



APPLIED ECONOMETRICS

PROF. SABUJ KUMAR MANDAL

Department of Humanities and Social Sciences
IIT Madras

PRE-REQUISITES : Inferential statistics and Basic econometrics

INTENDED AUDIENCE : Anyone interested in data analysis

INDUSTRY SUPPORT : Banking, Analytics, Audit firms

COURSE OUTLINE :

After having a background in basic econometrics, this course on Applied Econometrics will help the students understanding and analyzing more complex economic data generated out of complex decision making. As the name suggests, the subject Applied Econometrics aims to measure economic relationship from more real life examples. After successful completion of the course, students would be able to formulate econometric model to analyze data and then would be able to establish any cause-effect relationship in their preferred areas of interest like economics, finance, management, engineering and science. An expertise in econometrics increases the job prospect of the students significantly.

ABOUT INSTRUCTOR :

Prof. Sabuj Kumar Mandal is currently working as an Assistant Professor in the Department of Humanities and Social Sciences, Indian Institute of Technology Madras (IITM), Chennai. He completed his B.Sc (Economics) from the Scottish Church College Kolkata (1999-2002) and M.Sc (Economics) from the University of Calcutta with a specialization in Econometrics. He completed his doctoral degree in economics from the Institute for Social and Economic Change, Bangalore. His teaching and research interests include Applied Econometrics, Energy and Environmental Economics (efficiency analysis), Adaptation to Climate Change, Environmental regulation and Firm Performance and Behavioral & Experimental Economics. He has several national and international publications in his credit. He was awarded Young Economist Award 2015 by the Indian Econometric Society for his contribution to quantitative economics. Recently, he has been awarded Fulbright Nehru Academic and Professional Excellence Award 2020-21 (research category) for conducting research in the area of 'Community Based Adaptation to Climate Change' taking Southeast Florida Regional Climate Change Compact (SFRCC) as a model for analysis. He aims to develop an economic framework based on rational choice theory, to identify the motivating factors that determine private participation in community based adaptation (CBA) focusing on individuals' perception about climate risk, time preference and their adaptive capacity

COURSE PLAN :

1. Instrumental Variable (IV) Estimation and Two Stage Least Squares

1. Omitted variable bias
2. Statistical inference with IV estimator
3. IV estimation of the Multiple Regression Model
4. Two stage least squares with single and multiple endogenous explanatory variables
5. Examples and estimation using the statistical software STATA

2. Simultaneous Equations Models

1. The nature of simultaneous equation models
2. Identifying and estimation of a structural equation using reduced form
3. Systems with more than two equations
4. Examples and estimation using the statistical software STATA

3. Pooling Cross Sections across Time: Simple Panel Data Models

1. Pooling Independent Cross Sections across Time
2. Policy analysis with pooled cross sections
3. Two-period panel data analysis
4. Policy analysis
5. Examples and estimation using the statistical software STATA

4. Advanced Panel Data Models (static)

1. Fixed effects estimation
2. The dummy variable estimation (LSDV)
3. Random effects model
4. Random effects or fixed effects model?
5. Examples and estimation using the statistical software STATA

5. Advanced Panel Data Models (dynamic)

1. Dynamic panel data (DPD) setup
2. Correlation lagged dependent variable and the error term (Nickell bias)
3. Anderson and Hsiao estimation
4. Arellano and Bond estimation
5. System Vs Difference GMM estimation
6. Examples and estimation using the statistical software STATA

6. Introduction to Time Series Models

1. Distributed Lag models
2. Testing for unit roots
3. Cointegration and error correction models
4. Examples and estimation using the statistical software STATA

7. Time series properties of panel data

1. Panel unit root test
2. Panel cointegration
3. Panel vector error correction model
4. Examples and estimation using statistical software STATA

8. Qualitative response and limited dependent variables in econometrics

1. The linear probability model
2. The Probit and Logit model
3. Multinomial logit, conditional and mixed logit models
4. Ordered-response models
5. Estimation of logit and probit using panel data
6. Censored and truncated variables
7. The Tobit model
8. Heckman's selection model