Corporate Finance, Module 23: “Advanced Option Valuation”

Required reading, Eighth Edition:

(The attached PDF file has better formatting.)

Updated: November 22, 2005

{The Brealey and Myers textbook is excellent. We say to read certain sections and to skip others. This does not mean that certain sections are better; it means that the homework assignments and exam problems are based on the sections that you must read for this course. Some of the skipped sections are fascinating, but they are not tested.}

Review section 20.2, “Financial Alchemy with Options,” on pages 546-552. You read this for Module 20; make sure the put call parity relation on page 549 is crystal clear, since we use this relation often.

Read the sub-section “Spotting the Option” on pages 550-552. When spotting options, ask a series of questions:

- What is the risky asset or liability? (This is the underlying security of the option.)
- What is the non-risky asset or liability? (This is the strike price.)
- How does volatility of the risky item affect the value of the option?
- What are the rights of the option holder that affect the option value?

Read section 20.3, “What Determines Option Values,” on pages 552-558. Understand and memorize table 20.2 on page 557. The understanding takes time and review of problems; first memorize the table so you know what to expect. The final exam poses multiple choice questions on these relations.

Read section 21.3, “The Black-Scholes Formula,” on pages 575-578, including the sub-section “Using the Black-Scholes Formula” on pages 577-578, but skipping the sub-section “The Black-Scholes Formula and the Binomial Method” on page 559. Black-Scholes has four formulas:

- the value of the call option (top of page 576 and bottom of page 577)
- the value of the put option (derived from call option by put call parity)
- the value of d_1 (top of page 578)
- the value of d_2 (which is $d_1 - \sigma\sqrt{t}$)

On CAS Exam 8 and SOA Course 8 Investments, we derive the Black-Scholes formula. For the on-line corporate finance course, know how to use the formula; that is, know what each of the input parameters means. The final exam gives the equations (so you need not memorize them), but unless you have worked a few examples, you will be stumped.

Skip section 21.4, “Black-Scholes in Action,” on pages 579-581. Read section 21.5, “Option Values at a Glance,” on pages 582-584. American put options, European call and put options on dividend paying stocks, and American call options on dividend paying stocks are increasingly hard to price, and we do not have simple formulas (like Black-Scholes) that give exact values. The final exam does not ask you to price these options, but you must understand what each one means.