A hybrid strategy using Mean Reverting Indictor Donchian Channel and RSI

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Abstract—*According to mean reverting theory, the security price always reverts to its long-term mean. In this paper, we try to apply the mean reverting theory on Donchian Channel indicator. The Donchian Channel indicator mainly depends on the high and low price of n-period. The Donchian has three channels called upper channel, lower channel and middle channel.The Middle channel is identical to the moving average, so the mean reversing theory can be appliedto the Donchian Channel. After that, we combine the Donchian Channel to the Relative Strength Index (RSI) indicator, to reduce the drawback of both indicators and try to construct a Hybrid strategy. We apply this strategy on stock which is sampled using some important fundamental factors.*
Keywords—*Mean Reverting Theory, Donchian Channel, RSI, Fundamental factors*

I.   Introduction

Nowadays, investments in the financial market are very popular because their returns are comparatively high than Bank and other risk-free securities. According to behavioral finance, people are risk averse. But nowadays returns in risk-free security are very low so people are willing to take risks to get a good return on investments. In particularly, Equity markets are places where people and companies come to buy and sell securities.

Trading strategy is one of the significant tools in the market that can help identify profitable investments. This strategy is a part of technical analysis. Technical analysis is useful for the purpose of forecasting future prices and identifying price movements and trends. Technical indicators are known as the financial method in which developer applies mathematical and statistical formulas to the price of securities. There are several technical indicators like Trend Indicators, Volume Indicators, Momentum Indicators, Volatility indicators. In this paper, we work on the Donchian Channel and the Relative Strength Index (RSI) indicators. The Donchian Channel and RSI are volatility indicator and momentum indicator, respectively.

- **Fundamental analysis**

Fundamental Analysis is a method of measuring the intrinsic value ofstocks. Fundamental analysis helps to identify characteristics of companies. Fundamental analysis uses ratios and financial statement data to determine the intrinsic value of security. The fundamental factors used in this study are Market Capitalization and Current Ratio to select profitable stock of shortlisted companies from Nifty50 index.

Market Capitalization: The Market Capitalization of a company is, 'how much the Company is worth as determined by the stock market'. Market Capitalization generally refers as "Market Cap". Market Cap reflects the equity value of a Company. There are mainly three categories of Market Capitalization.
1.   Large Cap: Companies with a market cap above $ 10 billion.
2.   Mid Cap: Companies with a market cap between $1 billion to $10 billion.
3.   Small Cap: Companies with a market cap below $ 1 billion.
There are several factors that canaffectthe market cap. Significant changes in the price of security and traded volume of security are impactful factors to the market cap. The Formula of Market Capitalization is given below.

$$Market\ Capitalization\ =\ (Cost\ per\ share)\ x\ (Number\ of\ shares)$$

For example, if a Company has 8 million shares and the price per share is $40, its Market Capitalization is $320 million.

Current Ratio:The Current Ratio is a liquidity ratio that measures ability of a company to pay short-term debt within one year. Generally, preferable range of current ratio is between 1.5 to 3 but can vary from industry to industry. The value of current ratio less than 1 may indicate liquidity problems for the company and the value of current ratio greater than 3 may indicatethat the Company is not using its current assets efficiently. Current

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assets can be found on a Company's balance sheet and represent the value of all assets it can reasonably expect to convert into cash within one year. The Formula of current ratio is given below.

$$Current\ Ratio\ =\ Current\ Assets\ /\ Current\ Liabilities$$

- **Technical Indicator :**

Donchian Channel Indicator:Donchian Channel indicator was developed by Richard Donchian in 1936. There are three lines in the Donchian Channel called Upper Channel, Middle Channel and Lower Channel. The upper channel shows high price of n-period, the lower channel shows low price of n-period and the middle channel shows average of high and low price of n-period. The area between upper channel and lower channel represents the Donchian Channel. The Donchian Channel indicator is useful for determining market volatility, identifying better time entry and identifying explosive breakout trades before it occurs. Generally, investors use 3,5,20,50,100,200 period in n-period.

Calculation:

$$Upper\ Channel\ =\ Highest\ high\ in\ last\ n-periods$$
$$Lower\ Channel\ =\ Lowest\ low\ in\ last\ n-periods$$
$$Middle\ Channel\ =\ \frac{UC+LC}{2}$$

In this work,Donchian Channel is set at20-period. The middle channel of Donchian Channel is the average of high and low price of 20-period. This middle channel can be considered as moving average of 20-period high and low price. So, the theory of mean reversion can be appliedto theDonchian channel. According to mean reversion theory, price always reverts to its long run mean. So, if price is going far from middle channel then price willrevert to middle channel.

Relative Strength Index Indicator (RSI): Relative Strength Index (RSI) was developed by J. Welles Wilder in 1978 and introduced in his book "New Concepts in Technical Trading Systems". RSI is a momentum indicator that measures the oscillation of directional price movements. Momentum indicators help traders to identify the speed of price movement by comparing prices over time. RSI oscillates between 0 and 100. According to Wilder, RSI is considered overbought when it goes above 70 and oversold when it goes below 30. In this work RSI is set to 14-period.

Calculation:

$$RSI\ =\ 100-\left[\frac{100}{1+RS}\right]$$

where,

$$Relative\ Strength\ (RS)\ =\ \frac{Average\ Gain}{Average\ Loss}$$

$$First\ Average\ Gain\ =\ \frac{Sum\ of\ Gains\ over\ the\ past\ n-periods}{n}$$

$$First\ Average\ Loss\ =\ \frac{Sum\ of\ Losses\ over\ the\ past\ n-periods}{n}$$

$$Average\ Gain\ =\ \frac{(previous\ Average\ Gain)\ \times\ (n-1)+\ current\ Gain}{n}$$

$$Average\ Loss\ =\ \frac{(previous\ Average\ Loss)\ \times\ (n-1)+\ current\ Loss}{n}$$

$n=14\ period$

In this paper, we focus on applying mean reverting theory on Donchian channel and combine it with RSI indicator to increase profitability and reduce the drawback of bothindicators. To make complete investment/trading strategy, weadd some fundamental factors in stock selection process. Fundamental analysis is a method used to determine the value of stock by analyzing the financial data. An important characteristic of fundamental analysis is that it focuses exclusively on those variables that are directly related to the Company. Here, current ratio and market capitalization have been used.

II. Literature review

Bhargavi. R et. al (2017) analyzed that the Relative Strength Index(RSI) effectively used to create a portfolio. They examined the performance of fundamental factors namely Earning Per Share (EPS) and Price to Earning Ratio (P/E ratio) in the Indian Stock Market and concluded that P/E ratio more efficient than EPS. [1] Alhilfi (2019) studied that the use of Relative Strength Index (RSI) playedfundamental and effective role in rationalizing the speculation decisions of Bank of Baghdad shares listed on the Iraq Stock Exchange. The

researcher investigated that RSI helps in proactive prediciting of price trends and what prices will be in the future. [2]

Choudhuri (2019) proved that the returns generated by RSI were much higher than the simple buy and hold strategy. The researcher found that the probability of false signals was also very less. [3]

Reddy andBabu(2019) checked that the validity of RSI in Indian stock market. They found that the RSI was the most accurate tool for predicting stock movements. [4]

Anitha and Padmaja (2017) focused on comparing the effectiveness of different technical indicators. They concludedthat technical indicators could play a useful role in the trade entry and exit points andalso predict the immediate market trend. [5]

Valarmathiand Kowsalya (2016) studied the technical analysis of five IT companies using the technical tools Relative Strength Index (RSI) and Exponential Moving Average (EMA). They found that the market trend of IT industry tends up with gradual price fluctuation. [6]

Madhu et. al (2019) investigated algorithmic trading of three mean reversion indicators. And further improvised either by adding a new mean reversion indicator to the existing algorithm or by using a new combination of indicators.[7]

Singh and Gor (2020) developed a solution for derivative pricing a European put option under the assumption that the distribution returns follows Gumbel distributed at maturity and also checked its relevancy to the actual market. [8]

Vaghela and Gor (2020) worked on the combination of Elliott Wave theory and sentiment indicator to identify future market direction. They tried to reduce the complexity of Elliott Wave theory by using sentiment indicator. [9]

Panchal and Gor (2020) converted chart pattern of technical indicators which followed mean reversion into numeric form and determined buy and sell signal of investment without having to test the chart pattern. They tried to describe the hold phenomenon in the stock market. [10]

Panchal and Gor (2020) attempted to construct a hybrid strategy of Exponential Moving Average and Parabolic Stop and Reversal which follows Mean Reversion process. They concluded that the hybrid strategy provides better long and short positions in the market and good strength of trend rather than individual indicator. [11]

In this paper,the Donchian Channel indicator is applied to stocks that are selected by fundamental factors. RSI indicator has been combined with Donchian Channel indicator to reduce the drawback of Donchian Channel indicator. Thus, a new hybrid strategy has been proposed to find buy and sell positions.

III. Modelling the Hybrid Strategy of Donchian Channeland RSI:

In this work, we use two different indicators;Donchian Channel and Relative Strength Index. Among them one measures volatility and the other measures the momentum of security price. An indicator that measures volatility can be compared to a mean reverting indicator. Because of this, theory of mean reversion can be applied to theDonchian channel. Mainly, the mean reversion theory helps for better prediction. The Donchian channel is used for identifying breakout in security price but it cannot measure trend change in normal volatile market. RSI measures price moment in normal volatile market but it cannot measure breakout in highly volatile market. Both indicators have drawbacks but using them together can reduce drawback and increase profitability. With this idea, we model a hybrid strategy of Donchian Channel and RSI that follows the steps given below.

Stepwise Procedure followed:
- Select stock using fundamental factor current ratio and market cap.
- Using Donchian Channel, identify the price of security is upside or downside.
- Check whether the price of security is in weak tread or strong trend through RSI.
- Check whether market is highly or normal volatile through Donchian channel.
- Using hybrid outcome, take position in market.

IV. Research Methodology
1. Data Collection:
The data from 01st January 2018 to 31st December 2019was collected from the National Stock Exchange website www.nseindia.com
2. Computation:

- Fundamental Factors:

We used fundamental factors for selection of companies. We select 10 companies from NIFTY 50 index by using fundamental factors namely Market Capitalization and Current Ratio. The companies and its fundamentals are given in table 1.

Table 1: Stock Selection		
Company Name	Current Ratio	Market Cap (cr)
Tata Motors Limited	0.58	53,006.76
Hindalco Industries Limited	**1.68**	43,786.56
UltraTech Cement Limited	0.97	1,29,056.53
Eicher Motors Limited	**2.21**	**52,322.61**
Hero MotoCorp Limited	**1.96**	47,877.53
Maruti Suzuki India Limited	0.87	2,13,711.07
Indian Oil Corporation Limited	0.81	1,09,251.31
Power Grid Corporation of India Limited	0.62	99,635.62

In table 1, there are three companies namely Hindalco Industries Limited, Eicher Motors Limited and Hero MotoCorp Limited that have greater than 1 current ratio. Eicher Motors Limited has been selected because of it had highest Market Capitalization as compared to other two companies.

- Donchian Channel:
Calculation:

$$Upper\ Channel\ =\ Highest\ high\ in\ last\ n-periods$$
$$Lower\ Channel\ =\ Lowest\ low\ in\ last\ n-periods$$
$$Middle\ Channel\ =\ \frac{UC+LC}{2}$$

➤ Calculation of Donchian Channel using excel:
- Step 1: Calculate Upper Channel price by using highest high prices in last 20 periods.
- Step 2:Calculate Lower Channel price by using lowest low prices in last 20 periods.
- Step 3:Calculate Middle Channel price as the average of Upper Channel price and Lower Channel price.
- Step 4: Outcomes:
Buy signal generates when low price is less than Lower Channel price.
Sell signal generates when high price is greater than Upper Channel price.
If these two situations do not exist, then Hold position.

How to read the table 2.1 and 2.2	
2nd column	The open price of current day
3rd column	The high price of current day
4th column	The low price of current day
5th column	The close price of current day
6th column	UC price: Highest high in last 20 periods
7th column	LC price: Lowest low in last 20 periods
8th column	MC price: The average of UC price and LC price
9th column	Outcomes of Donchian Channel: Buy signals generates when low price is less than LC price. Sell signals generates when high price is greater than UC price. If these two situations do not exist then Hold.

Table 2.1: Observation Table of Donchian Channel (Buy Signal)(Year 2018)								
Date	Open	High	Low	Close	UC	LC	MC	Donchian Outcomes
8-Jan	29400	29400	29040.1	29197.4	30999	28298	29648.5	**HOLD**
9-Jan	29201	29241.7	28510.7	28596.9	30999	28298	29648.5	**HOLD**
10-Jan	28620	28699.9	28000	28097.5	30999	28298	29648.5	**BUY**
11-Jan	28100	28525	27820.5	28444.7	30999	28000	29499.5	**BUY**
12-Jan	28520	28780	28211	28649.8	30999	27820.5	29409.8	**HOLD**
15-Jan	28750	28750	27900	27981.5	30999	27820.5	29409.8	**HOLD**
16-Jan	28010	28150	27701	27891.2	30999	27820.5	29409.8	**BUY**
17-Jan	27800	28301	27680.1	28222.8	30999	27701	29350	**BUY**
18-Jan	28228.8	28479	27811.1	27954.4	30999	27680.1	29339.5	**HOLD**
19-Jan	27880	28188.3	27751	28009.4	30720.1	27680.1	29200.1	**HOLD**
22-Jan	28009.4	28097.8	27590	27649.8	30720.1	27680.1	29200.1	**BUY**

23-Jan	27700	27829.4	27020	27071.2	30466.4	27590	29028.2	**BUY**
24-Jan	27006	27050	26302.2	26404.1	30466.4	27020	28743.2	**BUY**
25-Jan	26500	26730	26208.1	26519.4	30466.4	26302.2	28384.3	**BUY**
29-Jan	26730	27849	26566.1	27453.7	30466.4	26208.1	28337.3	**HOLD**
30-Jan	27450	27453	26559	26689.4	30420	26208.1	28314	**HOLD**
31-Jan	26827.3	27387	26525.2	26923.6	29955	26208.1	28081.5	**HOLD**
1-Feb	26984	28300	26714.5	28047.3	29400	26208.1	27804	**HOLD**

Table 2.2: Observation Table of Donchian Channel (Sell Signal) (Year 2018)								
Date	**Open**	**High**	**Low**	**Close**	**UC**	**LC**	**MC**	**Donchian Outcomes**
3-Apr	28235.7	28235.7	27800	27990	29059.9	27251.2	28155.5	**HOLD**
4-Apr	28498	29250	28400.7	28934.2	29059.9	27251.2	28155.5	**SELL**
5-Apr	29200	29749	29100.1	29677.8	29250	27251.2	28250.6	**SELL**
6-Apr	29748	29899.9	29568	29799.2	29749	27301.1	28525	**SELL**
9-Apr	29900	29986.2	29700	29805.8	29899.9	27301.1	28600.5	**SELL**
10-Apr	29811	30170	29650	29972.1	29986.2	27301.1	28643.6	**SELL**
11-Apr	29999.9	30840	29925	30685.1	30170	27301.1	28735.5	**SELL**
12-Apr	30545.8	30900	30530	30681.6	30840	27301.1	29070.5	**SELL**
13-Apr	30681	31500	30600	31353	30900	27301.1	29100.5	**SELL**
16-Apr	31400	31400	31000	31299.2	31500	27301.1	29400.5	**HOLD**
17-Apr	31300	31468.2	30900	31027.6	31500	27301.1	29400.5	**HOLD**
18-Apr	31050.1	31337.2	30800	30873.9	31500	27301.1	29400.5	**HOLD**
19-Apr	31180	31189	30580	30920.2	31500	27339.3	29419.7	**HOLD**
20-Apr	30850	31220	30677.6	31148.7	31500	27339.3	29419.7	**HOLD**
23-Apr	31399.9	31399.9	31000	31065.2	31500	27339.3	29419.7	**HOLD**
24-Apr	31150	31500	30950.7	31136.8	31500	27339.3	29419.7	**HOLD**
25-Apr	31150	31200	30607.2	30746.9	31500	27608.2	29554.1	**HOLD**
26-Apr	30750	31316	30750	31205.2	31500	27800	29650	**HOLD**

Figure 1: DonchianChannel Indicator on Eicher Motors Limited

- Relative Strength Index:

Calculation

$$RSI \ = \ 100 - \left[\frac{100}{1 + RS}\right]$$

where,

$$Relative\ Strength\ (RS)\ =\ \frac{Average\ Gain}{Average\ Loss}$$

$$First\ Average\ Gain\ =\ \frac{Sum\ of\ Gains\ over\ the\ past\ n-periods}{n}$$

$$First\ Average\ Loss\ =\ \frac{Sum\ of\ Losses\ over\ the\ past\ n-periods}{n}$$

$$Average\ Gain\ =\ \frac{(previous\ Average\ Gain) \times (n-1) + current\ Gain}{n}$$

$$Average\ Loss\ = \frac{(previous\ Average\ Loss)\ \times\ (n-1)+\ current\ Loss}{n}$$
$$n = 14\ period$$

➢ Calculation of RSI using excel:
- Step 1: Calculate Change by using this formula, Change = Close price – Previous Close price
- Step 2: Calculate Gain as given below.

When Change price > 0 then the value of Change is Gain otherwise Gain is zero.
- Step 3: Calculate Loss as given below.

When Change price<0 then the value of Change is Loss otherwise Loss is zero.
- Step 4: Calculate First Average Gain as given below.

$$First\ Average\ Gain\ = \frac{Sum\ of\ Gains\ over\ the\ past\ n-periods}{n}$$

- Step 5: Calculate First Average Loss as given below.

$$First\ Average\ Loss\ = \frac{Sum\ of\ Losses\ over\ the\ past\ n-periods}{n}$$

- Step 6: Calculate Average Gain as given below.

$$Average\ Gain\ = \frac{(previous\ Average\ Gain)\ \times\ (n-1)+\ current\ Gain}{n}$$

- Step 6: Calculate Average Loss as given below.

$$Average\ Loss\ = \frac{(previous\ Average\ Loss)\ \times\ (n-1)+\ current\ Loss}{n}$$

- Step 7: Calculate Relative Strength (RS) as given below.

$$Relative\ Strength\ (RS)\ = \frac{Average\ Gain}{Average\ Loss}$$

- Step 8: Calculate Relative Strength Index (RSI) price as given below.

$$RSI\ =\ 100 - \left[\frac{100}{1+RS}\right]$$

- Step 9: Outcomes:

Buy signals generates when the RSI price below than 36.
Sell signals generates when the RSI price above than 66.
If these two situations do not exist, then Hold position.

How to read the table 3.1 and 3.2	
2nd column	The open price of current day
3rd column	The close price of current day
4th column	Change = Close price – Previous Close price
5th column	Gain: When Change price > 0 then the value of Change is our Gain. When Change price < 0 then our Gain is zero.
6th column	Loss: When Change price < 0 then the value of Change is our Loss. When Change price > 0 then our Loss is zero.
7th column	Average Gain = [(previous Average Gain) x (13) + current Gain] / 14
8th column	Average Loss = [(previous Average Loss) x (13) + current Loss] / 14
9th column	RS = Average Gain / Average Loss
10th column	RSI = 100 – [100 / (1+RS)]
11th column	Outcomes of RSI: Buy signals generates when the RSI price below than 36. Sell signals generates when the RSI price above than 66. If these two situations do not exist then Hold.

Table 3.1: Observation Table of RSI (Buy Signal)(Year 2018)										
Date	Open	Close	Change	Gain	Loss	Average Gain	Average Loss	Relative Strength	RSI	RSI Outcomes
8-Jan	29400	29197.4	-39.6	0	39.6	166.93	201.2	0.83	45.34	**HOLD**
9-Jan	29201	28596.9	-600.5	0	600.5	155.01	229.72	0.67	40.29	**HOLD**
10-Jan	28620	28097.5	-499.4	0	499.4	143.93	248.99	0.58	36.63	**HOLD**
11-Jan	28100	28444.7	347.2	347.2	0	158.45	231.2	0.69	40.66	**HOLD**
12-Jan	28520	28649.8	205.1	205.1	0	161.78	214.69	0.75	42.97	**HOLD**
15-Jan	28750	27981.5	-668.3	0	668.3	150.23	247.09	0.61	37.81	**HOLD**
16-Jan	28010	27891.2	-90.3	0	90.3	139.5	235.89	0.59	37.16	**HOLD**
17-Jan	27800	28222.8	331.6	331.6	0	153.22	219.04	0.7	41.16	**HOLD**
18-Jan	28228.8	27954.4	-268.4	0	268.4	142.28	222.57	0.64	39	**HOLD**

Date	Open	Close	Change	Gain	Loss					
19-Jan	27880	28009.4	55	55	0	136.04	206.67	0.66	39.7	**HOLD**
22-Jan	28009.4	27649.8	-359.6	0	359.6	126.32	217.59	0.58	36.73	**HOLD**
23-Jan	27700	27071.2	-578.6	0	578.6	117.3	243.38	0.48	32.52	**BUY**
24-Jan	27006	26404.1	-667.1	0	667.1	108.92	273.64	0.4	28.47	**BUY**
25-Jan	26500	26519.4	115.3	115.3	0	109.38	254.1	0.43	30.09	**BUY**
29-Jan	26730	27453.7	934.3	934.3	0	168.3	235.95	0.71	41.63	**HOLD**
30-Jan	27450	26689.4	-764.3	0	764.3	156.28	273.69	0.57	36.35	**HOLD**
31-Jan	26827.3	26923.6	234.2	234.2	0	161.84	254.14	0.64	38.91	**HOLD**
1-Feb	26984	28047.3	1123.7	1123.7	0	230.55	235.99	0.98	49.42	**HOLD**

Table 3.2: Observation Table of RSI (Sell Signal)(Year 2018)										
Date	**Open**	**Close**	**Change**	**Gain**	**Loss**	**Average Gain**	**Average Loss**	**Relative Strength**	**RSI**	**RSI Outcomes**
3-Apr	28235.7	27990	-298.8	0	298.8	146.39	147.36	0.99	49.83	**HOLD**
4-Apr	28498	28934.2	944.2	944.2	0	203.37	136.83	1.49	59.78	**HOLD**
5-Apr	29200	29677.8	743.6	743.6	0	241.96	127.06	1.9	65.57	**HOLD**
6-Apr	29748	29799.2	121.4	121.4	0	233.35	117.98	1.98	66.42	**SELL**
9-Apr	29900	29805.8	6.6	6.6	0	217.15	109.55	1.98	66.47	**SE LL**
10-Apr	29811	29972.1	166.3	166.3	0	213.52	101.73	2.1	67.73	**SELL**
11-Apr	29999.9	30685.1	713	713	0	249.2	94.46	2.64	72.51	**SELL**
12-Apr	30545.8	30681.6	-3.5	0	3.5	231.4	87.97	2.63	72.46	**SELL**
13-Apr	30681	31353	671.4	671.4	0	262.83	81.68	3.22	76.29	**SELL**
16-Apr	31400	31299.2	-53.8	0	53.8	244.05	79.69	3.06	75.38	**SELL**
17-Apr	31300	31027.6	-271.6	0	271.6	226.62	93.4	2.43	70.81	**SELL**
18-Apr	31050.1	30873.9	-153.7	0	153.7	210.43	97.71	2.15	68.29	**SELL**
19-Apr	31180	30920.2	46.3	46.3	0	198.71	90.73	2.19	68.65	**SELL**
20-Apr	30850	31148.7	228.5	228.5	0	200.84	84.25	2.38	70.45	**SELL**
23-Apr	31399.9	31065.2	-83.5	0	83.5	186.49	84.19	2.22	68.9	**SELL**
24-Apr	31150	31136.8	71.6	71.6	0	178.29	78.18	2.28	69.52	**SELL**
25-Apr	31150	30746.9	-389.9	0	389.9	165.55	100.44	1.65	62.24	**HOLD**
26-Apr	30750	31205.2	458.3	458.3	0	186.46	93.27	2	66.66	**SELL**

Figure 2: RSI Indicator on Eicher Motors Limited

3. Observation

Step 1: Calculate Donchian Channel for 20 periods and find its outcomes as above mentioned.

Step 2: Calculate RSI for 14 periods and find its outcomes as above mentioned.

Step 3: Donchian Channel and RSI both generates buy signal then itsstrong buy signal.

Step 4: Donchian Channel and RSI both generates sell signal then its strong sell signal.

Step5:Donchian Channel generates buy signal (sell signal) and RSI generates hold signal then its hold signal.

Step 6: Donchian Channel generates hold signal and RSI generates buy signal (sell signal) then its hold signal.

How to read thefor table 4.1 and 4.2	
2nd column	Outcomes of <u>Donchian Channel</u>: Buy signals generates when low price is less than LC price. Sell signals generates when high price is greater than UC price. If these two situations do not exist then Hold.
3rd column	Outcomes of <u>RSI</u>: Buy signals generates when the RSI price below than 36. Sell signals generates when the RSI price above than 66. If these two situations do not exist then Hold.
4th column	Hybrid Strategy Outcomes: Strong buy signal generates when Donchian Channel and RSI both generates buy signal. Strong sell signal generates when Donchian Channel and RSI both generates sell signal. If these two situations do not exist then Hold.

Table 4.1: Observation Table of Hybrid Strategy
(Buy Signal) (Year 2018)

Date	Donchian Outcomes	RSI Outcomes	Hybrid Strategy Outcomes
8-Jan	HOLD	HOLD	HOLD
9-Jan	HOLD	HOLD	HOLD
10-Jan	BUY	HOLD	HOLD
11-Jan	BUY	HOLD	HOLD
12-Jan	HOLD	HOLD	HOLD
15-Jan	HOLD	HOLD	HOLD
16-Jan	BUY	HOLD	HOLD
17-Jan	BUY	HOLD	HOLD
18-Jan	HOLD	HOLD	HOLD
19-Jan	HOLD	HOLD	HOLD
22-Jan	BUY	HOLD	HOLD
23-Jan	BUY	BUY	STRONG BUY
24-Jan	BUY	BUY	STRONG BUY
25-Jan	BUY	BUY	STRONG BUY
29-Jan	HOLD	HOLD	HOLD
30-Jan	HOLD	HOLD	HOLD
31-Jan	HOLD	HOLD	HOLD
1-Feb	HOLD	HOLD	HOLD

Table 4.2: Observation Table of Hybrid Strategy
(Sell Signal) (Year 2018)

Date	Donchian Outcomes	RSI Outcomes	Hybrid Strategy Outcomes
3-Apr	HOLD	HOLD	HOLD
4-Apr	SELL	HOLD	HOLD
5-Apr	SELL	HOLD	HOLD
6-Apr	SELL	SELL	STRONG SELL
9-Apr	SELL	SELL	STRONG SELL
10-Apr	SELL	SELL	STRONG SELL
11-Apr	SELL	SELL	STRONG SELL
12-Apr	SELL	SELL	STRONG SELL
13-Apr	SELL	SELL	STRONG SELL
16-Apr	HOLD	SELL	HOLD
17-Apr	HOLD	SELL	HOLD
18-Apr	HOLD	SELL	HOLD
19-Apr	HOLD	SELL	HOLD
20-Apr	HOLD	SELL	HOLD
23-Apr	HOLD	SELL	HOLD
24-Apr	HOLD	SELL	HOLD
25-Apr	HOLD	HOLD	HOLD
26-Apr	HOLD	SELL	HOLD

Figure 3: Hybrid Strategy on Eicher Motors Limited

V. Conclusion

In this paper, the Donchian Channel indicator is applied to stocks that are selected by fundamental factors. RSI indicator has been combined with Donchian Channel indicator to reduce the drawback of Donchian Channel indicator. Thus, a new hybrid strategy has been proposed to find buy and sell positions. This Hybrid strategy is useful in both highly volatile market and normal volatile market. The combination of Donchian Channel and RSI indicators gives better buy and sell signals. The combination of Fundamental Analysis and Technical Analysis provides a profitable strategy in the market and is used to overcome losses.

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