

### Chapter 10 - Homework Questions and Problems Answers

**1. Calculating Returns.** Suppose a stock had an initial price of \$72 per share, paid a dividend of \$1.65 per share during the year, and had an ending share price of \$85. Compute the percentage total return. What was the dividend yield? The capital gains yield?

**Answer:** The return of any asset is the increase in price, plus any dividends or cash flows, all divided by the initial price. The return of this stock is:

$$R = [(\$85 - 72) + 1.65] / \$72$$

$$R = .2035, \text{ or } 20.35\%$$

The dividend yield is the dividend divided by price at the initial period price, so:

$$\text{Dividend yield} = \$1.65 / \$72$$

$$\text{Dividend yield} = .0229, \text{ or } 2.29\%$$

And the capital gains yield is the increase in price divided by the initial price, so:

$$\text{Capital gains yield} = (\$85 - 72) / \$72$$

$$\text{Capital gains yield} = .1806, \text{ or } 18.06\%$$

**7. Calculating Returns and Variability.** Using the following returns, calculate the average returns, the variances, and the standard deviations for X and Y.

Year	Returns	
	X	Y
1	16%	36%
2	-17	-8
3	13	21
4	15	-15
5	24	39

**Answer:** The average return is the sum of the returns, divided by the number of returns. The average return for each stock was:

$$\bar{X} = \left[ \sum_{i=1}^N x_i \right] / N = \frac{.16 - .17 + .13 + .15 + .24}{5} = .1020, \text{ or } 10.20\%$$

$$\bar{Y} = \left[ \sum_{i=1}^N y_i \right] / N = \frac{.36 - .08 + .21 - .15 + .39}{5} = .1460, \text{ or } 14.60\%$$

We calculate the variance of each stock as:

$$\sigma_X^2 = \left[ \sum_{i=1}^N (x_i - \bar{x})^2 \right] / (N - 1)$$

$$\sigma_X^2 = \frac{1}{5-1} \left\{ (.16 - .102)^2 + (-.17 - .102)^2 + (.13 - .102)^2 + (.15 - .102)^2 + (.24 - .102)^2 \right\} = .02487$$

$$\sigma_Y^2 = \frac{1}{5-1} \left\{ (.36 - .146)^2 + (-.08 - .146)^2 + (.21 - .146)^2 + (-.15 - .146)^2 + (.39 - .146)^2 \right\} = .06203$$

The standard deviation is the square root of the variance, so the standard deviation of each stock is:

$$\sigma_X = .02487^{1/2}$$

$$\sigma_X = .1577, \text{ or } 15.77\%$$

$$\sigma_Y = .06203^{1/2}$$

$$\sigma_Y = .2491, \text{ or } 24.91\%$$

WE KNOW THESE CALCULATIONS CAN BE DONE ON EXCEL IN JUST A FEW STEPS