



Monte Carlo Sims: Your New Best Friend

By Dorice Maynard

Monte Carlo simulations were the first tool we ever created for EIA analysis. They are used in several current MCP Premium programs: MC-Sim, Sim Study (both of the Portfolio Tools Module), and MC-Planz (of the EIA Comparisons Module). We have big plans to more fully integrate Monte Carlo reports in the MCP Suite 2007 versions, making it even easier to use.

In general, a "Monte Carlo simulation" is a mathematical way of evaluating or measuring all possible outcomes of a future event. Although this type of statistical modeling originated with the U.S. military in the 1940's, it is now quite popular with businesses and even the financial services industry.

Here's why: Attempting to forecast a future value of an investment that does not have the same rate of return each year poses problems. One way to get around this has been to look at past performance over a set period, calculate the average rate earned over that period, and apply that percent to each year in an attempt forecast future results. There are several problems with using this method for investments: it is inaccurate, it is unreliable, and it misrepresents the volatile nature of investments having a return tied to something as variable as the stock market.

Monte Carlo simulations, on the other hand, allow for a more realistic picture of future growth. They allow the possibility of losses to enter into the equation and as used in our software, invite additional rates of return to be factored in that may have not actually occurred yet. This is because we work within a historical range of stock index returns and don't restrict ourselves to just the rate of return that actually occurred. Let me explain further.

In our AnalyzeTHIS program, you get to evaluate the entire scope of stock index returns. However, many users feel most comfortable working with the returns of the last 10 years. With the S&P 500 for example, each year's annual return percentages look something like this: 34.11, 20.26, 31.01, 26.67, 19.53, -10.14, -13.04, -23.37, 26.38, and 8.99. Some Monte Carlo simulations will use only these exact values and simply alter their order at random. This method has a shortfall: How often do the exact same returns ever show up again, in reality? And statistically speaking, it severely limits the pool of numbers to work from to 10. In MCP Premium software, we solve this by looking at historical data more the way a financial analyst would.

When you export the last 10 years of S&P 500 stock index data as listed above to our Monte Carlo simulation tool, MCPlanz, it will set up a range with 34.11 (the highest return in the last 10 years) as the "Maximum Return" and -23.37 as the "Minimum Return" (the lowest return in the last 10 years). When a simulation is run, our program will at random select a

number that is in between 34.11 and -23.37, calculate the investment growth, choose another number, calculate, so on and so on until all years in your desired scenario have been calculated, and then sets aside the final ending value. This is repeated 1,000 times and results in a thorough statistical forecast that is still based on historically what the stock market returns have been.

The resulting reports present a realistic picture of what future results could be like. Using just the simple historical reporting in EIAAnalyst2, you will find that an S&P 500 investment of \$10,000 in 1995 would have grown to \$26,388 - an average rate of return of 12.04%. But this doesn't tell the "real" story. Using the ranges discussed previously, when you run a 10-year Simple Growth Scenario in MC-Planz you find that a \$10,000 investment had its highest probable ending value (39.8%) falling between \$13,401 to \$23,523 with a 22.5% Probability of Loss. This "Probability of Loss" is a percentage reflecting the number of times (statistically speaking) that an ending value was less than the original investment amount. You can verify by adding up any ending values (Page 4) that were less.

Some final notes: These reports are an awesome way to demonstrate how the reset properties of an EIA protect investment growth. The process will be much more simplified in 2007 versions through the use of Wizards and as a by-product of your historical hypothetical comparisons.

For more details on the power and simplicity of Monte Carlo simulations, register for a Demo Webinar today!

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