KASNEB

CIFA PART III SECTION 6

ADVANCED PORTFOLIO MANAGEMENT

THURSDAY: 26 May 2016. **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) Discuss the following enhanced bond indexing strategies as identified by Kenneth E. Volpert (2000):

(i) Lower cost enhancements. (1 mark)

(ii) Issue selection enhancements. (1 mark)

(iii) Yield curve positioning. (1 mark)

(iv) Sector and quality positioning. (1 mark)

(v) Call exposure positioning. (1 mark)

(b) Highlight three assumptions of classical bond immunisation theory. (3 marks)

(c) The investment committee of RBC Bank Ltd.'s pension scheme is not pleased with the recent performance of the fixed-income portion of their investment and have fired the fixed-income manager. The investment committee has hired a consultant from Alexandria Financial Services (AFS) to assess the portfolio's risks, submit recommendations to the committee, and manage the portfolio on its behalf on an interim basis. The current portfolio benchmarked against an index is shown in Table I below:

Table I: RBC Bank Ltd.'s pension scheme fixed-income portfolio information:

	Portfolio		Index	
Sector	**%**	**Duration**	**%**	**Duration**
Treasury	47.74	5.50	49.67	5.96
Agencies	14.79	5.80	14.79	5.10
Corporates	12.35	4.50	16.54	5.61
Mortgage-backed securities	25.12	4.65	19.10	4.65

Note: Spread durations are the same as effective durations for all sectors with similar spread risk.

The consultant has noticed that the fired manager's portfolio did not constitute securities outside of the index universe. The investment committee has requested him to consider an indexing strategy including related benefits and logical problems.

The consultant has identified the undermentioned three factors that had limited the manager's ability to replicate a bond index:

1. Lack of availability of certain bond issues.
2. Limited market capitalisation of the bond universe.
3. Differences between the bond prices used by the manager and the index provider.

After conducting further analysis of the current treasury securities portion of the portfolio, the consultant discovers that there was a significant overweight in a 5-year treasury bond (Sh.10 million par value). He anticipates the yield curve to flatten and forecasts a six-month horizon price of the 5-year treasury bond to be Sh.99.50. Therefore, his strategy will be to sell 5-year treasury bonds and invest the proceeds in 10-year treasury bonds and cash while maintaining the dollar duration of the portfolio.

The Treasury bond information is shown in Table II below:

Table II: Treasury bond information:

Tenor (Years)	Coupon (%)	Maturity date	Duration	Price (Sh.)	Yield (%)
5-year	4.125	15 May 2011	4.53	100.40625	4.03
10-year	5.250	15 May 2016	8.22	109.09375	4.14

Note: Prices are shown per Sh.100 par value.

Required:

(i) The duration of the RBC Bank Ltd.'s pension scheme fixed income portfolio with reference to the information given in Table I above. (2 marks)

(ii) Using the information given in Table I, compute the spread duration of RBC Bank Ltd.'s fixed-income portfolio. (2 marks)

(iii) Based on the data in Table I, identify, giving an appropriate reason, the bond portfolio strategy used by the fired manager. (1 mark)

(iv) In relation to the three factors identified by the consultant, describe the factor that is least likely to limit a manager's ability to replicate a bond index. (1 mark)

(v) Using the consultant's forecasted price and the bond information given in Table II, calculate the expected 6-month total return of the 5-year, 4.125% treasury bond.
(Assume zero accrued interest at purchase).
(2 marks)

(vi) With reference to the information given in Table II, estimate the par value of the 10-year bonds to be purchased to execute the consultants' strategy. (4 marks)

(Total: 20 marks)

QUESTION TWO

(a) In relation to relative value analysis, evaluate the following tools used by fixed income portfolio managers when analysing yield spread levels:

(i) Mean-reversion analysis. (2 marks)

(ii) Quality spread analysis. (2 marks)

(iii) Per cent yield spread analysis. (2 marks)

(b) Peterson Orengo, a portfolio manager with Beta Asset Managers (BAM) decided to buy corporate bonds with a market value of Sh.5 million. To finance 60 per cent of this purchase, Peterson entered into a 30-day repurchase agreement (repo) with the bond dealer. The 30-day term repo rate was 4.6 per cent per annum. At the end of the 30 days, the bonds purchased by Peterson had increased in value by 0.5 per cent and Peterson decided to sell the bonds. No coupons were received during the 30-day period.

Required:

(i) The 30-day rate of return on the equity and the borrowed components of the portfolio. (3 marks)

(ii) The 30-day portfolio rate of return. (2 marks)

(iii) The 30-day portfolio rate of return assuming the increase in value of the bonds was 0.3% instead of 0.5 %. (2 marks)

(iv) Based on the result obtained in (b)(ii) and (b)(iii) above, comment on the effect of leverage on the portfolio rate of return. (2 marks)

(v) Explain the reason why the bond dealer faces credit risk even if he holds the collateral. (1 mark)

(c) Anthony Wanyagia, an equity portfolio manager, has reviewed the holdings of the existing large cap portfolio and has asked his trader to sell the four securities illustrated below:

Trade order and market data

Security	Order size (shares)	Average daily volume (shares)	Bid-ask Spread	Share price (Sh.)	Urgency to complete trade
A	15,000	812,000	Wide	15.50	Low
B	48,000	972,000	Narrow	12.50	Low
C	3,000	77,000	Narrow	9.80	High
D	19,000	59,000	Narrow	7.50	High

Required:
Using the data provided, justify the security for which each of the following trade execution tactics is most appropriate:

(i) Volume weighted average price (VWAP) algorithm. (2 marks)

(ii) Implementation shortfall algorithm. (2 marks)
(Total: 20 marks)

QUESTION THREE

(a) Highlight three limitations of holdings-based style analysis compared to returns-based style analysis. (3 marks)

(b) Giving four reasons, justify why some investors believe that more price inefficiency could be found on the short side of the market than on the long side of the market. (4 marks)

(c) Vincent Nderi is a pension consultant and is tasked to evaluate the following portfolios:

1. **Portfolio 1:** A highly concentrated portfolio with five stocks representing 75% of the total portfolio.
2. **Portfolio 2:** A highly diversified portfolio with over 400 stocks, none of which represent more than 1% of the total portfolio.
3. **Portfolio 3:** A diversified portfolio of 70 stocks, with the top ten names representing 30% of the total portfolio.

The following investment results were recorded in the year 2015:

	Portfolio 1	Portfolio 2	Portfolio 3	Market Index
Return (%)	42.0	25.0	16.0	20.0
Standard deviation	1.20	0.40	0.20	0.50
Beta	1.80	1.20	0.50	1.00

The risk free rate is 6%.

Required:
For each portfolio, calculate and interpret the following:

(i) Treynor measure. (2 marks)

(ii) Modigliani-Modigliani (M^2) measure. (2 marks)

(iii) Jensen measure. (2 marks)

(d) Mike Mutivo, a portfolio manager at Kancom Capital, made the following transactions in CMS Limited shares for a portfolio that he manages:

Day 1: At market close, CMS Limited shares are priced at Sh.75.
Day 2: Before the market opens, he decides to buy 8,000 shares at Sh.74 per share by placing a limit order that would expire at the end of the day. The limit order does not fill and the CMS Limited shares close the day at Sh.75.75. After the market closes, the company announces that it has entered into a joint venture which would expand its international presence. Mike assumes that this announcement could make the price of the company move up or down by Sh.1.00.

Day 3: He places a new limit order to buy 8,000 shares of CMS Limited at a price of Sh.77. As the trading day nears to an end, 4,000 shares fill at Sh.77 per share plus Sh.1,500 in commission. CMS Limited shares close at Sh.79 that day and the remaining 4,000 shares are never purchased.

Required:
The total amount of implementation shortfall for CMS Limited's shares transaction. (3 marks)

(e) Elimu Foundation has received a Sh.20 million global government bond portfolio from a German donor. This bond will be denominated in Shillings and managed separately from Elimu Foundation's non-shilling denominated bonds. The bond portfolio is currently hedged and the Chief Finance Officer of Elimu Foundation is considering whether to hedge the currency risk of the portfolio.

The bond portfolio's current allocation and relevant country performance data are given below:

Elimu Foundation
Current Allocation
Global Government Bond Portfolio

Country	Allocation (%)	Maturity (years)
Germany	25	5
A	40	5
B	10	10
C	10	5
D	15	10

Country Performance Data
(in local currency)

Country	Cash return (%)	5-year excess bond return (%)	10-year excess bond return (%)	Unhedged currency return (%)
Germany	2.0	1.5	2.0	-
A	1.0	2.0	3.0	-4.0
B	4.0	0.5	1.0	2.0
C	3.0	1.0	2.0	-2.0
D	2.6	1.4	2.4	-3.0

Required:
The expected total annual return of the current bond portfolio. (Assume that the Chief Executive Officer of the foundation decides to leave the currency risk unhedged). (4 marks)
(Total: 20 marks)

QUESTION FOUR

(a) Describe how integrating the Black-Litterman approach into the asset allocation process would affect the following:

(i) Specification of expected return. (2 marks)

(ii) Level of market diversification of the resulting portfolio. (2 marks)

(b) James Kiptoo, a Portfolio Manager, intends to purchase 5,000 shares of EAP Ltd., which had an initial public offer (IPO) recently. However, James was not able to get any shares at the IPO price of Sh.30 per share. James would still like to purchase the 5,000 shares, but not at a price above Sh.45 per share.

Required:
(i) Giving an appropriate reason, explain whether James should place a market order or a limit order. (1 mark)

(ii) Evaluate one advantage and one disadvantage of the preferred order in (b)(i) above. (2 marks)

(c) Johnson Makau, a CFA graduate working as a Portfolio Manager with East Africa Financial Services (EAFS), expects to receive a cash inflow of Sh.50 million in three months time. Johnson intends to use futures contracts to take a Sh.17.5 million synthetic position in stocks and Sh.32.5 million in bonds today.

Additional information:

1. The stock would have a beta of 1.15.
2. The bonds would have a modified duration of 7.65.
3. A stock index futures contract with a beta of 0.93 is priced at Sh.175,210.
4. A bond futures contract with a modified duration of 5.65 is priced at Sh.95,750.
5. When the futures contract expires in three months, stocks and bonds will have declined by 5.4% and 3.06% respectively.

Required:

(i) The number of stock and bond futures contracts that Johnson Makau would have to trade in order to synthetically take the desired position in stocks and bonds today. (7 marks)

(ii) Show that profits on the futures positions are essentially the same as the change in the value of stocks and bonds during the three-month period. (6 marks)

(Total: 20 marks)

QUESTION FIVE

(a) Evaluate three practical risk management benefits that might accrue to an investment manager who keeps rebalancing his clients' portfolios. (3 marks)

(b) Discuss four biases that could arise in the hedge fund benchmark selection. (4 marks)

(c) Jamal Shah holds an investment account with Fahali Financial Services (FFS), a local investment firm based in her country. Jamal makes contributions to her account based on availability of funds. Being a business person, Jamal receives money from her clients on an irregular basis. By 1 June 2015, her account had Sh.100,000. On 14 June 2015, Jamal received Sh.3,000 and deposited the amount to her account the same day. On 21 June 2015, she received Sh.2,500 and made another contribution to her account. The value of her account after the 14 June 2015 contribution was Sh.105,000, and her account value after the 21 June 2015 contribution was Sh.108,000. Jamal's account was valued at Sh.110,000 on 30 June 2015.

Required:

Jamal Shah's time-weighted rate of return. (6 marks)

(d) A Japanese company issues a corporate bond with a face value of ¥1.2 billion and a coupon rate of 5.25 per cent. The company decides to use a swap to convert this bond into a euro-denominated bond. The current exchange rate is ¥120/€. The fixed rate on euro-denominated swaps is 6 per cent, and the fixed rate on yen-denominated swaps is 3 per cent.

(**Note:** All payments will be made annually, so there is no adjustment such as Days/360).

Required:

(i) Describe the terms of the swap and identify the cash flows at the start. (3 marks)

(ii) Identify all interest cash flows at each interest payment date. (2 marks)

(iii) Identify all principal cash flows at the maturity of the bond. (2 marks)

(Total: 20 marks)

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