



CIFA PART III SECTION 6

ADVANCED PORTFOLIO MANAGEMENT

FRIDAY: 27 November 2020.

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) Explain three sources of generating income from an equity investment portfolio. (3 marks)
- (b) On Wednesday, the share price of Takuzi Ltd. closed at Sh.50 per share. On Thursday morning before the market open, a portfolio manager decides to buy Takuzi Ltd.'s shares and transfers a limit order for 1,000 shares at Sh.49.95 per share. The order expires unfilled. The share closes at Sh.50.05. On Friday, the order is revised to a limit of Sh.50.07. The order is partially filled that day as 700 shares are bought at Sh.50.07. The commission is Sh.23. The share closes at 50.09 and the order is cancelled.

**Required:**

The implementation shortfall in percentage. (4 marks)

- (c) (i) An analyst gathers the following data about asset allocation by a portfolio manager of ABC Capital:

Market	Actual weight in market	Benchmark weight in market	Market return (%)
Equity	0.70	0.70	5.81
Fixed income	0.07	0.25	1.45
Cash	0.23	0.05	0.48

**Required:**

The contribution of asset allocation to performance. (3 marks)

- (ii) Another analyst gathers the following data on a different allocation:

Market	Portfolio performance (%)	Index performance (%)	Portfolio weight
Equity	7.28	5.00	0.70
Fixed income	1.89	1.45	0.07

**Required:**

The contribution of selection to total performance. (2 marks)

- (d) A portfolio manager is analysing a University Endowment Fund with three years financial projections as shown in the table below:

Year	Market value of the portfolio	Additional capital injection (donations)
	Sh. "million"	Sh. "million"
2017	100	-
2018	130	40
2019	140	-

**Additional information:**

- The market value of the portfolio is quoted at the end of the financial year.
- The additional capital donations was at the beginning of the financial year.
- The Sh.40 million donation was from alumni association.

**Required:**

- (i) Money-weighted rate of return (MWRR). (3 marks)
- (ii) Time-weighted rate of return (TWRR). (3 marks)
- (iii) Advise on the most appropriate performance measure between the MWRR in (d) (i) above and TWRR in (d) (ii) above given that the donation is unrelated to the manager's market view. (2 marks)

**(Total: 20 marks)****QUESTION TWO**

- (a) William and his wife Kazoo recently inherited Sh.6,000,000 from their father and have approached Gerland Kisaka, a portfolio investment specialist for investment advice. Both William and Kazoo are 30 years old. William is employed in a steel manufacturing company earning a monthly salary of Sh.80,000 whereas Kazoo is a nurse earning a monthly salary of Sh.36,000. Their four children are aged 6, 5, 4 and 3 years. They currently have no other investments but have credit card with a debt of Sh.300,000.

During their interview with Gerland Kisaka, William made the following statements:

- I love being on top of the latest trends in investing.
- My friend Kahunyo told me that the really smart investors holds shares for no more than a month. After that if you haven't made a profit, you probably won't.
- Can you believe that my mother still have the same portfolio she had a year ago? How boring.
- Technology shares are hot, everyone is buying them.

**Required:**

- (i) Giving reasons, determine the couple's ability and willingness to take on risk. (3 marks)
- (ii) Determine the couple's time horizon constraints. (3 marks)
- (iii) Determine the couple's liquidity and legal/regulatory constraints. (2 marks)
- (b) Philip Ndavi's Sh.25 million investment portfolio is invested in domestic equities and Treasury bills in the proportion of 65% and 35% respectively. Philip decides to implement a constant mix rebalancing strategy by setting the multiplier equal to a value of 0.5. He also determines that domestic equities are expected to generate a return of 12% in the coming month.

**Required:**

Determine the value of equities to be sold to rebalance the portfolio should Ndavi's forecast concerning domestic equities materialise. (3 marks)

- (c) Grace Nyambura's investment portfolio is allocated to equities and bonds in the proportion of 30/70. She is exploring the potential for allocating a further Sh.3 million to the fund of funds (FOF) offered by a local hedge fund. She collects the monthly return on the hedge fund and its benchmark the Hedge Fund Composite Index for the previous year, 2019. She will use the data to forecast future fund performance. She plans to invest in the fund for a period of eight months.

**Monthly return for local hedge fund Fund of funds (2019)**

Month	Hedge Fund (%)
January	15.7
February	18.8
March	-5.7
April	12.7
May	2.7
June	9.8
July	15.0
August	-14.0
September	-2.0
October	14.3
November	18.7
December	22.1

Further, Grace evaluates whether the investment will improve the portfolio's annualised risk-adjusted performance. She compiles expected performance on the portfolio and hedge fund for the current year 2020.

#### Current performance of portfolio and Hedge Fund Investment (2020)

	Existing Portfolio*	FoFs Investment
Annualised return (%)	9.7	14.8
Annualised risk free rate (%)	2.2	2.2
Annualised standard deviation (%)	15.0	28.9
Correlation between portfolio's return and hedge fund investment return is – 0.5		

\* Performance before the inclusion of the FoFs investment

#### Required:

- (i) The value of Grace's investment at the end of her investment horizon using the eight month average rolling return. (6 marks)
- (ii) Justify whether Grace should allocate Sh.3 million to the FoF. (3 marks)

(Total: 20 marks)

#### QUESTION THREE

Ken's family charitable foundation (KFCF) plans to fund projects in perpetuity that will provide clean water in the country. The current portfolio is worth Sh.250 million and is invested equally in equities and fixed income. The portfolio's equity holding are in a fund tracking a broad index of stocks and the fixed income are in a fund tracking on all maturity index of government bonds. The portfolio of the foundation is rebalanced every six months. An analyst is hired to advise on KFCF's asset allocation and investments.

The foundation seeks to achieve the following objectives:

1. Spend at least 3% of the fund's beginning value on projects each year in order to satisfy a legal requirement.
2. As part of this annual distribution, spend at least Sh.5 million (inflation adjusted each year on projects in its county).
3. Minimise the likelihood of a decline in the portfolio's value of more than 10% in any single year.

The analyst recommends that KFCF establish an investment policy statement (IPS) and globally diversify its portfolio. The analyst discusses the asset only (AO) and asset liability management (ALM) approaches to setting KFCF's policy asset allocation.

To better diversify the policy asset allocation, the analyst specifically recommends that the foundation consider adding the following four asset classes:

- Non domestic developed equities.
- Emerging market equities.
- Broad domestic fixed income including government and credit.
- Alternative investments, including real estate, commodities and private equity.

The analyst evaluates whether adding an additional asset class to KFCF's portfolio will improve its risk-return characteristics.

#### Additional information:

1. The inflation rate is 0.5%.
2. The risk free rate is 1%.
3. The correlation between current portfolio and emerging market equities is 0.79.
4. Long-term capital market expectations:

	Return (%)	Standard deviation (%)
Current KFCF portfolio	4.5	6.5
Emerging market equities	7.5	13.5

5. The analyst also evaluates available methods for determining the target asset class weights in the IPS. The analyst decides to use a Monte Carlo simulation rather than a single period mean variance optimisation (MVO) to establish these target weights. The KFCF has an above average risk tolerance.

**Required:**

- (a) Discuss why each of the following approaches could be appropriate in setting KFCF's policy asset allocation:
- (i) Asset only (AO) approach. (3 marks)
- (ii) Asset liability management (ALM) approach. (2 marks)
- (b) Giving three reasons, explain why the set of six asset classes (current portfolio plus the analyst's recommendation) for the KFCF policy asset allocation are not appropriately specified. (6 marks)
- (c) Determine, based on mean-variance analysis, whether emerging market equities should be added to the current KFCF portfolio. (5 marks)
- (d) Support with two reasons, the analyst's choice of Monte Carlo simulation rather than mean variance optimisation (MVO), to determine KFCF's target asset class weights. (4 marks)
- (Total: 20 marks)**

**QUESTION FOUR**

- (a) Elucidate three factors that should be considered while selecting a fixed-income manager in portfolio management. (6 marks)
- (b) Distinguish between "macro attribution" and "micro attribution" as used in evaluating portfolio performance. (4 marks)
- (c) Omogi Ltd. has presented the following data relating to its portfolio account and the benchmark portfolio for the year 2019:

	Omogi Ltd. account	Benchmark portfolio	Market index
Return (%)	2.0	2.1	2.5
Beta ( $\beta$ )	0.8	0.8	1.0
Standard deviation (%)	1.1	1.3	1.4
One year Treasury Bill rate (%)	0.2	0.2	0.2

**Required:**

Calculate the following performance measures for Omogi Ltd.'s portfolio and the benchmark portfolio:

- (i) Sharpe ratio. (2 marks)
- (ii) Treynor's measure. (2 marks)
- (iii) Explain the results obtained in (c) (i) and (c) (ii) above. (2 marks)
- (d) A manager has collected the following data on a bullet (no embedded options), a callable and puttable bond of the same issuer:

Bond	A	B	C
G-Spread (basis points)	425	423	426
I-Spread (basis points)	429	426	429
Z-Spread (basis points)	435	434	434
Option adjusted spread OAS (basis points)	351	503	434
Price	95.00	97.00	99.00
Accrued interest per 100 par	0.60	1.10	0.75

The bonds are similar in all other regards.

The manager purchases Sh.3 million and Sh.2 million par of bond A and bond C respectively.

**Required:**

Calculate the most relevant measure of portfolio spread.

(4 marks)  
**(Total: 20 marks)**  
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**QUESTION FIVE**

- (a) Highlight four sources of excess return for an international bond portfolio. (4 marks)
- (b) A fixed income consultant reviews the bonds held by an insurance company. He wants to rebalance the portfolio's money duration to Sh.240,000 while maintaining the existing security weights.

Security	Price (Sh.)	Market value in (Sh.)	Duration
Government bond	96.42	771,360	11.2
Company K corporate bond	95.00	855,000	9.4
Company L corporate bond	104.00	728,000	9.1
<b>Total</b>	-	<u>2,354,360</u>	-

**Required:**

- Calculate the amount (in shillings) of cash required to rebalance the portfolio's money duration. (6 marks)
- (c) With respect to currency portfolio management, explain four active currency trading strategies. (4 marks)
- (d) Davis Chirchir is currently based in the United States (US) and oversees the global equity fund offered by Triple A Ltd., a portfolio management firm. The fund holds global (Canadian, Mexican and British) and domestic US equities. Foreign currency exposures are currently unhedged.

The table below shows the value of the fund assets, spot exchange rates and correlations between movements in foreign currency asset returns and foreign currency returns:

**Fund asset values, spot rates and correlations**

	Year	
	2018	2019
CAD-denominated asset value (in CAD millions)	100	150
MXN-denominated asset value (in MXN millions)	80	70
GBP-denominated asset value (in GBP millions)	230	300
USD-denominated asset value (in USD millions)	500	450
CAD/USD spot rate	0.7900	0.8100
USD/MXN spot rate	15.2420	15.0050
GBP/USD spot rate	1.4754	1.5000

**Correlation between the currencies:**

- (RCAD, RCAD/USD) +0.7
- (RMXN, RMXN/USD) -0.3
- (RGBP, RGBP/USD) +0.2

Naomi has her portfolio held in the fund and her allocation to CAD, MXN, GBP and USD denominated equities is 30%, 40%, 25% and 5% respectively. Naomi is yet to establish the degree to which currency risk exposures should be hedged.

Where: CAD → Canadian Dollars  
 MXN → Mexican Peso  
 GBP → Great Britain Pound  
 USD → United States Dollar

**Required:**

- (i) Calculate the domestic currency return on Naomi portfolio. (3 marks)
- (ii) Describe three potential considerations which Naomi will need to account for when determining the degree of currency risk exposure to undertake.

Your answer should focus on the information provided above.

(3 marks)

**(Total: 20 marks)**