Solutions to Problem Set 6

Corporate Finance, Sections 001 and 002

1. Because the proceeds from Year 1 are reinvested in Year 2 etc., the proper summary measure for returns is the geometric average of the annual returns. Thus, the geometric average returns are:

   Fund A
   $$= (1.16 \times 1.10 \times 1.14 \times 1.02 \times 1.04)^{1/5} - 1 = .090631$$

   Fund B
   $$= (1.3 \times .9 \times 1.28 \times 1.17 \times .98)^{1/5} - 1 = .114196$$

   The amount of money at the end can be calculated in either of 2 ways for each fund:

   Fund A
   $$= \$100(1.16 \times 1.10 \times 1.14 \times 1.02 \times 1.04) = \$154.308$$

   or $\$100(1.090631)^5 = \$154.308$.

   Fund B
   $$= \$100(1.3 \times .9 \times 1.28 \times 1.17 \times .98) = \$171.715$$

   or $\$100(1.114196)^5 = \$171.715$.

2. (a) The general formula for expected return for a two-security portfolio is:

   $$E(R_p) = X_1 E(R_1) + X_2 E(R_2)$$

   Also, the variance of return for a two-security portfolio is:

   $$\sigma_p^2 = X_1^2 \sigma_1^2 + X_2^2 \sigma_2^2 + 2X_1 X_2 \sigma_1 \sigma_2 \rho.$$

   Substituting the numerical values given in the question into these equations produces the following results (remember to take square roots or square terms where necessary):

	Expected Return	Standard Deviation
i)	.15	.200
ii)	.20	.200
iii)	.25	.245
iv)	.30	.316
v)	.35	.400

   (b) All portfolios *except* (i) might be chosen by an investor who likes mean and dislikes standard deviation. Portfolio (i) would never be chosen because its expected return is less than that of portfolio (ii) while the variances are equal.