Lesson 6 of 30

Welcome to Lesson 6.
In Lesson five we discussed about the automation being better over manual trading, Systematic risk, Unsystematic risk and the risk and probability analysis.
If you have missed the last lesson not to worry, simply send a request to support@strategyland.com.sg about the missing lesson. We will send you the requested lesson right away.
Today we will discuss some very interesting facts,

In Casino's, why the machines win over humans?
Why BotTrading can again win over humans?
And of course, A tip for the day

Before we start the discussion do you know how strategy works in StrategyBot?
A strategy is a mathematical algorithm designed to work in the auto execution platform StrategyBot, In such a way that it creates an auto buy and execute order and auto sell and execute order with a risk control on unexpected volatile movements and execute order based on the certain mathematical criteria. These mathematical criteria could be based on technical analysis indicators or probability or statistical values.

In Casino, why the machines win over humans

The StrategyLand simulation, a statistical technique used to model the expected outcomes of a random series of events such as a casino game, also has valuable applications in the evaluation of a systematic trading program.

Courtesy to StrategyLand R&D Section

When you think of a successful trader, what comes to mind? Chances are you conjure up the image of a financial sage like Warren Buffett or George Soros, someone who can seemingly gaze into a crystal ball and pick out a winner. Or maybe you picture a commodity pit trader, hardened and wizened from days spent in battle on the exchange floor.

Now what if I told you a successful trader might have the most in common with a casino manager? How can the proud and noble trader possibly lower his self-image to equate it with that of a gambling house? Indeed, the word gambling has a most negative reputation.

Think about the word. According to Webster, "Gambling" is defined" to bet on an uncertain outcome." The term does not need to be synonymous with the word "losing," however. After all, the casino industry nets substantial profits every year. Casinos have learned to turn the short-term uncertainty of the casino games into the long-term certainty of profits. If you learn to think like the house instead of like the player, you can turn the trading odds in your favor. An analysis technique called the StrategyLand-Simulation can help evaluate trading models in this fashion.

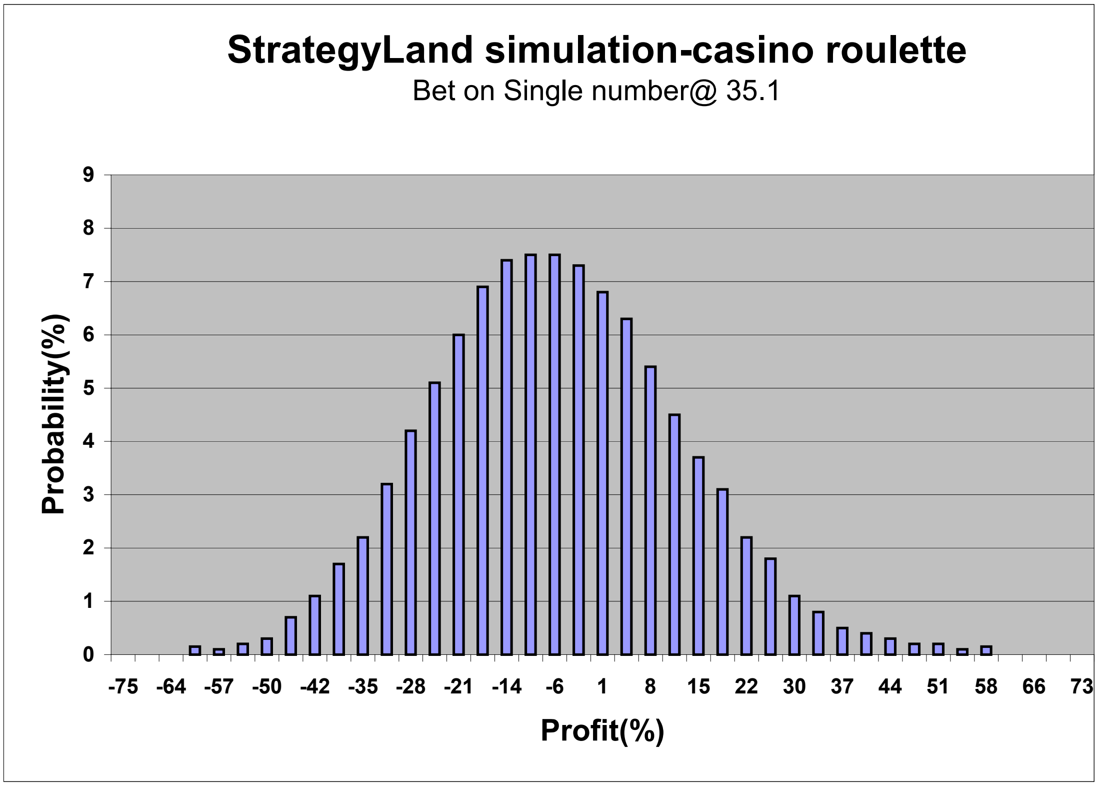
Let's start by examining the simple casino game of roulette. The roulette wheel has 38 numbered slots into which a ball may fall - zero, double zero, and one through 36. We shall focus on betting on a single number. The chance of hitting any one number is 1:38, or 2.63%. The payout when you pick the winning number is 35:1, meaning that you get back $35 for every $1 you wager ($35 plus your $1 bet returned). The odds (35:1) that the casino pays are less than the true odds (38:1) of the particular wager. Paying less than true odds is the means by which the casino makes its profits. How can the average gambler expect to fare at the roulette tables? Figure 1 shows a distribution of simulated outcomes. We assume that 50,000 random gamblers each play 1,000 consecutive spins of the roulette wheel. They each start with $1,000 and wager $1 on a single number per spin. At the extremes of the curve are a few especially lucky or unlucky individuals who do extremely well or extremely poorly. However, the average gambler is left with a small loss. The house edge for this bet is 5.26% - over time, the house can expect to win 5.26 cents for every dollar wagered. The longer we play, the more we can expect to lose.

In reality, most gamblers fare worse than our hypothetical ones, because they quit after only a couple of losing rolls, wager too much on a single bet, or take bets with poor payouts proportionate to risk. In much the same way, if traders try to second-guess their trading systems by ignoring liquidation signals, or try to get even by taking a big position in a long-shot trade, they are setting themselves up for a loss disproportionate to what they must accept if they played the percentages.

A rational person would not play roulette given the above information. Of course, we can see that the occasional lucky person (always someone else, never us!) manages to beat the house in the short run. That small chance of lavish success may be why most people are still willing to take their chances in the casino despite the odds. Yet if these results were the output from a trading system, no trader would care to adopt such a money-losing strategy. Fortunately, we can apply this sort of analysis to a potential trading system so we might evaluate its prospects more objectively.

Why BotTrading can again win over humans

The StrategyLand method is the simulation of a sequence of random events. While it has obvious implications to analyzing games of chance, the StrategyLand has applications in fields such as quantum physics and portfolio management. A computer can be readily programmed to perform these simulations. We can run thousands of trials in a matter of seconds on a personal computer. The power of the StrategyLand analysis is that out of a series of random inputs, a patterned distribution of outcomes will become visible.



DISTRIBUTION OF SIMULATED OUTCOMES: In this casino roulette example, the house edge is 5.26%. In reality, gamblers fare much worse.
We have seen how StrategyLand can apply different strategies trying to mimic a casino game. Can we do the same with a simple hypothetical trading system? Assume that we have developed a trading system we will call **system A**. Let us further assume that system A is a simplistic system that holds a trade until it either hits a modest profit objective or gets stopped out for a small loss. We have back tested the system performance over a sufficient amount of historical data to derive these performance statistics:

Trading system A
Starting equity: $100,000
Percent winners: 35%
Winning trade pays $2,000
Losing trade loses $1,000

In the simulation, 50,000 random trials were performed with a sequence of 1,000 trades each. A computer was programmed to step through each trial, generate a random number to determine whether we won (35%) or lost (65%) on the trade, and then adjust our sample equity appropriately (+$2,000 or-$1,000, respectively).
The results of the simulation of system A show that it has, on average, made a 45% profit. The best possible outcome was a profit of 230%, while the worst was to lose everything and go $45,000 into debt. However, the chance of being wiped out was tiny-only 35 instances in 50,000 (0.07%). Moreover, 84% of the time the system at least broke even. Altogether, this system would

seem to have pretty good potential. Even though it only wins 35% of the time, the 2:1 win-loss ratio slowly works in our favor.
Indeed, in the world of systems development, finding a system that is even remotely profitable is rare. Most profitable systems may have only a very small statistical edge, which is why an analysis in evaluating the statistical significance of the edge in prospective systems. In the same way that the casino manager would never allow a game with a negative statistical edge to go onto the casino floor, we should never allow a questionable system to commence trading.

StrategyLand has developed a lot of systems where the win traders can be within 60% to 85% as against 35% in the above example.

Analyzing Phenomena

A phenomenon that the StrategyLand analysis helps us analyze is referred to as the theory of runs. This theory states that in any random process, there will still be short-term "runs" of consecutive identical outcomes. The probability of winning tells us that our odds of a winning trade in system “A” are 35% over a sufficiently large number of trades. However, there is no guarantee as to the order or frequency of those trades in the short term. Over the duration of just 100 trades, for example, there is no guarantee we will have exactly 35 winners. Nor do we know in what order the winning trades will appear; we may have several winners or losers in a row. The StrategyLand simulation allows us to incorporate the possibilities of such a set of rogue events into our analysis and prepare for them, however unlikely events.

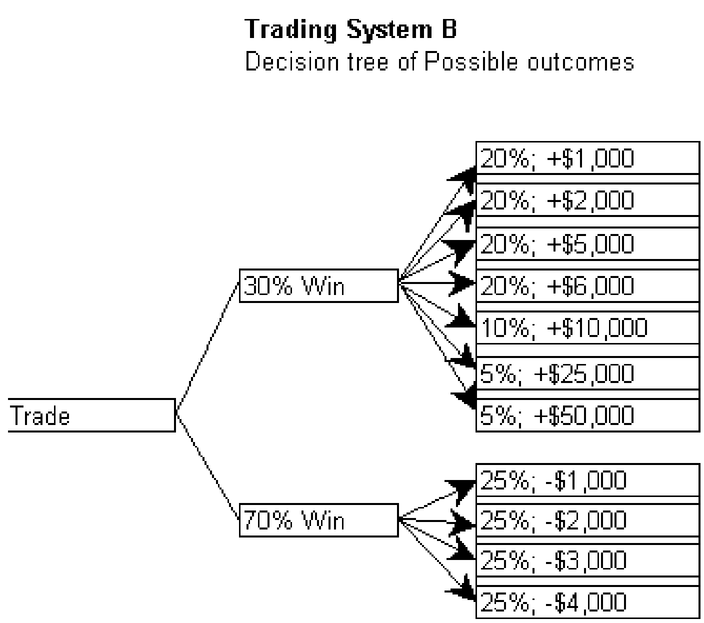
The probability of going broke, which is called the risk of ruin in portfolio management, is another paramount concern. While the chance of system “A” going broke is remote, it is still a possibility that must be considered. Risk of ruin can be controlled or eliminated by reducing the amount risked per trade, increasing the size of the trading account, or both. However, this added confidence comes at the expense of having more capital tied up, thereby reducing the net rate of return of the I system.

In reality, the trading systems we will develop will not have such a simple set of returns. Therefore, let us look at a more complex illustration. We will analyze another hypothetical trading system.

TRADING SYSTEM B

Parameters for system “B” in decision-tree format. A decision tree is simply a representation of all the possible sequences of outcomes, and the probabilities attached to each outcome. As our StrategyLand simulations become more advanced, a decision tree makes it easier to visualize the logic.

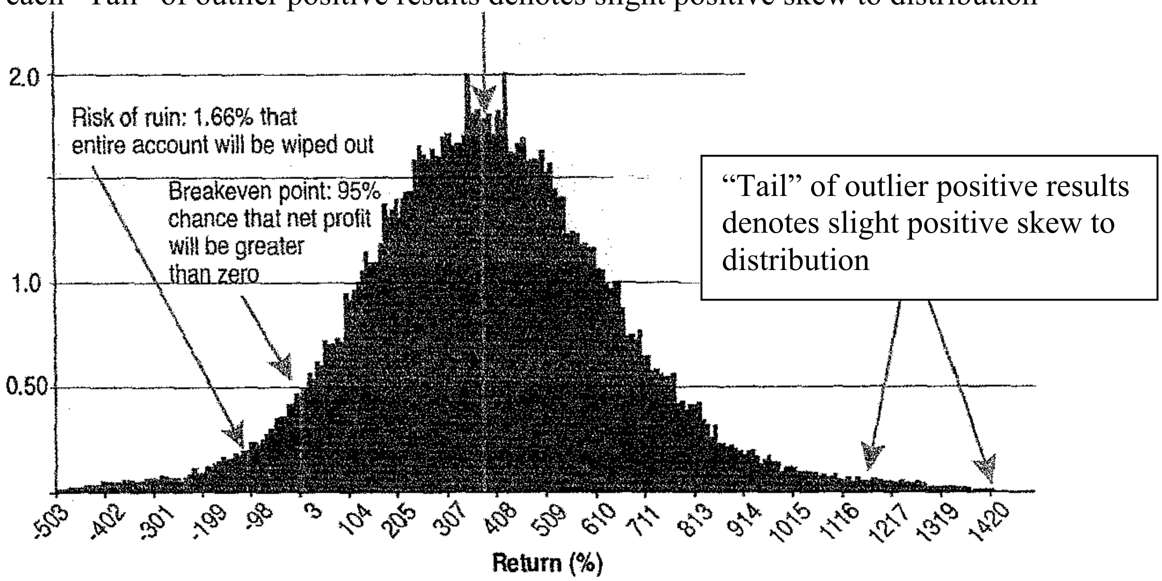
We can see from the decision tree that there are quite a few more outcomes in system B. Our win-loss ratio is lower than in system A - only 30% winning trades this time. However, the winning trades produce larger net wins, with (small) chances of extremely big winners.



PARAMETERS OF TRADING SYSTEM B. Here you see the parameters in decision-tree format. Only 30% of the trades are winners, but those trades produce large net wins.
Team at StrategyLand ran 50,000 trials of 1,000 consecutive trades. The strategies return an average of 380%, and only 5% of the trials ended up losing money. The risk of ruin is 1.66%. From the decision tree alone, it isn't readily obvious how favorable this system is. When we can see the simulation results presented graphically, the interpretation becomes much more obvious.

StrategyLand Simulation- Trading System B

Average: 380%, standard deviation: +/-232%, results of 50,000 trails of 1,000 trades each "Tail" of outlier positive results denotes slight positive skew to distribution



StrategyLand Simulation of Trading System B. The average return of this system is 380%. The download is limited because of slight money management.
The distribution is slightly skewed, with a "tail" to the right side of the distribution. This phenomenon is referred to as *positive skew.* Because of this system's tight money management, the downside is limited as losses are cut. Most of our trades turn out to be either small winners or small losers. However, the occasional trade turns into a big winner. If we are fortunate and hit several of these big winners in a relatively short period of time, then our performance can be substantially above expectations. Since we are controlling our downside risk in this case, we do not see the same tail on the left (negative) side of the distribution.

EQUITY CURVES

A drawback of the frequency distribution that the StrategyLand analysis provides is , that it only shows the net results of trading at the end of the sample period. One way to complement the StrategyLand system is by looking at *equity curves.* An equity curve is simply a graph of hypothetical or actual account equity over time.

If we concentrate our analysis on just the first 100 trades or so from each equity curve, it will not be clear whether we have a successful system from such a small sample. It is only when we look at a sufficiently large number of trades that we can see the upward bias to the model. This effect stresses the importance of simulating a sufficient number of sequential events that are realistic for a particular trading time horizon.

If we re-run the same simulation over a different number of trades, say 100 trades or 10,000 trades, we will get different results. Testing our StrategyLand simulations over a period that is realistic for our trading plan allows us to manage our expectations appropriately. If we test and simulate 10 years of trading a particular model and find it to be sufficiently profitable over that horizon, then we should not become upset if we don't make a profit in our first month of trading the system.

A glance at the equity curve graphs tells us that the most significant lesson to learn is that there is no "get-rich-quick" solution, at least not without accepting substantial levels of downside risk. The trader with phenomenal short-term success must force himself to make a quick ego check to consider the possibility that his run was due to exceptional luck, rather than exceptional skill! If you are willing to accept a sizable risk of ruin, then massive profits are indeed possible - but so is massive bankruptcy. If you want to maximize your upside exposure while controlling downside risk at the same time, then slow, controlled accumulation of wealth, cutting of losses, and diversification of trades is the only safe course.

PORTFOLIO MANAGEMENT

The analysis I have just made assumes that we only have one trade on at a time, but let's go back to the casino. Imagine you are playing five slot machines at once. If all five machines lose or win simultaneously, you will be making or losing money five times as fast as if you were playing just one machine. You will need to make sure your bankroll is large enough to handle the ebbs and flows that the game requires. The same concept holds true for your trading account. By adding additional parameters to the StrategyLand method, we can add variables simulating multiple open trades with varying trade lengths to get a better idea of what sort of funding will be required.

We also need to be aware of the average duration and frequency of historical trades when we evaluate our equity curves and StrategyLand results. The returns for our 1,000- systems seem good if the average trade length is just a few days, the system generates a large number of signals, and we are diversified across many markets. If, however, the average trade length is several months, the system only generates signals at irregular intervals, and it is designed for a limited number of markets, then it may take decades to turn over those 1,000 trades.

CAVEATS

It is not as simple to model trading results as it is to model a casino game. One issue is the *quantity of* input data. If the results programmed into a StrategyLand simulation are only based on a few historical trades, the reliability of the results will be in serious question. The second issue is the *quality* of the input data. If a system has been heavily optimized to historical data, commonly referred to as *curve-fitting,* then its predictive value will be highly questionable, regardless of what the StrategyLand simulation may indicate.

The final caveat revolves around the terms *probability* and *random,* which have been mentioned numerous times in this article. Many students of the market will take exception to the argument that sequences of trades are as random and independent as a series of dice rolls. However, those who advocate applying statistical methods to trading will argue that reducing a trading system to a set of probabilities will take the emotion out of trading. The objective trader will be far less susceptible to the emotional ebbs and flows of trading than the discretionary trader will. You must decide if you are comfortable with these underlying premises before adopting these tactics into your own trading strategy.

SUMMARY

Once armed with a good system and a robust analysis of its results, we must have the discipline to follow it objectively. To second-guess the system is to throw all the analysis out the window. As with any system, there will be periods of feast and famine, but if we have done our homework, the long- term accumulation of wealth will be in our favor.

Nonetheless, a blind allegiance to the system can be just as fatal. A periodic dose of common sense is always required. We must also step back once in a while and make sure the system is meeting our desired goals. If the system has failed to live up to expectations, if you develop a system you like better, or if market dynamics have changed from the time of the original analysis, then it is time to evaluate other choices.

StrategyLand simulations provide a valuable asset to simulate the sensitivity of a trading system to an array of market conditions.

Tips of The day

Before we close our lesson, do you know the following

Emini S&P	1 point is = $ 50
Emini Nasdaq	1 point is = $ 20
Eurostoxx-50	1 point is = € 10
FDAX	1 point is = € 25
Euro	1 pip is = $12.5

This concludes lesson 6.
In our next class we will learn about:-
Auto trading in real life advantages
Dangers and pitfalls - overloading leading to strategy errors, greed etc.

Remember: Any trading game is one persons loss and other persons gain, and money travels from the less knowledgeable to the more knowledgeable people and who use smart tools.
