Business Finance

Examination Two
Spring 2005

Select the best answer for each of the following questions. Mark your selection on the examination and on your scantron. You may also record your selection on the answer sheet. Show all work on the problems. Turn in your examination and scantron when you are finished; keep the answer sheet. Answer keys will be posted ten minutes after the exam is completed. Your score will be based on your answers on the scantron and not on the answer sheet.

5 points per question

1. When two assets are combined into a portfolio, diversification can be achieved. The requirement for some degree of diversification to occur is that:
   a. the correlation coefficient between those securities must be greater than one.
   b. the covariance between those securities must be greater than one.
   c. **the correlation coefficient between those securities must be less than one.**
   d. the covariance between those securities must be less than one.
   e. the correlation coefficient between those securities must be equal to zero.

2. Over the past two months, political problems in the Middle East have caused oil prices to rise and inflationary expectations to increase. What impact should these events have on the Security Market Line, all other things held constant?
   a. Shift down and less steep slope.
   b. Shift up and have steeper slope.
   c. Shift up and have less steep slope.
   d. **Shift up and keep same slope.**
   e. Shift down and keep same slope.

3. Given the following graph of the Security Market Line (SML):

   ![SML Diagram]

   What type securities are represented by point Z?
   a. Securities that are undervalued.
   b. Securities that have less systematic risk than the market on average.
   c. Securities that exhibit high levels of systematic risk.
   d. **Securities that do not compensate the investor for their levels of systematic risk.**
   e. Securities that have low correlations with other securities.
4. An investor is given the four investment alternatives (A, B, C and D) with the following characteristics:

<table>
<thead>
<tr>
<th>Asset</th>
<th>Expected Return</th>
<th>Standard Deviation of Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.0 percent</td>
<td>6.0 percent</td>
</tr>
<tr>
<td>2</td>
<td>10.0 percent</td>
<td>8.0 percent</td>
</tr>
<tr>
<td>3</td>
<td>8.0 percent</td>
<td>8.0 percent</td>
</tr>
<tr>
<td>4</td>
<td>12.0 percent</td>
<td>10.0 percent</td>
</tr>
<tr>
<td>5</td>
<td>14.0 percent</td>
<td>12.0 percent</td>
</tr>
</tbody>
</table>

Which of the following statements best describes the rational investor's investment decision?

a. A rational investor would never prefer Asset 5 in isolation.
b. A rational investor would never prefer Asset 4 in isolation.
c. A rational investor would never prefer Asset 3 in isolation.
d. A rational investor would never prefer Asset 1 in isolation.
e. A rational investor would never prefer Asset 2 in isolation.

5. As the number of securities in a portfolio increases (say, from 10 to 25 assets), the __________ risk of the portfolio declines; the majority of the risk remaining in the portfolio is __________ risk.

a. market; unsystematic
b. systematic; diversifiable
c. unsystematic; total
d. total; market
e. systematic; total

6. Which of the following statements is correct given the securities with the following characteristics?

<table>
<thead>
<tr>
<th>Stock</th>
<th>Standard Deviation</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>0.25</td>
<td>1.2</td>
</tr>
<tr>
<td>B</td>
<td>0.20</td>
<td>1.5</td>
</tr>
</tbody>
</table>

a. Stock A has more total risk but less market risk than stock B.
b. Stock A has more total risk and more market risk than stock B.
c. Stock A has less total risk but more market risk than stock B.
d. Stock A has less total risk and less market risk than stock B.

e. Stock A has less total risk but less market risk than stock B.

7. Which of the following security types have averaged the lowest rates of return and lowest variation in returns over the past 75 years?

a. Long-term government bonds
b. Large company stocks
c. Long-term corporate
d. US Treasury bills
e. Small company stocks
8. Five years ago you bought $75.00 stock that is now worth $20.00. Assuming that the stock paid no dividends, the rate of return on your investment was:
   a. -7.7 percent  d. -23.2 percent
   b. -16.7 percent  e. -29.0 percent
   c. -7.3 percent

9. If $11,000 is placed in an account that earns a nominal 12%, compounded monthly, for 9 years, what will it be worth in 9 years?
   a. $42,855.74  d. $30,503.74
   b. $32,218.18  e. $35,373.95
   c. $46,096.77

10. You have been saving money for the last two years. You made deposits of $9,000 on January 1, 1998, and July 1, 1998, in a savings account paying 8 percent compounded semi-annually. On January 1, 1999, the bank increased the interest rate paid on savings accounts to 9 percent, annual compounding. You made a third $9,000 deposit on April 1, 1999. How much will be in your account on January 1, 2000?
    a. $30,622.90  d. $30,821.90
    b. $30,413.81  e. $28,169.28
    c. $31,030.99

11. If you were promised 15 annual payments of $2,000 starting with the first payment today, compute the present value of these flows if your opportunity cost is 7 percent.
    a. $19,491  d. $18,216
    b. $17,024  e. $53,776
    c. $46,970
12. If you have $30,000 in an account that has been paying an annual rate of 7 percent, compounded continuously, since you deposited some funds 6 years ago, how much was the original deposit?

   a.  $27,971.81   d.  $19,990.27
   b.  $23,899.10   e.  $19,711.40
   c.  $18,378.79

13. According to a local department store, the store charges customers 0.8 percent per month on the outstanding balances of their charge accounts. What is the effective annual rate on such customer credit? Assume the store recalculates your account balance at the end of each month.

   a.  9.60 percent   d.  9.40 percent
   b.  11.00 percent   e.  9.73 percent
   c.  10.03 percent

14. Starting on January 1, 1991, and then on each January 1 until 2000 (10 payments), you will make payments of $9,000 into an investment which yields 5 percent. How much will your investment be worth on December 31 in the year 2010?

   a.  $297,593.59   d.  $213,201.03
   b.  $184,392.55   e.  $200,623.14
   c.  $193,612.18

15. Find the present value for the following income stream if the interest rate is 9 percent.

<table>
<thead>
<tr>
<th>YEARS</th>
<th>CASHFLOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4</td>
<td>$ 300</td>
</tr>
<tr>
<td>5-10</td>
<td>$ 600</td>
</tr>
<tr>
<td>11-15</td>
<td>$1,000</td>
</tr>
</tbody>
</table>

   a.  $ 6,016   d.  $ 4,402
   b.  $ 5,968   e.  $ 4,522
   c.  $ 5,420
16. Jason and Bryan McNutt are presently 3 and 5 years old. Their parents are planning to send them to college at age 18 at a cost of $8,000 per year for each. How much must the parents contribute annually to a college fund to ensure the boys' college education if the interest rate is 7 percent compounded annually? The payments start in one year and end when the younger brother starts college.
   a. $2,269  d. $2,156
   b. $2,215  e. $2,475
   c. $2,648

17. You are thinking about buying a new car, and a local bank is willing to lend you $27,000 to buy the automobile. Under the terms of the loan, it will be fully amortized over four years (48 monthly payments) and the nominal interest will be 9 percent. What would be the monthly payment on the loan?
   a. $ 572.36  d. $ 671.90
   b. $ 622.13  e. $ 690.22
   c. $ 522.59

Consider the following information and calculate the required rate of return for the Winkler Investment Fund. The total investment fund is $20,000.

<table>
<thead>
<tr>
<th>Stock</th>
<th>Investment</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$5,000</td>
<td>1.50</td>
</tr>
<tr>
<td>B</td>
<td>$10,000</td>
<td>0.90</td>
</tr>
<tr>
<td>C</td>
<td>$2,000</td>
<td>0.75</td>
</tr>
<tr>
<td>D</td>
<td>$3,000</td>
<td>1.20</td>
</tr>
</tbody>
</table>

18. Suppose required rate of return on the market ($R_m$) is 10 percent and the risk-free rate ($R_f$) is 3 percent; what is the expected portfolio return?
   a. 10.00 percent  d. 14.26 percent
   b. 10.56 percent  e. 12.30 percent
   c. 17.26 percent
Given the following information concerning ASSETS X and Y:

<table>
<thead>
<tr>
<th>Possible Outcomes</th>
<th>Probability</th>
<th>Return of X</th>
<th>Return of Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.15</td>
<td>-10.0%</td>
<td>50.0%</td>
</tr>
<tr>
<td>2</td>
<td>0.30</td>
<td>10.0%</td>
<td>35.0%</td>
</tr>
<tr>
<td>3</td>
<td>0.40</td>
<td>15.0%</td>
<td>20.0%</td>
</tr>
<tr>
<td>4</td>
<td>0.15</td>
<td>35.0%</td>
<td>-10.0%</td>
</tr>
</tbody>
</table>

Standard Deviation of Returns: 0.1250 0.1781
Correlation Coefficient: -0.9653

19. What is the expected return of a portfolio comprised of 60 percent of an investor's wealth invested in ASSET X and 40 percent invested in ASSET Y?
   a. 17.45 percent
   b. 20.98 percent
   c. 16.28 percent
   d. 18.63 percent
   e. 19.80 percent

20. What is the standard deviation of a portfolio comprised of 60 percent of an investor's wealth invested in ASSET X and 40 percent invested in ASSET Y?
   a. 8.90 percent
   b. 0.20 percent
   c. 6.01 percent
   d. 1.96 percent
   e. 3.85 percent
Formula and Answer Sheet

Price = \sum (1 + k)^t \times \text{Cashflow}_t

Price = \text{Coupon}(PVIFA_{K,N}) + \text{Par}(PVIF_{K,N})

P_0 = D_0(1+g_c)/(k-g_c) \quad k = (D_0(1+g_c)/P_0) + g_c

E(R_i) = \sum p_i R_i \quad E(R_p) = \sum w_i E(R_i)

\sigma^2 = \sum p_i(x_i - E(x))^2 \quad \rho_{AB} = \frac{\text{Cov}(A,B)}{\sigma_A \sigma_B}

\text{Cov}(A,B) = \sum p_i(A_i - E(A))(B_i - E(B))

\sigma^2_p = w_A^2 \sigma_A^2 + w_B^2 \sigma_B^2 + 2 w_A w_B \sigma_A \sigma_B \rho_{AB}

E(R_i) = R_F + \beta(E(R_M) - R_F)

E(R_i) = R_F + \beta(E(R_M) - R_F) = k = (D_0(1+g_c)/P_0) + g_c

PV(1 + k)^n = FV \quad PV(1 + k/m)^{mn} = FV \quad PV e^{kn} = FV

EAR = (1 + k/m)^m - 1 \quad EAR = e^k - 1

PV = \text{Pmt}(PVIFA_{k,n}) \quad PVIFA_{k,n} = \frac{1 - (1/(1+k)^n)}{k}

FV = \text{Pmt}(FVIFA_{k,n}) \quad FVIFA_{k,n} = \frac{(1+k)^n - 1}{k}

1. _____ 5 pts  11. _____ 5 pts
2. _____ 5 pts  12. _____ 5 pts
3. _____ 5 pts  13. _____ 5 pts
4. _____ 5 pts  14. _____ 5 pts
5. _____ 5 pts  15. _____ 5 pts
6. _____ 5 pts  16. _____ 5 pts
7. _____ 5 pts  17. _____ 5 pts
8. _____ 5 pts  18. _____ 5 pts
9. _____ 5 pts  19. _____ 5 pts
10. _____ 5 pts  20. _____ 5 pts