TRADING SYSTEM EQUITY GROWTH
By
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INTRODUCTION

Many among the great unwashed believe that making profits from the market has the same random probability as gambling. Their beliefs are reinforced by popular books such as "A Random Walk Down Wall Street". This belief persists although patently false and intellectually dishonest. More serious investors look at fundamental considerations such as P/E ratios, Sales, Debt, etc., and give scant attention to technical analysis. The technique described in this article not only show that there is merit to trading using technical analysis trading systems but also enable you to visualize what equity growth performance you can reasonably expect from your system.

There are basically two ways to trade using technical analysis – Discretionarily and Systematically. Discretionary traders can, and have, made spectacular amounts of money. They integrate their life's experience, knowledge of the markets, and technical indicators to make their trading decisions. System traders, on the other hand, need know very little about the market or have much experience. Instead, they rely on the trading signals automatically produced by rules implemented by computer programs. They have the confidence to rely on the computerized systems because the performance statistics can repeatedly be produced by backtesting. There are all kinds of ways to cheat on backtested performance, but this is an article about what you can realistically expect from your trading system rather than how to cheat the statistics.

SYSTEM STATISTICS

There are a number of statistics that are important if you are putting your hard-earned money at risk. Maximum drawdown is important because that, plus required margin, is the absolute minimum amount of money you should have in your account to avoid a margin call with reasonable probability. The average profit per trade is important to know because you must cover your transaction costs, commission plus slippage, before you can start making money for yourself. The number of consecutive losers is a test of how strong your stomach must be to trade the system.

Taking away all the details of the particular system, there are two statistics that enable you to assess what performance you can expect. These are the percentage of profitable trades and the profit factor. It is desirable to have as high percentage winners as possible, but not necessary to be greater than 50% to be profitable if you make more on winning trades than you lose on losing trades. Profit Factor is the ratio of Gross Winnings to Gross Losses. In terms of gaming, it is the payout probability. By determining whether a trade is a winner or a loser using a random number generator, applying the payout probability to each trade, and summing the randomly selected trades we can provide realistic expectations of the equity growth produced by the system will look like. Only in this sense can randomization be introduced to establish performance. Simply winning or losing is not a random occurrence.

EQUITY GROWTH GENERATOR

We can make an equity growth simulator and plot the results in an Excel spreadsheet. We need to first insert the two important statistics. In cell A1 type "% Winners" and in cell A2 type 45. In cell B1 type "Profit Factor" and in cell B2 type 1.6. The values of 45 and 1.6 are only initial values. Later, you can change either of these constants to visualize their impact on equity growth.

In cell A3 input =RAND(). This creates a random number having a uniform probability density in the range between 0 and 1. We compare this random number to the probability of a win by inserting =IF(A3<B1/100,B2,0). This conditional statement says that if the random number falls within the winning probability then assign the payout probability (the Profit Factor) to the trade, otherwise assign a value of –1 to the trade. This is the outcome of the trade. In cell C3 input =B3. Copy all of row 3 into row 4. Then change cell C4 to be =C3+B4. Thus sums the trades in column C. Next copy all of row 4 and paste into rows 5 through 500. Column C now becomes the equity growth for the randomized set of trades using only the percent winners and Profit Factor. This equity growth changes every time you double click on cell C3 and then press enter, causing the spreadsheet to recalculate.

You can plot the equity curve for ease of interpretation. To do this, highlight cells C3 through C500. Then click on the chart wizard and input the data as requested. First, select a line type chart and click on the type shown in the upper left-hand corner of the thumbnail examples. Click Next. Then click Finish. Your chart is done! Now you are free to experiment with the kind of equity growth you can expect from your trading system. Just double click in cell A3 and press Enter. You will create a new randomized equity growth curve. Repeat as often as you desire to get a feeling you know what to expect. Figures 1 and 2 are just two examples we ran using the default statistics.

Another interesting way to evaluate a system is provided by a commercial software product called Portfolio MCS (footnote: Inside Edge Systems Corp, 10 Fresenius Road, Westport, CT 06880, (203) 454-2754, www.insideedge.net). MCS stands for Monte Carlo Simulator. Portfolio MCS evaluates the risk/reward of a trading system by taking the real trading results of each trade and running the performance a large number of times with the order of the trades taken in a random sequence rather than in the order they occurred in a back test. This is a Monte Carlo Simulation of back tested trading results. This procedure creates bell curve statistics so the deviation from the mean establishes an expection of the drawdown the system will produce. Portfolio MCS extends the analysis from a single system to multiple systems or the same system on multiple securities so you can minimize the risk in overall portfolio performance.

To see what a nice equity growth curve looks like, change cell A2 to 50 and cell B2 to 2.0. MESA Software is among the few systems developers that have systems with statistics such as these. You can see the equity curves of some of our systems at www.mesa-systems.com. Next, let's explore what the lower limit statistics might be for a profitable trading system. Our experience is that the boundary is 42 in cell A2 and 1.5 in cell B2. Explore for yourself.

CONCLUSIONS

We hope this randomized generation of equity curves, given the global statistics of a trading system, will help you have a realistic expectation of how your trading

system will perform. More importantly, we hope we have given you a tool to evaluate a trading system you are developing or considering purchasing.
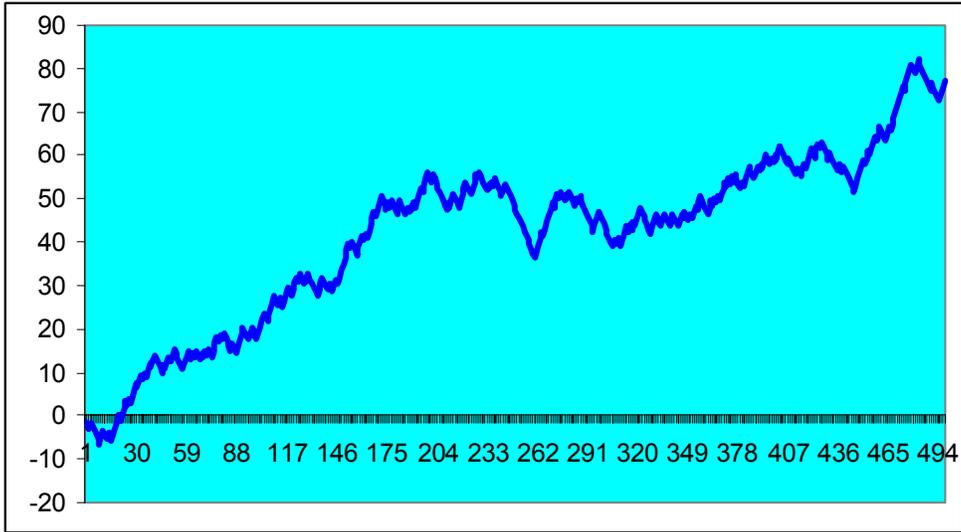
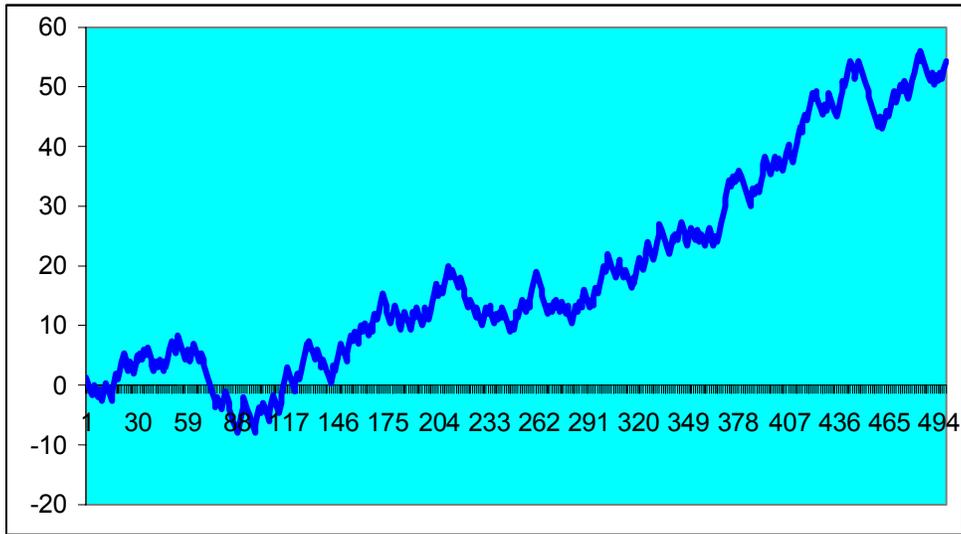Figure 1. Hypothetical Equity Growth for %Profitable=45 and P.F.=1.50

Figure 2. A Second Hypothetical Equity Growth for %Profitable=45 and P.F.=1.50