

Lesson 3: Monte Carlo Simulation

Monte Carlo simulation generates random numbers and operator inputs to synthetically create probability distributions for variables. It is used to calculate expected values and dispersion measures of random variables, which are then used for statistical inferences.

Investment Applications

- To experiment with a proposed policy before actually implementing it.
- To provide a probability distribution that is used to estimate investment risk.
- To provide expected values of investments that can be difficult to price.
- To test models and investment tools and strategies.

Limitations

- Answers are as good as the assumptions and model used.
- Does not provide cause-and-effect relationships.
- It does not provide any cause-and-effect relationship information.

Historical simulation assumes that the distribution of the random variable going forward depends on its distribution in the past.

Advantage

- The distribution of risk factors does not have to be estimated.

Limitations

- A risk factor that was not represented in historical data will not be considered in the simulation.
- It does not facilitate “what if” analysis when the “if” factor has not occurred in the past.
- It assumes that the future will be similar to the past.

