



UNIVERSITY OF JOHANNESBURG
UNIVERSITEIT VAN JOHANNESBURG

DEPARTMENT OF ECONOMICS AND
ECONOMETRICS
EKONOMIE EN EKONOMETRIE
DEPARTEMENT

NOVEMBER EXAMINATION / EKSAMEN
2014

Course / Kursus : Econometrics / *Ekonometrie 2B*
Examiner / Eksaminator : Mrs / Mev M Pretorius
Internal Moderator / Interne moderator : Mr J Kouadio
Time / Tyd : 180 minutes / *minute*
Marks / Punte : 120

Instructions:

1. Answer all questions / *Beantwoord al die vrae.*
 2. This paper consists of 12 pages / *Hierdie vraestel bestaan uit 12 bladsye.*
 3. Please round off to 2 decimal places / *Rond asb af tot 2 desimale plekke.*
-

Initials & Surname / Voorletters en van: _____

Student number / Studentenommer: _____

Telephone number / Telefoonnommer: _____

SECTION	TOTAL	MARK	AUDITED MARK
A	40		
B	20		
C	40		
D	20		
TOTAL	120		

Section / Afdeling A**[40]**

Answer the following theory questions:

Beantwoord die volgende teorie vrae:

1. Name and shortly discuss the assumptions underlying the method of least squares.

Noem en bespreek die aannames onderliggend aan die metode van kleinste kwadrate kortliks. (14)

1	
2	
3	
4	
5	
6	
7	

2. The disturbance term u_i is a surrogate for all those variables that are omitted from an econometric model that collectively affect Y . Give 7 reasons why these variables are not introduced explicitly into the model.

Die fouteterm u_i is 'n surrogaat vir al die veranderlikes wat uit 'n ekonometriese model gelaat word wat gesamentlik Y beïnvloed. Gee 7 redes hoekom hierdie veranderlikes nie eksplisiet in die model ingesluit word nie. (7)

1.
2.
3.
4.
5.
6.
7.

3. Given the following model:
Gegewe die volgende model:

$$Y_t = \alpha_1 + \alpha_2 D_t + \beta_1 X_t + \beta_2 (D_t X_t) + u_t$$

Give the null hypothesis if you want to test the following:
Gee die nulhipotese vir indien jy die volgende wil toets:

a. Same intercept / *Dieselfde intersep* (2)

b. Same slope / *Dieselfde helling* (2)

4. Clearly explain the following econometric problems:
Verduidelik die volgende ekonometriese probleme duidelik:

(6)

Multicollinearity / *Multikollineariteit*:

Heteroskedasticity / *Heteroskedastisiteit*:

Autocorrelation / *Outokorrelasie*:

5. What is the difference between a type I and II error and how are they related to the p-value?

Wat is die verskil tussen 'n tipe I en II foute en hoe is dit verwant aan die p-waarde? (5)

6. Given the following Cobb-Douglas production function:
Gegewe die volgende Cobb-Douglas produksie funksie:

$$\ln Y = 3.8876 + 0.4683 \ln X_2 + 0.5213 \ln X_3$$

where / *waar*:

Y = Output / *Uitset*

X_2 = Labour input / *Arbeid-inset*

X_3 = Capital input / *Kapitaal-inset*

Comment on the returns to scale for this model.

Lewer kommentaar oor die skaalvoordele van hierdie model.

(4)

Section / Afdeling B

[20]

The amount of goods and services that South Africans import (Imports) depend on the Rand/Dollar exchange rate (Exch). Use the data provided in sheet "Section B" where necessary to answer the following questions:

Die hoeveelheid goedere en dienste wat Suid-Afrikaners invoer (Imports) hang af van die Rand/Doller wisselkoers (Exch). Gebruik die data verskaf in blad "Section B" waar nodig om die volgende vrae te beantwoord:

1. What do **you** think is the relationship between Imports and the R/\$ Exchange rate? Explain why you say so.

*Wat dink **jy** is die verhouding tussen Invoere en die R/\$ wisselkoers? Verduidelik hoekom jy so sê.*

(3)

2. Make use of a scattergram and correlation analysis to check whether the data confirms your expectations in 1. Give your results and comments.

Maak gebruik van 'n verspreidingsdiagram en korrelasie-analise om te kyk of die data jou verwagtinge in 1. bevestig. Gee jou resultate en lewer kommentaar. (3)

3. Calculate and interpret 3 measures of dispersion for Imports. (6)
Bereken en interpreteer 3 maatstawwe van verspreiding vir Imports.

4. Calculate and interpret 2 measures of central tendency for Exch. (4)
Bereken en interpreteer 2 maatstawwe van sentrale geneigdheid vir Exch.

5. Estimate a regression for the above mentioned relationship where the coefficients will be representative of elasticities. Write down your model. (2)
Bereken 'n regressie vir die bogenoemde verhouding waar die koëffisiënte verteenwoordigend sal wees van elasticiteite. Skryf jou model neer.

6. Interpret the coefficient of your explanatory variable. (2)
Interpreteer die koëffisiënt van jou verduidelikende veranderlike.

Section / Afdeling C

[40]

According to Keynesian theory, money supply depends on income, inflation and the real interest rate. Data has been supplied for M3 money supply (M3), Gross National Income (GNI), the inflation rate (Inflation) and the real interest rate (Prime). Use the data in the Excel worksheet "Section C" and answer the following questions:

Volgens Keynesiaanse teorie hang geldvoorraad af van inkome, inflasie en die reële rentekoers. Data is gegee vir M3 geldvoorraad (M3), Bruto Nasionale Inkome (GNI), die inflasiekoers (Inflation) en die reële rentekoers (Prime). Gebruik die data in die Excel werkblad "Section C" en beantwoord die volgende vrae:

1. Estimate the model and give your regression results. (2)
Bereken die model en gee jou regressie resultate.

2. Interpret the partial regression coefficients of the model. (4)
Interpreteer die gedeeltelike regressie koëffisiënte van die model.

3. Do the interpretations you did in 2. make economic sense? Explain for each variable. (6)
Maak die interpretasies wat jy in 2. gemaak het ekonomies sin? Verduidelik vir elke veranderlike.

Variable <i>Veranderlike</i>	Economic sense. Yes/No? <i>Ekonomiese sin. Ja/Nee?</i>	Why? <i>Hoekom?</i>
GNI		
Inflation		
Prime		

4. Construct a 95% confidence interval for the GNI coefficient. Show all your steps.
Bou 'n 95% vertrouensinterval vir die GNI koëffisiënt. Wys al jou stappe.

(4)

5. Is GNI statistically significant? Explain by making use of the confidence interval you constructed in 4.

Is GNI statisties betekenisvol? Verduidelik deur gebruik te maak van die vertrouensinterval wat jy in 4. bereken het.

(3)

6. Is Inflation statistically significant? Explain by making use of the t-statistic. Show all your steps.

Is Inflation statisties betekenisvol? Verduidelik deur gebruik te maak van die t-statistiek. Wys al jou stappe.

(3)

7. Is Prime statistically significant? Explain by making use of the p-value. Show all your steps.

Is Prime statisties betekenisvol? Verduidelik deur gebruik te maak van die p-waarde. Wys al jou stappe.

(3)

8. Comment on the overall significance of this model by making use of an appropriate test.

Lewer kommentaar oor die algehele betekenisvolheid van hierdie model deur gebruik te maak van 'n voldoende toets.

(3)

9. Test if this model suffers from a structural break in the second quarter of 1994. Show all your steps.

Toets of hierdie model 'n strukturele breuk het in die tweede kwartaal van 1994. Wys al jou stappe.

(3)

10. Are the residuals of this regression normally distributed? Explain your answer.

Is die residue van hierdie regressie normaal verdeel? Verduidelik jou antwoord.

(3)

11. Which variable contributes the most to this regression? Show all your steps.
Watter veranderlik dra die meeste by tot die regressie? Wys al jou stappe.

(6)

Section I / Afdeling D

[20]

Use the data supplied in “Section D” and create a new workfile using the Unstructured/Undated workfile structure type in Eviews with 51 observations. Import the data on the following 4 variables: salaries of teachers; spending on public school per learner and two dummy variables relating to the province in which the teacher works (if $D_1=1$, the province is west and if $D_2=1$, the province is north).

Gebruik die data verskaf in “Section D” en maak ‘n nuwe werksblad oop in Eviews deur van die “Unstructured/Undated workfile structure type” in Eviews gebruik te maak met 51 observasies. Voer die volgende 4 veranderlikes in: onderwysers salarisse; besteding op publieke skole per leerder en twee fopveranderlikes verwant aan die provinsie waarin die onderwyser werk (indien $D_1=1$, is die provinsie in die weste en as $D_2=1$, is die provinsie in die noorde).

Equation / Vergelyking: $Salary_i = \beta_0 + \beta_1 D_1 + \beta_2 D_2 + \beta_3 Spending + \varepsilon_i$

1. Estimate the equation and give your regression results.
Bereken die vergelyking en gee jou regressie resultate.

(2)

2. Interpret the coefficients of the model.
Interpreteer die koëffisiënte van die model. (4)

3. Is this a good model? Explain.
Is hierdie 'n goeie model? Verduidelik. (3)

4. Does this model suffer from heteroskedasticity? Explain by making use of an appropriate econometric test.
Het hierdie model heteroskedastisiteit teenwoordig? Verduidelik deur gebruik te maak van 'n voldoende ekonometriese toets. (3)

5. Does this model suffer from autocorrelation? Explain by making use of two appropriate econometric tests.
Het hierdie model outokorrelasie teenwoordig? Verduidelik deur gebruik te maak van twee voldoende ekonometriese toetse. (5)

6. Is this model correctly specified? Explain by making use of an appropriate econometric test.

Is hierdie model korrek gespesifiseer? Verduidelik deur gebruik te maak van 'n voldoende ekonometriese toets. (3)

----oOo----