



## Lahore University of Management Sciences

### FINN 321 – Econometrics

Fall Semester 2017

(Tentative-Under review)

Instructor	Syed Zahid Ali
Room No.	247 Economics Wing First Floor
Office Hours	TBA
Email	szahid@lums.edu.pk
Telephone	Ext. 8074
Secretary/TA	TBA
TA Office Hours	TBA
Course URL (if any)	<a href="http://Suraj.lums.edu.pk">Suraj.lums.edu.pk</a>

#### COURSE BASICS

Credit Hours	4			
Lecture(s)	Nbr of Lec(s) Per Week	2	Duration	100
Recitation/Lab (per week)	Nbr of Lec(s) Per Week	1	Duration	60
Tutorial (per week)	Nbr of Lec(s) Per Week	TBA	Duration	

#### COURSE DISTRIBUTION

Core	Yes
Elective	
Open for Student Category	Sophomore/Junior/senior
Close for Student Category	Lacking the prerequisite

#### COURSE DESCRIPTION

##### Overall Theme

This is the second course in the statistics/econometrics sequence and looks at the broad range of estimation problems that often arise in economic applications. In particular, we look at the criteria used to select a particular estimation method and the scenarios under which the OLS estimator becomes sub-optimal. The purpose of this course is to teach students econometric theory and also to give them hands-on experience with using a statistical package *Stata EXCEL, and Eviews*, which will be helpful in later applications especially for those students who choose to do an empirical senior project.

#### COURSE PREREQUISITE(S)

MATH 231	Statistics
	OR
DISC 203	Probability and Statistics
	OR
ECON 230	Statistics and Data Analysis
	&
ECON 111	Principles of Microeconomics
	OR
MECO 111	Principles of Microeconomics



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### COURSE LEARNING OBJECTIVES

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- On successful completion students will:
1. Be able to develop a suitable regression model for a variety of empirically interesting problems and validate the selected model via a battery of tests.
  2. Be able to compare different estimators based on their finite sample and asymptotic properties.
  3. Develop a basic understanding of the use of dummy variables also learn the use of Probit, Logit, and Tobit models.
  4. Develop a basic understanding of time series econometrics and its application in the field of finance.
  5. Be able to estimate and interpret dynamic models and have experience with simultaneous equation models.
  6. Be proficient in the use of the statistical software Stata Eviews and Excel.

#### Course Policies

**Quizzes:** There will be announced in-class quizzes, which will take place (almost) every other week. There will be one announced in-lab quiz towards the end of the term.

**Lab Attendance:** Attendance in the labs is highly recommended and we will be taking attendance during each lab session. Anyone who does not arrive within the first 15 minutes of the lab will be marked as absent from that lab. An individual who is absent in more than THREE labs will be given a grade of zero in one of his highest scoring lab assignments.

**Lab Submission:** Students are encouraged to work on the assignments in groups of 2-3 students. However, the submission of assignment is to be done individually by each student in their *own* handwriting. There will be group grading of assignments (an individual's assignment from within a group will be picked randomly for grading and the same grade will be assigned to the entire group for that lab). Please note that it is possible under this grading scheme for all group members to get zero even if one group member does not submit the assignment (or its correct solution). This is to improve learning by encouraging discussion within groups while also ensuring that everyone gets to do the assignment. Please note that sharing or discussing assignments with anyone outside your own group is NOT allowed and makes grounds for a disciplinary action. *Group formation* is voluntary but some groups may need to be adjusted.

**Missed Quizzes/Assignments:** As per the rules of the Student Handbook, students must contact the instructor with a petition form and valid supporting documents either before or within three days of missing an instrument. The decision on such petitions will be made on a case-by-case basis and may involve grade deduction before assigning the student's quiz average. Under ordinary circumstances, there will be no make-up for missed assignments.

**Instrument Grading:** All the course instruments are checked as thoroughly and fairly as possible and the process consumes a lot of your TAs' and instructor's time. Therefore, and to ensure uniformity in grading across all students, there will be absolutely no ad-hoc adjustment of marks ex-post. While we encourage student queries meant to improve learning from mistakes, please note that your TAs will not change your marks once an instrument has been graded.

### LEARNING OUTCOMES

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- Critical thinking – analyzes information; utilizes logic and microeconomic models; recognizes patterns and rationality to form optimizing conclusions; recognizes and evaluates assumptions, and support of arguments.
- Literature research skills – doing independent research / use of available literature to synthesize information into coherent whole.
- Global Awareness – understands the global environment in which economies operate.



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<b>UNDERGRADUATE PROGRAM LEARNING GOALS &amp; OBJECTIVES</b>	
	<p><b><u>General Learning Goals &amp; Objectives</u></b></p> <p><b>Goal 1 –Effective Written and Oral Communication</b>  <b>Objective:</b> Students will demonstrate effective writing and oral communication skills</p> <p><b>Goal 2 –Ethical Understanding and Reasoning</b>  <b>Objective:</b> Students will demonstrate that they are able to identify and address ethical issues in an organizational context.</p> <p><b>Goal 3 – Analytical Thinking and Problem Solving Skills</b>  <b>Objective:</b> Students will demonstrate that they are able to identify key problems and generate viable solutions.</p> <p><b>Goal 4 – Application of Information Technology</b>  <b>Objective:</b> Students will demonstrate that they are able to use current technologies in business and management context.</p> <p><b>Goal 5 – Teamwork in Diverse and Multicultural Environments</b>  <b>Objective:</b> Students will demonstrate that they are able to work effectively in diverse environments.</p> <p><b>Goal 6 – Understanding Organizational Ecosystems</b>  <b>Objective:</b> Students will demonstrate that they have an understanding of Economic, Political, Regulatory, Legal, Technological, and Social environment of organizations.</p> <p><b><u>Major Specific Learning Goals &amp; Objectives</u></b></p> <p><b>Goal 7 (a) – Discipline Specific Knowledge and Understanding</b>  <b>Objective:</b> Students will demonstrate knowledge of key business disciplines and how they interact including application to real world situations (Including subject knowledge).</p> <p><b>Goal 7 (b) – Understanding the “science” behind the decision-making process (for MGS Majors)</b>  <b>Objective:</b> Students will demonstrate ability to analyze a business problem, design and apply appropriate decision-support tools, interpret results and make meaningful recommendations to support the decision-maker</p>

Indicate below how the course learning objectives specifically relate to any program learning goals and objectives.

PROGRAM LEARNING GOALS AND OBJECTIVES	COURSE LEARNING OBJECTIVES	COURSE ASSESSMENT ITEM
Goal 1 –Effective Written and Oral Communication	<i>e.g(Provide student opportunity to demonstrate effective communication)</i> CLO #	Quizzes and homework
Goal 2 –Ethical Understanding and Reasoning		
Goal 3 – Analytical Thinking and Problem Solving Skills	Class participation	
Goal 4 – Application of Information Technology	Home work will be based on Excel Stata, and Eviews Programming	
Goal 5 – Teamwork in Diverse and Multicultural Environments		
Goal 6 – Understanding Organizational		



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Ecosystems		
Goal 7 (a) – Discipline Specific Knowledge and Understanding	Exams	Quizzes+mid+final
Goal 7 (b) – Understanding the “science” behind the decision-making process	Exams	Quizzes+mid+final

### GRADING BREAKUP AND POLICY

Assignment(s):  
 Home Work: 10%  
 Quiz(s): 20%  
 Class Participation: 5%  
 Attendance:  
 Midterm Examination: 25%  
 Project:  
 Final Examination: 40%

### EXAMINATION DETAIL

Midterm Exam	Yes/No: YES Combine Separate: Combine Duration: 120 minutes Preferred Date: Exam Specifications: closed books and closed notes
Final Exam	Yes/No: YES Combine Separate: Combine Duration: 120 minutes Exam Specifications: closed books closed notes

### COURSE OVERVIEW

WEEK	TOPICS	<b>RECOMMENDED READINGS</b> <b>* THE READINGS ARE ALL FROM THE TEXTBOOK UNLESS OTHERWISE INDICATED</b>
1-2	<b>Introduction</b> What is econometrics? Steps in empirical economic analysis The structure of economic data; random sampling <b>Two-Variable Regression Analysis-Basic ideas</b> The concept of PRF The concept of Linearity	Chapters.1,2



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	The concept of SRF	
2,3	<b>Two-Variable Regression Analysis: Estimation</b>  Mechanics and Interpretation of OLS and Method of Maximum Likelihood (ML) Classical Linear Model Assumptions The Gauss-Markov Theorem Properties of OLS – Mean and Variance Goodness of fit The normality assumption	Chapters. 2,3,4
4	<b>Two-Variable Regression: Interval Estimation and Hypothesis Testing</b> Construction of confidence interval and Testing of hypothesis related to regression coefficients and variance. The science of p-values.	Chapter. 5
5	<b>Extension of the Two-Variable linear Regression Model</b>  Regression through origin, scaling and units of measurements, functional form of the model and log-linear models estimation	Chapter.6
6	<b>Multiple Regression Analysis: The problem of Estimation and Multicollinearity</b> The three variable model The meaning of Partial Regression coefficients Concept of R-square and testing of hypothesis	Chapter 7,8,9
7	<b>Heteroskedasticity</b> Consequences of Heteroskedasticity Robust inference Testing for heteroskedasticity Weighted Least Squares	Chapter 11
8	<b>Autocorrelation</b> OLS estimation in the presence of Autocorrelation; consequences and testing of autocorrelation; Remedial measures to autocorrelation	Chapter 12
9	<b>Regression on Dummy Variables</b> The nature of Dummy variables; regression with dummy variables and testing of hypothesis and doing analysis such as gender differences, structural change and regime change etc.	Chapter 15
10	<b>The regression on Dummy Dependent Variable: The LPM, Logit, Probit, and Tobit Models</b> Dummy dependent variable, The linear probability model (LPM); estimation and drawing inferences from such models	Chapter 16
11-12	<b>Dynamic Econometric Model: Autoregressive and Distributed-Lag Models</b> Estimation of distributed-lag models; Koyck approach to distributed-lag models, adaptive expectations stock adjustment and partial adjustment models; estimation of AR models	Chapter 17
12-13	<b>Introduction to Time series Econometrics</b> Stationary vs. non stationary process; test of stationarity (Dickey Fuller Test); trend stationarity and difference stationarity; cointegration and error correction model.	Chapter 21
14	<b>Simultaneous-Equation Models</b> The nature of Simultaneous-equation models; the simultaneous-equation bias, the identification problem; test of simultaneity; approaches to	Chapter 18,19,20



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estimation	
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### TEXTBOOK(S)/SUPPLEMENTARY READINGS

#### Readings:

##### Text Book

Basic Econometrics by Damodar Gujarati. 3<sup>rd</sup> edition or latest edition. McGraw-Hill 1995

##### Reference Texts

1. Hamilton, Lawrence C. 2006. *Statistics with Stata*. Thomson Brooks/Cole.
2. Kennedy, Peter. 2008. *A Guide to Econometrics*. 6<sup>th</sup> edition. Malden: Blackwell Publishing.

Levitt, Steven D., and Stephen J. Dubner. 2009. *Freakonomics: A Rogue Economist Explores the Hidden Side of Everything*. Harper Perennial

##### Online Resources

To learn STATA you may use:

<http://www.ats.ucla.edu/stat/stata/>

STATA illustrations for all our text book examples are at:

<http://fmwww.bc.edu/gstat/examples/wooldridge/wooldridge.html>

The power-point slides for the book are also available at:

<http://www.swlearning.com/economics/wooldridge/wooldridge2e/powerpoint.html>