

Chapter 8. Static Risk Management Options

“Derivatives are nothing more than a set of tools. And just as a saw can build your house, it can cut off your arm if it isn’t used properly.” Walter D. Hops, Treasurer, Ciba-Geigy, *Business Week* (October 31, 1994), p. 98.¹

Introduction

In this chapter, we explore various static risk management issues related to option contracts. Module 1 and 2 focus on applying the binomial framework that converges to either the lognormal distribution consistent with geometric Brownian motion or the normal distribution consistent with arithmetic Brownian motion. Three methods for computing Greeks (delta, gamma, theta, vega, and rho) are introduced, the standard method, the enhanced method, and the numerical method.

Module 3 and 4 focus on the continuous time versions based on GBM and ABM, respectively. Measurement error is explored between the binomial and continuous time models. Further, detailed derivations of the Greeks are also provided. Finally, various sensitivities are explored between the Greeks and underlying parameters. Module 5 addresses compound option static risk management. Detail derivations of the Greeks are provided.

¹For this and many other great quotes, see Don Chance’s website:

<http://www.bus.lsu.edu/academics/finance/faculty/dchance/MiscProf/DerivaQuote/Qot2.htm>.