A Simple Trading Strategy

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This is a simple trading strategy made for illustration purpose

1 Trading Algorithm Definition

There are various definitions for 'trading algorithm'. According to Leshik and Cralle [1], the word 'algorithm' has, literally, many definitions. A spray of examples could be:

- A plan consisting of a number of steps precisely setting out a sequence of actions to achieve a defined task. The basic algorithm is deterministic, giving the same results from the same inputs every time.
- A precise step-by-step plan for a computational procedure that begins with an input value and yields and output value.
- A computational procedure that takes values as input and produces values as output

2 The Strategy

The simple strategy would need the following parameters:

$$TS_{simple} = \{t, \theta | \theta < t\}$$

Where, t is the threshold used for looking for Directional Changes. θ is a parameter used for selling.

Once a t% increase is confirmed, p_0 and p_t are also confirmed. p_0 is the price at which the directional change event starts, and p_t is the price at which the directional change event confirms.

With the parameters, the trading strategy can be stated as following rules:

- 1. Take a long position, whenever an upward directional change event is confirmed;
- 2. Close the position if the price drops below the purchase price by θ %;

- 3. Close positions if the price increases another t% compare with p_t .
- This strategy takes long positions only

The above algorithm can be understood as that one should buy stocks when a upward directional change event is observed (p_t) . And the stocks should be held till the the price rises to 2t% times of p_0 , if the price does not drop below p_t by $\theta\%$; Otherwise, close the position.



Figure 1:

To illustrate the above strategy, figure 1 shows one possible look of the price curve summarised by Directional Changes. In the figure, the price starts from p_0 , and it reaches p_t subsequently and *etc.*.

 p_0 is where the directional change event starts. And p_t is where the directional change event is confirmed. Point A is the point at which the first overshoot ends and the second directional change event starts. And points B and C are second directional change event confirmation point and the last low respectively.

And in this case

$$(A - p_t) > (p_t - p_0);$$
 (1)

$$\frac{p_t - p_0}{p_0} = t\%$$
(2)

According to the above strategy, one should take a long position at p_t . And because of in-equation 1, one should have closed potions before the price reaches A.

3 Evaluation

The above strategy takes action under only 3 conditions (as stated in section 1, rule 1 to 3). Because of rule no. 3, this strategy could only make profits when $\frac{A-p_t}{p_t} \geq \frac{p_t-p_0}{p_0}$. Otherwise, if $\frac{A-p_t}{p_t} < \frac{p_t-p_0}{p_0}$, rule 3 would not be triggered. When the price drops below p_t by θ %, it closes the position, when the price is smaller than p_t , which is the purchase price. That means a loss.

One possible way to minimise the loss is to set θ to a reasonable small number. If it is set to 0, that means when the price falls back to purchase price, close the position (assume there is no liquidity issues). The smaller θ is, the more opportunities might be missed.

4 Summary

The above strategy is a simple strategy based on Directional Changes. In which there are 3 rules to direction an investor's trading, and various improvements could be made.

References

[1] E. A. L. J. Cralle, An Introduction to Algorithm Trading. Wiley, 2011.