

## 15.433 Investments

### Assignment 1: Securities, Markets & Capital Market Theory

*Each question is worth 0.2 points, the max points is 3 points*

1. The interest rate charged by banks with excess reserves at a Federal Reserve Bank to banks needing overnight loans to meet reserve requirements is called the\_\_\_\_\_.  
A) prime rate  
B) discount rate  
C) federal funds rate  
D) call money rate  
E) money market rate

Ans:

2. Which of the following statements is (are) true regarding municipal bonds?  
I) A municipal bond is a debt obligation issued by state or local governments.  
II) A municipal bond is a debt obligation issued by the federal government.  
III) The interest income from a municipal bond is exempt from federal income taxation.  
IV) The interest income from a municipal bond is exempt from state and local taxation in the issuing state.  
  
A) I and II only  
B) I and III only  
C) I, II, and III only  
D) I, III, and IV only  
E) I and IV only

Ans:

3. A form of short-term borrowing by dealers in government securities is  
A) reserve requirements.  
B) repurchase agreements  
C) banker's acceptances.  
D) commercial paper.  
E) brokers' calls.

Ans:

4. Restrictions on trading involving insider information apply to the following except  
A) corporate officers and directors.  
B) relatives of corporate directors and officers.

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- C) major stockholders.
- D) All of the above are subject to insider trading restrictions.
- E) None of the above is subject to insider trading restrictions.

Ans:

5. Discuss margin buying of common stocks. Include in your discussion the advantages and disadvantages, the types of margin requirements, how these requirements are met, and who determines these requirements.

Ans:

6. Security A has a beta of 1.0 and an expected return of 12%. Security B has a beta of 0.75 and an expected return of 11%. The risk-free rate is 6%. Explain the arbitrage opportunity that exists; explain how an investor can take advantage of it. Give specific details about how to form the portfolio, what to buy and what to sell (we assume that the company-specific risk can be neglected).

Ans:

7. In the APT model, what is the nonsystematic standard deviation of an equally-weighted portfolio that has an average value of  $\sigma(e_i)$  equal to 25% and 50 securities?
- A) 12.5%
  - B) 625%
  - C) 0.5%
  - D) 3.54%
  - E) 14.59%

Ans:

8. Consider a well-diversified portfolio, A, in a two-factor economy. The risk-free rate is 6%, the risk premium on the first factor portfolio is 4% and the risk premium on the second factor portfolio is 3%. If portfolio A has a beta of 1.2 on the first factor and .8 on the second factor, what is its expected return?
- A) 7.0%
  - B) 8.0%
  - C) 9.2%
  - D) 13.0%
  - E) 13.2%

Ans:

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9. The index model for stock B has been estimated with the following result:

$$R_B = 0.01 + 1.1R_M + e_B$$

If  $\sigma_M = 0.20$  and  $R_B^2 = 0.50$ , the standard deviation of the return on stock B is \_\_\_\_\_.

- A) 0.1111
- B) 0.2111
- C) 0.3111
- D) 0.4111
- E) none of the above

Ans:

10. Discuss the advantages of the single-index model over the Markowitz model in terms of numbers of variable estimates required and in terms of understanding risk relationships.

Ans:

11. Draw graphs that represent each of the following situations:

- Investors face an efficient frontier of risky assets. There is no borrowing or lending allowed at a risk-free rate. Using indifference curves, show an example of the optimal portfolio choice for Investor A, who has a strong aversion to risk, and one for Investor B, who is much less risk-averse. Label points A and B clearly.
- Investors face an efficient frontier of risky assets. Borrowing and lending at a risk-free rate are allowed. Using indifference curves, show an example of Investor C, who chooses to put 100% of his investment in the optimal risky portfolio. Show an example of Investor D, who chooses to put 75% of her investment in the optimal risky portfolio. Label points C and D clearly.
- Investors face an efficient frontier of risky assets. Lending at a risk-free rate is allowed, and investors can borrow at a slightly higher rate. Using an indifference curve, show an example of Investor E, who chooses to borrow. Label this point E. On the same graph show where the investor's indifference curve would be if she could borrow at the lending rate. Label this point F.

Ans:

12. Given an optimal risky portfolio with expected return of 14% and standard deviation of 22% and a risk free rate of 6%, what is the slope of the best feasible CAL?

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- A) 0.64
- B) 0.14
- C) 0.08
- D) 0.33
- E) 0.36

Ans:

13. Security X has expected return of 12% and standard deviation of 20%. Security Y has expected return of 15% and standard deviation of 27%. If the two securities have a correlation coefficient of 0.7, what is their covariance?
- A) 0.038
  - B) 0.070
  - C) 0.018
  - D) 0.013
  - E) 0.054

Ans:

14. What is an Exchange-traded fund? Give two examples of specific ETFs. What are some advantages they have over ordinary open-end mutual funds? What are some disadvantages?

Ans:

15. Of the items listed, which have the new SEC regulations designated as required disclosures?

- I) tax-adjusted returns over the last 10 years
- II) the fund's best and worst quarterly returns during the last 10 years
- III) the managers' ownership in the fund
- IV) the specific assets held by the fund

- A) I and II
- B) I and III
- C) III and IV
- D) I, III, and IV
- E) none of the above – the reporting of each of these items will be voluntary

Ans: