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CIFA PART III SECTION 6

ADVANCED PORTFOLIO MANAGEMENT

THURSDAY: 24 May 2018. **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) Argue four cases against the use of volume-weighted average price (VWAP) when evaluating trade executions.

(4 marks)

(b) The following information relates to trade executions of MIC Ltd. shares at Mesdaq Stock Exchange (MSE):

1. On Wednesday, 9 May 2018, MIC Ltd.'s shares closed at a market price per share (MPS) of Sh.50.00.

2. On Thursday, 10 May 2018 before the market opens, a trader places a limit order for 1,000 MIC Ltd. shares at Sh.49.95. The order expires unfilled. The company's shares close at a MPS of Sh.50.05.

3. On Friday, 11 May 2018, 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.23.00. The company shares close at Sh.50.09 and the order is cancelled.

Required:
The total implementation shortfall (IS).

(8 marks)

(c) The board of trustees of the Western Koru Ltd. pension plan is considering adding direct real estate investments to its diversified, Sh.500 million pension fund portfolio. This would be accomplished by acquiring commercial office buildings, shopping centres, industrial warehouses and residential properties. A consultant advised the board as follows:

"Our mean-variance computer model uses statistical data to optimise all asset classes. Based on that model, I recommend an optimal portfolio for Western Koru Ltd. consisting of 40% allocation of the portfolio to direct real estate investments given the risk and return objectives set by the board for the fund".

Required:
Evaluate the consultant's statement by addressing the return and risk characteristics of the data and the resulting recommendation of the consultant.

(4 marks)

(d) Mark Mutisya is an analyst for a fund sponsor in his country. The fund sponsor uses two equity managers (Manager A and Manager B) and each manager invests in developed and emerging markets. He prepares a performance attribution analysis for the total fund. He identifies the fund's sources of return and develops the macro attribution table below:

Total fund level
Macroattribution for 1 January - 31 March 2018

Decision making level (investment alternative)	Fund value Sh. "000"	Incremental return Contribution (%)	Incremental value contribution/withdrawal Sh. "000"
Beginning value	360,000	-	-
Risk-free asset	361,800	0.50	1,800
Asset category	388,872	7.52	27,072
Benchmarks	389,376	0.14	504
Investment managers	389,664	0.08	288
Allocation effects	389,304	−0.10	(360)
Total fund	389,304	8.14	29,304

Required:

(i) Determine whether the total fund outperformed the pure indexing strategy.

(2 marks)

(ii) Determine how much of the fund's return was due to style bias and active management.

(2 marks)

(Total: 20 marks)

QUESTION TWO

(a) Jackson Maina is a portfolio manager managing a Sh.200 million portfolio for a client. His proprietary research has led him to believe that the share price of Athi Ltd. will increase substantially. Athi Ltd. is currently trading at Sh.9.75 per share. He wants to purchase 1,000,000 shares of Athi Ltd. for the client's portfolio as quickly as possible with minimal effect on the share price. Average daily trading volume in Athi Ltd. over the previous 10 days was 1,500,000 shares. Jackson decides to use "advertise-to-draw-liquidity" techniques for this trade execution.

Jackson also buys 3,000 shares of TwoStream Homes (TSH) Ltd. for the client's portfolio. TSH Ltd. trades on a quote driven dealer market and has an average daily trading volume of 25,000,000 shares. His order is executed in two trades as shown below. He analyses the trading costs of the entire transaction.

TSH Ltd. trade data

	Bid price (Sh.)	Bid quantity (shares)	Ask price (Sh.)	Ask quantity (shares)	Trade price (Sh.)	Trade quantity (shares)
First trade	21.07	3000	21.13	2500	21.13	2000
Second trade	21.05	3000	21.11	2500	21.09	1000

Six months later, Jackson discusses three potential rebalancing strategies with his client: buy and hold, constant mix and constant-proportion portfolio insurance (CPPI). To manage risk, Jackson rebalances the client's portfolio by adjusting the allocation between equities and money market instruments. The client is willing to invest a greater proportion of his wealth in risky assets as his portfolio value increases. Jackson believes the recent bull market has ended and the market will be flat but oscillating. His objective is to choose the rebalancing strategy with the highest expected return that is also consistent with the client's risk tolerance.

Required:

(i) Explain two disadvantages of Jackson's proposed technique for the Athi Ltd. trade execution. (2 marks)

(ii) Calculate the share-volume-weighted effective spread for the TSH Ltd. transaction. (3 marks)

(iii) Determine, given Jackson's objective, the most appropriate rebalancing strategy. (1 mark)

(iv) Explain why the two strategies not selected are less appropriate. (2 marks)

(b) Annitta Mwilu is an investment advisor for institutional clients. She advises the Welcare Endowment Fund (WEF) and is tasked to recommend an optimal asset allocation. The objective of the WEF is to achieve a nominal return of 8.0% per annum with the lowest possible level of risk. The WEF board of directors' risk management policies include a maximum standard deviation of 14.0% and prohibit the use of leverage. The table below provides the results of a mean-variance optimisation (MVO) based on an annual inflation rate of 1.5% and a risk-free rate of 0.5%.

WEF corner portfolios

Corner portfolio	Expected return (%)	Expected standard deviation (%)	Expected Sharpe ratio	Domestic equity	Asset class weights (%) International equity	Corporate bonds	Government bonds
1	9.00	18.0	0.47	100	0	0	0
2	8.90	16.2	0.52	90	10	0	0
3	8.60	13.8	0.59	75	20	5	0
4	7.65	11.2	0.64	60	15	15	10
5	7.00	10.5	0.62	50	10	25	15

Annitta advises the board to allow the use of leverage. She proposes a strategic asset allocation that combines the corner portfolio closest to the tangency portfolio in the above table with a risk-free borrowing rate. WEF's annual nominal return objective remains at 8.0%.

Required:

(i) Recommend two corner portfolios that Annitta Mwilu should use for the optimal asset allocation to achieve WEF's fund return requirement. (2 marks)

(ii) Determine the weights for each of the two corner portfolios recommended in (b) (i) above. (3 marks)

(iii) Calculate the optimal level of leverage necessary to achieve WEF's return objective. (4 marks)

(iv) Determine whether the unleveraged or leveraged strategic asset allocation offers lower expected volatility to achieve WEF's return objective. (3 marks)

(Total: 20 marks)

QUESTION THREE

(a) Outline two advantages and two disadvantages of using each of the following benchmarks when evaluating portfolio performance:

    (i) Custom security-based benchmarks. (4 marks)

    (ii) Factor-model-based benchmarks. (4 marks)

(b) Sospeter Onyango, a portfolio manager with Stanbix Asset Managers (SAM) was provided with the data in the table below to appraise the performance of four asset management firms:

		Fund W	Fund X	Fund Y	Fund Z	Market index
	Performance appraisal data					
Return (%)		6.45	8.96	9.44	5.82	7.60
Standard deviation (%)		2.74	4.54	3.72	2.64	2.80
Beta		0.88	1.02	1.36	0.80	1.00

The risk-free rate of return for the relevant period was 3%.

Required:

Compute the following risk-adjusted performance measures for the four funds:

    (i) Jensen's alpha measure. (3 marks)

    (ii) Treynor's measure. (3 marks)

    (iii) Sharpe ratio. (3 marks)

    (iv) M^2 measure. (3 marks)

(Total: 20 marks)

QUESTION FOUR

(a) Identify four challenges that you are likely to face when managing emerging markets' currency exposures. (4 marks)

(b) Argue four cases against the use of mean-variance optimisation (MVO) approach to asset allocation. (4 marks)

(c) A global investor has invested Sh.100,000 in a global equity portfolio made up of United States (US), Asian and European stocks. On 31 December 2017, the portfolio consists of 500 shares of IBM listed in New York, 200 Sony Corporation shares listed in Tokyo, Japan and 50 shares of BMW listed in Frankfurt, Germany. He intends to beat the world index used as a benchmark. This index has a 50% weight in the US stock index, a 25% weight in the Japanese stock index and a 25% weight in the European stock index. The country components of the portfolio have an average risk relative to their respective country indices. He uses the United States dollar (USD) as the base currency. On 31 March 2018, his portfolio had gained 4.065%, while the world index gained only 0.735% in USD. He wishes to understand why his portfolio had such a good performance over the quarter. All the necessary data is provided below. There were no cash flows in the portfolio and there were no dividends paid.

Global equity portfolio: Composition and market data							
Portfolio	Number of shares	Price in local currency		Portfolio value on 31 December 2017		Portfolio value on 31 March 2018	
		31 December 2017	31 March 2018	Local currency	USD	Local currency	USD
US stocks: IBM	500	100	105	50,000	50,000	52,500	52,500
Japanese stocks: Sony Corp.	200	10,000	11,000	2,000,000	20,000	2,200,000	20,952
European stocks: BMW	50	600	600	30,000	30,000	30,000	30,612
Total					100,000		104,065

Market data	31 December 2017	31 March 2018
World index in USD	100	100.735
US Index in USD	100	103
Japanese index in Yen	100	105
European index in Euro	100	95
Yen/USD	100	105
Euro/USD	1	0.98

Required:

(i) Decompose the total return on the portfolio paid into capital gains (in local currency) and currency contribution. (4 marks)

(ii) Determine the contribution of security selection. (4 marks)

(iii) Attribute the performance relative to the benchmark (world index) to the various investment decisions. (4 marks)

(Total: 20 marks)

QUESTION FIVE

(a) Explain four international bond portfolio management styles. (4 marks)

(b) Global credit portfolio management presents a complex challenge. Each day, hundreds of credit portfolio managers face thousands of choices in the primary (new issue) and secondary markets. In addition to tracking primary and secondary flows, investors have to keep tabs on ever-varying issuer fundamentals, creditworthiness, acquisitions, earnings and credit ratings among others. The task of global credit portfolio management is to process all of this rapidly changing information about the credit markets (issuers, issues, dealers and competing managers) and to construct the portfolio with the best return for a given risk tolerance.

Required:
In relation to the above statement, discuss five methodologies for credit relative-value maximisation. (5 marks)

(c) The board of directors of Kenbrite Financial Services (KFS) are considering hiring a consultant to advise on fixed income portfolio management. They invite candidates for a presentation on the topic "bond portfolio immunisation".

The following are some of the statements that were made during the presentation:

1. A great thing about immunisation is that it is a set-and-forget strategy. That is, once you have immunised your portfolio, there is no subsequent work to be done.
2. The immunisation target rate of return is less than yield-to-maturity.
3. If a portfolio is immunised against a change in the market yield at a given horizon by matching portfolio duration to horizon, the portfolio faces no risk except for default risk.
4. The liquidity of securities used to construct an immunised portfolio is irrelevant.
5. In general, the entire portfolio does not have to be turned over to rebalance an immunised portfolio. Furthermore, rebalancing needs to be done on a daily basis.

Required:
Critique each of the above statements. (5 marks)

(d) Anthony Kipngetich, a trader in the options market, was provided with the following information:

Market price per share (MPS)	Sh.46.00
Exercise price of a call option	Sh.45.00
Call premium	Sh.5.00
The delta value	0.5420
Number of call options sold	1000
Value of delta at the end of the previous day	0.6400
Continuously compounded risk-free rate	4.5%

Required:

(i) The number of shares needed to delta-hedge the call position at the end of the previous day. (1 mark)

(ii) The market value of the portfolio today given that at the end of the previous day, there was a loan balance of Sh.3,000. (2 marks)

(iii) Assuming that the market price per share is Sh.45.50 and the call premium is Sh.4.71 the following day, calculate the market value of the delta-hedged portfolio and compare it with a benchmark based on the market value of the delta-hedged portfolio calculated in (d) (ii) above. (3 marks)

(Total: 20 marks)

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