

Chapter 7 Introduction to Risk and Return

OVERVIEW

This chapter provides a historical overview of return and risk for various securities like stocks, bonds, and T-bills. It lays the foundation for understanding risk and return, which is crucial for financial decision-making. It provides a method for estimating the opportunity cost of capital using historical data. It shows how to calculate the expected return and the standard deviation of returns for a portfolio. Finally, the concept of beta as a measure of risk is introduced in this chapter.

LEARNING OBJECTIVES

- To be able to explain the concepts of expected return, security risk, diversification, portfolio risk, and beta
- To be able to calculate expected return and variance of return (or standard deviation) for single securities and portfolios
- To be able to calculate the beta of a security or portfolio
- Diversification and value-adding property

CHAPTER OUTLINE

Over a century of capital market history in one easy lesson

This section presents long-run average rates of return for Treasury bills, government bonds, and common stocks. It explains that safer securities have yielded the lowest returns. To the extent that these long-run averages represent “normal” rates of return, they can be used as benchmarks for estimating current opportunity costs of capital. Several graphs and tables are provided. The method used for calculating the average annual return is shown. Historical data can be used to estimate current cost of capital. A risk premium for various countries is provided.

Measuring portfolio risk

This section discusses how past volatility of stock returns can be measured by their standard deviation or variance. It explains how diversification reduces portfolio risk and distinguishes between market risk and unique risk. The data on standard deviations and variances of annual returns for Treasury bills, government bonds and common stocks are given. The data on the standard deviation of annual returns of markets around the world are also given. A demonstration of how diversification reduces risk is given. This is an important concept and must be explained at an intuitive level also.

Calculating portfolio risk

The calculation of portfolio expected return and portfolio standard deviation (variance) is presented using a two-stock portfolio example. This includes the concepts of covariance and correlation coefficient. Diversification limits are shown. A stock's contribution to portfolio risk depends on its average covariance with the stocks in the portfolio.

How individual securities affect portfolio risk

This section makes one of the most important points in the book: The risk of a well-diversified portfolio depends on the market risk of the securities included in the portfolio. Market risk is measured by beta.

The methodology for estimating the beta of a stock is demonstrated. It is easier to understand risk in a relative sense rather than in an absolute sense. Beta is a relative measure of risk and provides a risk measure relative to the market risk that has a value of 1.

$$\text{Beta } (\beta) = \sigma_{im} / (\sigma_m^2)$$

Diversification & value additivity

Diversification makes sense for individuals. It does not make sense for firms. So long as investors have access to well-functioning capital markets, there are no benefits to the firm from diversification, and hence the value additive property holds.

$$PV(AB) = PV(A) + PV(B)$$