CHRISTIAN SERVICE UNIVERSITY COLLEGE

KUMASI

SCHOOL OF BUSINESS

DEPARTMENT OF ACCOUNTING AND FINANCE

End of Second semester examination

Course: Financial Econometrics **Course Code: MACF 512** **Date:**

Time: 3hours

Instructions to students

i.	*This examination is made up of **Sections A and B** which contains **nine (9)** questions*
ii.	***Section A** has **four (4)** questions and candidates are required to answer any **two (2)** of these questions*
iii.	*In **Section B** which contains the remaining **five (5)** questions, candidates are required to answer any **three (3)***
iv.	*Each question carries **20 marks***
v.	*Statistical tables are provided*
vi.	*Candidates are to pay attention to detail, clear and neat work to earn bonus marks*

QUESTION 3

a) With the aid of diagrams, explain the difference between homoscedascity and heteroscedascity.

(5 marks)

b) Explain two (2) causes of hetroscedascity

(5 marks)

c) Consider the following regression equation;

$$y_t = \alpha + \beta_1 x_{2t} + \beta_2 x_{3t} + \varepsilon_t \quad \ldots\ldots 1$$

and the

$$var(\varepsilon_t) = \sigma^2 \vartheta^2 \quad \ldots\ldots 2$$

How do remove this hetroscedascity problem? *(10 marks)*

[Total marks =20 marks]

QUESTION 4

a. Write down the following models **(6 marks)**

i. AR (3)
ii. MA (4)
iii. ARMA (4, 3)

b. Develop equations that represent **(6 marks)**

i. Time-series model
ii. Cross-sectional model
iii. Panel model

c. Explain any two advantages of panel modeling in finance **(2 marks)**

d. Given the $y_t = \mu_t + \theta_1 \mu_{t-1} + \theta_2 \mu_{t-2}$
Where μ_t has zero mean white noise process; ie $E(\mu_t) = 0$ with var $(\mu_t) = \sigma^2$

i. Calculate the mean of y_t **(3 marks)**
ii. The variance of y_t **(3 marks)**

a) Interpret D_2 and D_3 **(5 marks)**

b) Explain the consequences of having three dummies in the model to represent all three zones. **(5 marks)**

c) Why is Probit or Logic technique not appropriate for this data **(5 marks)**

d) Explain why logistic models are preferred to the use of ordinary least squares in categorical or qualitative data **(5 marks)**

[Total marks =20 marks]

QUESTION 2

A researcher estimated the equation below in order to evaluate the effects of various firm-specific factors on the returns of a sample of 200 firms listed on the Ghana Stock Exchange. A cross-sectional method was used as follows;

$$r_i = 0.080 + 0.801S_i + 0.321MB_i + 0.164PE_i + 0.084BETA_i$$

SE (0.064) (0.147) (0.136) (0.420) (0.120)

Where;

$r_i = the\ percentage\ annual\ return\ for\ the\ stock$

$S_i = the\ size\ of\ firm\ i\ measured\ in\ terms\ of\ sales\ revenue$

$MB_i = market\ to\ book\ ratio\ of\ the\ firm$

$PE_i = the\ price/earnings\ ratio$

$BETA_i = stock's\ CAPM\ beta\ coefficient$

a) Calculate the t-ratios **(10 marks)**

b) On the basis of (a), what variables are relevant in explaining the returns of the firms **(5 marks)**

c) Explain the coefficients of S_i and MB_i **(5 marks)**

[Total marks =20 marks]

Prob(F-statistic)	0.000000

Table 2. showing Variance Inflation Factors (VIF) results from the model

Variance Inflation Factors
Date: 04/09/18 Time: 12:13
Sample: 1 32
Included observations: 32

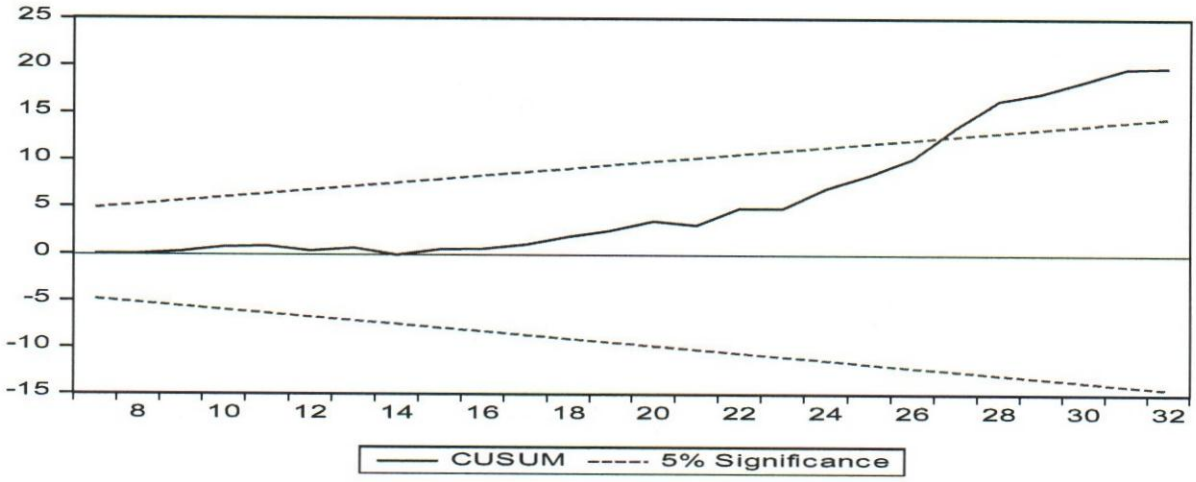
Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	572.7015	35.94940	NA
GDPG	1.714849	3.624356	1.570414
GOVEXP	8.591209	63.32129	2.127742
FDI	2.954903	2.386401	1.414934
OPENNESS	0.123088	35.19738	4.030771
GDI	2.693725	58.12891	3.167811

Table 3. showing Heteroskedasticity Test results from the model

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	3.834336	Prob. F(5,26)	0.0098
Obs*R-squared	13.58138	Prob. Chi-Square(5)	0.0185
Scaled explained SS	9.624598	Prob. Chi-Square(5)	0.0866

Figure 2 showing CUSUM test



a) Interpret the coefficients of GOVEXP, FDI and OPENNESS *(10 marks)*

b) Using the diagnostic test result, check the presence of following

i. Multicollinearity

ii. Heteroscedascity

iii. Serial correlation

iv. Normality of the errors *(8 marks)*

c) Determine the stability of the model using CUSUM graph *(2 marks)*

[Total marks =20 marks]

QUESTION 5

It is argued that the objective of hedging is to minimize the variance of the hedged portfolio returns. If this argument stands, then the appropriate hedge ratio will be the slope estimates β in a model where the dependent variable is a time-series of spot return (RSpot) and the independent variable of future returns (RFuture). Thus, the following model was estimated in line with this argument.

$$Rspot_t = \alpha + \beta RFuture_t + \mu_t; \text{ where } \mu_t \text{ is the error term}$$

The result is shown on Table 1

Dependent variable: RSpot
Method: Least squares
Observation: 65

Table 1: showing estimates of optimal hedging

Variable	Coefficients	Std error	t-statistics	Prob
c	0.363302	0.44369	-	-
Rfuture	0.958301	0.13379	-	-
R^2	-			
S.E of regression	3.546955		Mean	0.42123
RSS	792.596		S.D Dependent variable	3.542992
ESS	10.781		Akaike info Criterion	5.400342
TSS	803.377		Scwarz Info Criterion	5.467246
F-Stats	0.85707		Durbin Watson Stats	2.116689
Prob(F-stats)	0.358093			

a. Test the null hypothesis that the slope is zero, that is;
   Ho; $\beta = 0$ ***(5 marks)***
b. Interpret the results obtained on the table ***(5 marks)***
c. Estimate the R^2 ***(5 marks)***
d. Is the overall model significant? ***(5 marks)***

[Total marks =20 marks]

Examiner: Dr Sulemana Mahawiya