Great Zimbabwe University

HEBERT CHITEPO SCHOOL OF LAW AND BUSINESS SCIENCES

DEPARTMENT OF ECONOMICS & FINANCE

BACHELOR OF COMMERCE DEGREE

LEVEL 4 SEMESTER 2

EXAMINATION QUESTION PAPER

MODULE CODE	**HFE 4210**
MODULE NARRATION	**PORTIFOLIO ENGINEERING**
DATE	**JUNE 2024**
DURATION	**3 HOURS**

INSTRUCTIONS TO CANDIDATES:

1. Answer any four questions
2. All questions carry equal marks
3. Start each question on a fresh page
4. Show all workings where applicable

QUESTION 1

(a) The executive director of GZU University Endowment estimates that the capital will provide a 9% expected return for an endowment portfolio taking above-average risk, and a 7% expected return for an endowment portfolio taking average risk. The GZU Endowment provides tuition scholarships for GZU University students. The spending rate has been 4%, and the expected tuition inflation rate is 3%. Recently, University officials have pressured the endowment to increase the spending rate to 6%. The endowment has an average to below-average ability to accept risk and only an average willingness to take risk, but a university official claims that the risk tolerance should be raised because higher returns are needed. Discuss an appropriate return objective and risk tolerance for the GZU Endowment. [10]

(b) Susan Labieer, treasurer for U. S based Life insurance, has just joined the body of a charitable organization that has a large endowment portfolio. She is researching on how the investment policy for an endowment differs from that of life insurance companies and has thus far reached the following conclusions:

• Both endowments and insurance companies have aggressive return requirements.

• Endowments are less willing to assume risk than life insurance companies because of donor concerns of volatility and loss of principal.

• Endowments are less able to assume risk than life insurance companies because of expectations that endowments should provide stable funding for charitable operations.

• Endowments have lower liquidity requirements than life insurance companies because endowment spending needs are met through a combination of current income and capital appreciation.

• Both endowments and life insurance companies are subject to stringent legal and regulatory oversight.

Evaluate each of Leibeer's statements in terms of accuracy and justify your conclusions. [15]

[TOTAL 25]

QUESTION 2

a) An investment firm is an investment management focused on high-net-worth individuals. As a preliminary step to asset allocation twice a year deVere develops three or four economic scenarios in-house. The senior staff assigns probabilities and generates return forecasts for domestic stocks, domestic bonds, and cash equivalents (the only asset types the firm uses); then expected values are computed for each asset category. Discuss the importance of asset allocation for portfolio performance. [10]

b) In active portfolio management, the attempt to beat the market is itself a significant contributor to portfolio risk. Discuss this statement, using appropriate examples. [8]

c) Explain any three reasons why successful implementation of asset allocation decisions is even more difficult in practice than in theory. [7]

[TOTAL 25]

QUESTION 3

a) A husband and his wife are both 46 years old and are aggressive investors; they have an investment portfolio worth over $250,000. Their target asset allocations are 60 percent equities and 40 percent bonds and cash; they have invested these assets in 10 mutual funds. Their actual asset class weights differ from their targets as shown below on (Table 2) because of the underperformance of the equity part of their portfolio. When should they rebalance their portfolio, and how should they do this? [8]

Table 2: Asset class weights

Asset class	Actual Weight	Target weight	Difference
Equity	0.70	0.60	0.10
Bonds	0.20	0.30	-0.10
Cash	0.10	0.10	0

b) An investor wants to put together a portfolio consisting of up to six different bonds. He has certain cash-flow requirements in the future that the coupons of the bonds should cover. These payments are independent of interest rate changes. Excess payments in a period can be reinvested, to be available in the next period, at a certain interest rate. Explain how should the investor choose his portfolio to minimize the cost of the bonds, while making sure that the payments cover his future cash-flow requirements? [9]

c) Slyvia and Stanley have a portfolio containing three asset classes. The equity benchmark for their portfolio is the S&P 500 index, the bond benchmark for their portfolio is the Salomon Brothers Intermediate index, and the cash benchmark for their portfolio is the Barclays Cash index. Benchmark weights are their target asset allocations, and their actual asset weights differ from their targets since they have not rebalanced recently. They are happy with their current asset class weights and last quarter, Slyvia and Stanley's portfolio had the following performance;

Table: 3 Asset class weights and returns vs. Benchmark returns

Asset class	Actual Return	Actual weight	Benchmark weight	Benchmark return
Equity	2.0%	0.70	0.60	2.5%
Bonds	1.0%	0.20	0.30	1.2%
Cash	0.5%	0.10	0.10	0.5%

Using any three portfolio performance measures, calculate the risk-adjusted performance for the fund and the market making recommendations on the most appropriate measure. [8]

[TOTAL 25]

QUESTION 4

a) The Barclays 2000 Index measures the performance of the small-cap segment of the U.S. equity universe and is comprised of the smallest 2000 companies in the Barclays 3000 Index, representing approximately 10% of the total market capitalization of that Index. It includes approximately 2000 of the smallest securities based on a combination of their market cap and current index membership. An investment manager has been given a mandate for managing a Barclays 2000 index fund for a moderate-size foundation. The manager must choose either full replication or optimization for managing the portfolio. Recommend the most appropriate method for constructing this index portfolio. [15]

b) Jeff Fujimori is responsible for the investment of a new USD10 billion contribution to the Honshu Bank's pension fund and the mandate is to invest with active managers. The equity portion of the pension plan has a broad equity market benchmark. Explain the major features of active equity management in terms of philosophy and objective. [10]

[TOTAL 25]

QUESTION 5

a) A U.K.-based pension fund has a large portfolio of British corporate and government bonds. The market value of the bond portfolio is £50 million. The duration of the portfolio is 9.52. An economic consulting firm that provides economic forecasts to the pension fund has advised the fund that the chance of an upward shift in interest rates in the near term is greater than the market currently perceives. In view of this advice the pension fund has decided to reduce the duration of its bond portfolio to 7.5 by using a futures contract priced at £100,000 that has a duration of 8.47. Assume that the conversion factor for the futures contract is 1.1. Would the pension fund need to buy futures contracts or sell and approximately, how many futures? [5]

b) Discuss the use of credit options in hedging a fixed income portfolios.[6]

c) Discuss the use of futures and options in active equity portfolio management[7]

d) In a portfolio held by XYM Fund managers, options mature in eight months, and the futures contract underlying the option matures in nine months. The current nine-month futures price is $8 per ounce, the exercise price of the options is $8, the risk-free interest rate is 12%

per annum, and the volatility of silver futures prices is 18% per annum. What is the delta of a short position in 1,000 European call options on silver futures? [7]

[TOTAL 25]

END