



CIFA PART III SECTION 6

ADVANCED PORTFOLIO MANAGEMENT

WEDNESDAY: 27 November 2019.

Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

QUESTION ONE

- (a) Uchaguzi Foundation has endowed Uwazi Limited Fund for monitoring electoral integrity, supervise elections and political campaigns in a country implementing a new constitution and undergoing a political transition.

The Fund is headquartered in your country and it has received an initial grant of Sh.200 million with an additional Sh.400 million expected to be received over the next three years. The Fund's charter expressly decrees that the Fund should spend itself out of existence within 10 years of its founding rather than trying to become a permanent institution.

Required:

- (i) Recommend an appropriate risk objective and return objective for the Fund. (4 marks)
- (ii) Analyse five investment constraints for the Fund. (5 marks)
- (b) (i) With an aid of a well labelled diagram, explain the term "corner portfolio" as used in portfolio construction. (2 marks)
- (ii) Identify three characteristics of an efficient portfolio in the context of strategic asset allocation. (3 marks)
- (c) Samuel Kimanzi and his wife Ruth, both aged 54 years are Kenyan residents. The couple is planning to retire next year at age 55. They have approached Cabel Mutua, an investment advisor, to help them analyse their investment strategy and retirement choices.

Once the couple retires, Ruth will receive annual payments from her company's defined contribution (DC) pension plan and both of them will receive payments from the National Social Security Fund (NSSF). Samuel Kimanzi does not participate in any company or individual retirement plan.

The investment advisor has compiled financial data and market expectations for the couple's retirement as shown below:

Financial Data and Market Expectations		
Expected annual expenses		Sh.1,000,000
Annual pension income from Ruth's DC pension plan	Sh.320,000	
Combined NSSF receipts	<u>Sh.320,000</u>	
Total annual pension income	<u>Sh.640,000</u>	
Expected annual inflation	5.0%	

Currently, Cabel Mutua estimates that the couple's investment portfolio will grow to Sh.10 million by the retirement date next year. The investment advisor recommends that they plan to pay off their mortgage by withdrawing Sh.1.5 million from their portfolio upon retirement.

Required:

- Geometric nominal return to be included in the couple's investment policy statement (IPS). (6 marks)
- (Total: 20 marks)

**QUESTION TWO**

- (a) Explain the following terms as used in fixed income portfolio management:
  - (i) Ladder portfolio. (1 mark)
  - (ii) Barbell portfolio. (1 mark)
  - (iii) Bullet portfolio. (1 mark)
  - (iv) Contingent immunisation. (1 mark)
- (b) Examine three conditions that must be satisfied to immunise a portfolio. (6 marks)
- (c) A client has asked you as his investment manager to match the absolute price sensitivity of its government bond portfolio to the absolute price sensitivity of its liability benchmark.

Due to the nature of the liabilities, the duration of the liability benchmark remains constant.

At the beginning of the current financial year, the bond portfolio absolute price sensitivity was equal to the absolute price sensitivity of the liability benchmark. At the end of the financial year, the manager is required to balance the portfolio so that the absolute price sensitivity of the assets again matches the absolute price sensitivity of the liability benchmark, while keeping the portfolio proportions of each bond unchanged.

The data required for rebalancing is provided below:

	<b>Government bond portfolio</b>			
	<b>Beginning of Year</b>		<b>End of Year</b>	
	<b>Price</b>	<b>Duration</b>	<b>Price</b>	<b>Duration</b>
<b>Bond 1</b>	94.50	4.9	94.00	4.3
<b>Bond 2</b>	90.00	7.0	93.00	6.3
<b>Bond 3</b>	103.50	5.5	102.00	5.0

**Note:** Each bond has a total par value of Sh.100,000  
Bond prices are shown as a percentage of par.

**Required:**

The amount of cash required for rebalancing the government bond portfolio. (7 marks)

- (d) Catherine Messo is a portfolio manager with Zedmac Investments Limited, a regional Fund managers. She is considering investments in alternative assets and decides to buy one August 5,000 bushel corn futures contract at Sh.250 per bushel.

The initial margin deposit is Sh.100,000 and the maintenance margin is Sh.75,000. At the end of the following day, the spot price of corn is Sh.245 and the price of August corn has fallen to Sh.240 per bushel.

**Required:**

The deposit required to bring the account back to the required level. (3 marks)

**(Total: 20 marks)**

**QUESTION THREE**

- (a) Propose two approaches that could be used by a portfolio manager in constructing a passive equity portfolio. (4 marks)
- (b) Describe four limitations of the mean-variance optimisation (MVO) technique used in asset allocation. (4 marks)
- (c) Kabaka Musa has approached his investment adviser for help to determine an appropriate asset allocation. During conversations with Kabaka, the advisor finds that his risk-tolerance is average ( $\lambda = 4$ ) and that he would also like to minimise the chance of earning less than 3%.

The following asset allocations are available:

Allocation	Expected return (ER)	Variance ( $\sigma^2$ )
1	8%	0.0225
2	6%	0.0144
3	4%	0.0025

**Required:**

Advise Kabaka on the appropriate asset allocation.

(5 marks)

- (d) A client uses three long only portfolio managers for its equity investments. Details of those investments including expected performance relative to client's equity benchmark are provided below:

Clients equity portfolio managers	Investment size (Sh.millions)	Expected alpha	Expected tracking error
Manager D	100	0%	0%
Manager E	20	1.5%	2.5%
Manager F	10	2.0%	4.0%

**Required:**

- (i) Describe the approach used in constructing the portfolio for the client. (2 marks)
- (ii) The expected alpha for the portfolio. (2 marks)
- (iii) The expected tracking error for the portfolio. (3 marks)

(Total: 20 marks)

**QUESTION FOUR**

- (a) Evaluate five key determinants of the optimal corridor width of an asset class in a percentage of portfolio rebalancing program. (5 marks)
- (b) Assess four types of benchmarks which could be used in performance evaluation of a portfolio. (4 marks)
- (c) (i) Highlight three benefits of performance attribution analysis in portfolio management. (3 marks)
- (ii) The following information relates to John Meja, a portfolio manager responsible for managing Sh.100 million equity portfolios:

Sector	Portfolio's actual weight in sector at beginning of the period (%)	Benchmark weight in sector at beginning of the period (%)	Sector return (%)
Financials	35.00	30.00	6.50
Agriculture	20.00	30.00	3.20
Industrial	45.00	40.00	8.98

**Additional information:**

- The Portfolio manager invests at the local Securities Exchange and is currently using the equity index as the benchmark.
- The equity index return is 6.5%.

**Required:**

Sector selection attribute for the portfolio.

(5 marks)

- (d) A Euro-based investor has a 75% position in a Great Britain Pound (GBP) denominated assets and a 25% position in United States Dollar (USD) denominated assets. The results for the past one year are as follows:

Return for the GBP assets	12%
Return for the USD assets	5%
Beginning EUR/GBP exchange rate	1.1666
Ending EUR/GBP exchange rate	1.1437
Beginning USD/EUR exchange rate	1.332
Ending USD/EUR exchange rate	1.324

**Required:**

Calculate the investor's return over the period in domestic (EUR) currency terms.

(3 marks)

(Total: 20 marks)

### QUESTION FIVE

- (a) Distinguish between “top down approach” and “bottom up approach” in relation to global credit bond portfolio management. (2 marks)
- (b) An investor has a Sh.10 million portfolio of bonds in a long position. Suppose the confidence interval is 95% and that the actual daily standard deviation of the portfolio over one trading year is 3.67%. The investor prefers to use risk metrics approach to calculate value at risk (VaR).

**Note:** Risk metrics uses 1.645 as the Z-score for 95% confidence level.

**Required:**

- (i) The value at risk (VaR) of the portfolio. (2 marks)
- (ii) The value at risk (VaR) for a 1-month horizon (30 days). (2 marks)
- (c) Nancy Nderitu, an investor at the Securities Exchange has realised that the bid-ask prices for Orion Group Limited’s shares are Sh.11.25 and Sh.11.30 respectively. A commission of Sh.2,500 is charged on purchase or sale of shares.

**Required:**

The transaction cost assuming that Nancy decides to purchase 10,000 shares and sell them immediately. (2 marks)

- (d) Frankline Wafula is considering to purchase 10,000 additional shares of Safariland Limited. He is not certain whether to use a market order or a limit order. The current limit order for the company’s shares at the Securities Exchange is provided below:

Price Sh.	Bid Size	Time	Price Sh.	Ask Size	Time
27.96	100	11 a.m.	28.10	500	11 a.m.
27.95	500	11 a.m.	28.12	300	11 a.m.
27.91	1,000	11 a.m.	28.13	1,500	11 a.m.
27.90	5,000	11 a.m.	28.16	3,000	11 a.m.
27.89	2,600	11 a.m.	28.18	5,000	11 a.m.
27.87	3,000	11 a.m.	28.25	4,500	11 a.m.
27.86	400	11 a.m.	28.27	4,700	11 a.m.

**Required:**

- (i) The average price per share assuming that Frankline entered a market order to purchase 10,000 shares of the company. (3 marks)
- (ii) The number of shares and average price per share assuming that Frankline entered a limit order of Sh.28.15. (3 marks)
- (e) Both direct and indirect investors in private equity need to understand the basics of direct private equity investment in order to have a grasp of its return and risk characteristics.

In light of the above statement, suggest three issues that must be addressed by a portfolio manager in formulating a strategy for private equity investments. (6 marks)

**(Total: 20 marks)**

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