

## Corporate Finance, Module 1: "Present Value and the Opportunity Cost of Capital"

*Readings for Tenth Edition (2010)*

(The attached PDF file has better formatting.)

Updated: October 9, 2010

The page numbers here are for the *tenth* edition of Brealey and Myers. You may also use the seventh, eighth, or ninth editions of this text. The page numbers for earlier editions are in separate postings. The substantive changes in the textbook are slight among these editions, but the final exam problems are based on the tenth edition.

Chapter 1 is an introduction to the textbook; no final exam questions are taken from the first chapter. Module 1 deals with present values, which candidates use every day in their work. Read Chapter 2 of Brealey and Myers, sections 2.1 and 2.2 on pages 20-33. Brealey and Myers use a net present value (NPV) rule, which is equivalent to a rate of return rule; see the bottom of page 25. For investment courses, you must know compounding frequencies and the difference between a discount rate and an investment yield. For SOA Course FM (CAS Exam 2), you focus on compounding frequency, such as annual effective yield vs continuously compounded yield. We use these concepts in the corporate finance VEE course, but this is *not the focus* of the course.

The opportunity cost of capital considers the risk of default. For example, suppose a risk-free investment of \$1,000 gives a return of \$1,100 at the end of the year. A second investment has a 10% chance of defaulting and paying nothing at the end of the year. What is the appropriate return for the second investment if it does not default?

One is tempted to say:  $90\% \times Z + 10\% \times \$0 = \$1,100 \Rightarrow Z = \$1,100 / 90\% = \$1,222$ , or a 22.2% return. But this is not correct. A promised return on \$1,222 with a 10% chance of default is an expected return of 10%. If the investment has no systematic risk, the proper expected return is indeed 10%, or a return of 22.2% if the security does not default. If the investment does have systematic risk, the expected return must be greater than 10%, for a return in the no-default scenario higher than 22.2%.

We discuss these issues in later modules. For now, know that expected return are adjusted for expected defaults and for systematic risk.

Section 2.3 on pages 33-35 cover growing annuities and perpetuities, which is covered in greater depth on SOA Course FM (CAS Exam 2). If you have already taken Course FM, you know this material; if you have not yet sat for Course FM, you must learn this material anyway.

Know the formulas for the present value of perpetuities and growing perpetuities and the present value of annuities. The notation for Course FM is slightly different, but the formulas are the same. This corporate finance VEE course focuses on the financial theory, not on

annuity valuation. The final exam questions can be solved by present values of cash flows, but the annuity and perpetuity formulas simplify the mathematics. The formulas themselves are *not* tested on the corporate finance VEE exam.

The annuity and perpetuity formulas are used for the present value of perpetual debt. The debt always itself has a maturity; it is not permanent. Perpetual debt means that the firm intends to refinance the debt at its maturity. The formula to evaluate the tax shields from perpetual debt is used for the capital structure modules of this course.

Read Section 2.4, "How Interest is Paid and Quoted," on pages 35-39; know the formula in the second paragraph on page 36. Candidate new to financial economics sometimes think a 10% semi-annual coupon bond pays the par value  $\times (1.10^{0.5} - 1)$  each half year, for an annual effective rate of 10%. This is not correct; the bond pays 5% each half year, for an annual effective rate of 10.25%.

The summaries at the end of chapters are good reviews for the final exam. Read the Summary for this module on page 39.

The quiz at the end of each chapter is useful for checking that you understand the material. Review problems 1-9 on pages 39-40; these questions require little computation and similar problems are tested on the final exam. Review problems 17 and 18 on page 41.

Some final exam problems ask for the change in present value if the discount rate increases or decreases by a given amount.

The textbook questions are *not* the homework assignments for this course, though they help you review the material. Illustrative test questions, problems, and homework assignments are shown separately on the discussion forum.