Monte Carlo Simulations: Advanced Techniques

SECOND EDITION
Special thanks to Neil J. Beaton, CPA/ABV, CFA, ASA, for his expert guidance and contributions to this special report.
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*Editor's Note: BVR is pleased to present the second edition of this special report, which is based on two webinar workshops.*
Introduction

By Neil J. Beaton, CPA/ABV, CFA, ASA

Valuation professionals are constantly presented with challenging client needs, such as valuing new, often exotic securities with a variety of features that defy standard valuation techniques. Monte Carlo simulations can help bridge that gap. In this report, a group of valuation experts explain how to apply Monte Carlo techniques to a broad spectrum of valuation issues. In the first edition, David Dufendach and Jason Andrews covered the basics of what is included in Monte Carlo, how to consider applying the analysis, and how to use the information developed from the simulation. This second edition adds more detailed and complex examples of Monte Carlo applications, with Dufendach joined in discussion and analysis by Randy Heng, Oksana Westerbeke, and Jared Hannon.

The Monte Carlo analysis arose out of computer simulations created to address equilibrium properties for specific experiments. Prior to the advent of computers, the outcome of an experiment could be predicted in only one way: by making use of a theory that provided an approximate description of the system under consideration. An approximate theory was used because very few model systems could compute exact equilibrium properties. As a result, most properties of real materials were predicted on the basis of approximate theories. However, approximate theories required one to execute an experiment and then compare the results with the thesis. This was suboptimal because such experimentation and feedback took so much time. With the advent of computer simulation, researchers were able to obtain essentially exact results for a given model system without having to rely on approximate theories. It is from this original work that Monte Carlo has found its way into the world of valuation.

Numerous versions of simulation software are out there. The contributors to this report have used Oracle’s Crystal Ball, and thus their references are specifically to that software, but others may be used.

With this report, Dufendach and his fellow experts have taken Monte Carlo simulations out of the laboratory and into the workplace. Monte Carlo simulations are explained and applied to real-life valuation problems so that any valuation professional will be able to understand the underlying concepts and begin the journey to full appreciation of this technique. Modeling examples and useful applications are explained, and minefields or potential problems are exposed.

The four appendixes provide a valuable trove of additional information on incorporating Monte Carlo analysis into a business valuation practice. Appendix 1, an article by the BVR staff, explores the diffidence that many business valuation experts feel in approaching Monte Carlo and offers tips from those who have taken the plunge. Similarly, Appendix 2 deals with the reluctance of valuators to defend this still-unfamiliar method in court and illustrates its successful use by others. In Appendix 3, David Dufendach ties Monte Carlo together with the accounting rules that are
specific to valuation under generally accepted accounting principles. Steve Hoye of Oracle discusses in Appendix 4 how Crystal Ball, a software application widely used for Monte Carlo analysis, is currently being used both in Monte Carlo and other applications.

This report is essential for practitioners wishing to elevate their valuation analyses of complex assignments requiring more than what traditional valuation procedures can provide. I highly recommend it for that purpose.

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About the Contributors

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Monte Carlo Simulations: Advanced Techniques, Second Edition

In the ongoing search for simple, easy to explain valuation methods, many appraisers have given wide berth to Monte Carlo simulations, fearing their perceived complexity and unsure of their proper implementation. In doing so, valuable insights and metrics may have been missed, potentially at the peril of the appraiser.

Essential for practitioners who wish to elevate their valuation analyses for complex assignments, Monte Carlo Simulations: Advanced Techniques is a new report that takes simulations out of the laboratory and into practical application. Experts explain Monte Carlo simulations and how they can be applied to real-life valuation problems and readers will learn how and when to use Monte Carlo simulations, as well as be able to identify pitfalls and prepare for potential problems.

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