**Quiz Problems for Chapters 10 and 11**

1. Using the following annual returns, calculate the estimates of the arithmetic mean returns, the variances, and the standard deviations for assets X and Y. Also calculate the estimates of the covariance and correlation between X and Y. These five years are a sample of the entire population of returns for X and Y.

|  |  |  |
| --- | --- | --- |
|  | Returns | |
| Year | X | Y |
| 2001 | 11% | 36% |
| 2002 | 6% | -7% |
| 2003 | -8% | 21% |
| 2004 | 28% | -12% |
| 2005 | 13% | 43% |

1. A stock has had returns over the past six years of 29%, 14%, 23%, -8%, 9%, and -14%. What was its arithmetic mean and geometric mean returns over that period? What was the standard deviation of its returns over this six-year period?
2. Suppose the value of the S&P 500 was 1,352 on January 1 and now, on July 1 it is 1,400. What was the simple return for the S&P 500 over that time? What was the annualized return if you assume semiannual compounding? What is it if you assume continuous compounding?
3. If we assume that the returns from investing in stocks are normally distributed, what is the probability that you will lose money (next year) by investing in a diversified portfolio of common stock if the risk-free rate is 3.5%, the market-risk premium is 5.7%, and you expect stocks to have a variance of .0484 in the future.
4. Coca-Cola has a beta of 1.1 and an expected return of 16%. The standard deviation of its returns is 5% and it sells for $60 per share.

General Electric has a beta of 0.9 and an expected return of 12%. The standard deviation of its returns is 8% and it sells for $30 per share.

Microsoft has a beta of 1.0 and an expected return of 14%. The standard deviation of its returns is 7% and it sells for $30 per share.

The correlation coefficient between Coca-Cola and General Electric is 0.5.

The correlation coefficient between Coca-Cola and Microsoft is 0.7.

The correlation coefficient between General Electric and Microsoft is 0.3.

What is the expected return and standard deviation of your portfolio if you purchase 100 shares of each stock?

1. The stock of Walt Disney Corp. has a standard deviation of 30%. The market has a standard deviation of 20%. The correlation between Disney and the market is 0.6. The risk-free rate of interest is currently 3%, but it has been 4% (on average) for the past 20 years. It is mid-June and the market is down 15% year-to-date. Disney’s stock has been up 7% per year for the past 10 years. You expect (on average) the market to outperform the risk-free rate by 5.7% per year in the future. According to the CAPM, what is the expected return for Disney’s stock?
2. The expected returns and standard deviations of stocks X and Y are: E(RX) = 15%, E(RY) = 25%,

σX = 40%, and σY = 65%. Calculate the expected return and standard deviation of a portfolio that is composed of 40 percent X and 60 percent Y when the correlation between the returns on X and Y is A) 0.5 B) -0.5

1. Based on the information in the table below, calculate the expected return and standard deviation for each stock. Also, calculate the covariance and correlation between the two stocks.

|  |  |  |  |
| --- | --- | --- | --- |
| State of Economy | Probability of State of Economy | Return on Stock J | Return on Stock K |
| Bear | .25 | -.020 | .050 |
| Normal | .60 | .092 | .062 |
| Bull | .15 | .154 | .074 |

1. The expected return on Asset A is 10 percent. The expected return on Asset B is 20 percent. How must you structure your portfolio so that you can achieve an expected return of 25 percent when Assets A and B are the only assets available for you to use and you have $100 available to invest?
2. You own a portfolio consisting of 20 different stocks. In order to balance-out your portfolio, you have just finished allocating your money so that you have exactly $10,000 invested in each stock. The stocks you have chosen are pretty risky – each has a standard deviation of 60%. However, you have chosen them carefully so that the correlation between each pair of stocks is exactly 0.10. If each stock has an expected return of 12%, what is the standard deviation of your portfolio?