CHAPTER 1

THE INVESTMENT SETTING

I. Rationale for Investment

    A. Income streams and spending needs usually do not coincide
       1. If income is greater than spending – people tend to invest the surplus
       2. If spending is greater than income – people tend to borrow to cover the deficit

    B. People would be willing to forgo current consumption only if they are confident of achieving greater consumption in the future.

    C. The rate of exchange between future consumption (future dollars) and present consumption (current dollars) is the pure rate of interest. Market forces determine this rate.

    D. Investment is the current commitment of dollars for a period of time to obtain future payments that will compensate the investor for the time the funds are committed, for the expected rate of inflation, and for the uncertainty of the future payments.

II. Measures of Return and Risk

    A. Measures of Historical Rates of Return
       1. Holding Period Return (HPR) - the total return from an investment, including all sources of income, for a given period of time. A value of 1.0 indicates no gain or loss.

$$HPR = \frac{Ending\ Value\ of\ Investment}{Beginning\ Value\ of\ Investment}$$

       2. Holding Period Yield (HPY) - the total return from an investment for a given period of time stated as a percentage.

          HPY = HPR - 1

          Annual HPR = $HPR^{1/n}$
          where:
          n is the number of years the investment is held

    B. Computing Mean Historical Returns
       1. Mean rate of return - the average of an investment's returns over time.
       2. Single Investment
          a. Arithmetic Mean (AM) - a measure of mean return equal to the sum of annual HPYs divided by the number of years.

$$AM = \Sigma \ HPY/n$$

b. Geometric Mean (GM) - the nth root of the product of the annual holding period returns for n years, minus one (1).

$$GM = [\pi HPR]^{1/n} - 1$$
where:
π = the product of the annual holding period returns, i.e., (HPR) x (HPR_2) ... (HPR_n)

3. A Portfolio of Investments – The mean historical rate of return for a portfolio of investments is measured as the weighted average of the HPYs for the individual investments in the portfolio, or the overall change in value of the original portfolio. The weights used in computing the averages are the relative *beginning* market values for each investment; this is referred to as *dollar-weighted* or *value-weighted* mean rate of return.

C. Calculating Expected Rates of Return
1. Risk - the uncertainty that an investment will earn its expected rate of return.
2. Probability – the likelihood of an outcome
3. To compute the expected rate of return, the investor assigns probability values to all possible returns. These probabilities range from zero (no chance) to one (complete certainty).
4. Expected Return

$$\text{Expected Return} = \sum_{i=1}^{n} (\text{Prob. of Return}) \ x \ (\text{Possible Return})$$

$$E(R_i) = \sum_{i=1}^{n} (P_i)(R_i)$$

5. Risk aversion - the assumption that most investors will choose the least risky alternative, all else being equal and that they will not accept additional risk unless they are compensated in the form of higher return.

D. Measuring the Risk of Expected Rates of Return
1. Variance - a measure of risk equal to the sum of the probability of return times the squares of a return's deviation from the mean.

$$\text{Variance} = \sum_{i=1}^{n} (\text{Prob.})(\text{Possible Return} - \text{Expected Return})^2$$

$$\sigma^2 = \sum_{i=1}^{n} (P_i)[R_i - E(R_i)]^2$$

2. Standard Deviation (σ) - a measure of risk equal to the square root of variance.

3. Coefficient of variation (CV) - a measure of relative variability that indicates risk per unit of return. It is used to compare alternative investments whose rates of return and standard deviation vary widely.

$$CV = \frac{\text{Standard Deviation of Returns}}{\text{Expected Rate of Return}}$$

III. Determinants of Required Rates of Return

A. Rates of Return - vary over time and across investments (Exhibit 1.5).

B. The Real Risk-Free Rate (RRFR) - the basic interest rate assuming no inflation or uncertainty about future flows.
   1. Factors that influence this rate
      A. Time preference for consumption of income
      B. Investment opportunities available in the economy.
   2. This real risk-free rate is determined by the long-run real growth rate of the economy that is impacted by growth rate of labor force, hours worked, and rate of productivity
   3. A *positive* relationship exists between the real growth rate in the economy and the RRFR

C. The Nominal Risk-Free Rate (NRFR) – incorporates inflation
   1. Note the substantial variation in government T-bill rates over time (Exhibit 1.6)
   2. Factors that influence NRFR
      A. Conditions in the Capital Markets - Relative ease or tightness (this is a short-run phenomenon)
      B. Expected Rate of Inflation - this is a major influence (Exhibit 1.6)

      Nominal RRFR = (1 + RRFR) (1 + Expected Rate of Inflation) -1

      $$RRFR = \frac{(1 + \text{Nominal RFR})}{(1 + \text{Rate of Inflation})} - 1$$
   3. The Common Effect – all factors discussed thus far affects **all** investments equally irrespective of type or form.

D. Risk Premium – varies from asset to asset and is responsible for differences in rates of return between assets at a certain point in time. The major determinants of the risk premium are:
   1. Business risk – uncertainty of income flows caused by the nature of a firm's business. Sales volatility and operating leverage determine the level of business risk
   2. Financial risk – uncertainty caused by the use of debt financing
   3. Liquidity risk - the inability to buy or sell an asset quickly with little price change.
   4. Exchange rate risk - the uncertainty of returns on securities acquired in a foreign

currency.

5. Country risk – also called political risk. It is the uncertainty due to the possibility of major political or economic change in the country where an investment has been made.

E. Risk Premium and Portfolio Theory
- The relevant risk measure for an individual asset is its comovement with the market portfolio

F. Fundamental Risk versus Systematic Risk
- Fundamental risk comprises business risk, financial risk, liquidity risk, exchange rate risk, and country risk, while systematic risk refers to the portion of an individual asset's total variance attributable to the variability of the total market portfolio

G. Research studies have generally concluded that a significant relationship exists between the market measure of risk and the fundamental measures of risk

H. Required Rate of Return – minimum acceptable rate of return from an investment. Determined by the economy's RRFR, the variables that influence the NRFR, and the risk premium on the investment

IV. Relationship between Risks and Return

A. Security Market Line (Exhibit 1.7)

B. Movements along the SML - A movement along the line indicates a change in the level of risk for a given company or asset. (Exhibit 1.8)

C. Changes in the Slope of the SML - A change in the slope of the SML indicates a change in the attitudes of investors toward risk--i.e., a change in the required risk premium for a given asset or asset class. (Exhibit 1.10)

D. Shift in the SML (Exhibit 1.11)
Can be caused by a change in any of the following:
1. expected real growth in the economy
2. capital market conditions
3. expected rate of inflation.

E. Summary of Changes in the Required Rate of Return
1. A movement along the SML
2. A change in the slope of the SML
3. A shift in the SML