Econometric Theory - Web course

COURSE OUTLINE

The course starts with the topics on simple linear regression model to develop the basic concepts about the methodologies. The concepts are extended to multiple linear regression model. The statistical derivations, related concepts, least squares as well as maximum likelihood estimators of regression parameters are discussed. The statistical properties of the estimators are derived and the testing of hypothesis along with confidence interval estimation in simple and multiple regression models are detailed. The predictors based on least squares estimators are developed and their statistical properties are discussed when they are used for within sample, outside sample and simultaneous prediction of values of dependent variable. The generalized least squares estimation is introduced and the properties of the estimators are derived. The regression analysis under exact and mixed type of linear restrictions is discussed. The problems of multicollinearity, heteroskedasticity and autocorrelation along with their detection, test and estimation of parameters in a given sample of data are described from the statistical point of view. The role of regression analysis in dummy variable model is described. The problem of specification error and structural change and stability of parameters are described and the statistical tools for their detection are developed. The issues of asymptotic theory in the set up of linear models and stochastic regressors are discussed. The Stein rule estimation procedure and instrumental variable estimation method are introduced. The estimation of parameters in measurement error models is discussed. The issues related to these models along with the estimation of parameters are addressed under the simultaneous equation models. The seemingly unrelated regression equation models are described and estimation of parameters is discussed.

COURSE DETAIL

Module number	Topics	Number of lectures
1	Introduction to Econometrics	2
2	Simple linear regression analysis	6
3	Multiple linear regression analysis	7
4	Predictions in linear regression model	2
5	Generalized and weighted least squares estimation	1
6	Regression analysis under linear restrictions	2
7	Multicollinearity	4
8	Heteroskedasticity	2
9	Autocorrelation	3
10	Dummy variables models	1
11	Specification error analysis	1
12	Tests for structural change and stability	1
13	Asymptotic theory and stochastic regressors	2
14	Stein-rule estimation	1
15	Instrumental variable estimation	1
16	Measurement error models	3
17	Simultaneous equations models	4

NP-TEL

NPTEL

http://nptel.iitm.ac.in

Mathematics

Pre-requisites:

Knowledge of basic statistics

Additional Reading:

1. George G. Judge, William E. Griffiths, R. Carter Hill, Helmut Lütkepohl, Tsoung-Chao Lee (1985): The Theory and Practice of Econometrics, John Wiley.
2. C.R. Rao, H. Toutenburg, Shalabh and C. Heumann (2008): Linear Models and Generalizations - Least Squares and Alternatives, Springer.
3. J.M. Woolridge(2002): Introductory Econometrics- A Modern Approach, South-Western College, Publications.
4. Badi H. Baltagi (1999): Econometrics, Second edition, Springer-Verlag.
5. Aman Ullah and H.D. Vinod (1981): Recent Advances in Regression Models, Marcel Dekker.

18	Seemingly unrelated regression equations models	1
19	Exercises	
Total		**44**

References:

1. Jack Johnston and John DiNardo (1997): Econometric Methods, Third edition, McGraw Hill.
2. G.S. Maddala (2002): Introduction to Econometrics, Third edition, John Wiley.
3. Damodar Gujrati (2003): Basic Econometrics, McGraw Hill.
4. William Greene (2008): Econometric Analysis,Prentice Hall, Sixth edition.
6. Henry Theil (1971): Principles of Econometrics, John Wiley.

Coordinators:

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