**DTU406 – PORTFOLIO MANAGEMENT**

**MOCK EXAM QUESTION BOOKLET**

**October 2019**

**Time: 90 minutes**

**Name : Student ID :**

**PART 1. MULTIPLE CHOICE QUESTIONS (40 points)**

***There are 20 questions in this part. Please choose ONE answer for each question. Each question is worth 0.2 points.***

1. \_\_\_\_\_\_\_\_\_\_\_ refer(s) to the ability to convert assets to cash quickly and at a fair market price and often increase(s) as one approaches the later stages of the investment life cycle.

**A)** Liquidity needs

**B)** Time horizons

**C)** Capital liquidations

1. An investment manager is looking at ten possible stocks to include in a client’s portfolio. In order to achieve the maximum efficiency of the portfolio, the manager must:

**A)** find the combination of stocks that produces a portfolio with the maximum expected rate of return at a given level of risk.

**B)** include only the stocks that have the lowest volatility at a given expected rate of return.

**C)** include all ten stocks in the portfolio in equal amounts.

1. Which of the following statements regarding individual and institutional investors is true?

**A**) Taxes are generally more important to institutional investors than to individual investors.

**B**) Institutional investors tend to be less precise about their assets and liabilities than individual investors.

**C**) Individuals generally have greater freedom in their investment decisions than do institutional investors.

1. In a two-asset portfolio, reducing the correlation between the two assets moves the efficient frontier in which direction?

**A)** The efficient frontier is stable unless the asset’s expected volatility changes. This depends on each asset’s standard deviation.

**B)** The frontier extends to the left, or northwest quadrant representing a reduction in risk while maintaining or enhancing portfolio returns.

**C)** The efficient frontier is stable unless return expectations change. If expectations change, the efficient frontier will extend to the upper right with little or no change in risk.

1. According to the APT model and the following information, what are the expected returns for stock Y and Z?

λ0 = 0.05 by,1 = 0.75 bz,1 = 1.5

λ1 = 0.06 by,2 = 1.35 bz,2 = 0.85

λ2  = 0.05

**A**) 14.25% and 18.25%

**B**) 16.25% and 18.25%

**C**) 16.25% and 20.25%

1. Charlie Smith holds two portfolios, Portfolio X and Portfolio Y. They are both liquid, well-diversified portfolios with approximately equal market values. He expects Portfolio X to return 13% and Portfolio Y to return 14% over the upcoming year. Because of an unexpected need for cash, Smith is forced to sell at least one of the portfolios. He uses the security market line to determine whether his portfolios are undervalued or overvalued. Portfolio X’s beta is 0.9 and Portfolio Y’s beta is 1.1. The expected return on the market is 12% and the risk-free rate is 5%. Smith should sell:

**A)** both portfolios X and Y because they are both overvalued.

**B)** portfolio Y only.

**C)** either portfolio X or Y because they are both properly valued.

1. Consider the data presented below on three mutual funds and the market.

Standard

Fund Beta Deviation (%) Return (%) Rf (%)

AAA 0.75 6.0 15 3

BBB 1.05 7.0 18 3

CCC 0.89 8.0 20 3

Using the Sharpe Measure, which portfolio performed best?

**A**) AAA

**B**) BBB

**C**) CCC

1. Consider the following two factor APT model

E(R) = λ0 + λ1*b*1 + λ2*b*2

**A**) λ1 is the expected return on the asset with zero systematic risk.

**B**) λ1 is the factor loading.

**C**) λ1 is the risk premium.

1. What is the expected return of the three stock portfolio described below?

Common Stock Market Value Expected Return

Ando Inc. 95,000 12.0%

Bee Co. 30,000 8.75%

Cool Inc. 65,000 17.7%

**A**) 13.44%

**B**) 12.82%

**C**) 15.27%

1. Which of the following statements regarding the Capital Asset Pricing Model is least accurate?

**A)** It is useful for determining an appropriate discount rate.

**B)** Its accuracy depends upon the accuracy of the beta estimates.

**C)** It is when the security market line (SML) and capital market line (CML) converge.

1. For a portfolio which is one of many combined into a larger investment fund, the most appropriate measure of portfolio performance would be

**A**) The Treynor measure because it weighs excess returns against systematic risk.

**B**) The Sharpe measure because it examines both unsystematic and systematic risk.

**C**) The Information ratio because it weights the alpha of the portfolio by the nonsystematic risk measure.

1. The index model has been estimated for stocks A and B with the following results:   
   RA = 0.01 + 0.8RM + eA  
   RB = 0.02 + 1.2RM + eB  
   σM = 0.20 σ(eA) = 0.20 σ (eB) = 0.10  
   The standard deviation for stock A is \_\_\_\_\_\_\_\_\_\_.

**A**) 0.2000 **B)** 0.2561 **C**) 0.2600

1. Consider the following probability distribution for stocks A and B:

|  |  |  |  |
| --- | --- | --- | --- |
| State | Probability | Return on Stock A | Return on Stock B |
| 1 | 0.1 | 10% | 8% |
| 2 | 0.2 | 13% | 7% |
| 3 | 0.2 | 12% | 6% |
| 4 | 0.3 | 14% | 9% |
| 5 | 0.2 | 15% | 8% |

If you invest 40% of your money in A and 60% in B, what would be your portfolio's expected rate of return?

**A**) 9.5%

**B**) 9.7%

**C**) 9.9%

1. The Sharpe ratio, Treynor measure, the M2 measure and Jensen’s alpha techniques all measure the risk/return performance of portfolios. Which of the following statements about these measurement techniques is least accurate?
2. Using the capital market line the M2 compares the account's return to the market return and is a comparative measure.
3. While the Treynor measure computes excess return per unit of risk, Jensen's Alpha measures differential return for a given level of risk.
4. The Sharpe ratio measures the slope of the capital allocation line (CAL), with the lowest slope having the most desirable risk/return combination
5. Peter Michaels, CFA, works at Composite Consulting, and is in charge of evaluating the performance of various portfolio managers. His main tasks are to measure and evaluate the sources of return that can be attributed to manager performance. Michaels understands the importance of incorporating risk into his analyses, but realizes the limitations associated with some performance measurement techniques in accomplishing that particular objective. Michaels begins the evaluation of a number of managers by examining return information from both the portfolio being evaluated and its designated benchmark.

Michaels has the following return information for the AM Growth Fund:

|  |  |  |
| --- | --- | --- |
|  | *AM Growth Fund* | *S&P 500* |
| Return | 14% | 12% |
| Standard deviation | 25% | 18% |
| Beta | 1.15 | 1.00 |

If the risk-free rate is currently 4%, which of the following represent the calculation for the Sharpe Ratio and the Treynor measure, respectively, for the AM Growth Fund?

1. 0.08 and 0.02.
2. 0.40 and 0.09.
3. 0.56 and 0.12.
4. Which phase of the business cycle is characterized by rising stock prices but increased investor nervousness?
5. Initial recovery.
6. Slowdown.
7. Late expansion.
8. Jack Gallon is a portfolio manager whose fund sponsor would like to evaluate his performance. It is very important to the fund sponsor to minimize tracking risk. Which of the following would be most appropriate for evaluating his performance?
9. The Treynor ratio.
10. The information ratio.
11. Jensen’s alpha.
12. Which of the following equity strategies would provide the lowest expected tracking risk?
13. Enhanced indexing.
14. Passive.
15. Risk-controlled active management.
16. An investor believes markets are efficient and pursues an equity investment strategy consistent with their beliefs. Which of the following best characterizes their portfolio, relative to other possible equity strategies?
17. High tracking risk and low information ratio.
18. Low tracking risk and high information ratio.
19. Low tracking risk and low information ratio.
20. A manager wishes to use a passive strategy to mimic the returns of a price-weighted stock index that consists of 50 stocks. Which of the following would be the best method to use in composing this portfolio?
21. To compose a portfolio that consists of an equal number of shares of a sample of the stocks in the index.
22. Using the full replication method.
23. To compose a portfolio that is equally weighted using a sample of stocks in the index.
24. Jim Kyle has been the manager of the Superior Asset Portfolio for the past ten years. During this time, Superior’s average return was 14.50%. For the purpose of performance evaluation, the Superior Asset Portfolio is compared to the S&P 500. During the same time period, the S&P 500 had an average annual return of 18%. The standard deviation of surplus return is 23%. What is Superior’s information ratio?
25. - 0.15. **B**) 0.16. **C**) -0.56.
26. Which of the following is most accurate regarding growth stocks? Growth stocks are likely to:
27. outperform during an economic contraction and outperform during an economic expansion.
28. outperform during an economic contraction and underperform during an economic expansion.
29. underperform during an economic contraction and outperform during an economic expansion
30. Which of the following statements about value and growth investors is least accurate?
31. Growth investors seek industries where low expected earnings growth will drive the stock price down.
32. Value investors focus on the numerator of the P/E ratio while growth investors focus on the denominator.
33. Growth investors may do better during an economic contraction than during an expansion
34. Kim and Darren Jones are both 55 years old and want to retire within the next 12 - 18 months. They currently have the following portfolio:

|  |  |
| --- | --- |
| *Asset Class* | *%* |
| Small cap growth | 35 |
| Large cap value | 30 |
| High yield bonds | 30 |
| T-bills | 0 |
| Corporate bonds | 5 |
|  | 100 |

What can be said about the current allocations?

1. Properly diversified.
2. Too aggressive.
3. Not aggressive enough.
4. Which of the following measures would be the most appropriate one to use when comparing the results of two portfolios in which each portfolio contains only a few number of stocks representing a limited number of industries?
5. Sharpe ratio.
6. Treynor measure.
7. Information ratio.
8. In global performance evaluation, performance attribution seeks to:
9. differentiate whether returns come from a manager’s luck or skill.
10. identify the sources of difference between portfolio and benchmark return.
11. measure the risk and return of the portfolio.
12. Of the Sharpe, Treynor, and Jensen’s Alpha measures, when dealing with a sector fund which will be added to the investor’s overall larger portfolio, which is the most relevant measurement technique to assess relative risk/return performance?
13. Both measures are equally appropriate.
14. Treynor measure.
15. Sharpe ratio.
16. Lee Hill, CFA, is evaluating three portfolio managers that he is considering adding to his consulting firm’s select list. The risk-free rate is 5%.

|  |  |  |  |
| --- | --- | --- | --- |
| *Portfolio Manager* | *Return* | *Beta* | *Standard Deviation* |
| A | 0.13 | 0.75 | 0.06 |
| B | 0.17 | 0.85 | 0.11 |
| C | 0.08 | 1.20 | 0.01 |

If Hill uses the Sharpe measure as his chosen performance measure, which portfolio would he add?

1. Manager C.
2. Manager A.
3. Manager B.
4. The following data has been collected to appraise the performance of four asset management firms:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | *Dixon Fund* | *Adams Fund* | *Bould Fund* | *Winterburn Fund* | *Market Index* |
| Return | 5.12% | 7.68% | 8.00% | 4.80% | 6.4% |
| Beta | 0.95 | 1.08 | 1.40 | 0.80 | 1.00 |
| Variance | 14.05 | 15.50 | 20.25 | 9.20 | 12.25 |

The risk free rate of return is 4%. Using the Treynor measure, rank the four funds in terms of the risk adjusted excess returns starting with the highest performing fund and ending with the lowest performing fund:

1. Adams, Bould, Winterburn, Dixon.
2. Bould, Adams, Dixon, Winterburn.
3. Adams, Bould, Dixon, Winterburn.

**PART 2. EXERCISES**

**Question 1. Individual Investors (3 points)**

Roberto and Mariana Carvalho live in a large city in Brazil with their two children, ages four and two. Roberto is 30 years old and Mariana will be 30 years old later this month. Roberto is a manager in a manufacturing facility and Mariana is a musician in the local symphony orchestra.

Roberto and Mariana’s annual salaries total 120,000 Brazilian reais (BRL) after tax. Their salaries just cover their living expenses. The average annual inflation rate is four percent and their salaries and expenses are expected to increase at this rate. They are healthy and believe their jobs and earning potential are secure. The Carvalhos’ salaries, dividends, and interest are taxed at 20 percent, and capital gains at 15 percent.

Mariana’s parents have significant wealth and funded an irrevocable personal trust for her. Brazil has a wealth transfer tax that applies to transfers into trusts and to inheritances. Brazil has adopted the Prudent Investor Rule for the administration of trusts. The current value of the trust is BRL 1,500,000. The terms of the trust state that when Mariana reaches the age of 30, she will receive a tax-free distribution of half the value of the trust. The balance of the trust will remain invested and will distribute in total to her when she reaches age 40. Since she does not have access to the remaining balance for ten years, this balance is not considered a part of the Carvalhos’ investable assets, but is part of their total net worth. In addition, Mariana expects to inherit a substantial sum of money upon the death of both parents.

The Carvalhos have BRL 500,000 in investable assets, currently all in short-term bank deposits. It is their intention to maintain at least this amount in investable assets, on an inflation-adjusted basis, in the future.

The Carvalhos currently live with Mariana’s parents, but are now purchasing a home. The purchase price of the home is BRL 850,000. The down payment is 30 percent of the cost of the home and will be funded from the trust distribution. The Carvalhos will take out a fixed rate mortgage for the balance of the purchase price. The after-tax mortgage cost will be fixed at BRL 55,000 (principal and interest) annually for 30 years, with the first annual payment due one year from now.

The Carvalhos’ immediate investment goal is to have their investment portfolio cover the cost of the mortgage, while maintaining the portfolio’s inflation-adjusted value. They plan to retire at the age of 60 and their long-term goal is to have an investment portfolio that will provide an annual income comparable to their current salaries adjusted by inflation. Their family health insurance is provided by Roberto’s employer, both now and in retirement. They are hopeful their two children will attend the local university at no cost. The university does not charge tuition fees for qualified students who pass its entrance exam. Those who do not pass the exam are required to pay full tuition, which is high relative to the Carvalhos’ living expenses.

In order to meet their investment goals, the Carvalhos realize they need to consider investments other than short-term bank deposits. The Carvalhos hire Luiz Oliveira, CFA, to manage an investment portfolio that they will fund with their BRL 500,000 in bank deposits and the net proceeds of Mariana’s trust distribution at age 30.

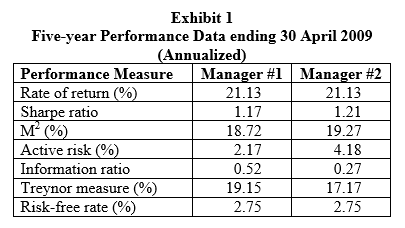
1. Prepare the return objectives portion of the Carvalhos’ investment policy statement (IPS). Calculate the after-tax nominal rate of return that is required for the next year. Show your calculations. (1.2 points)

2. Identify two factors in the Carvalhos’ situation that increase their ability to take risk. Identify two factors in the Carvalhos’ situation that decrease their ability to take risk. Determine whether the Carvalhos have below-average, average, or above-average ability to take risk. (1 point)

3. Prepare the liquidity and time horizon constraints of the Carvalhos’ IPS (0.8 points)

**Question 2. Portfolio Evaluation (1.5 points)**

A fund sponsor has adopted a formal policy to guide its manager evaluations. Cecilia Velasco and Alberto Roca, two staff members, appraise the performance of two traditional European equity managers. As part of the monitoring process, they have collected the information shown in Exhibit 1. Assume that it is appropriate to compare the performance of the two managers.

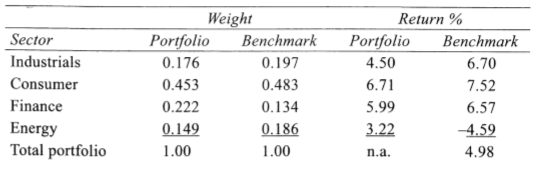


Determine, for each case below, the most appropriate performance measure from Exhibit 1 to compare Manager #1 and Manager #2. Identify, in each case, which manager outperformed. Explain what caused the difference in performance between the two managers.

1. Reward per unit of systematic risk incurred (0.5 points)
2. Reward per unit of total risk incurred (0.5 points)
3. Reward per unit of risk earned by deviating from the benchmark’s holdings (0.5 points)

**Question 3. (1.5 points)**

1. State and explain primary problems with mean-variance optimization. (0.5 points)
2. Alyssa Chong reviews the micro attribution data of an account:



1. Compute the total value added by the manager. (0.5 points)
2. Compute the pure sector allocation effect. (0.5 points)

THE END