

Foundations of Finance
B01.2311

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Course Description

This is a rigorous quantitative course introducing students to the structure of markets and the valuation of financial assets, including stocks, bonds, futures, forwards, options and swaps. Principles of modern portfolio theory, with domestic and international applications, are developed to explain the concepts of risk-adjusted returns, beta and efficient portfolio selection within a mean-variance framework. Fixed income analytics, including yield to maturity, duration, and forward rates are applied to analyzing yield curves and bond arbitrage. Options and futures contracts are valued within the framework of arbitrage-based models. Although this is an introductory course, students are expected to understand the underlying analytical framework as well as knowing how to apply the valuation formulas.

Sample Questions
For
Waiver Exam
In
Foundations of Finance

1. A T-bill has a face value of \$10,000 and is selling for \$9,800. If the T-bill matures in 90 days, what is its effective annual yield?
 - a. 8.16%
 - b. 2.04%
 - c. 8.53%
 - d. 6.12%
 - e. 8.42%
2. Consider the following W, X, Y, Z portfolios. Which one out of that group cannot lie on the same efficient frontier as described by Markowitz?
 - a. portfolio W with expected return 15%, standard deviation 36%
 - b. portfolio X with expected return 12%, standard deviation 15%
 - c. portfolio Z with expected return 5%, standard deviation 7%
 - d. portfolio Y with expected return 9%, standard deviation 21%
 - e. all the portfolios above can lie on the same efficient frontier

3. A bond's duration is higher when

- (a) The coupon rate is higher
- (b) The coupon rate is lower
- (c) Yield to maturity is higher
- (d) None of the above

4. Consider the following uncorrelated securities:

Security	A	B
Expected Return %	8	20
Standard Deviation %	18	24

An investor using the Mean-Variation Criterion

- a. will never concentrate all her investments in one security
- b. may concentrate all investments in Security B
- c. may concentrate all investments in Security A
- d. will hold equal proportions of A and B in her portfolio

5. Assume that the variance of IBM is 0.16 and the variance of Intel is 0.25. The variance of an equally weighted portfolio of these stocks is 0.0525. The covariance between these stocks is

- a. 0.10
- b. 0.20
- c. 0.25
- d. -0.10

6. If the one year spot rate is 4% and the forward rates for years 2, 3, 4, 5 are 5%, 7%, 8%, and 6%, respectively, then today's interest rate on a five-year bond should be

- a. 4%
- b. 5%
- c. 6%
- d. 7%
- e. 8%

7. The Dividend Discount Model (DDM)

- a. is a valuation model for riskless projects only
- b. is a dividend distribution model used by corporate managers for dividend decisions
- c. is a valuation model for new issues only
- d. accounts for risk by adjusting the discount rate

8. What is the expected return on a two asset portfolio, where you invest 150% of your net worth in A, with a mean return of 10%, and borrow 50% of your net worth by selling short B, which has a mean return of 6%

- a. 8%
- b. 18%
- c. 120%
- d. 12%
- e. None of the above

9. Suppose you have a two asset portfolio with $s_1 = .05$ and $s_2 = .08$. Assume the correlation coefficient of returns on the two assets is -1.0 . Assuming you must hold positive amounts of both securities, what fraction of the portfolio should you hold in asset 2 to reduce the risk of the portfolio to zero.

- (a) .62 (b) .5 (c) .42 (d) .38

10. Which of the following statements about a one-year short sale of U.S. one-year Government bonds is true:

- (a) It is impossible to sell short U.S. Government bonds for more than six months
- (b) Even combined with other securities, the short sale makes no sense unless you expect to buy back the Government bonds after the price declines.
- (c) This transaction is functionally equivalent to borrowing money for one year
- (d) This transaction will be profitable only if yields fall in the future

1. A 5-yr 20,000 loan at 10% with equal annual repayments has a payment size of \$5,276. The amortization component of the first payment is

- (a) 3,275
- (b) 2,000
- (c) 2,638
- (d) 1,055

12. According to the Capital Asset Pricing Model, if the expected return on asset 1, $E(r_1)$ is greater than the expected return on asset 2, $E(r_2)$, then
- (a) $r_1 > r_2$ always
 - (b) $\sigma_1 > \sigma_2$
 - (c) $\beta_1 > \beta_2$
 - (d) None of the above
13. The efficient market hypothesis says
- (a) No one can ever beat the market over a ten year period
 - (b) Insider trading should be illegal
 - (c) Everyone should hold the same portfolio
 - (d) None of the above
14. The following price data is available for SQV stock

Date	12/31/93	6/30/94	12/31/94
SQV	75	95	90

At the end of 1993, using \$100,000 of your own money, you buy \$150,000 worth of SQV stock on margin at \$75 per share. The call money rate (which is the rate that your broker charges you on any borrowed funds) was 8% per annum Effective Annual Rate. SQV did not pay any dividends in 1994. Ignore commissions. What is the value of your net worth at the end of 1994 (i.e., on 12/31/94)?

- A. 180,000
 - B. \$176,000
 - C. \$130,000
 - D. \$126,000
15. John and Jim are both risk averse and only care about the mean and standard deviation of their portfolio's return. They agree on the opportunity set available. There are N risky assets and a riskless asset. Which of the following statements is correct?
- (a) John and Jim hold the same portfolio of all assets.
 - (b) John and Jim may hold completely different portfolios of risky assets.
 - (c) When choosing between 2 portfolios, John and Jim always prefer the one with the lowest standard deviation.
 - (d) John holds any two risky assets in the same ratio as Jim does in his portfolio.

16. If forward-spot parity holds, what is the one-year forward price of the British Pound, assuming that the current exchange rate is \$1.60/£, the British one-year interest rate is 7% (expressed as an Effective Annual Rate) and the U.S. one-year rate is 9% (also expressed as an Effective Annual Rate)?

- (a) £0.61
- (b) \$1.57
- (c) \$1.63
- (d) Not enough information has been provided.

17. Which of the following five-year investments has the highest effective annual rate

- (a) An 8 percent coupon annual pay bond selling at 97
- (b) An 8 percent coupon semi-annual pay bond selling at par
- (c) A zero coupon bond with \$ 1 000 face value selling at \$665
- (d) They all have the same EAR

18. If the futures price on gold for delivery in six months is \$430, and the one-year Treasury bill rate is 8%, then the spot price of gold should be

- (a) 398.15
- (b) 413.46
- (c) 447,20
- (d) 464.40

19. According to the liquidity premium theory, an upward sloping yield implies

- (a) Short-term rates are expected to rise
- (b) Long-term rates are expected to rise
- (c) Short-term rates are definitely not expected to decline
- (d) You cannot tell

20. According to the Black Scholes model, if $N(d_1)$ and $N(d_2)$ for a particular call option are both =0, which of the following is most true

- (a) The call is worthless
- (b) The call will be exercised with certainty
- (c) The call will equal the minimum value
- (d) The call will be less than the minimum value

Answer Key

1. C
2. D
3. B
4. B
5. D
6. C
7. D
8. D
9. D
10. C

11. A
12. C
13. D
14. D
15. D
16. C
17. A
18. B
19. D
20. A