Chapter 05

Chapter 05 Risk and Return: Past and Prologue Answer Key

Multiple Choice Questions

1. You put up $50 at the beginning of the year for an investment. The value of the investment grows 4% and you earn a dividend of $3.50. Your HPR was ____.
A. 4.00%
B. 3.50%
C. 7.00%
D. 11.00%

$$4\% + \frac{\$3.50}{\$50} = 11\%$$

Difficulty: Medium

2. The _____ measure of returns ignores compounding.
A. geometric average
B. arithmetic average
C. IRR
D. dollar weighted

Difficulty: Easy

Difficulty: Medium

4. Which one of the following measure time weighted returns?
I. Geometric average return
II. Arithmetic average return
III. Dollar weighted return
A. I only
B. II only
C. I and II only
D. I and III only

Difficulty: Medium

5. Rank the following from highest average historical return to lowest average historical return from 1926-2008.
I. Small stocks
II. Long term bonds
III. Large stocks
IV. T-bills
A. I, II, III, IV
B. III, IV, II, I
C. I, III, II, IV
D. III, I, II, IV

Difficulty: Medium

6. Rank the following from highest average historical standard deviation to lowest average historical standard deviation from 1926-2008.
I. Small stocks
II. Long term bonds
III. Large stocks
IV. T-bills
A. I, II, III, IV
B. III, IV, II, I
C. I, III, II, IV
D. III, I, II, IV

Difficulty: Medium

7. You have calculated the historical dollar weighted return, annual geometric average return and annual arithmetic average return. If you desire to forecast performance for next year, the best forecast will be given by the _____.
A. dollar weighted return
B. geometric average return
C. arithmetic average return
D. index return

Difficulty: Medium

8. The complete portfolio refers to the investment in _____.
A. the risk-free asset
B. the risky portfolio
C. the risk-free asset and the risky portfolio combined
D. the risky portfolio and the index

Difficulty: Easy

9. You have calculated the historical dollar weighted return, annual geometric average return and annual arithmetic average return. You always reinvest your dividends and interest earned on the portfolio. Which method provides the best measure of the actual average historical performance of the investments you have chosen?
A. Dollar weighted return
B. Geometric average return
C. Arithmetic average return
D. Index return

Difficulty: Medium

10. The holding period return on a stock is equal to _____.
A. the capital gain yield over the period plus the inflation rate
B. the capital gain yield over the period plus the dividend yield
C. the current yield plus the dividend yield
D. the dividend yield plus the risk premium

Difficulty: Easy

Difficulty: Medium

12. Published data on past returns earned by mutual funds are required to be _____.
A. dollar weighted returns
B. geometric returns
C. excess returns
D. index returns

Difficulty: Medium

13. The arithmetic average of -11%, 15% and 20% is _____.
A. 15.67%
B. 8.00%
C. 11.22%
D. 6.45%

$$\frac{-11\% + 15\% + 20\%}{3} = 8.00\%$$

Difficulty: Easy

14. The geometric average of -12%, 20% and 25% is _____.
A. 8.42%
B. 11.00%
C. 9.70%
D. 18.88%

$$\left[(1 + -.12)(1 + .20)(1 + .25)\right]^{1/3} - 1 = 9.70\%$$

Difficulty: Medium

16. An investment earns 10% the first year, 15% the second year and loses 12% the third year. Your total compound return over the three years was _____.
A. 41.68%
B. 11.32%
C. 3.64%
D. 13.00%

(1.10)(1.15)(1 - .12) = 11.32%

Difficulty: Medium

17. Annual percentage rates can be converted to effective annual rates by means of the following formula:
A. (1 + (APR/n))n - 1
B. (APR)(n)
C. (APR/n)
D. (periodic rate)(n)

Difficulty: Easy

18. Suppose you pay $9,700 for a $10,000 par Treasury bill maturing in three months. What is the holding period return for this investment?
A. 3.01%
B. 3.09%
C. 12.42%
D. 16.71%

$$\frac{10{,}000 - 9{,}700}{9{,}700} = 3.09\%$$

Difficulty: Easy

19. Suppose you pay $9,800 for a $10,000 par Treasury bill maturing in two months. What is the annual percentage rate of return for this investment?
A. 2.04%
B. 12.00 %
C. 12.24%
D. 12.89%

$$\left(\frac{10{,}000-9800}{9800}\right)\left(\frac{12}{2}\right)=12.24\%$$

Difficulty: Medium

20. Suppose you pay $9,400 for a $10,000 par Treasury bill maturing in six months. What is the effective annual rate of return for this investment?
A. 6.38%
B. 12.77%
C. 13.17%
D. 14.25%

$$\left[\frac{10{,}000}{9400}\right]^{\frac{12}{6}}-1=13.17\%$$

Difficulty: Medium

Difficulty: Medium

Difficulty: Medium

23. The market risk premium is defined as _____.
A. the difference between the return on an index fund and the return on Treasury bills
B. the difference between the return on a small firm mutual fund and the return on the Standard and Poor's 500 index
C. the difference between the return on the risky asset with the lowest returns and the return on Treasury bills
D. the difference between the return on the highest yielding asset and the lowest yielding asset

Difficulty: Easy

24. The excess return is the _____.
A. rate of return that can be earned with certainty
B. rate of return in excess of the Treasury bill rate
C. rate of return to risk aversion
D. index return

Difficulty: Easy

25. The rate of return on _____ is known at the beginning of the holding period while the rate of return on ____ is not known until the end of the holding period.
A. risky assets, Treasury bills
B. Treasury bills, risky assets
C. excess returns, risky assets
D. index assets, bonds

Difficulty: Medium

26. The reward/variability ratio is given by _____.
A. the slope of the capital allocation line
B. the second derivative of the capital allocation line
C. the point at which the second derivative of the investor's indifference curve reaches zero
D. portfolio excess return

Difficulty: Easy

27. Your investment has a 20% chance of earning a 30% rate of return, a 50% chance of earning a 10% rate of return and a 30% chance of losing 6%. What is your expected return on this investment?
A. 12.8%
B. 11.0%
C. 8.9%
D. 9.2%

(0.2)(30%) + (0.5)(10%) + (0.3)(-6%) = 9.2%

Difficulty: Medium

28. Your investment has a 40% chance of earning a 15% rate of return, a 50% chance of earning a 10% rate of return and a 10% chance of losing 3%. What is the standard deviation of this investment?
A. 5.14%
B. 7.59%
C. 9.29%
D. 8.43%

$$E(r_p) = (.4)(15\%) + (.5)(10\%) + (.10)(-3\%) = 10.7\%$$

$$\sigma r_p = .4(.15 - .107)^2 + .5(.10 - .107)^2 + .10(-.03 - .107)^2$$

$$\sigma r_p = 5.14\%$$

Difficulty: Hard

29. During the 1926 to 2008 period the geometric mean return on small firm stocks was _____.
A. 5.31%
B. 5.56%
C. 9.34%
D. 11.43%

Difficulty: Medium

30. During the 1926 to 2008 period the geometric mean return on Treasury bills was _____.
A. 5.31%
B. 5.56%
C. 9.34%
D. 11.43%

Difficulty: Medium

31. During the 1926 to 2008 period the Sharpe ratio was greatest for which of the following asset classes?
A. Small U.S. stocks
B. Large U.S. stocks
C. Long-Term U.S. Treasury Bonds
D. Bond World portfolio return in U.S. dollars

Difficulty: Medium

32. During the 1985 to 2008 period the Sharpe ratio was greatest for which of the following asset classes?
A. Small U.S. stocks
B. Large U.S. stocks
C. Long-Term U.S. Treasury Bonds
D. Equity world portfolio in U.S. dollars

Difficulty: Hard

33. During the 1926 to 2008 period which one of the following asset classes provided the lowest real return?
A. Small U.S. stocks
B. Large U.S. stocks
C. Long-Term U.S. Treasury Bonds
D. Equity world portfolio in U.S. dollars

Difficulty: Medium

34. Both investors and gamblers take on risk. The difference between an investor and a gambler is that an investor _____.
A. is normally risk neutral
B. requires a risk premium to take on the risk
C. knows he or she will not lose money
D. knows the outcomes at the beginning of the holding period

Difficulty: Easy

35. Historical returns have generally been _____ for stocks of small firms as/than for stocks of large firms.
A. the same
B. lower
C. higher
D. There is no evidence of a systematic relationship between returns on small firm stocks and returns on small firm stocks

Difficulty: Easy

36. Historically small firm stocks have earned higher returns than large firm stocks. When viewed in the context of an efficient market, this suggests that _____.
A. small firms are better run than large firms
B. government subsidies available to small firms produce effects that are discernible in stock market statistics
C. small firms are riskier than large firms
D. small firms are not being accurately represented in the data

Difficulty: Medium

37. When calculating the variance of a portfolio's returns squaring the deviations from the mean results in _____.
I. preventing the sum of the deviations from always equaling zero
II. exaggerating the effects of large positive and negative deviations
III. a number in units of percentage of returns
A. I only
B. I and II only
C. I and III only
D. I, II and III

Difficulty: Medium

38. If you are promised a nominal return of 12% on a one year investment, and you expect the rate of inflation to be 3%, what real rate do you expect to earn?
A. 5.48%
B. 8.74%
C. 9.00%
D. 12.00%

$$Real\ Rate = \frac{1.12}{1.03} - 1 = 8.74\%$$

Difficulty: Medium

39. If you require a real growth in the purchasing power of your investment of 8%, and you expect the rate of inflation over the next year to be 3%, what is the lowest nominal return that you would be satisfied with?
A. 3.00%
B. 8.00%
C. 11.00%
D. 11.24%

$$\text{Nominal rate} = (1.08)(1.03) - 1 = 11.24\%$$

Difficulty: Medium

40. One method to forecast the risk premium is to use the _____.
A. coefficient of variation of analysts' earnings forecasts
B. variations in the risk free rate over time
C. average historical excess returns for the asset under consideration
D. average abnormal return on the index portfolio

Difficulty: Medium

41. Treasury bills are paying a 4% rate of return. A risk averse investor with a risk aversion of A = 3 should invest in a risky portfolio with a standard deviation of 24% only if the risky portfolio's expected return is at least _____.
A. 8.67%
B. 9.84%
C. 12.64%
D. 14.68%

$$E(r_p) = r_F + \frac{1}{2} A \sigma_p^2$$

$$Min \quad E(r_p) = .04 + \left[\frac{1}{2}(3)(.24)^2 \right] = 12.64\%$$

Difficulty: Hard

42. In the mean-standard deviation graph, the line that connects the risk-free rate and the optimal risky portfolio, P, is called _____.
A. the capital allocation line
B. the indifference curve
C. the investor's utility line
D. the security market line

Difficulty: Medium

43. Most studies indicate that investors' risk aversion is in the range _____.
A. 1-3
B. 2-4
C. 3-5
D. 4-6

Difficulty: Medium

44. Two assets have the following expected returns and standard deviations when the risk-free rate is 5%:

Asset A	**$E(r_A) = 10\%$**	**$\sigma_A = 20\%$**
Asset B	**$E(r_B) = 15\%$**	**$\sigma_B = 27\%$**

An investor with a risk aversion of A = 3 would find that _____ on a risk return basis.
A. only Asset A is acceptable
B. only Asset B is acceptable
C. neither Asset A nor Asset B is acceptable
D. both Asset A and Asset B are acceptable

$$Asset\ A\ Min\ E(r_p) = .05 + \left[\frac{1}{2}(3)(.20)^2\right] = 11\%$$

A is unacceptable

$$Asset\ B\ \ Min\ E(r_p) = .05 + \left[\frac{1}{2}(3)(.27)^2\right] = 15.94\%$$

Asset B is unacceptable

Difficulty: Hard

45. Historically the best asset for the long term investor wanting to fend off the threats of inflation and taxes while making his money grow has been ____.
A. stocks
B. bonds
C. money market funds
D. Treasury bills

Difficulty: Easy

46. The formula $\frac{E(r_p) - r_f}{\sigma_p}$ is used to calculate the _____.
A. Sharpe measure
B. Treynor measure
C. Coefficient of variation
D. Real rate of return

Difficulty: Easy

47. A portfolio with a 25% standard deviation generated a return of 15% last year when T-bills were paying 4.5%. This portfolio had a Sharpe measure of ____.
A. 0.22
B. 0.60
C. 0.42
D. 0.25

$$\frac{15 - 4.5}{25} = 0.42$$

Difficulty: Medium

48. Consider a treasury bill with a rate of return of 5% and the following risky securities:
Security A: E(r) = .15; variance = .0400
Security B: E(r) = .10; variance = .0225
Security C: E(r) = .12; variance = .1000
Security D: E(r) = .13; variance = .0625
The investor must develop a complete portfolio by combining the risk-free asset with one of the securities mentioned above. The security the investor should choose as part of his complete portfolio to achieve the best CAL would be _____.
A. security A
B. security B
C. security C
D. security D

A has the steepest slope; found as: $$Slope = \frac{.15 - .05}{(.04)^{.5}} = .5000$$

Difficulty: Medium

49. You purchased a share of stock for $29. One year later you received $2.25 as dividend and sold the share for $28. Your holding-period return was _____.
A. -3.57%
B. - 3.45%
C. 4.31%
D. 8.03%

$$\frac{28 + 2.25 - 29}{29} = 4.31\%$$

Difficulty: Medium

50. Security A has a higher standard deviation of returns than Security B. We would expect that _____.
I. Security A would have a higher risk premium than Security B
II. the likely range of returns for Security A in any given year would be higher than the likely range of returns for Security B
III. the Sharpe measure of A will be higher than the Sharpe measure of B.
A. I only
B. I and II only
C. II and III only
D. I, II and III

Difficulty: Medium

51. The holding period return on a stock was 25%. Its ending price was $18 and its beginning price was $16. Its cash dividend must have been _____.
A. $0.25
B. $1.00
C. $2.00
D. $4.00

$$\text{Div} = 16.00(.25) - (18.00 - 16.00) = 2$$

Difficulty: Medium

52. An investor invests 70% of her wealth in a risky asset with an expected rate of return of 15% and a variance of 5% and she puts 30% in a Treasury bill that pays 5%. Her portfolio's expected rate of return and standard deviation are _____ and _____ respectively.
A. 10.0%, 6.7%
B. 12.0%, 22.4%
C. 12.0%, 15.7%
D. 10.0%, 35.0%

$$E(r_p) = .70(15\%) + .30(5\%) = 12\%$$
$$\sigma r_p = .70(.05)^{1/2} = 15.7\%$$

Difficulty: Medium

53. The holding period return on a stock was 32%. Its beginning price was $25 and its cash dividend was $1.50. Its ending price must have been _____.
A. $28.50
B. $33.20
C. $31.50
D. $29.75

$$\frac{P_1 + 1.50 - 25}{25} = .32; P_1 = \$31.50$$

Difficulty: Medium

54. Consider the following two investment alternatives. First, a risky portfolio that pays 15% rate of return with a probability of 40% or 5% with a probability of 60%. Second, a treasury bill that pays 6%. The risk premium on the risky investment is _____.
A. 1%
B. 3%
C. 6%
D. 9%

$$\text{Risk Premium} = \left[.4(.15) + .6(.05)\right] - .06 = .03$$

Difficulty: Medium

55. Consider the following two investment alternatives. First, a risky portfolio that pays 20% rate of return with a probability of 60% or 5% with a probability of 40%. Second, a treasury bill that pays 6%. If you invest $50,000 in the risky portfolio, your expected profit would be _____.

A. $3,000
B. $7,000
C. $7,500
D. $10,000

$$\text{Expected Profit} = 50{,}000\left[.6(.20)+.4(.05)\right] = 7{,}000$$

Difficulty: Medium

56. You invest $10,000 in a complete portfolio. The complete portfolio is composed of a risky asset with an expected rate of return of 15% and a standard deviation of 21% and a treasury bill with a rate of return of 5%. How much money should be invested in the risky asset to form a portfolio with an expected return of 11%?

A. $6,000
B. $4,000
C. $7,000
D. $3,000

15x + 5(1 - x) = 11; x = 60%; 0.60(10,000) = $6,000

Difficulty: Hard

You invest $1,000 in a complete portfolio. The complete portfolio is composed of a risky asset with an expected rate of return of 16% and a standard deviation of 20% and a treasury bill with a rate of return of 6%.

57. _____ of your complete portfolio should be invested in the risky portfolio if you want your complete portfolio to have a standard deviation of 9%.
A. 100%
B. 90%
C. 45%
D. 10%

$w_{rp}(20) = 9;\ w_{rp} = 45\ \%$

Difficulty: Easy

58. A portfolio that has an expected value in one year of $1,100 could be formed if you _____.
A. Place 40% of your money in the risky portfolio and the rest in the risk free asset
B. Place 55% of your money in the risky portfolio and the rest in the risk free asset
C. Place 60% of your money in the risky portfolio and the rest in the risk free asset
D. Place 75% of your money in the risky portfolio and the rest in the risk free asset

$1100 = x(1000)(1.16) + (1 - x)1000(1.06)$ $x = 40\% = w_{rp}$

Difficulty: Hard

59. The slope of the capital allocation line formed with the risky asset and the risk-free asset is _____.
A. 1.40
B. 0.80
C. 0.50
D. 0.40

$$\frac{16-6}{20} = 0.50$$

Difficulty: Medium

60. You have $500,000 available to invest. The risk-free rate as well as your borrowing rate is 8%. The return on the risky portfolio is 16%. If you wish to earn a 22% return, you should _____.
A. invest $125,000 in the risk-free asset
B. invest $375,000 in the risk-free asset
C. borrow $125,000
D. borrow $375,000

$$y = \frac{.22 - .08}{.16 - .08} = 1.75$$

$$\text{Borrowing} = 500{,}000(1.75 - 1) = 375{,}000$$

Difficulty: Hard

61. The return on the risky portfolio is 15%. The risk-free rate as well as the investor's borrowing rate is 10%. The standard deviation of return on the risky portfolio is 20%. If the standard deviation on the complete portfolio is 25%, the expected return on the complete portfolio is _____.
A. 6.00%
B. 8.75 %
C. 10.00%
D. 16.25%

$w_{rp}(20) = 25;\ w_{rp} = 25/20 = 1.25$

$E(r_p) = -.25(10) + 1.25(15) = 16.25\%$

Difficulty: Hard

You are considering investing $1,000 in a complete portfolio. The complete portfolio is composed of treasury bills that pay 5% and a risky portfolio, P, constructed with 2 risky securities X and Y. The optimal weights of X and Y in P are 60% and 40% respectively. X has an expected rate of return of 14% and Y has an expected rate of return of 10%.

62. To form a complete portfolio with an expected rate of return of 11%, you should invest _____ of your complete portfolio in treasury bills.
A. 19%
B. 25%
C. 36%
D. 50%

$$.11 = W_f(.05) + (1 - W_f)[(.6)(.14) + (.4)(.10)]$$

$$W_f = .19$$

Difficulty: Hard

63. To form a complete portfolio with an expected rate of return of 8%, you should invest approximately _____ in the risky portfolio. This will mean you will also invest approximately _____ and _____ of your complete portfolio in security X and Y respectively.
A. 0%, 60%, 40%
B. 25%, 45%, 30%
C. 40%, 24%, 16%
D. 50%, 30%, 20%

$E(r_p) = .6(14) + .4(10) = 12.4\%$
$.08 = w_{rp}(.124) + (1 - w_{rp})(.05)$
$w_{rp} \cong 40\%$
w_x in complete portfolio $= .40(.60) = 24\%$
w_y in complete portfolio $= .40(.40) = 16\%$

Difficulty: Hard

Difficulty: Hard

You have the following rates of return for a risky portfolio for several recent years:

2005	**35.23%**
2006	**18.67%**
2007	**-9.87%**
2008	**23.45%**

66. If you invested $1,000 at the beginning of 2005 your investment at the end of 2008 would be worth _____.
A. $2,176.60
B. $1,785.56
C. $1,645.53
D. $1,247.87

$1(1.3523)(1.1867)(1 + -.0987)(1.2345) = $1.7856

Difficulty: Medium

67. The annualized average return on this investment is
A. 16.15%
B. 16.87%
C. 21.32%
D. 15.60%

$(1.17856)^{1/4} - 1 = 15.60\%$

Difficulty: Hard

68. A security with normally distributed returns has an annual expected return of 18% and standard deviation of 23%. The probability of getting a return between -28% and 64% in any one year is
A. 68.26%
B. 95.44%
C. 99.74%
D. 100.00%

probability of a return within $\pm 2\sigma$ = 95.44%

Difficulty: Medium

69. The Manhawkin Fund has an expected return of 16% and a standard deviation of 20%. The risk free rate is 4%. What is the reward-to-volatility ratio for the Manhawkin Fund?
A. 0.8
B. 0.6
C. 9.0
D. 1.0

$$\frac{16-4}{20}=.06$$

Difficulty: Medium

70. From 1926 to 2008 the world stock portfolio offered _____ return and _____ volatility than the portfolio of large U.S. stocks.
A. lower; higher
B. lower; lower
C. higher; lower
D. higher; higher

Difficulty: Medium

71. The price of a stock is $55 at the beginning of the year and $50 at the end of the year. If the stock paid a $3 dividend and inflation was 3%, what is the real holding period return for the year?
A. -3.64%
B. -6.36%
C. -6.44%
D. -11.74%

$$\frac{50+3}{55}-1=-3.64\%$$

Nominal return on stock:

Real return $\frac{-3.64-3}{1.03}=-6.44\%$

Difficulty: Hard

72. The price of a stock is $38 at the beginning of the year and $41 at the end of the year. If the stock paid a $2.50 dividend what is the holding period return for the year?
A. 6.58%
B. 8.86%
C. 14.47%
D. 18.66%

HPR = (41 - 38 + 2.50)/38 = 0.1447

Difficulty: Easy

73. You invest all of your money in one year T-bills. Which of the following statements is/are correct?
I. Your nominal return on the T-bills is riskless.
II. Your real return on the T-bills is riskless.
III. Your nominal Sharpe measure is zero.
A. I only
B. I and III only
C. II only
D. I, II and III

Difficulty: Medium

74. Which one of the following would be considered a risk-free asset in real terms as opposed to nominal?
A. Money market fund
B. U.S. T-bill
C. Short term corporate bonds
D. U.S. T-bill whose return was indexed to inflation

Difficulty: Medium

75. What is the geometric average return of the following quarterly returns: 3%, 5%, 4%, and 7%, respectively?
A. 3.72%
B. 4.23%
C. 4.74%
D. 4.90%

Return = $(1.03 \times 1.04 \times 1.05 \times 1.07)^{.25} - 1 = .0474$

Difficulty: Medium

76. What is the geometric average return over one year if the quarterly returns are 8%, 9%, 5%, and 12%, respectively?
A. 8.00%
B. 8.33 %
C. 8.47%
D. 8.50 %

Return = $(1.05 \times 1.08 \times 1.09 \times 1.12)^{.25} - 1 = .0847$

Difficulty: Medium

77. If nominal rate of return on investment is 6% and inflation is 2% over a holding period, what is the real rate of return on this investment?
A. 3.92%
B. 4.00%
C. 4.12%
D. 6.00%

$$\frac{6-2}{1.02} = 3.92\%$$

Difficulty: Medium

78. According to historical data, over the long run which of the following assets has the best chance to provide the best after inflation, after tax rate of return?
A. Long term Treasury bonds
B. Corporate bonds
C. Common stocks
D. Preferred stocks

Difficulty: Easy

Difficulty: Hard

81. The CAL provided by combinations of one month T-bills and a broad index of common stocks is called the _____.
A. SML
B. CAPM
C. CML
D. Total Return Line

Difficulty: Easy

82. Which of the following are correct arguments supporting passive investment strategies?
I. Active trading strategies may not guarantee higher returns but guarantee higher costs
II. Passive investors can free ride on the activity of knowledge investors whose trades force prices to reflect currently available information
III. Passive investors are guaranteed to earn higher rates of return than active investors over sufficiently long time horizons
A. I only
B. I and II only
C. II and III only
D. I, II and III

Difficulty: Medium

You have the following rates of return for a risky portfolio for several recent years. Assume that the stock pays no dividends

Year	Beginning of year price	# shares bought or sold
2005	$50	100 bought
2006	$55	50 bought
2007	$51	75 sold
2008	$54	75 sold

83. What is the geometric average return for the period?
A. 2.87%
B. 0.74%
C. 2.60%
D. 2.21%

$$\text{yr 1}\ \frac{55-50}{50} = 10\% \quad \text{yr 2}\ \frac{51-55}{55} = -7.27 \quad \text{yr 3}\ \frac{54-51}{51} = 5.88\%$$

$[(1.10)(1 + -.0727)(1.0588)]^{1/3} - 1 = 2.60\%$

Difficulty: Hard