

UNIVERSITY OF STELLENBOSCH
ECONOMICS DEPARTMENT
ECONOMICS 388: 2019
INTRODUCTORY ECONOMETRICS

Lecturer: Le Roux Burrows
Office: Schumann 512
Telephone: 021-808-2243
E-Mail: LRB@SUN.AC.ZA

A AIM OF THE COURSE

Econometrics can be divided into two main components: theoretical econometrics and applied econometrics. The aim of the course is to provide students with a basic grounding in econometric theory, together with a dose of applied work. The applied work incorporates computer-based projects.

The abovementioned aim is embodied in the following outcomes:

- * Students must illustrate that they have mastered the basic applied statistics required for introductory econometrics.
- * Students must illustrate that they have mastered the basic theoretical aspects of introductory econometrics. A score of at least 50% in the test is required.
- * Students must illustrate that they have mastered the basic practical applications of introductory econometrics. Proof required that the end of chapter exercises were completed. Answer to the exercises will be provided.
- * Students must estimate a number of regression functions with E-Views and submit a report on each.

B METHOD OF PRESENTATION
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For this module where both Afrikaans and English are used in the same class group, the combination of facilitated learning opportunities is as follows:

- o During each lecture, all information is conveyed at least in English and summaries or emphasis on content are also given in Afrikaans. Questions in Afrikaans and English are, at the least, answered in the language of the question.
- o Students are supported in Afrikaans and English during a combination of appropriate, facilitated learning opportunities (e.g. consultations during office hours, or scheduled tutorials and Practicals).

The lectures are scheduled for Mondays 13:00-14:50; Tuesdays 11:00-11:50 and Thursdays 09:00-09:50 in the Van der Sterr, room 2118. Some of the sessions will be relocated to FHARGA for computer applications. The first part of the course is a review of statistical and mathematical concepts while the second part focuses on theoretical econometrics. Experience shows that students attending classes well prepared understand the work much easier. The Powerpoint presentation will be uploaded to SUNLearn before every lecture.

C ASSESSMENT

The final mark (FM) is calculated as a weighted average mark of the four main assessments (A1S1, A2S1, A1S2 and A2S2) and the further assessments (FA) scheduled during the year. If a student, that has participated in all the main assessments, and did not obtain a 50% upon completion of the scheduled main assessments, will gain automatic entrance to the final main assessment (A3S2) scheduled during the second examination period of the second semester. In this case the best mark obtained in A2S2 or A3S2 will be used to calculate the final mark (FM). If the student uses A3S2 as a supplementary assessment (e.g. not as a sick assessment), a maximum FM of 50% can be obtained. In year modules a minimum of three main assessments have to be completed to obtain a valid FM.

The main assessment (A1S1, A2S1, A1S2 and A2S2) will focus on prescribed sections of the work. If a student missed, for whatever reason, a maximum of two of the main assessments (A1S1, A2S1, A1S2 and A2S2) the last main assessment (A3S2) on all the work of the year and scheduled during the second examination period of the second semester must be completed. The contribution of A3S2 towards the FM will be similar to the main assessment(s) it replaces. If a student misses more than two main assessments A1S1, A2S1, A1S2 or A2S2 (for whatever reason) the student cannot pass the module.

The type and weights of the assessments used in calculation of the final mark for Economics 388 are as follows: THIS IS PRELIMINARY AND CAN CHANGE

Main assessment 1 Semester 1 (A1S1) Test: 11 April 2019 (Contribution to FM: 15%)	
Main assessment 2 Semester 1 (A2S1) Test: 6 June 2019 (Contribution to FM: 20%)	
Main assessment 1 Semester 2 (A1S2) Test: 23 September 2019 (Contribution to FM: 20%)	
Further assessments (FA)	
<p style="text-align: center;">Summative (FAS):</p> <p style="text-align: center;">Semester 1: Assignment first quarter (3.5%) Submission dates will be announced</p> <p style="text-align: center;">Semester 2: Assignment third quarter (18%) Assignment fourth quarter (3.5%) Submission dates will be announced</p> <p style="text-align: center;">Combined contribution to FM: 25%</p>	<p style="text-align: center;">Formative (FAF): Quizzes, student discussions, tutorials, computer practicals</p> <p style="text-align: center;">Participation percentage to be achieved: None</p> <p style="text-align: center;">Level of competency to be achieved: None</p>
Main assessment 2 Semester 2 (A2S2) Test: 12 November 2019 (Contribution to FM: 20%)	
Main assessment 3 Semester 2 (A3S2) Test: 5 December 2019	

D COMPUTER FACILITIES

The computer programme used for this course is called E-Views, release 10. This program is installed on the computers in FHARGA. Practical training sessions will be organised.

E	PRESCRIBED LITERATURE
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Gujarati, D.N.; Porter, D.C. (2010). Essentials of Econometrics. 4th edition. New York: McGraw-Hill.

SA Reserve Bank Quarterly Bulletin, December 2018 - Available in electronic format on SUNLearn.

F	MODULE OUTLINE
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The course consists of two parts, i.e. theoretical and practical. The practical part is integrated with the theoretical part. Data sets (if required) will be uploaded to SUNLearn.

1 Nature and scope of econometrics (Gujarati: 1)

Exercise: 1.6 – 1.8

2 Statistics

The focus of this section is on the statistical concepts considered a prerequisite for econometrics.

2.1 Basic statistics (Gujarati: Appendixes A and B)

- 2.1.1 Notation
- 2.1.2 Statistical terms
- 2.1.3 Probability
- 2.1.4 Probability density function
- 2.1.5 Multivariate density function
- 2.1.6 Characteristics of probability distributions

Exercise: A13 - A18; B10 - B16

2.2 Probability distributions (Gujarati: Appendix C)

- 2.2.1 The normal distribution
- 2.2.2 The t distribution
- 2.2.3 The chi-square distribution
- 2.2.4 The F distribution

Exercise: C10 - C20

2.3 Statistical inference (Gujarati: Appendix D)

- 2.3.1 What is statistical inference?
- 2.3.2 Estimation and hypothesis testing: Twin branches of statistical inference
- 2.3.3 Estimation of parameters
- 2.3.4 Properties of point estimators
- 2.3.5 Hypothesis testing

Exercise: D7 - D20

3 Introductory theoretical aspects

The focus of this section is on regression and hypothesis testing - the corner stones of econometrics.

3.1 Simple linear regression (Gujarati: 2)

- 3.1.1 What is regression?
- 3.1.2 Population regression function
- 3.1.3 The nature of the stochastic error term
- 3.1.4 Sample regression function
- 3.1.5 The meaning of "linear" regression
- 3.1.6 Estimation of parameters

Exercise: 2.9 - 2.13; 2.15; 2.19 (2.14; 2.16 -2.18 later)

3.2 Hypothesis testing (Gujarati: 3)

- 3.2.1 The Classical Linear Regression Model
- 3.2.2 Variances and standard errors
- 3.2.3 Properties of OLS
- 3.2.4 Distributions of OLS parameters
- 3.2.5 Hypothesis testing
- 3.2.6 The coefficient of determination
- 3.2.7 Tests for normality

Exercise: 3.14; 3.15; 3.16; 3.17; 3.18; 3.19

3.3 Multiple regression (Gujarati: 4)

- 3.3.1 What is multiple regression?
- 3.3.2 Multicollinearity
- 3.3.3 Multiple coefficient of determination
- 3.3.4 Hypothesis testing

Exercise: 4.14; 4.18; 4.19

4 Advanced theoretical aspects

Functional forms and qualitative variables is the focus of this section.

4.1 Functional forms of regression models (Gujarati: 5)

- 4.1.1 Log-linear models
- 4.2.2 Semilog models
- 4.3.3 Lin-log models
- 4.4.4 Reciprocal models
- 4.5.5 Polynomial models

Exercise: Geen / None

4.2 Dummy variables (Gujarati: 6)

- 4.2.1 Nature of dummy variables
- 4.2.2 The dummy variable trap

Exercise: In practical class

5 Model selection: Criteria and tests (Gujarati: 7)

- 5.1 Attributes of a good model
- 5.2 Types of specification errors
- 5.3 Variables: Included or not?
- 5.4 Functional form
- 5.5 Errors of measurement
- 5.6 Tests of specification errors

Exercise: In practical class

6 Violations of assumptions

Three critical problems experienced in practical applications.

6.1 Multicollinearity (Gujarati: 8)

- 6.1.1 Perfect multicollinearity
- 6.1.2 Imperfect multicollinearity
- 6.1.3 Consequences of multicollinearity
- 6.1.4 Measurement of multicollinearity
- 6.1.5 Is multicollinearity necessarily bad?
- 6.1.6 Remedial measures

Exercise: In practical class

6.2 Heteroscedasticity (Gujarati: 9)

- 6.2.1 The nature of heteroscedasticity
- 6.2.2 Consequences of heteroscedasticity
- 6.2.3 Detecting heteroscedasticity
- 6.2.4 Remedial measures

Exercise: In practical class

6.3 Autocorrelation (Gujarati: 10)

- 6.3.1 The nature of autocorrelation
- 6.3.2 Consequences of autocorrelation
- 6.3.3 Detecting autocorrelation
- 6.3.4 Remedial measures

Exercise: In practical class