

Chapter 4. Valuation Bonds and Stocks

“Underlying all practical problems in connection with the financial aspects of the corporation, there is the problem of value.” Arthur Stone Dewing [1941]

Introduction

Starting with this chapter, we adopt a particular template for presenting modules. Each module will start with learning objectives and an executive summary. The goal here is simply to inform you on what you can expect to learn from the particular module. Second, the central finance concepts will be examined from a non-quantitative perspective. You can view this section as sort of the 30,000 foot view from on high. Most trade books and many textbooks are written with this approach. Once the big idea is covered, we turn to the quantitative finance materials. In this section, the detailed formulas and quantitative techniques are examined and where possible numerical examples illustrated. The final section will cover selected R code excerpts with related commentary. Most of the time, most of the code will not be reviewed. The R code is provided electronically, and the R code is heavily commented to aid your understanding.

In this chapter, we present different ways to compute the value of stocks and bonds. The objective here is to introduce these methods within the R framework. We explore here various valuation issues related to U.S. Treasury bonds, corporate bonds, and stocks.

Many of the techniques and valuation analysis are unique. The goal is two-fold: First, we seek to encourage you to be creative in the way you appraise value. Remember, finance is and will always be a social science. Hence, value is subjective and will never submit to solely mechanistic equations unless it is tautological. For example, many financial analysts think they can value a bond by simply inputting the yield to maturity into the appropriate bond value formula. Although true, this is simply a tautology. That is, the yield to maturity was found by taking the bond market price and solving for the implied yield to maturity. Although there are benefits to these types of tautologies, professional financial analysts need better valuation tools.

Second, we seek to introduce you to innovative valuation approaches that will ultimately improve your financial decision-making skills. If we can break out of the tautological valuation approaches, then we can better appraise relative value.

Each of these programs is presented in separate modules. In the remainder of the book, we will provide some commentary on R code implementations of quantitative finance applications. Again, the advantage of this approach is your ability to skip around and focus solely on those modules most important to you and allow you to develop on whatever R code you desire. As many risk management modules require valuation calculations related to stocks and bonds, this chapter is foundational. As before, there will be some effort to make each module stand alone. Another advantage of this modular approach is your ability to find the source code within the materials you downloaded from the website.