



AFRICAN ECONOMIC RESEARCH CONSORTIUM

Collaborative MA Programme in Economics for Anglophone Africa
(Except Nigeria and South Africa)

JOINT FACILITY FOR ELECTIVES
JULY - OCTOBER 2002

CORPORATE FINANCE AND INVESTMENT

-----Second Session: Final Examination

Time: 9:00 am. - 12 noon

Monday, September 30, 2002

Instructions:

Answer ANY **FOUR** questions.

This is a closed book exam. Lexicon, present value tables and non-programmable calculators are allowed. This exam has five questions. The total mark is 60, out of 100 for this session.

Read the questions thoroughly and write your answers clearly and consistently. The use of mathematical formulas and graphs in your answers is highly recommended. Your marks will most of all depend on your ability to apply the relevant theory, identify relevant factors and, indicating important matters in contrast to not so important matters. Do not apply formulas without explaining why you are using them, and which assumptions they rely on. Endeavour to arrange your work in such a way that the ideas contained there in flow from one answered question to another. Explain when figures are rounded, e.g., to the nearest decimal or whole number.

Total marks 60.

A formula sheet is attached to this exam.

- 1a. A firm is considering a new project which will enable it to produce insecticides for the use of farmers. The cash in flows from the project are Ksh 20,000, and they will occur for each of the eight years marking the life of the project. Expenses are expected to be Ksh 14,000 per year, throughout the project's life. At the end of its life, the plant and other physical assets will have Ksh 2,000 as salvage value. The project is expected to cost Ksh 30,000, while 15 percent is regarded as the appropriate discount rate for the new project.

Required

Calculate the net present value (NPV) of this project and show whether or not the project should be accepted by the firm. (5 marks)

- 1b. A firm is thinking of undertaking two projects, A and B. The projects are mutually exclusive. The following are the characteristics of the projects:

Year	0	1	2	3	IRR (%)
	Ksh	Ksh	Ksh	Ksh	
Cash flows, A:	-10,000	10,000	1,000	1,000	16.04
Cash flows, B:	-10,000	1,000	1,000	12,000	12.94

Suppose

There are two possible discount rates that can be used to evaluate the cash flows of each of projects A and B, that is, 10 percent and 15 percent. Determine which of the two mutually exclusive projects should be accepted by the firm, and why. (Hint: Use the NPV method and examine incremental cash flows).

(7 marks)

- 1c. What are the implications of one of the problems of the internal rate of return (IRR), that is, "Investing or Financing?" (3 marks)
- 2a. Jonny and Company is a fast-growing manufacturing all-equity firm, with a beta, β , of 1.21. The firm intends to undertake three **non-mutually exclusive** projects,

that is, A, B, and C. As at the time the projects were being considered, the market risk premium was 9.2 percent, the risk-free rate was 5 percent, while the cost of each of the projects is Ksh 100,000. The following are the firms' characteristics:

Project	Project's Beta (β)	Expected Cash flows of Project Next Year (KSh '000)	Internal Rate of Return (%)
A	1.21	140	40
B	1.21	120	20
C	1.21	110	10

Required

Calculate the firm's expected return, and given that the new projects have the same risk level as that of the firm, use this discount rate to obtain the net present value of each project. Which of the projects should the firm accept and why? If the security market line (SML) is applicable, draw the diagram for the three projects. (5 marks)

- 2b. Suppose the returns on the shares of a firm (R_i), and the returns on a market portfolio proxied by the Ghana Stock Exchange Index for four years are as follows:

Year	Firm i (R_i) (%)	Index (R_m) (%)
1	-10	-40
2	3	-30
3	20	10
4	15	20

Required

Calculate the beta, β_i of this firm, and show the significance of the value of beta obtained from your calculation, for diversification purposes. (7 marks)

2c. Briefly discuss the strengths and weaknesses of using or adopting industry beta by any particular firm in its industry. (3 marks)

3a. Ologbon Omo and Company has 1.4 million shares outstanding. Its shares currently sells at Ksh 20 per share. Being a publicly quoted company, its debt is publicly traded, it is quoted at 93 percent of face value, with the total face value being Ksh 5 million. This debt is currently priced to yield 11 percent. The risk free rate is 8 percent, while the market risk premium is 7 percent. The firm has estimated its beta to be 0.74. If the corporate tax is 34 percent, what is the weighted average cost of capital (WACC) of this firm. (Hint: Use the SML for obtaining the firm's cost of equity). (5 marks)

3b. Omoluabi and Company intends to take on a new project. The firm has Ksh 5 million of debt outstanding, which yields 8 percent. The firm's shareholders account for the Ksh 10 million as their contribution or investment toward the project. It is hoped that the project will not only pay its way, but it will bring perpetual cash inflow of Ksh 2.085 million to the firm. However, these are cash flows before interest and taxes (EBIT). This amount is 25 percent higher than originally anticipated or forecast. Owing to this impressive performance by the project, the firm's 1 million shares outstanding are trading at Ksh 7.50 per share, implying a 50 percent capital gain on the shareholders' original investment of Ksh 5 per share. The shares offer an expected future rate of return of 14.60 percent, while the firm's tax rate is 35 percent. This new project is assumed to have the same risk as that of the firm.

Required

Calculate the weighted average cost of capital r_{WACC} , of the new project; and obtain its after tax cash flows. Thereafter, calculate the project's net present value. (Hint: Market Values are relevant here, rather than Book Values).

(7 marks)

3c. Why will the r_{WACC} be always less than the return on equity, r_s , in a levered firm, and in a world with taxes? (3 marks)

4a. You have just come across two bonds that are identical in every respect, except for the coupons and, their prices. Both bonds have 12 years to maturity. While the first bond has a 10 percent coupon rate and sells for Ksh 935.08, the second

has a 12 percent coupon rate. What price do you think that the second bond would sell for? (Hint: The trial and error method should preferably be used here).

(4 marks)

- 4b. Suppose a firm issues a five-year zero coupon bond at Ksh 1,000 face value. The initial price of the bond is set at Ksh 497. If the current tax law provides that the implicit interest on the bond be determined by amortizing the loan, and if its yield to maturity is 15 percent, calculate the total interest paid over the life of the bond.

(5 marks)

- 4c. A share is selling for Ksh 20, and you were told that its next dividend will be one Kenya shilling per share. However, you think, that the firm's dividend will grow by 10 percent per annum, and this situation is expected to remain indefinitely. If your thinking is correct, what return will this share offer you if you were to buy it?

(3 marks)

- 4d. Briefly examine the implications of the dividend growth model for the required rate of return in 4c. above.

(3 marks)

- 5a. Suppose that a stock currently selling for KSh 100 will either increase in value by 15 percent by the end of the year with probability of 0.5, or fall by 5 percent with probability of 0.5. This firm pays no dividends on its shares.

Required

- a) What are the geometric and arithmetic mean returns on the share?
- b) What is the expected end-of-year value of the share?
- c) Which measure of expected return is superior, and why?

(4 marks)

- 5b. The following data concern a particular sample period:

	Portfolio P (%)	Market M (%)
Average return	35	28
Beta	1.20	1.00
Standard deviation	42	30
Nonsystematic risk, $\sigma(e)$	18	0

Required

Calculate the Sharpe, Jensen (alpha), Treynor, and Appraisal Ratio, if treasury bill rate was 6 percent. By which measure did portfolio P outperform the market?

(7 marks)

5c. Briefly compare and contrast the four measures of performance in 5b. above.

(4 marks)