BUAD 340 Principles of Finance Fall 2018/Dr. Minor Risk and Return Handout 181026

Van Horne Chapter 5. Risk and Return

Portfolio Analysis

Determining Portfolio Expected Return

$$\bar{R}_P = \sum_{J=1}^{m} (W_j)(\bar{R}_j)$$

R_P is the expected return for the portfolio,
W_j is the weight (investment proportion) for the j^{th} asset in the portfolio,
R_j is the expected return of the j^{th} asset,
m is the total number of assets in the portfolio.

Determining Portfolio Standard Deviation

$$\boxed{\sigma_P = \sqrt{\sum_{J=1}^{m} \sum_{K=1}^{m} W_j W_k \sigma_{jk}}}$$

W_j is the weight (investment proportion) for the j^{th} asset in the portfolio,
W_k is the weight (investment proportion) for the k^{th} asset in the portfolio,
s_{jk} is the covariance between returns for the j^{th} and k^{th} assets in the portfolio.

Example 5.29. You are creating a portfolio of Stock D and Stock BW (from earlier). You are investing \$2,000 in Stock BW and \$3,000 in Stock D. Remember that the expected return and standard deviation of Stock BW is 9% and 13.15% respectively. The expected return and standard deviation of Stock D is 8% and 10.65% respectively. The correlation coefficient between BW and D is 0.75. What is the expected return and standard deviation of the portfolio?

W_{BW} = \$2,000/\$5,000 = 0.4
W_D = \$3,000/\$5,000 = 0.6

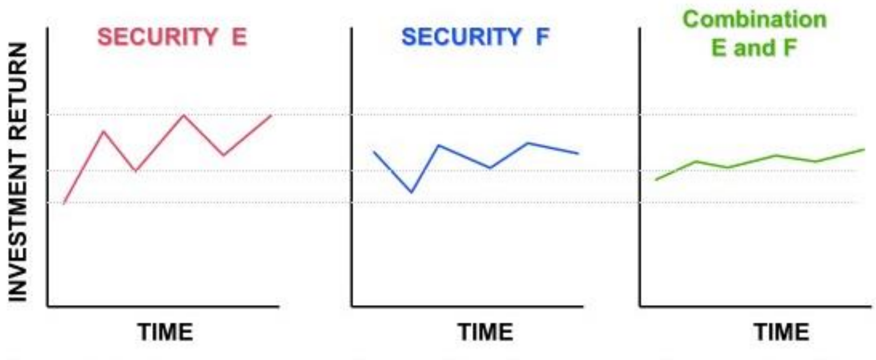
$R_P = (W_{BW})(R_{BW}) + (W_D)(R_D)$
$R_P = (0.4)(9\%) + (0.6)(8\%)$
$R_P = (3.6\%) + (4.8\%) = 8.4\%$

Portfolio Return versus Individual Stock Return and Risk

	Stock C	Stock D	Portfolio
Return	9.00%	8.00%	8.64%
Stand. Dev.	13.15%	10.65%	10.91%
CV	1.46	1.33	1.26

Which is the least risky investment?

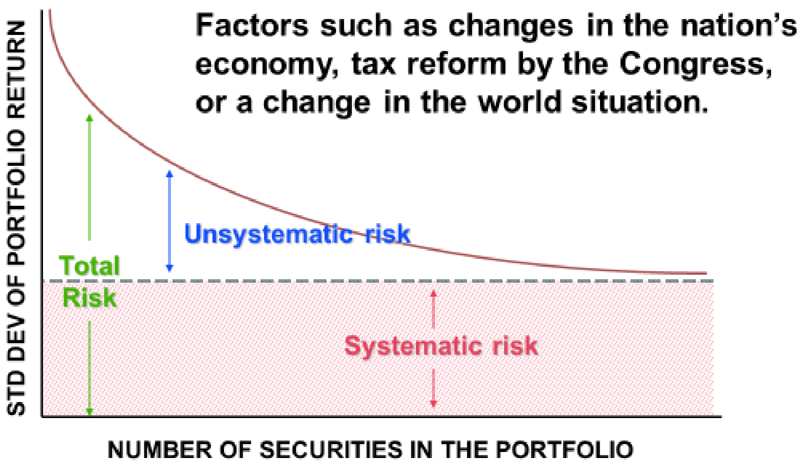
Diversification and the Correlation Coefficient



Combining securities that are not perfectly, positively correlated reduces risk.

Total Risk = *Systematic Risk* + *Unsystematic Risk*

Systematic Risk is the variability of return on stocks or portfolios associated with changes in return on the market as a whole.
Unsystematic Risk is the variability of return on stocks or portfolios not explained by general market movements. It is avoidable through diversification.



Capital Asset Pricing Model (CAPM

CAPM is a model that describes the *relationship* between *risk* and expected (required) *return*; in this model, a security's expected (required) return is the risk-free rate plus a premium based on the *systematic risk* of the security.

CAPM Assumptions:
1. Capital markets are efficient.
2. Homogeneous investor expectations over a given period.
3. *Risk-free* asset return is certain (use short- to intermediate-term Treasuries as a proxy).
4. Market portfolio contains *only systematic risk* (use S&P 500 Index or similar as a proxy).