Chapter 11 - #9~#12, #16, #22, #24, #26, #28, #35, and #37.

9. Returns and Standard Deviations Consider the following information:

State of Economy	Probability of State of Economy	Rate of Return if State Occurs		
		Stock *A*	Stock *B*	Stock *C*
Boom	.20	.24	.45	.33
Good	.35	.09	.10	.15
Poor	.30	.03	−.10	−.05
Bust	.15	−.05	−.25	−.09

a. Your portfolio is invested 30 percent each in *A* and *C*, and 40 percent in *B*. What is the expected return of the portfolio?
b. What is the variance of this portfolio? The standard deviation?

10. Calculating Portfolio Betas You own a stock portfolio invested 10 percent in Stock *Q*, 35 percent in Stock *R*, 20 percent in Stock *S*, and 35 percent in Stock *T*. The betas for these four stocks are .75, 1.90, 1.38, and 1.16, respectively. What is the portfolio beta?

11. Calculating Portfolio Betas You own a portfolio equally invested in a risk-free asset and two stocks. If one of the stocks has a beta of 1.65 and the total portfolio is equally as risky as the market, what must the beta be for the other stock in your portfolio?

12. Using CAPM A stock has a beta of 1.15, the expected return on the market is 11 percent, and the risk-free rate is 5 percent. What must the expected return on this stock be?

16. Using CAPM A stock has a beta of 1.13 and an expected return of 12.1 percent. A risk-free asset currently earns 5 percent.

a. What is the expected return on a portfolio that is equally invested in the two assets?
b. If a portfolio of the two assets has a beta of .50, what are the portfolio weights?
c. If a portfolio of the two assets has an expected return of 10 percent, what is its beta?
d. If a portfolio of the two assets has a beta of 2.26, what are the portfolio weights? How do you interpret the weights for the two assets in this case? Explain.

22. Portfolio Returns and Deviations Consider the following information about three stocks:

State of Economy	Probability of State of Economy	Rate of Return if State Occurs		
		Stock *A*	Stock *B*	Stock *C*
Boom	.30	.20	.25	.60
Normal	.45	.15	.11	.05
Bust	.25	.01	−.15	−.50

a. If your portfolio is invested 40 percent each in *A* and *B* and 20 percent in *C*, what is the portfolio expected return? The variance? The standard deviation?
b. If the expected T-bill rate is 3.80 percent, what is the expected risk premium on the portfolio?
c. If the expected inflation rate is 3.50 percent, what are the approximate and exact expected real returns on the portfolio? What are the approximate and exact expected real risk premiums on the portfolio?

24. Analyzing a Portfolio You have $100,000 to invest in a portfolio containing Stock *X*, Stock *Y*, and a risk-free asset. You must invest all of your money. Your goal is to create a portfolio that has an expected return of 11.22 percent and that has only 96 percent of the risk of the overall market. If *X* has an expected return of 15.35 percent and a beta of 1.55, *Y* has an expected return of 9.4 percent and a beta of .7, and the risk-free rate is 4.5 percent, how much money will you invest in Stock *X*? How do you interpret your answer?

26. Covariance and Correlation Based on the following information, calculate the expected return and standard deviation for each of the following stocks. What are the covariance and correlation between the returns of the two stocks?

State of Economy	Probability of State of Economy	Return on Stock *J*	Return on Stock *K*
Bear	.25	−.020	.034
Normal	.60	.138	.062
Bull	.15	.218	.092

28. Portfolio Standard Deviation Suppose the expected returns and standard deviations of Stocks *A* and *B* are $E(R_A) = .09$, $E(R_B) = .15$, $\sigma_A = .36$, and $\sigma_B = .62$.

a. Calculate the expected return and standard deviation of a portfolio that is composed of 35 percent *A* and 65 percent *B* when the correlation between the returns on *A* and *B* is .5.
b. Calculate the standard deviation of a portfolio with the same portfolio weights as in part (a) when the correlation coefficient between the returns on *A* and *B* is −.5.
c. How does the correlation between the returns on *A* and *B* affect the standard deviation of the portfolio?

35. **Covariance and Portfolio Standard Deviation** There are three securities in the market. The following chart shows their possible payoffs:

State	Probability of Outcome	Return on Security 1	Return on Security 2	Return on Security 3
1	.15	.20	.20	.05
2	.35	.15	.10	.10
3	.35	.10	.15	.15
4	.15	.05	.05	.20

a. What are the expected return and standard deviation of each security?
b. What are the covariances and correlations between the pairs of securities?
c. What are the expected return and standard deviation of a portfolio with half of its funds invested in Security 1 and half in Security 2?
d. What are the expected return and standard deviation of a portfolio with half of its funds invested in Security 1 and half in Security 3?
e. What are the expected return and standard deviation of a portfolio with half of its funds invested in Security 2 and half in Security 3?
f. What do your answers in Parts (a), (c), (d), and (e) imply about diversification?

37. **Standard Deviation and Beta** There are two stocks in the market, Stock *A* and Stock *B*. The price of Stock *A* today is $75. The price of Stock *A* next year will be $64 if the economy is in a recession, $87 if the economy is normal, and $97 if the economy is expanding. The probabilities of recession, normal times, and expansion are .2, .6, and .2, respectively. Stock *A* pays no dividends and has a correlation of .7 with the market portfolio. Stock *B* has an expected return of 14 percent, a standard deviation of 34 percent, a correlation with the market portfolio of .24, and a correlation with Stock *A* of .36. The market portfolio has a standard deviation of 18 percent. Assume the CAPM holds.

a. If you are a typical, risk-averse investor with a well-diversified portfolio, which stock would you prefer? Why?

b. What are the expected return and standard deviation of a portfolio consisting of 70 percent of Stock *A* and 30 percent of Stock *B*?
c. What is the beta of the portfolio in part (b)?