By Allan Roth CBS MoneyWatch February 22, 2010

Is Financial Monte Carlo Simulation Dead?

Monte Carlo Simulations are a modeling tool used to simulate reality and calculate probabilities of a portfolio supporting a certain withdrawal rate. With the market collapse of 2008, however, many people who relied on these simulations, and thought they were safe, found themselves in trouble. Indeed, Monte Carlo simulations have been attacked widely. Here's my take on the viability of this tool.

How Monte Carlo Simulation Works
This simulation relies on certain inputs such as:

- Current portfolio value
- Estimates of future contributions to portfolio
- Estimated annual average return
- Estimated volatility of the portfolio
- Estimated withdrawal amounts at retirement

The model then runs a thousand or more outcomes and generally predicts the likelihood of your portfolio lasting a certain number of years.

Most Monte Carlo Simulations are Garbage
Over the years, I've reviewed many Monte Carlo simulations and outputs run on those simulators. I'd say that roughly 99 percent of those are using assumptions that only exist in a fantasy world. I've seen simulations run using a base average return of 10% annually and then adding a couple of percent to reflect the planner's stock picking ability. Other models have a default of volatility that could only exist in a world where the stock market would only lose six percent in every one of forty years.

I'd argue, however, that it's not the Monte Carlo simulation that's flawed, but rather the garbage that is input into the simulation. Put another way, "garbage-in, garbage out."

Other Flaws of Monte Carlo Simulation
Beyond garbage inputs, Monte Carlo suffers from other flaws. Jim Otar, founder of **RetirementOptimizer.com**, notes the following flaws in his new book, **Unveiling the Retirement Myth**.

Otar states that the problems include how the models generate randomness, how trends are generated, and how the sequence of returns are formed. Otar notes that his retirement calculator relies on actual returns over the past hundred years and avoids the pitfalls he noted in Monte Carlo Simulation.

I spoke to Jim and he was kind enough to show me his model. I found it very impressive but, like any model, it was easy to put in garbage inputs to get the same garbage that Monte Carlo could produce. I gave Otar a portfolio value and mix and asked him to estimate a safe spend rate. He ran the model and got almost identical results to my own Monte Carlo simulation, using almost identical inputs. I found there was a 90 percent probability that one could safely spend four percent of one's portfolio for 25 years, while Otar's model gave that 90 percent of outcomes for thirty years.

Predicting the Future is Really Hard
I'm brilliant at predicting the past, but the future is another matter. While Otar disagrees, relying on the past 100 years, and no possibilities beyond those outcomes, has flaws not found in Monte Carlo simulators. For example, another terrorist event like 9/11, with all of its financial ramifications, is a real possibility.

My Take on Modeling
The goal of financial planning is to develop a nest egg to support the desired standard of living we hope to achieve in our retirement. That involves forecasting the future no matter which technique is used. Since the penalty for outliving your money is greater than the penalty of dying with money, one should use very conservative inputs.