FOREX OPTIMIZATION PROJECT

Fredrik Wallinder, PhD
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GOAL
The results of forex algoritmic trading depend strongly on the multi-dimensional parameter space connected with the input parameters, where each parameter spans one dimension in that space. Different values produce different outcomes. What is needed is an automatic feedback loop which optimizes the values according to the real-time market situation using machine learning or preferably real AI.

TECHNICAL BACKGROUND
The MT5 platform is free and has much better statistical output and better data input quality compared to the standard MT4 software. It runs on multi-core processors in contrast to MT4 so its strategy tester is much faster. The MT5 program can be downloaded at Metatrader5.com where a free demo account can be opened as well. The standard choice is USD account, 10k initial balance and 1:200 leverage. The strategy tester has its own documentation.

PROPOSED SYSTEM
The system uses a multi-step procedure with zero risk using live demo accounts to begin with and then live testing before real money is allocated. Hence,

THE MT5 OPTIMIZATION SYSTEM

The MT5 strategy tester has an option where all the assets the broker offers can be tested at the same time, using one set of input parameters. This helps with the first step, selection of asset. The next step is to backtest the algo using historical data, a few months should be enough. The result is a set of input parameters which are optimized for that asset and time frame. This set is then used for a live demo test and if the outcome is good enough a live test is started using real money but with minimal risk. If that is also successful then real funds may be allocated for live trading.

The challenge is to move away from this time-consuming manual process to an automatic one using machine learning or AI.

In other words, the questions to be answered are:
1. What set of input parameters has the highest probability of success with respect to the current market?

2. How can that information be used to control the trading software?

What is needed is to find the regions in parameter space which have the highest profit/risk-ratio and then act from that information automatically.

AN EXAMPLE

Our algorithm *Russiangrid* was tested with MT5 for the currency pair GBPAUD on the 1 hour time frame during the period 1/1-2018 to 21/5-2018. Initial deposit was 10k USD with 1:200 leverage. The function of the algo is that it senses when price has deviated away from the mean average and then takes the opposite trade, a standard mean reversal technique used by many hedge funds.

This the top of the optimization table, the last five input parameters on the right have been tested in different combinations, resulting in very impressive profits at about 9 million USD in 5 months.

The balance-equity curve for the most profitable case at the top of the previous table. The equity grows exponentially. The green histogram below shows that the account was stressed at some occasions, an effect which goes down with account size.

This is the optimization graph, the x-axis is just a number for the simulation and the y-axis is the balance. Each dot is a run with specific input parameters, with about 17,000 runs in total. It is clearly not a random distribution. If the highest profitability run is an isolated point at the fringes then there is low probability that the same market situation occurs again.
Here is the complete list of input parameters for the most successful run. Not all parameters have the same importance, which is useful knowledge since optimization of 19 parameter permutations would take a lot of cpu time.

The table of results contains not only net profit, it is even more important that the drawdown is under control. In this case it is rather large at a few occasions.
The strategy tester also provides information of when the algo is active and profitable. The test was for Jan-May 2018.

SUMMARY AND OUTLOOK

The result of this backtest example is fantastic, but its relevance can only be gained using actual live trading data. A successful automatic system for optimization as described will be extremely profitable. The ultimate goal is a super-intelligent trading robot which takes care of trading anything that moves in any market anywhere, anytime.