

International Journal of Computer Science and Mobile Computing



A Monthly Journal of Computer Science and Information Technology

ISSN 2320-088X

IMPACT FACTOR: 6.199

IJCSMC, Vol. 8, Issue. 6, June 2019, pg.7 – 13

Algorithmic Trading using Mean Reversion Indicators

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ABSTRACT: *A quantitative framework that utilizes day by day mean – reversion and swing exchanging diverse market routines to anticipate the costs of the stocks. The framework depends on three center standards which can be portrayed as underneath:*

A market - routine changing strategy to exploit various attributes of business sectors by utilizing short - term mean - reversion. Market - routine exchanging tells about the behavior markets in various situations. Each framework segment depends on unpredictability versatile measurements that it can deal with changes in instability over quite a while length. Instability versatile measurements necessitates that every individual part of the framework must be able to do powerfully dealing with changes in market unpredictability.

At last, since no routine exchanging model will probably wipe out every single false sign, each center framework segment shows vigor to routine false flag. Despite the technique we use to characterize the present market nature, false alerts. This forecast framework is intended to address these cases and guarantee heartiness to changes in nature of market, false alerts.

Keywords: *Algorithmic trading, Mean-Reversion Indicators, Back Testing*

INTRODUCTION

Essentially, an algorithm can be characterized as a lot of steps or guidelines which are pursued to take care of certain issues. When we join the word 'algorithm' with exchanging we are bringing the utilization of algorithms into exchanging. Algorithmic Trading includes building and executing exchanging procedures utilizing computer codes and programming. An exchanging procedure is essentially an arrangement or a lot of principles which are characterized to direct the way toward purchasing and offering while at the same time exchanging request to accomplish a specific result like expanding profitability, better execution, and so on.

Manual traders place their trades by contemplating the economic situations, breaking down the sign and diagrams and making an exchanging rationale in like manner. Though, in

algorithmic trading, we will put an trading logic in a machine and let the machine evaluate the opportunities dependent on the live economic situations and in this manner take or recommend an trading choice whether to go long or short or hold the position. In created markets where algorithmic exchanging has been there for a considerable length of time, algorithmic trading as of now represents in excess of 80 percent of the exchanging volumes driving trades.

The various algorithmic trading strategies for trading include

Momentum and Trend based Strategy:

The most widely recognized algorithmic exchanging systems pursue slants in moving midpoints, channel breakouts, value level developments, and related specialized markers. These are the least demanding and easiest procedures to execute through algorithmic exchanging on the grounds that these systems don't include making any expectations or value conjectures. Exchanges are started dependent on the event of attractive patterns, which are simple and clear to execute through algorithms without getting into the multifaceted nature of predictive analysis.

- **Arbitrage Opportunities:**

Purchasing a double recorded stock at a lower cost in one market and at the same time offering it at a more expensive rate in another market offers the value differential as hazard free benefit or exchange. A similar task can be duplicated for stocks. Executing a calculation to recognize such value differentials and putting in the requests proficiently permits gainful chances.

- **Mean Reversion Strategy:**

Mean Reversion methodology depends on the idea that the high and low costs of an advantage are a transitory wonder that return to their mean esteem occasionally. Distinguishing and characterizing a value extend and actualizing a calculation dependent on it enable exchanges to be set consequently when the cost of a benefit breaks all through its characterized range.

Out of all the above procedures, mean reversion system is an amazing technique that can be utilized either as independent or in blend with another exchanging methodology (contingent upon winning economic situations) beneficially.

EXISTING SYSTEM

The existing system uses trading strategy with these guidelines:

- 1) *Default parameter settings*: all indicators and system work parts should utilize default values, rather than advancing them for the most noteworthy net benefit.
- 2) *Avoid optimization*: optimization might be utilized to test if a system segment includes value, not to pick explicit settings.
- 3) *Long Timeframe*: we pick the most recent ten years as our time span. This gives us enough information for a strong investigation, and furthermore keeps us trading the present market, and not a century ago's market.

- 4) *Many Trades*: trend-following system that solitary trade a couple of times each year may have definitely various outcomes on the off chance that you miss a little example of trades. We favor a system that produces numerous trades since this adds to our confidence that system results are not excessively affected by a little arrangement of trades.

PROPOSED WORK

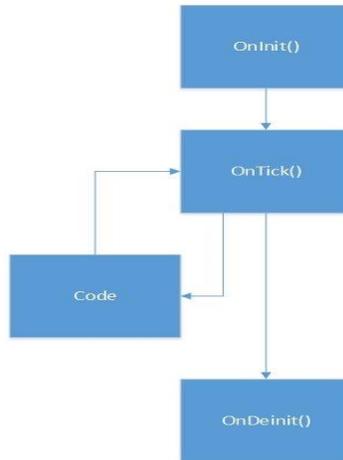


Figure showing over view of system

1) Initialization Function:

The initialization function is an exceptional function that is executed distinctly toward the start of the program. You can pinpoint this part when you see a line that says `OnInit()` on the code. This function will begin to pursue you've actualized the EA on a specific currency pair and time period before some other functions are executed. Some state this is only a discretionary piece of the code, as the remainder of the program can even now keep running without it.



Figure showing flow of algorithm

2) OnTick Function:

The OnTick function can be viewed as the minds of the program, as this is the place choices are made. This is for the most part where the greater part of the code goes since it is executed at each cost tick and refreshes in a circle for each new tick of information got.

The OnTick function work more often than not contains the conditions that must be fulfilled for the EA to produce an trade signal, the exit conditions and different directions that can enable the program to add to open positions, diminish presentation, and so on. Other exceptional client characterized outside functions can likewise be brought in this primary function.

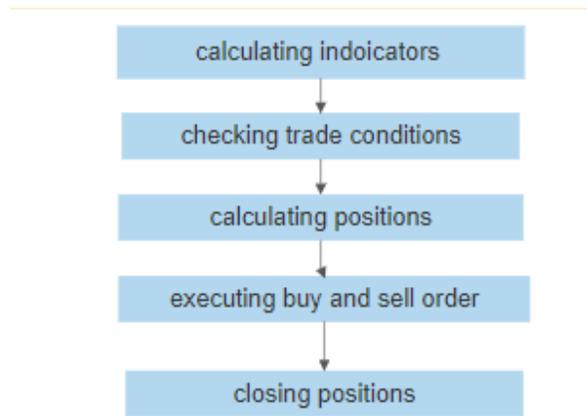


Figure showing trading logic flow

2) Deinitialization Function:

As its name proposes, the deinitialization function is executed toward the finish of the program. Much the same as the OnInit() function, the DeInit() function runs just amid the program end and is a discretionary piece of the code.

This function runs when a price chart is closed, when jumping between trading accounts, when changing the time period, when changing parameters on the chart, and when the EA is recompiled on the MetaEditor window.

WORKING:

What occurs after the Initialization of OnInit function is the name of the symbol is set and afterward the volume estimation of the symbol is checked with one of the three standard values on the server at that point to follow all trades occurring in the chosen symbol magic number is set.

When the channel for correspondence is set the volume for the trade is filled by the accessibility of symbol volume available, at that point the slippage is instantiated. Stop losses and take profits are set.

Once all the parameters for the trade are set then the filters and bands are set. Firstly, the stochastic filter is set then the bands are set with following options

- Standard deviation
- Standard deviation *2
- Standard deviation/2

The RSI indicator is set as well .now that all the handles are set, now the bot is ready to enter the trade.

After the handles are set the bot starts calculating indicators for the symbol depending upon the trading conditions the orders for buy and sell are send to the market before that the bot checks for any existing orders and keeps track of number of such orders, proceeding further bot executes the orders and closes the trades

RESULTS OBTAINED

The strategy uses three main Bollinger Bands indicators: "Bollinger Bands: number of standard deviations" specified in parameters, "Bollinger Bands: number of standard deviations" * 2.0 and "Bollinger Bands: number of standard deviations" / 2.0.

EURUSD 1H CHART



Snap shot of trading by bot

Bot back tested on the 1 year of historical data

Bars:	6244
Total Net Profit:	1 226.08
Gross Profit:	2 457.33
Gross Loss:	-1 231.25
Profit Factor:	2

Table1 showing results

Ticks:	20147923
Balance Drawdown Absolute:	209.1
Balance Drawdown Maximal:	441.66 (12.94%)
Balance Drawdown Relative:	12.94% (441.66)
Expected Payoff:	40.87

Table2 showing results

Symbols:	1
Equity Drawdown Absolute:	315.87
Equity Drawdown Maximal:	462.91 (13.52%)
Equity Drawdown Relative:	13.52% (462.91)
Margin Level:	2310.52%

Table3 showing results

CONCLUSION

Nowadays, traders are more inclined towards algorithmic trading. Algorithmic trading gives the traders edge by trading for them while they are sleeping. Our trading bot is an EA that is built over the mean reversion indicators. We have restricted the algorithm in this paper to use only three mean reversion indicators. This can be further improvised either by adding a new mean reversion indicator to the existing algorithm or by using a new combination of indicators.

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