



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2018/2019

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY IN BUSINESS ADMINISTRATION (FINANCE)

BAC 901: EMPIRICAL FINANCE

DATE: Wednesday, 3rd April 2019

TIME: 5.30pm - 8.30pm

INSTRUCTIONS:

Answer ALL Questions on the separate answer sheet provided.

QUESTION ONE

- i. The capital asset pricing model (CAPM) can be written as:

$$E(R_i) = Rf + \beta_i [E(Rm) - Rf] \text{ using the standard notation.}$$

Suppose you estimated this model based on 62 daily observations and found that the estimated beta for the stock Y and the standard error is: 1.147 and 0.0548 respectively.

A financial analyst tells you that security Y closely follows the market but it is more risky on average than the market.

Required:

Is the analyst claim that security Y is more risky than the market true? Explain the steps you would follow to test this claim. (8 marks)

- ii. The following is a presentation of a regression model:

$$Y_{it} = \beta_{1i} + \beta_2 X_{2it} + \beta_3 X_{3it} + \mu_{it}$$

The disturbance term μ_i is a surrogate for all those variables that are omitted from the model but that collectively affect Y.

Required:

Discuss **SIX** reasons why a researcher may not introduce these variables into the model explicitly to do away with the error term? (6marks)

- iii. Explain the consequences of running a regression model without accounting for heteroskedasticity. (1 marks)

(Total: 15 marks)

QUESTION TWO

Regression analysis can be used to test whether the market efficiently uses information in valuing stocks. For concreteness, let *return* be the total return from holding a firm's stock over the four-year period from the end of 2010 to the end of 2013. The *efficient markets hypothesis* says that these returns should not be systematically related to information known

in 2010. If firm characteristics known at the beginning of the period help to predict stock returns, then we could use this information in choosing stocks.

For 2010, let *DE* be a firm's debt to capital ratio, let *EPS* denote the earnings per share, let (log) *NI* denote net income, and let (log) *SAL* denote total compensation for the CEO.

- (i) Using the data in the data collected the following equation was estimated:

$$\text{Return} = 40.44 + 0.952DE + 0.472EPS - 0.025NI + 0.003SAL$$

(29.30) (.854) (.332) (.020) (.009)

$$n = 142, R^2 = .0285.$$

- a) Test whether the explanatory variables are jointly significant at the 5% level. (4 marks)
b) Is any explanatory variable individually significant? (4 marks)

- (ii) Now the reestimated model using the log form for *NI* and *SAL* is as follows:

$$\text{Return} = 69.12 + 1.056 DE + 0.586 EPS - 31.18 NI + 39.26 SAL$$

(164.66) (.847) (.336) (14.16) (26.40)

$$n = 142, R^2 = .0531.$$

- a) Test whether the explanatory variables are now jointly significant at the 5% level. (4 marks)
b) Is any explanatory variable individually significant now? (4 marks)

- (iii) Overall, from the results in (ii) above is the evidence for predictability of stock returns strong or weak? (4 marks)

(Total: 20 marks)

QUESTION THREE

- a) A financial researcher estimates instead the following model for asset returns, r_t is as follows (with standard errors in parentheses)

$$r_t = 0.0034 - 0.0183D_{1t} + 0.0155D_{2t} - 0.0007D_{3t} - 0.0272D_{4t} + \text{other variables}$$

(0.0146) (0.0068) (0.0231) (0.0179) (0.0193)

The model is estimated using 500 observations.

Is there significant evidence of any 'day-of-the-week effects' after allowing for the effects of the other variables? (6 marks)

- b) A financial researcher suggests that many investors rebalance their portfolios at the end of each financial year to realise losses and consequently reduce their tax liabilities.

Required:

Develop a procedure to test whether this behaviour might have an effect on equity returns. (4 marks)

- c) Identify and demonstrate any **five** set of stylized statistical facts which are common to a wide set of financial assets (5 marks)

(Total: 15 marks)

QUESTION FOUR

- i. Explain what is meant by the expression “tests of market efficiency are always tests of joint hypothesis” (2 marks)

- ii. Consider the following exponential regression model

i. $Y_t = \beta_1 X_t^{\beta_2} e^{u_t}$

Explain how the model can be transformed to allow for estimation as a linear regression model. (4 marks)

- iii. Discuss the advantages of panel data over cross-section or time series data in analysis problems in the field of finance. (4 marks)

(Total: 10 marks)