

PRACTICE QUESTIONS

Foundations of Financial Markets

October 15th 2007

1. Suppose your tax bracket is 28%. Would you prefer to earn a 6% taxable return or a 4% tax-free yield? What is the equivalent taxable yield of the 4% tax-free yield? [5.55%]
2. What is the tax exempt equivalent yield on a 9% bond yield given a marginal tax rate of 28%? [6.48%]
3. You purchased 100 shares of ABC common stock on margin at \$50 per share. Assume the initial margin is 50% and the maintenance margin is 30%. What is the stock price below which you would get a margin call? Assume the stock pays no dividend and ignore interest on margin. [\$35.71]
4. You purchased 300 shares of common stock on margin for \$50 per share. The initial margin is 60% and the stock pays no dividend. What would be your rate of return if you sell the stock at \$40 per share? Ignore interest on margin. [-33%]
5. The margin requirement on a stock purchase is 15%. You fully use the margin allowed to purchase 100 shares of MSFT at \$35. If the price drops to \$32, what is your percentage loss? [57%]
6. Stock A has an expected return of 10% and a standard deviation of 5%. Stock B has an expected return of 20% and a standard deviation of 15%. The correlation between stock A and stock B is -.3. The risk free rate is 7%.
 - (a) What is the reward to variability ratio of the CAL obtained investing in Stock A and in the risk free rate?
 - (b) What is the reward to variability ratio of the CAL obtained investing in Stock B and in the risk free rate?
 - (c) Define the minimum variance portfolio.
 - (d) What is the weight is stock A that delivers the minimum variance portfolio? [.84]
 - (e) What is the standard deviation of the minimum variance portfolio? [4.17%]
 - (f) What is the minimum expected return that you can obtain on the efficient frontier? [11.61%]
 - (g) Define the optimal risky portfolio.

- (h) A reliable source informs you that the portfolio share in stock A that gives the optimal risky portfolio is $w_A = 0.711$. What is the expected return of the optimal risky portfolio? What is its standard deviation? [12.89%, 4.71%]
- (i) What is the most efficient way to obtain an expected return of 15%? [Invest a share of -35% in the risk free rate and of 135% in the optimal risky portfolio]
7. Stock A and stock B have the same expected return of 10% and the same standard deviation of 5%. The risk free rate is 5%. The correlation between stock A and stock B is -0.5 . Would you ever consider investing in both stock A or stock B? Or would you prefer to stick to either of the two stocks since they command the same expected return and have the same standard deviation? Explain.
8. An investor can design a risky portfolio based on two stocks, A and B. The standard deviation of return on stock A is 20% while the standard deviation on stock B is 15%. The correlation coefficient between the return on A and B is 0. The expected return on stock A is 20% while on stock B it is 10%.
- (a) What is the proportion of the minimum variance portfolio that would be invested in stock B? [64%]
- (b) What is the expected return on the minimum variance portfolio? [13.6%]
- (c) What is the standard deviation of the minimum variance portfolio? [12%]
9. An investor's degree of risk aversion will determine his mix of risk-free asset and optimal risky asset. True or false?
10. Asset A has an expected return of 20% and a standard deviation of 25%. The risk free rate is 10%. What is the reward-to-variability ratio? [.4]
11. The degree to which the portfolio variance is reduced depends on the degree of correlation between securities is a true statement regarding the variance of risky portfolios. Do you agree?
12. Consider an investment opportunity set formed with two securities that are perfectly negatively correlated. What is the variance of the minimum variance portfolio?
13. The term efficient frontier refers to the set of portfolios that
- (a) yield the greatest return for a given level of risk
- (b) involve the least risk for a given level of return
- (c) Both a and b above
- (d) None of the above answers are correct

14. A portfolio is composed of two stocks, A and B. Stock A has a standard deviation of return of 25% while stock B has a standard deviation of return of 5%. Stock A comprises 20% of the portfolio while stock B comprises 80% of the portfolio. If the variance of return on the portfolio is .0050, what is the correlation coefficient between the returns on A and B? [.225]
15. Consider the CAPM. The expected return on the market is 18%. The expected return on a stock with a beta of 1.2 is 20%. What is the risk-free rate? [8%]
16. You invest \$600 in security A with a beta of 1.5 and \$400 in security B with a beta of .90. What is the beta of this formed portfolio? [1.26]
17. Use the CAPM relationship $E(r_i) = r_f + \beta_i(E(r_m) - r_f)$ to fill the entries that are missing in the table below.

risk free rate	3%	4%	7%	
$E(r_m)$	12%	15%		18%
β_i	0.8		2.1	1.4
$E(r_i)$		12%	15.9%	22%

18. The return on the risk-free asset is 3%. The expected return on the market portfolio is 9%.
- What is the intercept of the security market line? [3%]
 - What is the slope of the SML? [6%]
 - What is the expected return on asset E, which has a beta of 1.64? [12.8%]
 - Draw the SML. Use the label 'M' to show the point that represents the market portfolio and the label 'E' to show the point that represents asset E.
19. You estimate that the risk-free rate of return is 7.2% and the expected return on the market portfolio is 16.3%.
- Use the CAPM to calculate the expected returns on stocks 1 through 4 based on the information in the table below.
 - Indicate whether each asset is underpriced, overpriced, or correctly priced and calculate by how much.

	Stock 1	Stock 2	Stock 3	Stock 4
β_i	-0.2	0.74	1.53	2.46
CAPM $E(r_i)$				
Actual $E(r_i)$	7.48%	10.19%	31.30%	29.59%
Fairly price?				
Amount of mispricing				

20. Suppose that a well diversified portfolio Z is priced based on two factors. The beta for the first factor is 1.10 and the beta for the second factor is 0.45. The expected return on the first factor is 11%. The expected return on the second factor is 17%. The risk free rate of return is 5.2%. Use the arbitrage pricing theory to answer the following questions.
- (a) What is the risk premium on the first factor? [6.4%]
 - (b) What is the risk premium on the second factor? [5.3%]
 - (c) What is the total risk premium on portfolio Z? [11.7%]
 - (d) What is the total expected return on portfolio Z? [16.9%]