TRIN Strategy

quantra

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Objectives

In the previous units, we understood TRIN as a sentiment indicator. In this unit, we will try to understand a basic trading strategy using TRIN and trade in the big S&P 500 futures.

Logic for TRIN strategy

Below is the explanation of the logic for the strategy that we will code in the next unit.

1. The first step is to import the required libraries.
2. Next, we will pull data for required instruments from Quandl databases. Quandl is an online financial and economic data provider. It provides a python library which can be used to fetch data for different financial instruments as you will see in the next unit when we code the strategy. We require data for:

    - S&P 500 futures
    - Number of declining stocks on NYSE
    - Number of advancing stocks on NYSE
    - Advancing volume
    - Declining volume

    After pulling the data, it is important to fill non-null numerical data into places where data is missing. We will then calculate the value of TRIN.

3. As the value of TRIN is lopsided, we take its logarithm and replace the values stored earlier with the logarithmic values of TRIN.
4. We will then take a simple moving average (SMA) of TRIN. The window length for our simple moving average would be 22 days. You can optimize this parameter based on backtesting results to fit your strategy.

5. Calculate standard deviation of the moving average of TRIN with n = 22.
6. Next, we will construct Bollinger bands. An Upper Bollinger band would be 'k' times the 'n' period standard deviation above the moving average (i.e. SMA + kσ), where k = 1.5. Similarly, the Lower Bollinger band would be (SMA - kσ). You can optimize these parameters based on backtesting results to fit your strategy.
7. If the closing value of TRIN crosses these Upper or Lower Bollinger bands, we will take new trade positions.
8. While understanding TRIN, we learnt that whenever TRIN is high, it implies there is a bearish sentiment in the market. We are interested in those values of TRIN that are higher than its usual trend, i.e. when closing day TRIN is 1.5σ away from the SMA of TRIN on the upside. Hence, whenever the value of TRIN crosses the Upper Bollinger band (UBB), it would be considered as a spike in TRIN value implying that on that particular day there is a possibility of an oversold market. We will take a BUY position in the S&P 500 futures - a contrarian position. We will open a buy position only when the Upper Bollinger Band is crossed and there is no active trade in the account. Once we take a new position (open position), it is important to close the position. We will not take any new positions unless the previous open positions are closed. We close a position when either the Take Profit (TP) or Stop Loss (SL) conditions are met.

    - If the opening position was BUY, the TP condition is when TRIN reverts back from the UBB to the moving average. Our algorithm will generate a SELL order and close the open BUY position. This is because we expect the market to be priced correctly now, as TRIN has taken a value close to its average over the last 22 trading days.
    - We will use two SL conditions to limit our losses and exit trades before losing a lot of money. The first is when the value of TRIN goes beyond 2σ above the UBB, this limit is called the Upper Stop Loss Band (USL). Since we were expecting TRIN to revert back to the mean when we bought the security, but a move on the opposite side (further upwards) shows that we were wrong, hence it is important to close the position before it's too late.

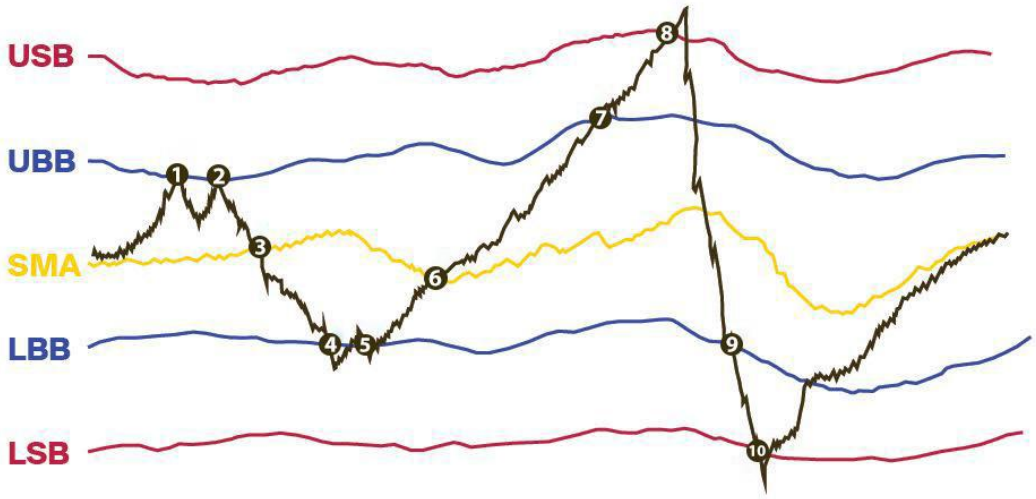
- The second condition for booking a loss and closing the open BUY position is determined by an absolute stop loss value. Before TRIN crosses the USL, if the S&P 500 index falls by 25 points, we will close our open BUY position by selling the futures contract, booking a loss.

9. The other set of TRIN values that we are interested in, is when TRIN is lower than its usual trend, which implies a bullish sentiment in the market i.e. when closing day TRIN values are 1.5σ away from the SMA of TRIN on the downside. Hence, whenever TRIN crosses the Lower Bollinger Band (LBB), it implies that there is a possibility of an overbought market. We will take a SELL S&P 500 futures position - a contrarian position. We will open a SELL position only when the LBB is crossed and there are no active trades in the account. We will not take any new positions unless the previous open positions are closed. Similar to the previous case, we will close the open SELL position when either the Take Profit or Stop Loss conditions are met.

   - If the opening position was sell, the TP condition is when TRIN reverts back from LBB to the moving average. Our algorithm will generate a BUY order and close the open SELL position. This is because we expect the market to be priced correctly now as TRIN has taken a value close to its average over the last 22 trading days.
   - The first SL condition is when the value of TRIN goes beyond 2σ below the LBB, and crosses the Lower Stop Loss Band (LSL), we buy and close our open sell position.
   - The second SL condition for closing the open SELL position is determined by an absolute stop loss value. Before TRIN crosses the LSL, if the S&P 500 index rises by 25 points, we will close our SELL position by buying the futures contract, booking a loss.

10. Always remember, the variable values can be changed and optimized while backtesting. Given below is a representative diagram that would help us in understanding various scenarios in which we are taking BUY/SELL positions or closing them down.

Note: The black line represents daily TRIN value.



1 -- When TRIN crosses the UBB, we BUY and take a new position (open position).

2 -- TRIN crosses the UBB here too, but we will not take a new position since we already have an open BUY position.

3 -- Here TRIN reverts back from the UBB to moving average. We SELL and take profit to close the trade.

4 -- When TRIN crosses the LBB, we SELL and take a new position (open position).

5 -- Here TRIN crosses the LBB, but we will not take a new SELL position since we have not closed the previous SELL position.

6 -- Here TRIN reverts back from LBB to moving average. We BUY and take profit to close the trade.

7 -- When TRIN crosses the UBB, we BUY and take a new position (open position).

8 -- Here after an open buy position, TRIN crosses the USB. We SELL and book a loss.

9 -- When TRIN crosses the LBB, we SELL and take a new position (open position).

10 -- Here after an open sell position, TRIN crosses the LSB. We BUY and book a loss.

Further, while coding the strategy, there are various flags used. Given below is the trade matrix which will help you understand the flag used in our code while taking positions. It may not help you presently, but you may refer to this trade matrix while the code is being explained in the next unit.

UBB_cross	buy_flag	LBB_cross	sell_flag	mAvg(high to low)	mAvg(low to high)	USL	LSL	Trade	
1	0	0	0	0	0	0	0	BUY	Bollinger crossing
0	0	1	0	0	0	0	0	SELL	
0	0	0	1	0	1	0	0	BUY	Moving average crossing
0	1	0	0	1	0	0	0	SELL	
0	1	0	0	0	0	1	0	SELL	Stoploss
0	0	0	1	0	0	0	1	BUY	

Note: Each trade starts with a bollinger band crossing and ends in moving average crossing or stoploss band crossing

sell_flag = 1 => previous transaction was a sell
buy_flag = 1 => previous transaction was a buy

sell_flag = 0 => selling is a possible transaction
buy_flag = 0 => buying is a possible transaction

In the next unit, we will code this strategy in Python. Let's code!!