

The Johns Hopkins Carey Business School

Investment Analysis and Portfolio Management

Spring 2010

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Final Exam

ANSWER ALL OF THESE. Please show your work. Each question is equally weighted. Please bring a hard copy of your answers to the class. Do not submit your answers electronically.

MIDTERM– DUE ON Monday March 22nd, 2010

Late submissions will not be graded.

Student:

1. Assume that stock market returns do not resemble a single-index structure. An investment fund analyzes 150 stocks in order to construct a mean-variance efficient portfolio constrained by 150 investments. They will need to calculate _____ expected returns and _____ variances of returns.

- A. 150, 150
- B. 150, 22500
- C. 22500, 150
- D. 22500, 22500
- E. none of the above

2. Consider the single-index model. The alpha of a stock is 0%. The return on the market index is 16%. The risk-free rate of return is 5%. The stock earns a return that exceeds the risk-free rate by 11% and there are no firm-specific events affecting the stock performance. The β of the stock is _____.

- A. 0.67
- B. 0.75
- C. 1.0
- D. 1.33
- E. 1.50

3. Suppose you held a well-diversified portfolio with a very large number of securities, and that the single index model holds. If the σ of your portfolio was 0.20 and σ_M was 0.16, the β of the portfolio would be approximately _____.

- A. 0.64
- B. 0.80
- C. 1.25
- D. 1.56
- E. none of the above

4. The index model for stock A has been estimated with the following result:

$$R_A = 0.01 + 0.9R_M + e_A$$

If $\sigma_M = 0.25$ and $R_A^2 = 0.25$, the standard deviation of return of stock A is _____.

- A. 0.2025
- B. 0.2500
- C. 0.4500
- D. 0.8100
- E. none of the above

5. The index model has been estimated for stocks A and B with the following results:

$$R_A = 0.01 + 0.5R_M + e_A$$

$$R_B = 0.02 + 1.3R_M + e_B$$

$$\sigma_M = 0.25 \quad \sigma(e_A) = 0.20 \quad \sigma(e_B) = 0.10$$

The covariance between the returns on stocks A and B is _____.

- A. 0.0384
- B. 0.0406
- C. 0.1920
- D. 0.0050
- E. 0.4000

6. The **expected** impact of unanticipated macroeconomic events on a security's return during the period is

- A. included in the security's expected return.
- B. zero.
- C. equal to the risk free rate.
- D. proportional to the firm's beta.
- E. infinite.

7. Consider the single-index model. The alpha of a stock is 0%. The return on the stock is 10%. The risk-free rate of return is 3%. The market index earns a return that exceeds the risk-free rate by 11% and there are no firm-specific events affecting the stock performance. The β of the stock is _____.

- A. 0.64
- B. 0.75
- C. 1.17
- D. 1.33
- E. 1.50

8. The risk-free rate and the expected market rate of return are 0.06 and 0.12, respectively. According to the capital asset pricing model (CAPM), the expected rate of return on security X with a beta of 1.2 is equal to

- A. 0.06.
- B. 0.144.
- C. 0.12.
- D. 0.132
- E. 0.18

9. According to the Capital Asset Pricing Model (CAPM), the expected rate of return on any security is equal to

- A. $R_f + \beta [E(R_M)]$.
- B. $R_f + \beta [E(R_M) - R_f]$.
- C. $\beta [E(R_M) - R_f]$.
- D. $E(R_M) + R_f$.
- E. none of the above.

10. According to the Capital Asset Pricing Model (CAPM),

- A. a security with a positive alpha is considered overpriced.
- B. a security with a zero alpha is considered to be a good buy.
- C. a security with a negative alpha is considered to be a good buy.
- D. a security with a positive alpha is considered to be underpriced.
- E. none of the above.

11. Your personal opinion is that a security has an expected rate of return of 0.11. It has a beta of 1.5. The risk-free rate is 0.05 and the market expected rate of return is 0.09. According to the Capital Asset Pricing Model, this security is

- A. underpriced.
- B. overpriced.
- C. fairly priced.
- D. cannot be determined from data provided.
- E. none of the above.

12. As a financial analyst, you are tasked with evaluating a capital budgeting project. You were instructed to use the IRR method and you need to determine an appropriate hurdle rate. The risk-free rate is 4 percent and the expected market rate of return is 11 percent. Your company has a beta of 1.0 and the project that you are evaluating is considered to have risk equal to the average project that the company has accepted in the past. According to CAPM, the appropriate hurdle rate would be _____%.

- A. 4
- B. 7
- C. 15
- D. 11
- E. 1

13. You invest 55% of your money in security A with a beta of 1.4 and the rest of your money in security B with a beta of 0.9. The beta of the resulting portfolio is

- A. 1.466
- B. 1.157
- C. 0.968
- D. 1.082
- E. 1.175

14. Given the following two stocks A and B

<u>Security</u>	<u>Expected rate of return</u>	<u>Beta</u>
A	0.12	1.2
B	0.14	1.8

If the expected market rate of return is 0.09 and the risk-free rate is 0.05, which security would be considered the better buy and why?

- A. A because it offers an expected excess return of 1.2%.
- B. B because it offers an expected excess return of 1.8%.
- C. A because it offers an expected excess return of 2.2%.
- D. B because it offers an expected return of 14%.
- E. B because it has a higher beta.

15. Standard deviation and beta both measure risk, but they are different in that

- A. beta measures both systematic and unsystematic risk.
- B. beta measures only systematic risk while standard deviation is a measure of total risk.
- C. beta measures only unsystematic risk while standard deviation is a measure of total risk.
- D. beta measures both systematic and unsystematic risk while standard deviation measures only systematic risk.
- E. beta measures total risk while standard deviation measures only nonsystematic risk.

16. The amount that an investor allocates to the market portfolio is negatively related to

- I) the expected return on the market portfolio.
- II) the investor's risk aversion coefficient.
- III) the risk-free rate of return.
- IV) the variance of the market portfolio

- A. I and II
- B. II and III
- C. II and IV
- D. II, III, and IV
- E. I, III, and IV

17. Studies of liquidity spreads in security markets have shown that

- A. liquid stocks earn higher returns than illiquid stocks.
- B. illiquid stocks earn higher returns than liquid stocks.
- C. both liquid and illiquid stocks earn the same returns.
- D. illiquid stocks are good investments for frequent, short-term traders.
- E. None of the above are true.

18. Black argues that past risk premiums on firm-characteristic variables, such as those described by Fama and French, are problematic because _____.

- A. they may result from data snooping.
- B. they are sources of systematic risk.
- C. they can be explained by security characteristic lines.
- D. they are more appropriate for a single-factor model.
- E. they are macroeconomic factors.

19. Consider the multifactor APT with two factors. Stock A has an expected return of 17.6%, a beta of 1.45 on factor 1 and a beta of .86 on factor 2. The risk premium on the factor 1 portfolio is 3.2%. The risk-free rate of return is 5%. What is the risk-premium on factor 2 if no arbitrage opportunities exist?

- A. 9.26%
- B. 3%
- C. 4%
- D. 7.75%
- E. none of the above

20. In a multi-factor APT model, the coefficients on the macro factors are often called _____.

- A. systemic risk
- B. factor sensitivities
- C. idiosyncratic risk
- D. factor betas
- E. B and D

21. Advantage(s) of the APT is(are)

- A. that the model provides specific guidance concerning the determination of the risk premiums on the factor portfolios.
- B. that the model does not require a specific benchmark market portfolio.
- C. that risk need not be considered.
- D. A and B.
- E. B and C.

Consider the multifactor APT. There are two independent economic factors, F_1 and F_2 . The risk-free rate of return is 6%. The following information is available about two well-diversified portfolios:

<u>Portfolio</u>	<u>β on F_1</u>	<u>β on F_2</u>	<u>Expected Return</u>
A	1.0	2.0	19%
B	2.0	0.0	12%

22. Assuming no arbitrage opportunities exist, the risk premium on the factor F_2 portfolio should be _____.

- A. 3%
- B. 4%
- C. 5%
- D. 6%
- E. none of the above

23. The factor F in the APT model represents

- A. firm-specific risk.
- B. the sensitivity of the firm to that factor.
- C. a factor that affects all security returns.
- D. the deviation from its expected value of a factor that affects all security returns.
- E. a random amount of return attributable to firm events.

24. Which of the following is **true** about the security market line (SML) derived from the APT?

- A. The SML has a downward slope.
- B. The SML for the APT shows expected return in relation to portfolio standard deviation.
- C. The SML for the APT has an intercept equal to the expected return on the market portfolio.
- D. The benchmark portfolio for the SML may be any well-diversified portfolio.
- E. The SML is not relevant for the APT.

25. In developing the APT, Ross assumed that uncertainty in asset returns was a result of

- A. a common macroeconomic factor
- B. firm-specific factors
- C. pricing error
- D. neither A nor B
- E. both A and B

26. Researchers have found that most of the small firm effect occurs

- A. during the spring months.
- B. during the summer months.
- C. in December.
- D. in January.
- E. randomly.

27. In an efficient market the correlation coefficient between stock returns for two non-overlapping time periods should be

- A. positive and large.
- B. positive and small.
- C. zero.
- D. negative and small.
- E. negative and large.

28. Studies of mutual fund performance

- A. indicate that one should not randomly select a mutual fund.
- B. indicate that historical performance is not necessarily indicative of future performance.
- C. indicate that the professional management of the fund insures above market returns.
- D. A and B.
- E. B and C.

29. A common strategy for passive management is _____.

- A. creating an index fund
- B. creating a small firm fund
- C. creating an investment club
- D. A and C
- E. B and C

30. The weak form of the efficient market hypothesis asserts that

- A. stock prices do not rapidly adjust to new information contained in past prices or past data.
- B. future changes in stock prices cannot be predicted from past prices.
- C. technicians cannot expect to outperform the market.
- D. A and B
- E. B and C

31. An example of _____ is that a person may reject an investment when it is posed in terms of risk surrounding potential gains but may accept the same investment if it is posed in terms of risk surrounding potential losses.

- A. framing
- B. regret avoidance
- C. overconfidence
- D. conservatism
- E. none of the above

32. Then confidence index is computed from _____ and higher values are considered _____ signals.

- A. bond yields; bearish
- B. odd lot trades; bearish
- C. odd lot trades; bullish
- D. put/call ratios; bullish
- E. bond yields; bullish

33. Studies of Siamese twin companies find _____ which _____ the EMH.

- A. correct relative pricing; supports
- B. correct relative pricing; does not support
- C. incorrect relative pricing; supports
- D. incorrect relative pricing; does not support
- E. none of the above

34. Barber and Odean (2000) ranked portfolios by turnover and report that the difference in return between the highest and lowest turnover portfolios is 7% per year. They attribute this to

- A. overconfidence
- B. framing
- C. regret avoidance
- D. sample neglect
- E. all of the above

35. Behavioral finance argues that _____.
- A. even if security prices are wrong it may be difficult to exploit them
 - B. the failure to uncover successful trading rules or traders cannot be taken as proof of market efficiency
 - C. investors are rational
 - D. A and B
 - E. all of the above
36. A coupon bond that pays interest of \$90 annually has a par value of \$1,000, matures in 9 years, and is selling today at a \$66 discount from par value. The yield to maturity on this bond is _____.
- A. 9.00%
 - B. 10.15%
 - C. 11.25%
 - D. 12.32%
 - E. none of the above
37. A convertible bond has a par value of \$1,000 and a current market value of \$1150. The current price of the issuing firm's stock is \$65 and the conversion ratio is 15 shares. The bond's conversion premium is _____.
- A. \$40
 - B. \$150
 - C. \$175
 - D. \$200
 - E. none of the above
38. If a 6.75% coupon bond is trading for \$1016.00, it has a current yield of _____ percent.
- A. 7.38
 - B. 6.64
 - C. 7.25
 - D. 8.53
 - E. 7.18

39. A coupon bond that pays interest semi-annually has a par value of \$1,000, matures in 7 years, and has a yield to maturity of 9.3%. The intrinsic value of the bond today will be _____ if the coupon rate is 9.5%.

- A. \$922.77
- B. \$1,010.12
- C. \$1,075.80
- D. \$1,077.22
- E. none of the above

40. Consider a 5-year bond with a 10% coupon that has a present yield to maturity of 8%. If interest rates remain constant, one year from now the price of this bond will be _____.

- A. higher
- B. lower
- C. the same
- D. cannot be determined
- E. \$1,000

Year	1-Year Forward Rate
1	5.8%
2	6.4%
3	7.1%
4	7.3%
5	7.4%

41. Calculate the price at the beginning of year 1 of a 10% annual coupon bond with face value \$1,000 and 5 years to maturity.

- A. \$1,105
- B. \$1,132
- C. \$1,179
- D. \$1,150
- E. \$1,119

Par Value	\$1,000
Time to Maturity	20 years
Coupon	10% (paid annually)
Current Price	\$850
Yield to Maturity	12%

42. Given the bond described above, if interest were paid semi-annually (rather than annually), and the bond continued to be priced at \$850, the resulting effective annual yield to maturity would be:

- A. Less than 12%
- B. More than 12%
- C. 12%
- D. Cannot be determined
- E. None of the above

<u>Year</u>	<u>1-Year Forward Rate</u>
1	4.6%
2	4.9%
3	5.2%
4	5.5%
5	5.8%

43. What is the yield to maturity of a 5-year bond?

- A. 4.6%
- B. 4.9%
- C. 5.2%
- D. 5.5%
- E. 5.8%

Suppose that all investors expect that interest rates for the 4 years will be as follows:

<u>Year</u>	<u>Forward Interest Rate</u>
0	(today)3%
1	4%
2	5%
3	6%

44. If you have just purchased a 4-year zero coupon bond, what would be the expected rate of return on your investment in the first year if the implied forward rates stay the same? (Par value of the bond = \$1,000)

- A. 5%
- B. 3%
- C. 9%
- D. 10%
- E. none of the above

45. If the value of a Treasury bond was higher than the value of the sum of its part (STRIPPED cash flows) you could

- A. profit by buying the stripped cash flows and reconstituting the bond.
- B. not profit by buying the stripped cash flows and reconstituting the bond.
- C. profit by buying the bond and creating STRIPS.
- D. B and C
- E. none of the above

46. You purchased an annual interest coupon bond one year ago that had 6 years remaining to maturity at that time. The coupon interest rate was 10% and the par value was \$1,000. At the time you purchased the bond, the yield to maturity was 8%. If you sold the bond after receiving the first interest payment and the yield to maturity continued to be 8%, your annual total rate of return on holding the bond for that year would have been _____.

- A. 7.00%
- B. 7.82%
- C. 8.00%
- D. 11.95%
- E. none of the above

47. Bond analysts might be more interested in a bond's yield to call if

- A. the bond's yield to maturity is insufficient.
- B. the firm has called some of its bonds in the past.
- C. the investor only plans to hold the bond until its first call date.
- D. interest rates are expected to rise.
- E. interest rates are expected to fall.

48. Which one of the following par value 12% coupon bonds experiences a price change of \$23 when the market yield changes by 50 basis points?

- A. The bond with a duration of 6 years.
- B. The bond with a duration of 5 years.
- C. The bond with a duration of 2.7 years.
- D. The bond with a duration of 5.15 years.
- E. None of the above.

49. Consider a bond selling at par with modified duration of 10.6 years and convexity of 210. A 2 percent decrease in yield would cause the price to increase by 21.2%, according to the duration rule. What would be the percentage price change according to the duration-with-convexity rule?

- A. 21.2%
- B. 25.4%
- C. 17.0%
- D. 10.6%
- E. none of the above.

50. Two bonds are selling at par value and each has 17 years to maturity. The first bond has a coupon rate of 6% and the second bond has a coupon rate of 13%. Which of the following is **true** about the durations of these bonds?

- A. The duration of the higher-coupon bond will be higher.
- B. The duration of the lower-coupon bond will be higher.
- C. The duration of the higher-coupon bond will equal the duration of the lower-coupon bond.
- D. There is no consistent statement that can be made about the durations of the bonds.
- E. The bond's durations cannot be determined without knowing the prices of the bonds.