

Stock Trading Strategy Based on Daily Stock Volatility

¹Ranjit Singh, ²Amit Kumar

¹CGC Technical Campus , Jhanjeri, Mohali, India

²College of Information Science & Technology, Nanjing Forestry University, Nanjing, Jiangsu, China

Abstract

In this paper, we introduced a stock trading strategy based on daily stock volatility. We have exploited the moment of the stock and used daily stock range (High price – Low price) and developed a strategy which recommends buying and selling at different prices with different quantities. The daily volatility of the stock makes this strategy highly successful and hence profitable.

Keywords

Volatility, Technical Analysis, Stock Price Range.

I. Introduction

Stock price never stays at particular price throughout the day. It’s fluctuating continuously and this changing nature of price is going to make this intraday strategy very powerful and profitable.

Every investor or trader can earn 1% profit daily if followed according to the strategy. How much money trader wants to earn daily depends on the initial amount invested. Traders have to invest money according to their target of daily profit. Use the formula below to decide how much amount of money have to invest.

Amount of money to invest = 100 × Profit trader want to earn daily.

Profit trader want to earn daily (INR)	Amount of money to invest (INR)
Rs.500/-	Rs.50000
Rs.1000/-	Rs.1 Lakh
Rs.1500/-	Rs.1.5 Lakh
Rs.2000/-	Rs.2 Lakh

II. Concept of Volatility

Volatility is a measure of the degree of price movement in a stock. It is the measure of a stock’s price movement based on historical prices. It measures how active a stock price is over a certain period of time. It is measured by taking the daily (close-to-close) percentage price changes in a stock and calculating the average over a given time period. This average is then expressed as an annualized percentage. Short-term or more active traders tend to use shorter time periods for measuring volatility, the most common being five-day, 10-day, 20-day and 30-day. Intermediate-term and long-term investors tend to use longer time periods, most commonly 60-day, 180-day and 360-day.

A. How to calculate volatility?

1. Measure the day-to-day price changes in a market. Calculate the natural log of the ratio (R_t) of a stock’s price (S) from the current day (t) to the previous day (t -1):

$$R_t = \log \left(\frac{S_t}{S_{t-1}} \right)$$

The result corresponds closely to the percentage price change of the stock.

2. Calculate the average day-to-day changes over a certain period. Add together all the changes for a given period (n) and calculate an average for them (R_m):

$$R_m = \frac{\sum R_t}{n}$$

3. Find out how far prices vary from the average calculated in Step

2. The historical volatility (HV) is the “average variance” from the mean (the “standard deviation”), and is estimated as:

$$HV = \sqrt{\frac{\sum (R_t - R_m)^2}{n - 1}}$$

4. Express Volatility as an Annual Percentage

To annualize the historical volatility, the above result is multiplied by the square root of 252 (the average number of trading days in a year). For example, if you calculated the 10-day historical volatility using Steps 1-4 and the result was 20 percent, this would mean that if the volatility present in the market over that 10-day period holds constant for the next year, the market could be expected to vary 20 percent from its current price. See Table 1.

III. Methodology With Empirical Example

Let’s suppose trader want to earn Rs.100/- daily, then they have to invest Rs. 10000/-. It means they must have Rs. 10000 in their broker’s account.

Let us invest this amount (Rs.10000) in some company’s stock (say TATAMOTORS). You can invest in any other stock also; there is no restriction on the selection of stock. This strategy does not depend on the selection of stock and its direction of movement. You will earn profit whether stock price goes up or down. No need to worry about the direction of movement of stock price.

Let’s suppose that current stock price of TATAMOTORS is Rs. 100. Now, you have to follow the following steps to earn profit daily:

Step 1: Buy 100 shares of TATAMOTORS at current price of Rs.100 with the target of Rs.101 (1% up) and stop loss of Rs.99.75 (0.25% down).

Always set the target of 1% and stop loss of 0.25%.

Now, two actions may take place:

Action 1. If stock price goes up and reaches to Rs.101 (up by 1%), then we have achieved the target. So, we earned the profit of Rs.100/- (1% profit on investment).

Action 2. If stock price goes down and reaches to Rs.99.75 (down by 0.25%), then stop loss has triggered. So, our position has closed and we booked a loss of Rs. 25/-. Don’t worry we will cover this loss.

But now our target is not to earn Rs.100/- , it’s Rs.125/- (Rs.100 as our daily target+Rs.25 as loss due to action 2).

Now, generate new position at Rs.99.75 according to step 2 (as explained below). Since stock is going down, so there are more chances of stock price to go down more. So, we will generate sell position first.

Step 2: Sell 125 shares of TATAMOTORS at current price of Rs.99.75 with the target of Rs.98.75(1% down) and stop loss of Rs.100(0.25% up).

Action 3: If stock price goes down and reaches to Rs.98.75 (down by 1%), then we have achieved the target.

Action 4: If stock price goes up and reaches to Rs.100 (up by 0.25%), then stop loss has again triggered. So, again our position has closed and we booked a loss of Rs. 30/- more. So far we have total loss of Rs.55/-(Rs.25 in action 2 + Rs.30 in action 4). Now, our new target is to earn Rs.155/- (Rs.100 as our daily target+Rs.55 as loss due to actions 2 & 4). Again, generate new position at Rs.100 according to step 3.

Step 3: Buy 155 shares of TATAMOTORS at current price of Rs.100

with the target of Rs.101 (1% up) and stop loss of Rs.99.75(0.25% down).

Action 5: If stock price goes up and reaches to Rs.101 (up by 1%), then we have achieved the target. So, we earned the profit of Rs.155/-.

Action 6: If stock price goes down and reaches to Rs.99.75 (down by 0.25%), then stop loss has triggered. So, our position has closed and we booked a loss of Rs. 40/-. So far ,we have total loss of Rs.95/- (Rs.25 in action 2 + Rs.30 in action 4 +Rs.40 in action 6). Now, our new target is to earn Rs.195/- (Rs.100 as our daily target+Rs.95 as loss). Again generate new position at Rs.99.75. Repeat this process until your target has achieved.

Don't worry, you will achieve the target as stock will not remain there between Rs.99.75 and Rs.100 throughout the day, it will move out of this range. Every stock trading in stock market has at least 2% or more than 2% daily volatility. It is advisable to use highly volatile stocks but must have high liquidity. But with each new position, increase the quantity of shares to cover the loss. Remember that generate buy position at Rs.100 and sell position at Rs. 99.75.

A. How to decide the quantity of shares in each new position?

We can cover the loss incurred in wrong positions by increasing the quantity of shares each time while generating new position.

We generate new position whenever we book a loss in position. Amount of money to invest in new position depends on the total loss in all the positions. Follow the table 2 to decide the amount of money to invest in new position.

You must be thinking that with the increase in quantity, you have to invest more money. It means you have to put more money in the broker's account. Actually it is not required to put more money in broker's account because each broker gives 10 times margin on intraday trading. You may use this margin amount to execute this technique.

You may also cover the loss due to transaction charges (Brokerage, STT, Security transaction cost, etc). You have to increase the quantity of shares while generating new position. Calculate the total transaction cost and then increase the shares accordingly.

B. How to gain more than 1% profit daily?

Suppose you have achieved the target in very less time (within 1 hour after opening of market), then you may apply again the technique to another stock which has not moved very much in either direction.

It is advisable to pick stocks which are in news or some announcement is expected. During result days, pick the stock whose result is going to announce on that day. Such activities increase the volatility of stocks and so stocks easily move in either direction.

If you are unable to select appropriate stock second time, then don't use technique again on same day. You just enjoy with 1% profit which you have already earned in very less time and devote the rest of time in other works.

IV. Conclusion

We have introduced an intraday stock market strategy and each step to be followed is explained with an empirical example of TATAMOTORS.

Table 2:

Action	Lost Amount	Total loss	Amount to invest to cover loss =Total loss x 100	Total amount to invest to achieve target	Total qty of shares
First loss due to Action 2	Rs.25	Rs.25	Rs.2500	Rs.10000 + Rs. 2500	Rs.12500/Stock price
Second loss due to Action 4	Rs. 30	Rs.55	Rs.5500	Rs.10000 + Rs. 5500	Rs.12500/Stock price
Third loss due to Action 6	Rs. 50	Rs.95	Rs.9500	Rs.10000 + Rs. 9500	Rs.19500/Stock price

Traders or investors can use this strategy and earn profit daily. The traders are required to pick the stock which are volatile and have liquidity. Volatility of stock can be determined as explained.

References

- [1] E. Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work", Journal of Finance, Vol. 25, No. 2, 1970, pp. 383-417.
- [2] B. G. Malkiel, "A Random Walk Down Wall Street", W. W. Norton & Company, New York and London, 1999.
- [3] Qin Qin, Qing-Guo Wang, Shuzhi Sam Ge, Ganesh Ramakrishnan, "Chinese Stock Price and Volatility Predictions with Multiple Technical Indicators", Journal of Intelligent Learning Systems and Applications, 2011, 3, pp. 209-219.
- [4] Stockcharts, [Online] Available: <http://stockcharts.com>
- [5] Steven B. Achelis, "Technical Analysis-from A to Z", Mc-Graw Hills, New York, USA, 2001.
- [6] Ravi Kant Jain, "Putting volatility to work", [Online] Available: <http://www.Activetradermag.com>, April 2001.



Ranjit Singh is working as an Associate Professor in CGC Technical Campus, Jhanjeri (Mohali), Punjab. He received his M.Sc. in Mathematics from Panjab University, Chandigarh, India in 2000 and M.Phil. in Mathematics in 2004. He is also pursuing his Ph.D. in Mathematics from Punjab Technical University, Jalandhar, Punjab, India. He is CSIR-UGC NET qualified. He has over 12 years of teaching experience of teaching

Engineering mathematics, quantitative techniques and operations research. He has many publications in national and international Journals. He is reviewer for many international Journals. His field of interest is Operation Research (OR) and its applications in financial analysis.

Table 1:

Date	Price	Rt	Sqr(Rt)	Sqr(Rt-Rm)
5/1/2015	86.25	-	-	-
6/1/2015	91.5	0.059	0.003481	0.00418
7/1/2015	94	0.0269	0.000724	0.00106
8/1/2015	88.8	-0.056	0.003136	0.00253
9/1/2015	89.65	0.0091	0.000083	0.00022
12/1/2015	86.1	-0.0398	0.001584	0.00117
13/1/2015	85	-0.0131	0.000172	0.00006
14/1/2015	86.25	0.0145	0.00021	0.00041
15/1/2015	85	-0.0145	0.00021	0.00008
16/1/2015	82.75	-0.0268	0.000718	0.00045
	81.5	-0.0152	0.000231	0.00009
		Rm=-0.00566		
		Sum=	0.010549	0.010238
		10 day HV=	51.83%	53.81%