AFRICAN ECONOMIC RESEARCH CONSORTIUM

Collaborative Masters Programme in Economics for Anglophone Africa (Except Nigeria)

JOINT FACILITY FOR ELECTIVES (JFE) 2017

JUNE – SEPTEMBER

FINANCIAL ECONOMICS I

First Semester: Final Examination

Duration: 3 Hours **Date: Friday, August 4, 2017**

INSTRUCTIONS:

1. This examination has six questions.
2. You are required to answer **ANY FOUR** questions.
3. All questions carry equal marks.

Question 1: (Portfolio Theory)

The universe of available securities includes two risky stock funds, A and B and Treasury bills. The data for the universe are as follows:

	Expected Return (%)	Standard Deviation (%)
A	10	20
B	30	60
Treasury Bills	5	6

The correlation coefficient between A and B is – 0.2.

(i) Draw the opportunity sets of funds A and B. (Use at least five portfolios.) **(14 marks)**

(ii) Identify the optimal risky portfolio, P, and obtain its expected return and standard deviation. **(2 marks)**

(iii) Find the *slope* of the Capital Market Line (CML) supported by Treasury bills and portfolio, P. **(4 marks)**

(iv) Obtain the expected return and standard deviation of the *minimum variance portfolio* in the opportunity set identified in part (i) above. Interpret your result. **(5 marks)**

Question 2: (Capital Market Equilibrium)

(a) Discuss *three* reasons advanced in the literature that can potentially explain the much-discussed equity premium puzzle in capital asset prices. **(9 marks)**

(b) Following the lack of clear empirical success of the capital asset pricing model (CAPM), some financial economists have declared that "beta is dead"! Discuss, with *two* reasons in *each* case, why you would *agree* or *disagree* with this 'declaration'? **(8 marks)**

(c) Suppose the following two factor model describes security returns in a market: $E(R_i) = \lambda_0\beta_0 + \lambda_1\beta_1 + \lambda_1\beta_1$. Suppose further that three portfolios exist with the following return and betas

Portfolio	Return (%)	Beta for factor 1	Beta for factor 2
D	17	1.0	0.8
E	15	0.7	1.0
K	12	0.6	0.5

(i) Using two-factor APT what will be the values of λ_0, λ_1 and λ_2 that are consistent with the portfolios of D, E and K? **(5 marks)**

(ii) Suppose that a stock, R, exists with expected return of 16% beta for factor 1 of 0.8 and beta for factor 2 of 0.7, can one make a riskless profit? Show your workings. **(3 marks)**

Question 3: (Corporate Governance)

(a) Resolving agency conflicts in a firm:

(i) How might incentive contracts be used to mitigate agency problems between management and shareholders? **(3 marks)**

(ii) What are the major shortcomings of agency contracts as a means to resolving the agency problem? **(3 marks)**

(b) The structure of the board of directors might impact heavily on the ability of the board to practice good corporate governance principles. Discuss this statement paying particular attention to the following issues:

(i) Inside and outside directors **(3 marks)**

(ii) Staggered boards **(4 marks)**

(c) The effectiveness of boards of directors as a check against undesirable managers' actions might be compromised by several factors. In particular, discuss how the following two factors might reduce the effectiveness of the board of directors in carrying out their mandate:

(i) Insufficient incentives **(3 marks)**

(ii) Board independence **(3 marks)**

(d) Corporate Boards of Directors may sometimes take decisions that are in the best interest of shareholders without "coercion" from any external sources or formal structures requiring them to do so. Discuss any *two* possible reasons for this. **(6 marks)**

Question 4: (Interest rates)

(a) Discuss *how* each of the following theories for the term structure of interest rates could explain a *downward sloping* yield curve:

(i) Segmented markets hypothesis **(2 marks)**

(ii) Uncertainty and term premiums (liquidity preference) **(2 marks)**

(b) Explain the relationship that exists between the following factors and interest rates in an economy. (Use demand and supply schedules in each case).

(i) An anticipated *increase* in the rate of inflation. **(3 marks)**

(ii) A *contraction* in the budget deficit. **(3 marks)**

(iii) An *increase* in the utility derived from assets purchased with borrowed funds. **(3 marks)**

(c) Namibian Treasury securities represent a significant proportion of most portfolios of financial institutions. On realizing this fact, you have decided to analyze the yield curve for treasury bonds. The following table provides the necessary data:

Years to Maturity	Par Coupon Yield to Maturity (%)	Calculated Spot Rates (%)	Calculated Forward Rates (%)
1	5.00	5.00	5.00
2	5.20	5.21	5.42
3	6.00	6.05	7.75
4	7.00	7.16	10.56
5	7.00	?	?

(i) Using the data in the table, calculate the five-year spot rate and forward rate assuming annual compounding. Show your calculations. **(8 marks)**

(ii) Define and describe each of the following concepts:

- Yield to maturity **(2 marks)**
- Spot rate **(2 marks)**

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Question 5: (Option Pricing)

As an investor with a keen interest in the performance of stock B, you have observed that its market price currently stands at KES 200. You are bullish about stock B and would like to speculate on an increase in its price. You decide to consult your investment advisor, Prof. Mali Raisi, PhD. The professor thinks that the fundamentals are strongly in favor of an upward movement in the price of stock B. He accordingly estimates that there is a 60 percent chance that the market price of stock B will move upwards by 7.50% in the next three months. However, in the pessimistic scenario, the professor estimates that the price of stock B will actually decline by 2.50% in the next three months. The probability of such an occurrence is 40 percent. These estimates are expected to persist over time, into the foreseeable future.

Based on the professor's learned advice, you decide to speculate on the stock's future price changes. However, the professor counsels that it would be wise to speculate through options rather than taking a position on stock B itself. You are aware that call options, with six-month maturities, issued against stock B are available at an exercise price of KES 210. Further, risk-free bonds are available in the market at a unit price of KES 100. The risk-free rate of return is 20%, compounded quarterly.

(a) What is the maximum amount you should pay for this call option today? Show all your workings and provide reasoned arguments to support all your contentions. **(14 marks)**

(b) Using the put-call parity theorem, obtain the fair price of a *put* option written against stock B with the same exercise price and maturation date. **(4 marks)**

(c) Comment on the professor's statement that, "it would be wise to speculate through options rather than taking a position on stock B itself." **(7 marks)**

Question 6: (Rational Choice; Market Efficiency)

(a) XYZ Ltd has ZAR 200,000 in cash to invest in various projects. The outcome, x_1, (in millions) next period that results from investing $100 - x_0$ (in thousands) this period is

$$x_1 = 108 - 1.04x_0 - 0.0004x_0^2$$

All investors can borrow or lend freely at a rate of 7% per period.

(i) Find the optimal level of investment for ABC Corporation. **(4 marks)**

(ii) Find the current value of ABC Corporation. **(2 marks)**

(iii) The utility function of the owner of ABC Corporation is given by

$U(C_0, C_1) = C_0C_1$, where C_t denotes consumption in period t.

Find the owner's optimal consumption bundle, (C_0^*, C_1^*). **(8 marks)**

(b) A market cannot be efficient unless market participants believe it is inefficient. Discuss. **(4 marks)**

(c) Describe the "event studies" methodology commonly used to test for market efficiency in the empirical literature. How might one interpret the existence of abnormal returns *prior* to the date of announcement of major news? **(7 marks)**

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FINANCIAL ECONOMICS II

Second Semester: Final Examination

Duration: 3 Hours **Date: Wednesday, September 20, 2017**

INSTRUCTIONS:

1. There are **FIVE** questions in this examination.
2. You are required to answer **ANY FOUR** questions.
3. All questions carry equal marks.
4. Be neat and clear, and start each question on a new page.

Question 1: [25 marks]

(a) A company in need of external financing may be required to issue new shares. When that is the case, the company can issue shares either through the primary market or through the aftermarket.

Identify and differentiate two types of issues of ordinary shares that would be made through the primary market. **(5 marks)**

(b) Ashanti Goldfields Ltd. has invested significantly in mining of gold and is currently one of the largest gold producers in the world. The company is planning to raise fresh equity capital by selling a large new issue of common stock. Ashanti is currently a publicly-traded company, and it needs to decide between an underwritten cash offer and a rights offering (not underwritten) to its current shareholders. Ashanti's management is interested in minimising the selling costs and has asked you for advice on the issue method to use.

Advise Ashanti Goldfields accordingly. **(10 marks)**

(c) Zodiak Radio, a popular radio station in Malawi, wants to go public. It has received bids on its IPO from five interested investors for a total of 8,000 shares, as follows:

1. Sadiki, who has also bid for 4,000 shares at MWK 10,000 per share, received Friday 11th August 2017 at 10.00 am;
2. Rashidi, who has bid for 4,000 shares at MWK 10,000 per share, received Thursday 10th August 2017 at 11.00 am;
3. Malatya, who has also bid for 2,000 shares but at MWK 14,000 per share, received Wednesday 9th August 2017 at 9.00 am;
4. Pirie, also bidding for 2,000 shares at MWK 12,000 per share, received Wednesday 9th August 2017 at 3.00 pm; and

5. Kananga, who has bid for 2,000 shares at MWK 16,000 per share, received Tuesday 8th August 2017 at 10.00 am.

   (i) State by how much the IPO has been oversubscribed. **(2 marks)**

   (ii) Although this is a cash offer, neither Zodiak Radio nor the underwriter has set a fixed price at which to sell the shares. Explain the method that would most likely be used to make the issue and to whom the shares will be issued. **(8 marks)**

Question 2: [25 marks]

Corporate governance can be defined broadly in reference to private and public institutions, including laws, regulations and accepted business practices, which in a market economy, govern the relationship between corporate managers and entrepreneurs ("corporate insiders") on one hand, and those who invest resources in corporations, on the other.

(i) State and explain the benefits of corporate governance to corporations and their stakeholders. In your response give four specific reasons why corporate governance is necessary. **(12 marks)**

(ii) Comment broadly on the status of implementation of corporate governance codes in African countries and explain some of the challenges in implementing corporate governance in Africa (at least five challenges). **(13 marks)**

Question 3: [25 marks]

David Bowie was a famous British musician and recording artist. However, his fame was not only in the music industry: he used a financing technique known as securitisation to obtain funding from his future music royalties by issuing "*Bowie bonds*".

(i) Explain "asset securitisation". **(5 marks)**

(ii) Give three reasons for a company to securitise. **(6 marks)**

(iii) Explain how asset securitisation differs from the traditional means of raising funds like issuing debt or equity securities in the capital market. **(6 marks)**

(iv) State four advantages and four disadvantages of raising finance through securitisation. **(8 marks)**

Question 4: [25 marks]

(a) Falcon Gold Zimbabwe is a respectable company listed on the Zimbabwe Stock Exchange. The company earned $10 million in the financial year ending 31 August 2017. On that date the company paid out 25% of its earnings as dividends. According to Ian Saunders, the company's Executive Director, Falcon Gold will continue to pay out 25% of its earnings as annual, end-of-year dividends. The remaining 75% of earnings is retained by the company for use in projects. The company has 1.25 million shares of common stock outstanding. The current price per share is $40. The return on equity (ROE) has always been 11%. This is expected to continue in the future.

   Calculate the required rate of return on the stock. **(8 marks)**

(b) Kulthum Jamal is the Managing Director of Jamal Group, a growing company in the tyre manufacturing sector. She is considering the launch of a new product. If the product goes directly to market, there is a 50% chance of success. For $150,000 the manager can conduct a focus group that will increase the product's chance of success to 70%. Alternatively, the manager has the option to pay a consulting firm $500,000 to research the market and refine the product. The consulting firm successfully launches new products 90% of the time. If the company successfully launches the product, the payoff will be $1.5 million. If the product is a failure, the NPV is zero.

Advise Kulthum on the course of action that will result in the highest expected payoff to the company. **(7 marks)**

(c) Warrants are securities which are considered to be similar to call options because of the following characteristics they possess:

1. They give holders the right, but not the obligation, to buy shares of common stock directly from a company at a fixed price for a given period.
2. Each warrant specifies the number of shares of stock that the holder can buy, the exercise price, and the expiration date.

(i) Differentiate a warrant from a traded call option. **(3 marks)**

(ii) A warrant has six months to expiration. It entitles its owner to buy 10 shares of the issuing company's ordinary shares for an exercise price of Shs. 310 per share. Assume the current market price of the share is Shs. 150 per share.

Explain whether the warrant will be worthless or not. **(3 marks)**

(iii) The capital structure of Essar Energy Plc. consists of 10 million shares of common stock and 1 million warrants. Each warrant gives its owner the right to purchase one share of common stock for an exercise price of Shs. 150. The current stock price is Shs. 170, and each warrant is worth Shs. 30.

Determine the new stock price if all warrant holders decide to exercise today. **(4 marks)**

Question 5: [25 marks]

(a) In their Proposition I, Modigliani and Miller (MM) argued that the capital structure of a company did not have any bearing on the value of the company. Theoretically, companies could structure their capitals anyhow, combining debt and equity, or either debt or equity alone. In their Proposition II, the same Modigliani and Miller (MM) took a definitive position in favour of debt capital: i.e. where possible, companies should, again theoretically, strive towards a 100% debt capital. However, the static trade-off theory suggests a cap on the amount of debt that can be issued, although the pecking order theory still prioritises debt in sourcing external financing.

(i) Explain the major assumptions that were made by Modigliani and Miller when coming up with their Proposition I. **(3 marks)**

(ii) Explain what led to a change in Modigliani and Miller's stance in MM II. **(3 marks)**

(iii) Explain why the static trade-off theory is capping the amount of debt that can be assumed. **(4 marks)**

(iv) Explain why the pecking order theory is prioritising debt in raising external finance, and explain the rules associated with this prioritisation. **(5 marks)**

(b) The financial year for Sameer International ended on 31st July 2017. The company's board convened early and quickly approved a dividend of Shs. 12.50 per share, which has just been paid. The Shs. 12.50 dividend paid is in line with the company's target payout ratio is 40%. In the current financial year beginning 1st August 2017 Sameer International projects earnings per share of Shs. 45.00, an amount well above earning attained in the year just ended. The company does not want to pay significantly higher dividends because it has doubts as to the permanence of the earnings increase. It wants to adjust dividend as per the *Lintner* model.

(i) Determine the dividend Sameer International will pay at the end of the current year if it applies the model and the speed of adjustment rate is:

a. 0.4. **(3 marks)**

b. 0.8. **(3 marks)**

(ii) Explain which of the two adjustment rates is more conservative. **(2 marks)**

(iii) Determine by how much the dividend to be paid out using the conservative adjustment rate is lower than the dividend that would have been paid per payout rate. **(2 marks)**