

DEPARTMENT OF ECONOMICS

MAHATMA GANDHI COLLEGE
THIRUVANATHAPURAM

*Is Offering a course
On*

APPLIED ECONOMETRICS USING GRETl

COURSE DURATION

30 HOURS

STARTING FROM

**31ST AUGUST
2022**

Faculty

SRUTHI.S
ASST.PROFESSOR
DEPT.ECONOMICS
MG COLLEGE,
TVPM



INTRESTED STUDENTS CONTACT
THE DEPARTMENT

Priya L G
PRIYA L G

Head of the Department
PG Dept. of Economics
MG College
Thiruvananthapuram

From

The HOD

Department of Economics

Mahatma Gandhi College, Tvpm.

22nd July 2022

Thiruvananthapuram

To

The Principal

Mahatma Gandhi College, Tvpm.

[Request for the approval of Add on course for the academic year 2022-23]


Sir/Ma'am,

The department is planning to offer an add on course during the academic year 2022-2023 under the title "EC 33 Applied Econometrics using GRETL". Smt Sruthi S, Assistant Professor, Department of Economics, Mahatma Gandhi college will be the course coordinator as well as the instructor. We have planned for a 30-hr course which is expected to commence by last week of August 2022 and is expected to conclude before February 2023. The targeted group is the Economics Graduate and Post-Graduate students. The details of the course are attached herewith.


Thanking You

Yours' sincerely

HoD


PRIVA LG
Head of the Department
PG Department of Economics
Mahatma Gandhi College
Thiruvananthapuram

Permitted


22/07/22

EC 33: Applied Econometrics using GRETL

Academic Year 2022-2023
Mahatma Gandhi College
Thiruvananthapuram

Course Synopsis

This is a course designed for final year undergraduate B A Economics or any M.A Economics student who has done a basic course in Econometrics in their undergraduate programme. The course is designed to extend students' knowledge of basic econometric concepts and techniques learnt in Econometrics. Students will learn multiple linear regression techniques with dummy variables, more functional forms, concepts of measurement errors, multicollinearity and heteroskedasticity. These skills can be utilized in analysing data across multiple disciplines such as economics, political science, finance, business etc.

GRET is a powerful free statistical software that allows us numerous ways to analyse, manipulate and present data. This course is designed to provide an introduction to this software, which can perform both basic as well as advanced statistical analyses. It is **not** intended to explain you the statistical and/or econometric methods. Students will be introduced to some basic features of Stata (e.g., learning how to do data analysis using econometric tools) leading to efficient data management skills. We will include several topics on statistical analyses, performing regression analyses, as well as delving into the territory of graphics.

Prerequisites

- Basic Econometrics, Basic Mathematics, Simple understanding of Hypothesis testing and Distributions.
- Laptop or desktop is recommended. [Those who want to do the course but don't have laptop or desktop can contact the instructor and get lab assistance from the college.]

Course Outcome

Participants who successfully complete the course are expected to understand:

1. How to estimate OLS (simple linear and multiple linear regressions)
2. CLRM assumptions and how violations of these assumptions can affect statistical inferences;
3. How to interpret OLS statistics in different functional forms
4. Multicollinearity and Heteroskedasticity (various test and remedies)
5. Instrumental variable approach to regression analysis;
6. Basics of the GRET or Microsoft Excel used by economists to analyse economic data.

Class Timing

Morning Slot: 8:00 to 9:30

Evening Slot: 3:30 to 5:00

The class timings are fixed dates will be intimated later after the inaugural class.

Instructors and Hours

Instructor : Sruthi S

Preferred Contact : sruthi@mgcollegetvm.org

Readings

- Required Textbook: Wooldridge, J. M. (2009). Introductory Econometrics: A modern approach, 6th edition, Cengage Learning, India. [JW]
- Stock, J. H. & Watson, M. W. (2019). Introduction to Econometrics, 4th edition, Pearson [SW].
- Damodar N Gujarati and Dawn C Porter (2009): Basic Econometrics, Fifth Edition, McGraw Hill International Edition. [GJ]
- Damodar N Gujarati (2011): Econometrics by Example, First Edition, Palgrave, MacMillan.[GJX]
- AH Studenmund: Using Econometrics: A Practical Guide, Fifth Edition, Pearson Education [SM]

Assessment

Evaluation will be 50% (internal lab exam in GRETL), 40% (Internal Written Exam: MCQ) and 10% for attendance and class participation.

Assessments:

You will have several assessments throughout the course. The classes will include lecture, lab sessions and the assessment will also be done continuously based on your performance in understanding the software and also your efficiency in understanding various econometric problems using GRETL.

Exams: There will be no assignment for the course. There will be a final exam (40% of your grade). The final exam will be held according to university schedule.

Academic Integrity: Academic Honesty, Cheating, and Plagiarism as per university policy.

Attendance Policy: As per University policy for any other regular course degree course.

Course Contents**Syllabus**

30 Hrs

Module I: Simple Linear & Multiple Regression Model

10 Hrs

Introduction to Econometrics -The concept of PRF & SRF -Significance of stochastic error term- Method of ordinary least squares- Assumptions underlying the method of least squares- Properties of estimators- Gauss Markov Theorem-Coefficient of determination, r^2 - Hypothesis testing- t and F tests-P value- Practical versus statistical significance-Prediction-

Multiple coefficients of determination R^2 and adjusted R^2 -Hypothesis testing-Testing the overall significance of the regression model-F test

Module II: Econometric Problems and their testing

10 Hrs

Multicollinearity- Nature, consequences, detection and remedial measures-Autocorrelation- Nature, consequences, detection, and remedial measures- Heteroskedasticity-Nature, consequences, detection and remedial measures.

Module III: Dummy Variable Regression Model

10 Hrs

Dummy variable-ANOVA models-ANCOVA models-Dummy variable trap-Dummy variables and seasonal analysis-Structural analysis-Piecewise linear regression.

Important: This syllabus is intended to give the student guidance in what may be covered during the semester and will be followed as closely as possible. However, the instructor reserves the right to modify, supplement and make changes as the course needs arise.

- Multiple Regression Analysis: Further Issues
JW: Chapter 6
- Multiple Regression Analysis with Qualitative Information
JW: Chapter 7 and SW: Chapter 11
- Heteroskedasticity

Faculty

[Signature]

SRUTHI S
Assistant Professor
Department of Economics
Mahatma Gandhi College, TVPM

[Signature]

PRIYA L G
Head of the Department
PG Department of Economics
Mahatma Gandhi College
Thiruvananthapuram

2022-23

Applied Econometrics using GRET

Faculty:	SRUTHI S
Start Date:	31st August 2022
End Date:	23rd January 2023
Hours:	32 hours
No of Days	23 days
Total no of reg students:	45

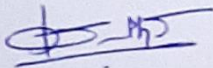
STUDENT LIST

sl no	Register number	Name
1	15020118003	ADHITHYA K A
2	15020118006	AMITHA . A . J
3	15020118009	ANOKHA S
4	15020118013	DEVIKA Y S
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34	55022118005	ANJANA S

SRUTHI S
Assistant Professor
Department of Economics
Maharaja Ganga College, TPV

35	55022118006	ARUN SANKAR S
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44	55022118015	SREERAKHI S S
45	55022118016	TEJI J

Instructor



SRUTHI S
Assistant Professor
Department of Economics
Mahatma Gandhi College, TVPM



PRIYA L G
Head of the Department
PG Department of Economics
Mahatma Gandhi College
Thiruvananthapuram

Department of Economics
Mahatma Gandhi College, Tvpm

Applied Econometrics using
GRETLE (EC 33)

January 23rd, 2023

16

NAME: Gowri Shankar S

SECTION: 55022118009 (1st MA)

Instructions: Calculators are allowed. Total
Marks: 20 points.

1. [1 point] In the equation $y = \beta_0 + \beta_1x + u$, β_0 is the intercept parameter
- (a) dependent variable
(b) independent variable
(c) slope parameter
(d) intercept parameter
2. [1 point] If an independent variable in a multiple linear regression model is an exact linear combination of other independent variables, the model suffers from the problem of perfect multicollinearity
- (a) perfect collinearity
(b) homoskedasticity
(c) heteroskedasticity
(d) omitted variable bias
3. [1 point] The assumption that there are no exact linear relationships among the independent variables in a multiple linear regression model fails if $n \leq k$, where n is the sample size and k is the number of parameters.
- (a) $n > 2$
(b) $n = k + 1$
(c) $n > k$
(d) $n < k + 1$
4. [1 point] The Gauss-Markov theorem will not hold if C.
- (a) the error term has the same variance given any values of the explanatory variables
(b) the error term has an expected value of non-zero given any values of the independent variables
(c) the independent variables have no exact linear relationships among them

- (d) the regression model relies on the method of random sampling for collection of data
5. [1 point] A model suffers from the problem of endogeneity if
- (a) OLS estimators are not predicted precisely.
 - (b) The unobservables do not have constant variance.
 - (c) Zero conditional mean assumption does not hold.
 - (d) When x_j is uncorrelated with u
6. [1 point] True or False: The estimate $\hat{\sigma}$ is interesting because it is an estimate of the standard deviation of the unobservables affecting y . In other words, it estimates the standard deviation in y after the effect of x has been taken out and is called the standard error (s.e.). **True**
7. [1 point] True or False: The term "linear" in a multiple linear regression model means that the equation is linear in the independent variables. **False**
8. [1 point] True or False: The regression model, $\text{ceosalary} = \hat{\alpha}_0 + \hat{\alpha}_1 \text{ceoten} + \hat{\alpha}_2 \text{ceoten}^2 + \hat{\alpha}_3 \text{gender}$ violates the assumption MLR 3. **False**
9. [1 point] True or False: Overspecifying a model that satisfies MLR. 1. through MLR. 4. has undesirable effects on the unbiasedness and efficiency of OLS estimators. **False**
10. [1 point] True or False: MLR. 3. rules out certain relationships between explanatory variables and MLR. 4. rules out relationships between unobservables and regressors. **True**
11. [2 points] True or False: Larger the sampling variance in x in an SLR model, larger the sampling variance for OLS estimators. **True**
12. [2 points] CEO salary and return on equity regression model looks like the following

$$\text{salary} = 963\,191 + 18.501\text{roe}$$

$$n = 209, R^2 = 0.0132$$

$$= 100 - (R^2 \cdot 100)$$

$$= 100 - 1.32$$

$$= \underline{\underline{98.68}}$$

The percentage of salary variations for CEO's salary left unexplained by roe is

- 2
- (a) 13.2%
 - (b) 1.32%
 - (c) 98.68%
 - (d) 18.501%

13. Using data on 5000 college students, the following equation was estimated by OLS

$$\text{colGPA} = 1.467 - 0.0128\text{hsperc} + 0.00192\text{sat}$$

$$n = 5000 \quad R^2 = 0.234$$

where colGPA is measured on a 4-point scale, hsperc is the percentile in the high school graduating class (defined so that, for example, $\text{hsperc} = 5$ means the top 5% of the class), and sat is the combined math and verbal scores on the student achievement test.

(a) [2 points] The predicted college GPA when $hsperc = 20$ and $sat = 1,050$ is:

- i. 2.676
- ii. 2.97
- iii. 2.978
- iv. 3.576

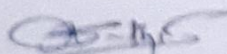
(b) [2 points] Suppose that two high school graduates, A and B, graduated in the same percentile from high school, but Student A's SAT score was 140 points higher (about one standard deviation in the sample). What is the predicted difference in college GPA for these two students?

- i. 0.2688
- ii. 1.0934
- iii. 0.3012
- iv. 0.2072

(c) [2 points] Holding $hsperc$ fixed, what approximate difference in SAT scores leads to a predicted college difference of .50, or one-half of a grade point?

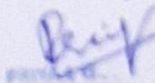
- i. 338
- ii. 200
- iii. 220
- iv. 260

Evaluated
Prepared by



SP

Verified by:



Head of the Department
PG Department of Economics
Mahatma Gandhi College
Thiruvananthapuram

**Department of Economics
Mahatma Gandhi College, Tvpm**

**Applied Econometrics using
GRETL (EC 33)**

January 23rd, 2023

NAME:
SECTION:

[Sample Question paper with solutions (answer key)]

Instructions: Calculators are allowed.

Total Marks: 20 points.

1. [1 point] In the equation $y = \beta_0 + \beta_1x + u$, β_0 is the _____.
 - (a) dependent variable
 - (b) independent variable
 - (c) slope parameter
 - (d) intercept parameter**

2. [1 point] If an independent variable in a multiple linear regression model is an exact linear combination of other independent variables, the model suffers from the problem of _____.
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 - (b) homoskedasticity
 - (c) heteroskedasticity
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3. [1 point] The assumption that there are no exact linear relationships among the independent variables in a multiple linear regression model fails if _____, where n is the sample size and k is the number of parameters.
 - (a) $n > 2$
 - (b) $n = k + 1$
 - (c) $n > k$
 - (d) $n < k + 1$ Ans: D**

4. [1 point] The Gauss-Markov theorem will not hold if _____.
 - (a) the error term has the same variance given any values of the explanatory variables
 - (b) the error term has an expected value of non-zero given any values of the independent variables**

- (c) the independent variables have no exact linear relationships among them
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The percentage of salary variations for CEO's salary left unexplained by roe is

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- (c) 98.68%
- (d) 18.501% **Ans: C**
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$$colGPA = 1.467 - 0.0128hsperc + 0.00192sat$$

$$n = 5000 \quad R^2 = 0.234$$

where $colGPA$ is measured on a 4-point scale, $hspc$ is the percentile in the high school graduating class (defined so that, for example, $hspc = 5$ means the top 5% of the class), and sat is the combined math and verbal scores on the student achievement test.

(a) [2 points] The predicted college GPA when $hspc = 20$ and $sat = 1,050$ is:

- i. 2.676
- ii. 3.227
- iii. 2.978
- iv. 3.576 Ans: ii

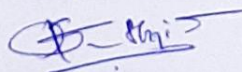
(b) [2 points] Suppose that two high school graduates, A and B, graduated in the same percentile from high school, but Student A's SAT score was 140 points higher (about one standard deviation in the sample). What is the predicted difference in college GPA for these two students?

- i. 0.2688
- ii. 1.0934
- iii. 0.3012
- iv. 0.2072 Ans: i

(c) [2 points] Holding $hspc$ fixed, what approximate difference in SAT scores leads to a predicted college difference of .50, or one-half of a grade point?

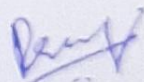
- i. 338
- ii. 200
- iii. 220
- iv. 260 Ans: iv

Prepared by



SRUTHI S
Assistant Professor
Department of Economics
Mahatma Gandhi College, TVPM

Verified by



Head of the Department
PG Department of Economics
Mahatma Gandhi College
Thiruvananthapuram

2022-23

Applied Econometrics using GRETL

Faculty: SRUTHI S
 Start Date: 31st August 2022
 End Date: 23rd January 2023
 Hours: 32 hours
 No of Days: 27 days
 Total no of reg students: 45

EVALUATION SHEET

sl no	Register number	Name	Marks	lab Grade	Sign
1	15020118003	ADHITHYA K A	17	A	[Signature]
2	15020118006	AMITHA . A . J	16	A	[Signature]
3	15020118009	ANOKHA S	17	A	[Signature]
4	15020118013	DEVIKA Y S	16	A	[Signature]
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6	15020118016	NANDANA A S	17	A	[Signature]
7	15020118017	NIVA A S	16	A	[Signature]
8	15020118018	RADHIKA R.S	16	A	[Signature]
9	15020118026	ADHITHYA SANKAR A A	18	A+	[Signature]
10	15020118029	AKASH B MANOHAR	17	A	[Signature]
11	15020118033	ARATHI B S	16	A	[Signature]
12	15020118035	ARAVIND A S	19	A+	[Signature]
13	15020118036	ARDRA B S	17	A	[Signature]
14	15020118037	ASHTAMI A.S	17	A	[Signature]
15	15020118038	ATHIRA .S	16	A	[Signature]
16	15020118043	GANGA P K	18	A+	[Signature]
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30	15020118075	GOWTHAMLAL	17	A	[Signature]
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32	55022118003	ALEX S DAS	20	A+	[Signature]
33	55022118004	ANAGHA DEV S	17	A	[Signature]
34	55022118005	ANJANA S	17	A	[Signature]

35	55022118006	ARUN SANKAR S	16	A +	<i>Arjun</i>
36	55022118007	ELA B	17	A	<i>Elab</i>
37	55022118008	GOURI SANKAR.S	16	A	<i>Gouri</i>
38	55022118009	MEGHA T GIREESH	18	A	<i>Mega</i>
39	55022118010	NANDHU HARIKRISHNAN	18	A +	<i>Nandu</i>
40	55022118011	NOUFIYA N	16	A	<i>Noufiya</i>
41	55022118012	SOORAJ R N	17	A +	<i>Sooraj</i>
42	55022118013	SOORYA ASHOK	18	A	<i>Soorya</i>
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Faculty

ASAS

SRUTHI S
 Assistant Professor
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 Mahatma Gandhi

Priya LG

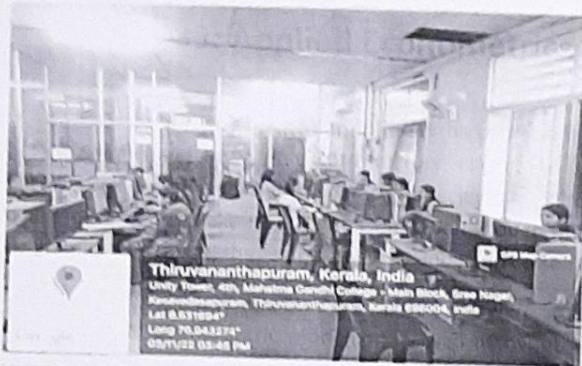
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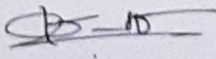
REPORT

EC 33: Applied Econometrics using GRET

Last year when the department offered the course only P.G students participated. So, this year the department gave few introductory classes to UG students to encourage their participation as well. Based on last year's feedback we arranged smaller duration lab hours along with lecture hours to make it more efficient. Even though there was no much alterations in the curriculum of the course; the course delivery undertook a sea change.

GRET being a free and student friendly software students were able to understand the basic concepts of econometric modelling as well as hypothesis testing. 2 to 3 students were clubbed into one group for the lab hours which was 1.5 hrs. rest of the sessions were planned as 1 hr sessions.




SRUTHI S
Assistant Professor
Department of Economics
Mahatma Gandhi College, TVPM

DEPARTMENT OF ECONOMICS

MAHATMA GANDHI COLLEGE, THIRUVANANTHAPURAM

KERALA

CERTIFICATE OF PARTICIPATION

Presented to

Mr. / Ms. *Jowrisankar (SS:022118009) of 1st MA Economics*

for completing the add-on course on "*Applied Econometrics using GRET*" organized by the department of Economics, Mahatma Gandhi College, Thiruvananthapuram in the academic year 2022-2023



Ms. Priya L.G
H.O.D

PRIYA L.G
Head of the Department
PG Department of Economics
Mahatma Gandhi College
Thiruvananthapuram



Ms. Sruthi S
Assistant Professor

SRUTHI S
Assistant Professor
Department of Economics
Mahatma Gandhi College, TYPM



Dr. Anandakumar VM
Principal

Principal
Mahatma Gandhi College
Thiruvananthapuram

