

First Lesson in the Robot Training Series

Smartly evaluating your robot's trading results

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When using robots (Expert Advisors) for the MetaTrader platform, you can run a historical backtest to evaluate how a robot performed in the past.

In this lesson you will learn how to read MetaTrader's test results like a pro, whether they are the results of your own tests, or the results obtained from a testing and review site, or even a sales website of a robot.

Lesson outline:

- Is "Total Profit" the most important?
- Producing the report
- Reading the report
 - Total net profit
 - Profit Factor
 - Absolute drawdown
 - Maximal drawdown
 - Profit trades (% of total)
 - Average profit trade, loss trade
 - Modeling quality
- Calculating expectancy
- Conclusion

Is "Total Profit" the most important?

The MetaTrader has a very smart feature that enables you to examine your trading results in great detail. You can easily see the winning rate, monthly profit / loss, frequency of trades, and many more important stats.

In the previous lesson you learned how to perform a backtest and forward test of a Forex strategy, so that you'll have all the stats at your disposal.

In this lesson I'll show you how I interpret these backtest and forward test reports, so you'll be able to look at the test results like a pro, and not fall into the traps most beginners tend to encounter.

For example, you ran a robot on a demo account and the test report shows that the robot made a profit of \$2500. It might sound nice but it doesn't really tell you a lot, as you'll see in a minute. It's also definitely NOT the most important data.

Many people mistakenly think they just need to look whether the strategy made a profit or not. Sometimes they also compare between strategies on the basis of which made the most money.

Wrong. The overall profit is just one of the parameters you should look at. I don't think it can actually be seen as the most important, because there are other parameters which must be examined in order to form any kind of opinion on the strategy.

This is a slightly "heavier" lesson which also includes some basic mathematics. So grab a cup of coffee, relax and let's dive together into the world of strategy analysis...

Producing the report

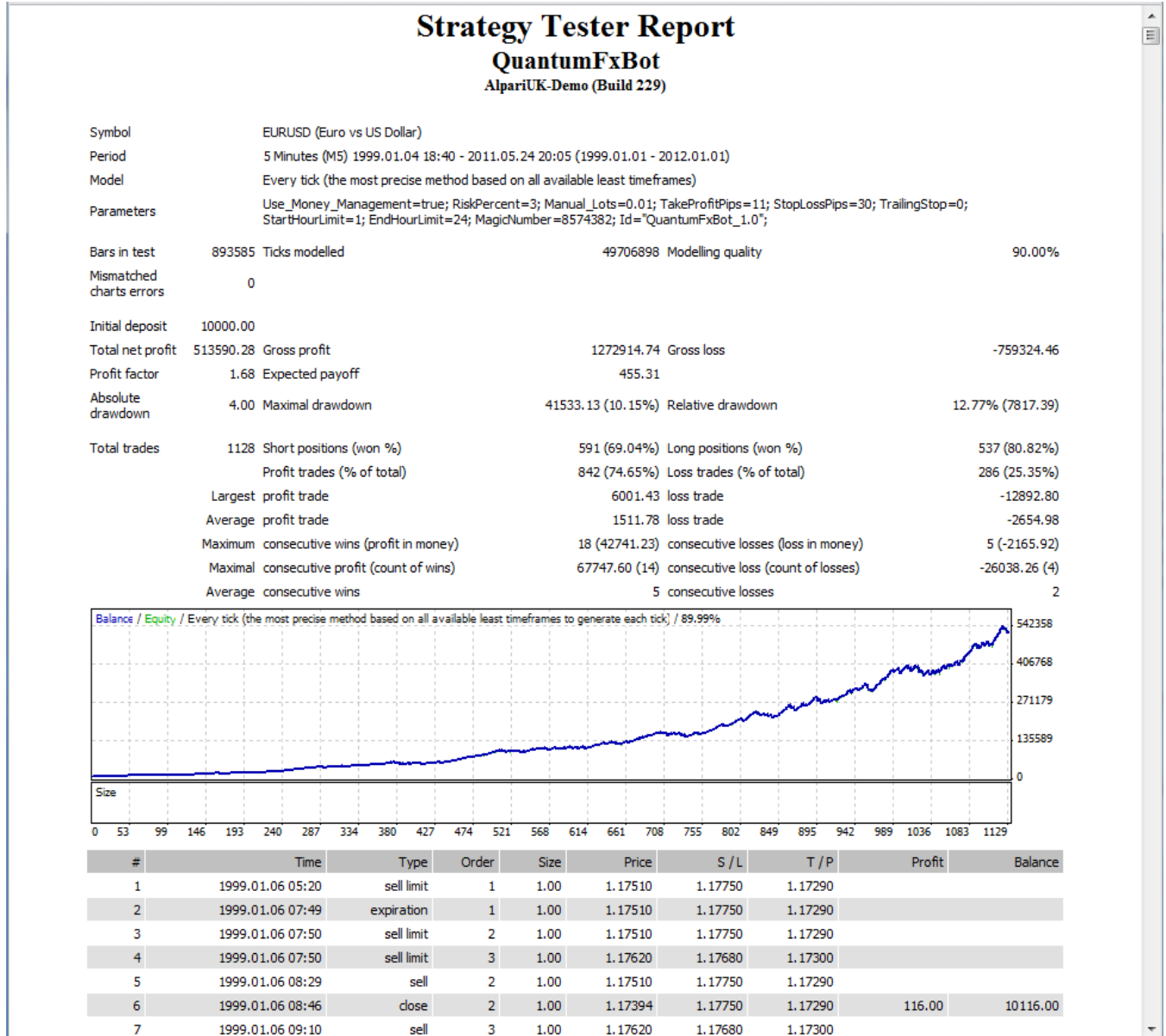
I assume that you have learned how to produce a forward test or a backtest report.

The report contains much more information than just how much the strategy made, and this information is very valuable in assessing the strengths and weaknesses of a strategy, whether it is a manual trading strategy or an automated robot.

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I'll now show you what to look for in these reports, so you can assess whether the strategy is a good candidate for your account.

The Strategy Tester produces a report with statistics similar to this:



[\[Click HERE to see the website with the full test report\]](#)

A backtest report is arranged a bit differently than a forward test report (real-time account statement) but they contain exactly the same stats.

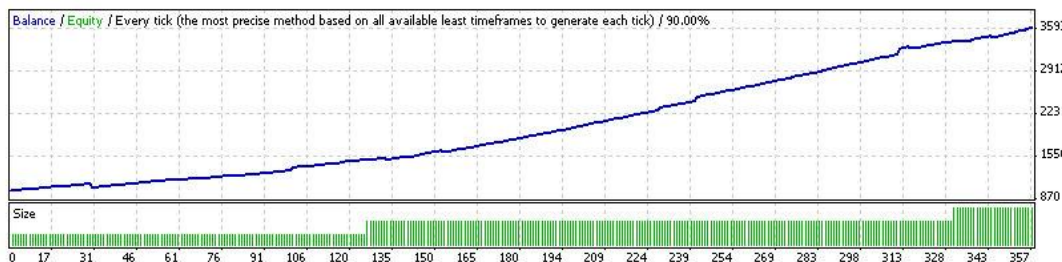
There are quite a lot of numbers in the stats sheet. Don't worry, unless you like drowning in numbers, you can just focus on the key statistics.

Reading the report

Let's take a sample Strategy Tester Report and analyze the most important information it reveals.

For your convenience, the key statistics are marked with colored rectangles in this screen shot:

Bars in test	25780	Ticks modelled	1876777	Modelling quality	90.00%
Mismatched charts errors	0				
Initial deposit	1000.00				
Total net profit	2608.46	Gross profit	2867.26	Gross loss	-258.80
Profit factor	11.08	Expected payoff	7.31		
Absolute drawdown	13.51	Maximal drawdown	135.79 (8.83%)	Relative drawdown	8.83% (135.79)
Total trades	357	Short positions (won %)	219 (92.69%)	Long positions (won %)	138 (98.55%)
		Profit trades (% of total)	339 (94.96%)	Loss trades (% of total)	18 (5.04%)
		Largest profit trade	91.08	loss trade	-59.97
		Average profit trade	8.46	loss trade	-14.38
		Maximum consecutive wins (profit in money)	146 (1549.43)	consecutive losses (loss in money)	2 (-16.59)
		Maximal consecutive profit (count of wins)	1549.43 (146)	consecutive loss (count of losses)	-59.97 (1)
		Average consecutive wins	19	consecutive losses	1



Note: in a forward test report, the layout is slightly different but you'll find exactly the same stats.

Total net profit

This is the actual profit made during the test period.

🎯 Ideal Total net profit: the higher the better.

In the above screen shot, the account started with \$1000 and ended \$2608.46 higher, which means the end balance was:
 $1000 + 2608.46 = \$3608.46$

Note: The account's end balance is not mentioned in the report. I've noticed that some people tend to confuse the Total net profit with the account end balance.

In this case, the account end balance would be:
 $1000 + 2608.46 = 3608.46$

Profit Factor

This is the ratio between the profits and losses. More accurately, it's the ratio between the Gross Profit and Gross Loss.

☛ Ideal Profit factor: the higher the better. Values above 1.5 are considered good.

Note that if Profit Factor is 1.0 it means the Gross Loss was the same as the Gross Profit. In plain English, the strategy produced as much losses as profits, which is an alarming sign.

In the above example Profit Factor was 11.08 which is excellent.

Absolute drawdown

How much did the strategy go down below the initial deposit value. For example, if you deposited \$1000 and at some point your account was at \$800, then the Absolute drawdown was \$200.

☛ Ideal Absolute drawdown: the lower the better.

The Absolute drawdown is not concerned with the account growth or the overall profits or losses of the strategy. It tells you if at any point your account was below the initial sum of money invested.

In the above example, the \$1000 account saw a minor bump of \$13.51 at the beginning of the period.

Maximal drawdown

Answers the question: what's the largest percentage loss that the account suffered during the test.

It calculates the largest difference between account balance peak and its subsequent bottom.

When you look at this number ask yourself, are you willing to endure a 10% loss in the account? 20%?

Every investor has his or her own tolerance level.

In the above example it was 8.83%

⊛ Ideal Maximal drawdown: the lower the better. Should fit your tolerance level. Many would not go for anything above 20% - 30%.

I look at the Maximal drawdown figure in conjunction with the Total net profit. In this example, the percentage of profit, which was over 260% is huge compared to the maximal drawdown the strategy suffered during the test period. This is a good sign.

Profit trades (% of total)

This shows you the accuracy of the entry and exit signals. A number above 50% means that more trades closed in profit than in loss.

⊛ Ideal Profit trades percentage: depends on the Average profitable and average losing trade. See explanation below.

A high percentage of profitable trades doesn't necessarily mean the strategy is very accurate. Why?

Let's say for the sake of this example that you fixed a stop loss of 1000 pips and a take profit of 10 pips. What's the most likely thing to happen next – the market will go against you 1000 pips, or go in your favor 10 pips?

In this scenario, it is obvious that you'll have many trades going in your favor, which means you'll have a very high percentage of profitable trades. Say 98%. Sound great, isn't it?

However, it takes just one unfortunate trade that reaches its stop loss of 1000 pips, to negate the results of 100 profitable trades. (because 100 profitable trades earn 1000 pips). In which case, a 98% accuracy rate is not enough to end in profit, since out of 100 trades, 2 will be losing.

Profitable trades: $98 * 10 = 980$

Losing trades: $2 * 1000 = 2000$

Total profit: $980 - 2000 = -1020$

Thus, a high percentage of winning trade is in itself not enough; you should also look at the average profit or loss per trade, as explained below. This is connected with the "Expectancy" of a strategy, a term you'll learn later in this lesson.

Average profit trade, loss trade

This shows you the typical profit for a profitable trade and the typical loss for a losing trade during the test period.

Some prefer to have the profits much larger than the losses. The effect of this is that even if your percentage of profitable trades is as low as, say, 40% - you can still make money. This is because the few large profits can easily cover the many small losses.

However the opposite is also true: if you have a high profit percentage like 90% you can make money even if the average profit is much smaller than the average loss. That's because the many small winners cover for the few large losers.

✪ Ideal Average profit trade: depends on the Profit trades percentage. See explanation above.

Modeling quality

The Modeling quality refers to the overall consistency of the historical data you are testing on. Since the Strategy Tester's lowest time frame is 1 minute, it only "knows" what happened between minutes. It doesn't have a way of knowing what happened during a minute.

Why? Because it only has a record of what happened at the beginning of the bar (the bar's Open price) and the end of the bar (the Close). However it does have an additional two small clues: the maximal and minimal prices during that minute.

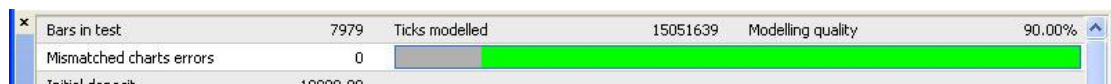
So, anything that happened in the market from the opening of a 1 minute bar to the closing of that bar is not known. Therefore, the tester needs to "guess" it according to its modeling formula.

To simplify things, let's just say that the tester takes the opening and closing prices of the bar, so it has a clear idea of where to start and where to finish the action on that particular bar. Then it takes the High and Low of that bar, and moves between them in a

way that simulates how the market might have moved during that minute.

In the previous lesson you learned how to provide the tester with consistent enough data to be able to show the highest modeling quality available, which is 90%.

🎯 Ideal Modeling quality: 90%. Notice the bar under Modeling quality is mostly green, with just 10% of it appearing gray.



Calculating expectancy

We'll finish this lesson with something that might slightly challenge the not-so-mathematically-minded students, but it's important enough to be included here:

Expectancy measures a strategy's profit potential, and considers the two crucial aspects you learned earlier:

1. Accuracy rate (profitable trades %).
2. Average size of profit and loss.

You must ensure that the strategy you are testing has a positive expectancy.

This is how you calculate the expectancy:

To shorten the formula, these acronyms are used:

PTP = Profitable Trades Percentage

LTP = Losing Trades Percentage

$$\text{Expectancy} = (\text{PTP} * \text{average profit}) - (\text{LTP} * \text{average loss})$$

For example, let's take the data from the sample strategy test report you analyzed during this lesson:

Profitable Trades Percentage = 94.96%

Losing Trades Percentage = 5.04%

Average Profit = \$8.46

Average Loss = \$14.38

Expectancy = $(0.9496 * 8.46) - (0.0504 * 14.38)$

Expectancy = 7.3

A value of 7.3 means that the strategy had a high positive expectancy during the testing period.

Conclusion

Ok, I know it hasn't been one of the easier or lighter lessons, however I think the information here is of utmost importance.

Next time you run into a backtest or live (forward) test of a robot, you will know how to read between the lines and see if the robot is as good as it claims.

The robot Quantum FxBot is an example of such a robot, which produces excellent performance in both the live and back tests. The performance results are displayed on the website:

<http://www.quantumfxbot.com/>

To your success,

Paul Morton

Quantum Forex Bot

