market. We back tested the strategy using HA and Stochastic RSI for NIFTY'S Index for one major time frame in the market. We find if the strategy gives consistent profits for traders in the markets. The study contributes to economic literature as well as to practical trading scenarios by the development of a trading strategy using Heiken-Ashi charts as a charting technique combined with Stochastic RSI as an indicator, which gives the trend generation and momentum in the market.*

Key Words: Technical Analysis, Back Testing, Heiken Ashi, Stochastic RSI, Trading.

1. INTRODUCTION

Charts are like the canvas that displays the story of the price action. The most popular charts among traders are candlestick and bar charts. Both types of charts display the price history of the underlying stock based on user selected time frames that can range from 1-minute to monthly.

Indicators are derived from price and volume data and can be used to gain further insights into key price levels. Selecting the right indicators help to identify support and resistance price levels, trends and potential future price targets. Moving Averages are commonly used to quantify areas of support and resistance. These are dynamic indicators that update their values throughout the day. Momentum indicators like MACD, Stochastic and RSI measure the overbought and oversold status of the current and historic price movement. Combining various indicators can help to generate a cumulative effect that provides trading signals when they converge.

2. REVIEW OF LITERATURE

- Candle Terminology and Market Emotion as depicted by Steve Nison in his book "Japanese Candlestick Charting Technique" "Technical Analysis is the only way to measure the emotional component of the market. We know that many times can be worth a pound of facts. How else can the sudden shift in market can be explained? A fascinating attribute to candlestick is that the name of the candle patterns is a colorful mechanism describing the emotional health of the market at the time these patterns are formed." This description shows the advantages of using technical analysis and candle stick charts to trade in the market.
- "Technical Analysis of Stock Trends" by Robert D Edwards, John Magee, W.H.C Bassetti. "Major Bull and Bear Markets have recurred in fairly regular patterns throughout all recorded economic history, and there is no reason to suppose that they will not continue to recur for as long as our present system exists. It is well to keep in mind that caution is in order whenever stock prices are at historically high levels and that purchases will usually work out well eventually when they are at historically low levels. If you make known your interest in your charts, you will be told that the chart analyst (like the Dow theorist) is always late—that he buys after prices have already started up, maybe not until long after the "smart money" has completed its accumulation, and that he sells after the trend has unmistakably turned down. Partly true, as you have no doubt already discovered for yourself mistakenly turned down. Partly true, as you have no doubt already discovered for yourself. But the secret of success lies not in buying at the very lowest possible price and selling at the absolute top. It is in the avoidance of large losses. (Small losses you will have to take, and as quickly as possible as warranted by the situation.)" Accordingly, no strategy can always predict the future but the important thing is to have a strategy that can reduce the losses and maximize the profits as getting a wrong indication sometimes and loss occurring because of it is inevitable. This study focuses on that.
- 'Handbook of Technical Analysis' by Mark Andrew Lim "Technical analysis is often criticized for the use of past information as a basis for forecasting future price action, relying on the notion that certain price behaviors tend to

repeat. Unfortunately, virtually all forms of forecasting are based on the use of prior or past information, which certainly includes statistical-, fundamental-, and behavior-based forecasting. Companies employ accounting data from the most recent and even past quarters as a basis for gauging the current value of a stock. In statistics, regression-line analysis requires the sampling of past data in order to predict probable future values. Even in behavioral finance, the quantitative measure of the market participant's past actions forms the basis for predicting future behavior".

- John Murphy, Technical Analysis of the Financial Markets "Market price tends to lead the known fundamentals. Market price acts as a leading indicator of the fundamentals." This definition by Murphy highlights a very important assumption in technical analysis, which is that price is a reflection of all known information acted upon in the markets. It is the sum of all market participants' trading and investment actions and decisions, including current and future expectations of market action. It also reflects the overall psychology, biases, and beliefs of all market participants. Therefore, the technical analysts believe that the charts tell the whole story and that everything that can or is expected to impact price has already been discounted. This assumption forms the very basis of technical analysis, and without it, technical analysis would be rendered completely pointless.

3. Heiken-Ashi as a Charting Technique:

Heiken-Ashi is a charting technique that had originated in Japan. It is quite similar to Candlestick Charts. The term Heiken-Ashi means average bar in Japanese. Heiken-Ashi charts are simply a derivative of the work of Homma in 1700's Japan when he developed what we know today as Candlestick charting.

Normal candlestick charts are composed of a series of open-high-low-close (OHLC) bars set apart by a time series.

The Heiken-Ashi technique uses a modified formula in order to calculate the candles OHLC:

- $xClose = (Open + High + Low + Close)/4$ - The average price of the current bar.
- $xOpen = [xOpen (Previous Bar) + xClose (Previous Bar)]/2$ - Midpoint of the previous bar.
- $xHigh = \text{Max} (High, xOpen, xClose)$ - Highest value in the set.
- $xLow = \text{Min} (Low, xOpen, xClose)$ - Lowest value in the set.

As a result, the last price we see on a regular candlestick chart is different from the Heiken Ashi chart. Thus, the main difference between traditional candlestick charts and Heiken Ashi (HA) charts is that HA charts the average price moves, creating a smoother chart.

4. STOCHASTIC RSI:

The Stochastic RSI indicator (Stoch RSI) is essentially an indicator of an indicator. It is used in technical analysis to provide a stochastic calculation to the RSI indicator. This means that it is a measure of RSI relative to its own high/low range over a user defined period of time. It calculates the RSI relative to its range in order to increase the sensitivity of the standard RSI. The values of the Stochastic RSI are from zero to one.

The Stochastic RSI can be interpreted several ways. Overbought/oversold conditions are indicated when the StochRSI crosses above .20 / below .80. A buy signal is generated when the StochRSI moves from oversold to above the midpoint (.50). A sell signal is generated when the StochRSI moves from overbought to below the midpoint. Also look for divergence with the price to indicate the end of a trend. The Stochastic RSI was developed by Tushar S. Chande and Stanley Kroll and is described in their 1994 book, The New Technical Trader.

Stochastic RSI measures the value of RSI in relation to its High and Low range over the required period: when a regular RSI reaches a new Low for the period, Stochastic RSI will be at 0. When RSI records a new high for the period, Stochastic RSI will be at 100.

4.1 Stochastic RSI Formula:

Stochastic RSI = $((\text{Today's RSI} - \text{Lowest RSI Low in \%K Periods}) / (\text{Highest RSI High in \%K Periods} - \text{Lowest RSI Low in \%K Periods})) * 100$

5. KEY STRATEGY

The following conditions were taken into consideration while opening and closing trades:

- BUY when candle is green. Thus, taking a long position when the candle is green. Also, along with it in Stochastic RSI, either %K or %D falls below a specific level (i.e. here 25) and then rises above that level. And the %K line rises above %D line we buy and take a long position.
- When the candle is red. And the Stochastic RSI, oscillator rises above a specific level (here:75) and the %D line is above the %K line. In such a situation we SELL and can take a short position.

When the conditions of both the chart and the Indicator is fulfilled only then we take a trading position.

Table -1: Results of Using Heikin-Ashi and Stochastic RSI for Technical Analysis

SR NO	Order Type	Date	Entry Price	Exit Price	Points	P/L %	Profit per Lot	Cumulative Profits
309					22,803.26			951615093
1	Long	02-02-2000	1575.58	1721.5	145.92	9.26%	10944	110944
2	Short	15-02-2000	1721.5	1718.53	2.97	0.17%	223	111167
3	Long	07-04-2000	1505.45	1549.31	43.86	2.91%	3289	114456
4	Short	13-04-2000	1549.31	1350.4	198.91	12.84%	14918	129374
5	Short	10-05-2000	1373.64	1247.54	126.10	9.18%	9458	138832
6	Long	25-05-2000	1247.54	1430.6	183.06	14.67%	13730	152562
7	Short	13-06-2000	1430.6	1485.2	-54.60	-3.82%	-4095	148467
8	Long	29-06-2000	1485.2	1513.43	28.23	1.90%	2117	150584
9	Short	14-07-2000	1518.05	1329.28	188.77	12.44%	14158	164742
10	Short	28-08-2000	1375.29	1288.78	86.51	6.29%	6488	171230
11	Long	04-10-2000	1288.78	1167.68	-121.10	-9.40%	-9082	162148
12	Short	10-11-2000	1254.95	1239.53	15.42	1.23%	1157	163305
13	Long	27-11-2000	1239.53	1329.81	90.28	7.28%	6771	170076
14	Short	15-12-2000	1329.81	1240.31	89.50	6.73%	6713	176789
15	Long	28-12-2000	1240.31	1302.15	61.84	4.99%	4638	181427
16	Short	10-01-2001	1302.15	1325.89	-23.74	-1.82%	-1781	179646
17	Long	15-03-2001	1199.79	1132.16	-67.63	-5.64%	-5072	174574
18	Short	02-04-2001	1132.16	1055.61	76.55	6.76%	5741	180315
19	Long	17-04-2001	1055.61	1116.68	61.07	5.79%	4580	184895
20	Short	27-04-2001	1116.68	1120.1	-3.42	-0.31%	-256	184639
21	Long	08-06-2001	1120.1	1082.66	-37.44	-3.34%	-2808	181831
22	Short	03-07-2001	1082.66	1078.16	4.50	0.42%	338	182169

23	Long	11-07-2001	1078.16	1101.3	23.14	2.15%	1735	183904
24	Short	17-07-2001	1101.3	1066.06	35.24	3.20%	2643	186547
25	Long	31-07-2001	1066.06	1068.19	2.13	0.20%	160	186707
26	Short	20-08-2001	1063.8	902.71	161.09	15.14%	12082	198789
27	Short	29-10-2001	982.81	1047.29	-64.48	-6.56%	-4836	193953
28	Long	31-12-2001	1047.29	1098.99	51.70	4.94%	3878	197831
29	Short	10-01-2002	1098.99	1073.18	25.81	2.35%	1936	199767
30	Long	31-01-2002	1073.18	1149.38	76.20	7.10%	5715	205482
31	Short	20-02-2002	1149.38	1180.79	-31.41	-2.73%	-2356	203126
32	Long	05-03-2002	1180.79	1124.93	-55.86	-4.73%	-4189	198937
33	Short	16-04-2002	1124.39	1109.85	14.54	1.29%	2181	201118
34	Long	24-04-2002	1109.85	1118.15	8.30	0.75%	1245	202363
35	Short	13-05-2002	1118.15	1063.83	54.32	4.86%	8148	210511
36	Long	27-05-2002	1063.83	1083.63	19.80	1.86%	2970	213481
37	Short	14-06-2002	1083.63	1056.38	27.25	2.51%	4088	217569
38	Long	28-06-2002	1056.38	1063.45	7.07	0.67%	1060	218629
39	Short	11-07-2002	1063.45	959.64	103.81	9.76%	15572	234201
40	Long	05-08-2002	959.64	985.56	25.92	2.70%	3888	238089
41	Short	28-08-2002	985.56	971.13	14.43	1.46%	2164	240253
42	Long	26-09-2002	971.13	970.24	-0.89	-0.09%	-133	240120
43	Short	21-10-2002	970.24	938.54	31.70	3.27%	4755	244875
44	Long	30-10-2002	938.54	955.56	17.02	1.81%	2553	247428
45	Long	13-11-2002	961.41	1045.5	84.09	8.75%	12614	260042
46	Long	13-12-2002	1080.61	1076.47	-4.14	-0.38%	-621	259421
47	Long	24-12-2002	1080.15	1083.75	3.60	0.33%	540	259961
48	Long	09-01-2003	1093.5	1075.69	-17.81	-1.63%	-2671	257290
49	Long	16-01-2003	1087.17	1077.2	-9.97	-0.92%	-1496	255794
50	Long	03-02-2003	1047.16	1063.45	16.29	1.56%	2443	258237
51	Short	25-02-2003	1063.45	1000.4	63.05	5.93%	9458	267695
52	Long	19-03-2003	1000.4	1010.79	10.39	1.04%	1559	269254
53	Short	09-04-2003	1010.79	932.18	78.61	7.78%	11792	281046
54	Long	29-04-2003	932.18	939.22	7.04	0.76%	1056	282102
55	Short	09-05-2003	939.22	948.24	-9.02	-0.96%	-1353	280749
56	Long	14-05-2003	948.24	965.91	17.67	1.86%	2650	283399

57	Long	27-05-2003	980.86	1041.34	60.48	6.17%	9072	292471
58	Long	17-06-2003	1067.44	1086.58	19.14	1.79%	2871	295342
59	Short	16-07-2003	1161.63	1130.58	31.05	2.67%	6986	302328
60	Long	24-07-2003	1130.58	1290.36	159.78	14.13%	35951	338279
61	Short	04-09-2003	1367.5	1348.36	19.14	1.40%	4307	342586
62	Long	24-09-2003	1348.36	1526.33	177.97	13.20%	40043	382629
62	Short	15-10-2003	1526.33	1537.07	-10.74	-0.70%	-2417	380212
63	Long	31-10-2003	1537.07	1592.45	55.38	3.60%	12461	392673
64	Short	10-11-2003	1592.45	1543.95	48.50	3.05%	14550	407223
65	Long	24-11-2003	1543.95	1644.32	100.37	6.50%	30111	437334
66	Short	08-12-2003	1644.32	1877.14	-232.82	-14.16%	-69846	367488
67	Long	27-01-2004	1877.14	1787.48	-89.66	-4.78%	-26898	340590
68	Long	06-02-2004	1818.48	1886.61	68.13	3.75%	20439	361029
69	Short	19-02-2004	1886.61	1825.71	60.90	3.23%	18270	379299
70	Long	01-03-2004	1825.71	1850.3	24.59	1.35%	7377	386676
71	Short	12-04-2004	1850.3	1800.45	49.85	2.69%	14955	401631
72	Long	05-05-2004	1800.45	1732.44	-68.01	-3.78%	-20403	381228
73	Long	19-05-2004	1540	1488.98	-51.02	-3.31%	-15306	365922
74	Long	07-06-2004	1535.81	1526.4	-9.41	-0.61%	-2823	363099
75	Short	11-06-2004	1526.4	1478.39	48.01	3.15%	14403	377502
76	Long	25-06-2004	1478.39	1544.11	65.72	4.45%	19716	397218
77	Short	08-07-2004	1544.11	1613.56	-69.45	-4.50%	-20835	376383
78	Long	17-08-2004	1613.56	1738.95	125.39	7.77%	37617	414000
79	Short	23-09-2004	1738.95	1737.55	1.40	0.08%	420	414420
80	Long	30-09-2004	1737.55	1882.95	145.40	8.37%	43620	458040
81	Short	19-11-2004	1882.95	1944.41	-61.46	-3.26%	-18438	439602
82	Long	27-01-2005	1944.41	2054.69	110.28	5.67%	33084	472686
83	Short	16-02-2005	2080.41	2058.08	22.33	1.07%	6699	479385
84	Long	23-02-2005	2058.08	2151.3	93.22	4.53%	34958	514343
85	Short	14-03-2005	2151.3	2017.06	134.24	6.24%	50340	564683
86	Long	31-03-2005	2017.06	2018.95	1.89	0.09%	709	565392
87	Short	11-04-2005	2018.95	1960.23	58.72	2.91%	22020	587412
88	Long	22-04-2005	1960.23	1982.25	22.02	1.12%	8257	595669
89	Long	23-05-2005	2004.26	2077.13	72.87	3.64%	27326	622995

90	Short	28-06-2005	2185.59	2216.2	-30.61	-1.40%	-11479	611516
91	Long	12-07-2005	2216.2	2195.16	-21.04	-0.95%	-7890	603626
92	Long	18-07-2005	2227.15	2348.34	121.19	5.44%	45446	649072
93	Short	08-08-2005	2348.34	2354.98	-6.64	-0.28%	-2490	646582
94	Long	26-08-2005	2354.98	2522.65	167.67	7.12%	62876	709458
95	Long	27-09-2005	2568.93	2589.29	20.36	0.79%	7635	717093
96	Short	22-11-2005	2589.29	2696.69	-107.40	-4.15%	-40275	676818
97	Long	08-12-2005	2696.69	2824.31	127.62	4.73%	47858	724676
98	Short	23-12-2005	2824.31	2809.21	15.10	0.53%	5662	730338
99	Long	29-12-2005	2809.21	2889.9	80.69	2.87%	30259	760597
100	Short	10-01-2006	2889.9	2842.25	47.65	1.65%	17869	778466
101	Long	19-01-2006	2842.25	2953.61	111.36	3.92%	41760	820226
102	Short	15-02-2006	3016.92	3043.65	-26.73	-0.89%	-10024	810202
103	Long	22-02-2006	3043.65	3148.89	105.24	3.46%	39465	849667
104	Short	10-04-2006	3462.22	3474.51	-12.29	-0.35%	-4609	845058
105	Long	18-04-2006	3474.51	3673.05	198.54	5.71%	74453	919511
106	Short	12-05-2006	3673.05	3210.74	462.31	12.59%	173366	1092877
107	Long	26-05-2006	3210.74	2957.36	-253.38	-7.89%	-95017	997860
108	Long	29-06-2006	2969.14	3120.8	151.66	5.11%	56873	1054733
109	Short	07-07-2006	3120.8	3016.02	104.78	3.36%	39293	1094026
110	Long	25-07-2006	3016.02	3162.27	146.25	4.85%	54844	1148870
111	Short	07-09-2006	3462.34	3466.2	-3.86	-0.11%	-1447	1147423
112	Long	14-09-2006	3466.2	3543.75	77.55	2.24%	29081	1176504
113	Short	04-10-2006	3543.75	3565.75	-22.00	-0.62%	-8250	1168254
114	Long	09-10-2006	3656.75	3692.73	35.98	0.98%	13493	1181747
115	Short	19-10-2006	3692.73	3806.83	-114.10	-3.09%	-42788	1138959
116	Long	14-12-2006	3806.83	3988.66	181.83	4.78%	68186	1207145
117	Short	05-01-2007	3988.66	4000.17	-11.51	-0.29%	-4316	1202829
118	Short	09-02-2007	4205.47	4098.88	106.59	2.53%	39971	1242800
119	Long	15-02-2007	4098.88	3992.15	-106.73	-2.60%	-40024	1202776
120	Long	08-03-2007	3698.8	3790.78	91.98	2.49%	34493	1237269
121	Short	28-03-2007	3790.78	3858.03	-67.25	-1.77%	-25219	1212050
122	Long	14-05-2007	4109.21	4222.75	113.54	2.76%	42578	1254628
123	Long	15-06-2007	4180.25	4386.78	206.53	4.94%	77449	1332077

124	Long	08-08-2007	4412	4495.73	83.73	1.90%	31399	1363476
125	Short	08-10-2007	5136.35	5331.09	-194.74	-3.79%	-73027	1290449
126	Long	23-10-2007	5331.09	6049.38	718.29	13.47%	269359	1559808
1271	Short	14-12-2007	6049.38	5882.19	167.19	2.76%	62696	1622504
128	Long	24-12-2007	5882.19	6231.24	349.05	5.93%	130894	1753398
129	Short	10-01-2008	6231.24	5213.17	1,018.07	16.34%	381776	2135174
130	Long	25-01-2008	5213.17	5228.56	15.39	0.30%	5771	2140945
131	Short	07-02-2008	5228.56	5077.89	150.67	2.88%	56501	2197446
132	Short	20-02-2008	5201.26	4903.93	297.33	5.72%	111499	2308945
133	Long	25-03-2008	4751.97	4831.88	79.91	1.68%	29966	2338911
134	Short	31-03-2008	4831.88	5061.07	-229.19	-4.74%	-85946	2252965
135	Long	15-05-2008	5061.07	4993.21	-67.86	-1.34%	-25447	2227518
136	Long	13-06-2008	4527.83	4429.34	-98.49	-2.18%	-36934	2190584
137	Short	20-06-2008	4429.34	4280.8	148.54	3.35%	55703	2246287
138	Long	07-07-2008	4037.13	4052.38	15.25	0.38%	5719	2252006
139	Short	28-07-2008	4312.31	4405.13	-92.82	-2.15%	-34807	2217199
140	Short	13-08-2008	4536.75	4342.51	194.24	4.28%	72840	2290039
141	Long	25-08-2008	4342.51	4429.4	86.89	2.00%	32584	2322623
142	Short	10-09-2008	4429.4	4147.37	282.03	6.37%	105761	2428384
143	Long	19-09-2008	4147.37	3705.53	-441.84	-10.65%	-165690	2262694
144	Long	31-10-2008	2799.89	2939.79	139.90	5.00%	52463	2315157
145	Short	06-11-2008	2939.79	2693.31	246.48	8.38%	92430	2407587
146	Long	24-11-2008	2693.31	3001.24	307.93	11.43%	115474	2523061
147	Short	23-12-2008	3001.24	2820.75	180.49	6.01%	67684	2590745
148	Long	19-01-2009	2820.75	2785.5	-35.25	-1.25%	-13219	2577526
149	Short	03-02-2009	2785.5	2754.69	30.81	1.11%	11554	2589080
150	Long	25-02-2009	2754.69	3005.84	251.15	9.12%	94181	2683261
151	Short	31-03-2009	3005.84	3245.8	-239.96	-7.98%	-89985	2593276
152	Short	17-04-2009	3400.75	3568.98	-168.23	-4.95%	-63086	2530190
153	Long	25-06-2009	4273.7	4518.49	244.79	5.73%	91796	2621986
154	Short	29-07-2009	4518.49	4534.06	-15.57	-0.34%	-5839	2616147
155	Long	13-08-2009	4534.06	4656.03	121.97	2.69%	45739	2661886
156	Short	01-09-2009	4656.03	4803.24	-147.21	-3.16%	-55204	2606682
157	Short	24-09-2009	4979.11	4945.45	33.66	0.68%	12622	2619304

158	Long	12-10-2009	4945.45	5012.53	67.08	1.36%	25155	2644459
159	Short	19-11-2009	5012.53	5068.82	-56.29	-1.12%	-21109	2623350
160	Long	23-12-2009	5068.82	5255.11	186.29	3.68%	69859	2693209
161	Short	08-01-2010	5255.11	4885.75	369.36	7.03%	138510	2831719
162	Long	10-02-2010	4781.29	4856.26	74.97	1.57%	28114	2859833
163	Long	22-04-2010	5267.71	4997.21	-270.50	-5.14%	-101438	2758395
164	Short	02-06-2010	4997.21	5103.97	-106.76	-2.14%	-40035	2718360
165	Long	07-07-2010	5266.1	5427.24	161.14	3.06%	60427	2778787
166	Short	27-07-2010	5427.24	5439.41	-12.17	-0.22%	-4564	2774223
167	Long	03-08-2010	5439.41	5481.59	42.18	0.78%	15818	2790041
168	Short	25-08-2010	5481.59	5439.14	42.45	0.77%	15919	2805960
169	Long	01-09-2010	5439.14	6008.34	569.20	10.46%	213450	3019410
170	Short	30-09-2010	6008.34	6163.84	-155.50	-2.59%	-58313	2961097
171	Long	13-10-2010	6163.84	6239.16	75.32	1.22%	28245	2989342
172	Short	11-11-2010	6239.16	5833.73	405.43	6.50%	152036	3141378
173	Long	30-11-2010	5833.73	5978.07	144.34	2.47%	54128	3195506
174	Short	07-12-2010	5978.07	5709.65	268.42	4.49%	100658	3296164
175	Long	19-01-11	5709.65	5550.02	-159.63	-2.80%	-59861	3236303
176	Long	14-02-2011	5400.07	5478.64	78.57	1.45%	29464	3265767
177	Short	21-02-2011	5478.64	5444.64	34.00	0.62%	12750	3278517
178	Long	23-03-2011	5444.64	5886.65	442.01	8.12%	165754	3444271
179	Short	07-04-2011	5886.65	5886.2	0.45	0.01%	169	3444440
180	Long	21-04-2011	5886.2	5732.79	-153.41	-2.61%	-57529	3386911
181	Long	09-05-2011	5553.69	5514.71	-38.98	-0.70%	-14617	3372294
182	Short	06-06-2011	5514.71	5408.97	105.74	1.92%	39652	3411946
183	Long	24-06-2011	5408.97	5641.03	232.06	4.29%	87022	3498968
184	Short	05-07-2011	5641.03	5605.05	35.98	0.64%	13492	3512460
185	Long	10-08-2011	5169.71	4956.34	-213.37	-4.13%	-80014	3432446
186	Short	12-09-2011	4956.34	4968.97	-12.63	-0.25%	-4736	3427710
187	Long	28-09-2011	4968.97	5038.88	69.91	1.41%	26216	3453926
188	Short	18-10-2011	5038.88	5110.86	-71.98	-1.43%	-26992	3426934
189	Short	01-11-2011	5271.43	4811.52	459.91	8.72%	172466	3599400
190	Long	28-11-2011	4811.52	4987.89	176.37	3.67%	66139	3665539
191	Short	08-12-2011	4987.89	4659.73	328.16	6.58%	123060	3788599

192	Long	21-12-2011	4659.73	4736.13	76.40	1.64%	28650	3817249
193	Short	23-02-2012	5492.89	5405.3	87.59	1.59%	32846	3850095
194	Long	09-03-2012	5315.39	5296.6	-18.79	-0.35%	-7046	3843049
195	Short	20-04-2012	5296.6	5228.3	68.30	1.29%	25613	3868662
196	Long	21-05-2012	4905.14	4960.54	55.40	1.13%	20775	3889437
197	Short	30-05-2012	4960.54	5038.1	-77.56	-1.56%	-29085	3860352
198	Short	09-07-2012	5279.3	5245.86	33.44	0.63%	12540	3872892
199	Long	19-07-2012	5245.86	5313.2	67.34	1.28%	25253	3898145
200	Short	10-08-2012	5313.2	5326.98	-13.78	-0.26%	-5167	3892978
201	Long	07-09-2012	5326.98	5551.86	224.88	4.22%	84330	3977308
202	Short	20-09-2012	5551.86	5594.72	-42.86	-0.77%	-16073	3961235
203	Long	21-11-2012	5594.72	5901.16	306.44	5.48%	114915	4076150
204	Short	12-12-2012	5901.16	5898.95	2.21	0.04%	829	4076979
205	Long	27-12-2012	5898.95	5989.15	90.20	1.53%	33825	4110804
206	Short	08-01-2013	5989.15	6076.67	-87.52	-1.46%	-32820	4077984
207	Short	18-02-2013	6076.67	5942.14	134.53	2.21%	50449	4128433
208	Long	13-02-2013	5942.14	5868.03	-74.11	-1.25%	-27791	4100642
209	Short	13-03-2013	5868.03	5657.03	211.00	3.60%	79125	4179767
210	Long	28-03-2013	5657.03	6039.13	382.10	6.75%	143288	4323055
211	Short	13-05-2013	6039.13	6037	2.13	0.04%	799	4323854
212	Long	27-05-2013	6037	5789.56	-247.44	-4.10%	-92790	4231064
213	Short	03-07-2013	5789.56	5605.08	184.48	3.19%	69180	4300244
214	Long	12-08-2013	5605.08	5834.28	229.20	4.09%	85950	4386194
215	Short	17-09-2013	5834.28	5862.28	-28.00	-0.48%	-10500	4375694
216	Long	03-10-2013	5862.28	6071.91	209.63	3.58%	78611	4454305
217	Short	17-10-2013	6071.91	6057.86	14.05	0.23%	5269	4459574
218	Long	14-11-2013	6057.86	6305.45	247.59	4.09%	92846	4552420
219	Short	11-12-2013	6305.45	6208.75	96.70	1.53%	36262	4588682
220	Long	19-12-2013	6208.75	6273	64.25	1.03%	24094	4612776
221	Short	02-01-2014	6273	6182.25	90.75	1.45%	34031	4646807
222	Long	10-01-2014	6182.25	6279.13	96.88	1.57%	36330	4683137
223	Short	20-01-2014	6279.13	6019.6	259.53	4.13%	97324	4780461
224	Long	06-02-2014	6019.6	6475.65	456.05	7.58%	171019	4951480
225	Short	21-02-2104	7255.4	7389.58	-134.18	-1.85%	-50318	4901162

226	Long	03-06-2014	7389.58	7603.54	213.96	2.90%	80235	4981397
227	Short	13-06-2014	7603.54	7575.16	28.38	0.37%	10643	4992040
228	Long	30-06-2014	7575.16	7708	132.84	1.75%	49815	5041855
229	Short	08-07-2014	7708	7590.28	117.72	1.53%	44145	5086000
230	Long	16-07-2014	7590.28	7760.98	170.70	2.25%	64012	5150012
231	Short	30-07-2014	7760.98	7701.6	59.38	0.77%	22267	5172279
232	Long	12-08-2014	7701.6	8111.88	410.28	5.33%	153855	5326134
233	Short	10-09-2014	8111.88	8031.49	80.39	0.99%	30146	5356280
234	Long	18-09-2014	8031.49	8393.1	361.61	4.50%	135604	5491884
235	Short	20-11-2014	8393.1	8139.35	253.75	3.02%	95156	5587040
236	Long	18-12-2014	8139.35	8222.96	83.61	1.03%	31354	5618394
237	Short	06-01-2015	8222.96	8680.07	-457.11	-5.56%	-171416	5446978
238	Long	11-02-2015	8680.07	8918.51	238.44	2.75%	89415	5536393
239	Short	05-03-2015	8918.51	8710.01	208.50	2.34%	78188	5614581
240	Long	18-03-2015	8710.01	8717.35	7.34	0.08%	2753	5617334
241	Short	16-04-2015	8717.35	8282.11	435.24	4.99%	163215	5780549
242	Long	04-05-2015	8282.11	8403.63	121.52	1.47%	45570	5826119
243	Short	25-05-2015	8403.63	8081.16	322.47	3.84%	120926	5947045
244	Long	10-06-2015	8081.16	8272.64	191.48	2.37%	71805	6018850
245	Short	29-06-2015	8272.64	8457.26	-184.62	-2.23%	-69233	5949617
246	Long	14-07-2015	8457.26	8573.9	116.64	1.38%	43740	5993357
247	Short	21-07-2015	8573.9	8426.5	147.40	1.72%	55275	6048632
248	Long	30-07-2015	8426.5	7923.6	-502.90	-5.97%	-188588	5860044
249	Long	28-08-2015	8027.28	7909.04	-118.24	-1.47%	-44340	5815704
250	Long	30-09-2015	7926.34	8123.13	196.79	2.48%	73796	5889500
251	Short	13-10-2015	8123.13	7834.94	288.19	3.55%	108071	5997571
252	Long	17-11-2015	7834.94	7883.01	48.07	0.61%	18026	6015597
253	Short	31-12-2015	7883.01	7672.54	210.47	2.67%	78926	6094523
254	Long	15-12-2015	7672.54	7858.62	186.08	2.43%	69780	6164303
255	Short	04-01-2016	7858.62	7384.79	473.83	6.03%	177686	6341989
256	Long	22-01-2016	7384.79	7506.64	121.85	1.65%	45694	6387683
257	Short	08-02-2016	7506.64	7122.96	383.68	5.11%	143880	6531563
258	Long	16-02-2016	7122.96	7048.56	-74.40	-1.04%	-27900	6503663
259	Short	24-02-2016	7048.56	7132.79	-84.23	-1.19%	-31586	6472077

260	Short	05-04-2016	7673.3	7611.21	62.09	0.81%	23284	6495361
261	Long	11-04-2016	7611.21	7896.95	285.74	3.75%	107153	6602514
262	Short	22-04-2016	7896.95	7812.12	84.83	1.07%	31811	6634325
263	Long	09-05-2016	7812.12	8233.72	421.60	5.40%	158100	6792425
264	Short	09-06-2016	8233.72	8169.47	64.25	0.78%	24094	6816519
265	Long	17-06-2016	8169.47	8328.51	159.04	1.95%	59640	6876159
266	Short	08-07-2016	8328.51	8640.73	-312.22	-3.75%	-117083	6759076
267	Long	05-08-2016	8640.73	8899.71	258.98	3.00%	97117	6856193
268	Short	09-09-2016	8899.71	8798.84	100.87	1.13%	37826	6894019
269	Long	03-10-2016	8696.11	8631.61	-64.50	-0.74%	-24188	6869831
270	Short	27-10-2016	8631.61	8055.31	576.30	6.68%	216113	7085944
271	Long	25-11-2016	8055.31	8117.42	62.11	0.77%	23291	7109235
272	Short	02-12-2016	8117.42	8052.84	64.58	0.80%	24218	7133453
273	Long	28-12-2016	8052.84	8593.73	540.89	6.72%	202834	7336287
274	Short	08-02-2017	8762.46	8958.82	-196.36	-2.24%	-73635	7262652
275	Long	07-03-2017	8958.82	9122.6	163.78	1.83%	61418	7324070
276	Short	21-03-2017	9122.6	9133.69	-11.09	-0.12%	-4159	7319911
277	Long	29-03-2017	9133.69	9327.24	193.55	2.12%	72581	7392492
278	Short	05-05-2017	9327.24	9449.07	-121.83	-1.31%	-45686	7346806
279	Long	25-05-2017	9449.07	9647.8	198.73	2.10%	74524	7421330
280	Short	09-06-2017	9647.8	9592.63	55.17	0.57%	20689	7442019
281	Long	03-07-2017	9592.63	9834.31	241.68	2.52%	90630	7532649
282	Short	18-07-2017	9834.31	9850.24	-15.93	-0.16%	-5974	7526675
283	Long	16-08-2017	9850.24	9907.39	57.15	0.58%	21431	7548106
284	Short	06-09-2017	9907.39	9869.81	37.58	0.38%	14093	7562199
285	Long	03-10-2017	9869.81	10173.05	303.24	3.07%	113715	7675914
286	Short	23-10-2017	10173.05	10304.95	-131.90	-1.30%	-49463	7626451
287	Long	17-11-2017	10304.95	10275.8	-29.15	-0.28%	-10931	7615520
288	Short	30-11-2017	10275.8	10118.67	157.13	1.53%	58924	7674444
289	Long	07-12-2017	10118.67	10224.76	106.09	1.05%	39784	7714228
290	Long	19-12-2017	10224.76	10492.78	268.02	2.62%	100508	7814736
291	Short	28-12-2017	10492.78	10553.14	-60.36	-0.58%	-22635	7792101
292	Long	15-02-2018	10553.14	10477.74	-75.40	-0.71%	-28275	7763826
293	Short	01-03-2018	10477.74	10363.03	114.71	1.09%	43016	7806842

294	Long	12-03-2018	10363.03	10691.96	328.93	3.17%	123349	7930191
295	Short	03-03-2018	10691.96	10572.56	119.40	1.12%	44775	7974966
296	Long	25-05-2018	10572.56	10812.05	239.49	2.27%	89809	8064775
297	Short	14-06-2018	10812.05	10682.61	129.44	1.20%	48540	8113315
298	Long	02-07-2018	10682.61	10975.39	292.78	2.74%	109793	8223108
299	Short	16-07-2018	10975.39	11137.7	-162.31	-1.48%	-60866	8162242
300	Long	25-07-2018	11137.7	11284.36	146.66	1.32%	54997	8217239
301	Short	02-08-2018	11284.36	11456.54	-172.18	-1.53%	-64568	8152671
302	Long	17-08-2018	11456.54	11677.51	220.97	1.93%	82864	8235535
303	Short	30-08-2018	11677.51	11558.69	118.82	1.02%	44557	8280092
304	Long	07-09-2018	11558.68	10318.24	-1,240.44	-10.73%	-465165	7814927
305	Long	31-10-2018	10274.31	10626.16	351.85	3.42%	131944	7946871
306	Short	22-11-2018	10626.16	10660.4	-34.24	-0.32%	-12840	7934031
307	Long	12-12-2018	10660.4	10850.14	189.74	1.78%	71152	8005183
308	Short	21-12-2018	10850.14	10799.09	51.05	0.47%	19144	8024327

6. CONCLUSIONS

The initial capital required is INR 100,000. Total number of positions taken is 309 out of which winning positions are 223 i.e. 72.16% while losing positions were 86 i.e. The absolute return in last 18 years is INR 95,16,15,093 which means the trading strategy has given a positive return of 951615% and grown the wealth by 9516 times. The biggest loss trade was a loss of 1240.44 points on 7th of September 2018.

- An earning of almost 22000 points was achieved by this strategy in the market.
- Even though heikin-ashi is a lagging charting technique due to the stochastic being a leading indicator the combination of lagging and leading gives more accurate results. This can be seen when Some false signals are avoided when Heiken-Ashi gives a signal later than stochastic and some opportunities are not missed due to the quicker signals of stochastic in some trades. Thus, this combination gives good results because of their differential leading and lagging qualities.
- Through the analysis we can see that due to the qualities of heikin-ashi charts and stochastic RSI a good amount of profit can be expected. Thus, this strategy can be quite useful for a swing trader as this analysis is based on the daily charts.

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