Group A

Paper X-A

5110 A NEW

Econometrics

Objectives: Applications of economic theory need a reasonable understanding of economic relationship and relevant statistical methods. The econometric methods thus become a very powerful tool for understanding of applied economic relationships and for meaningful research in economics. This paper accordingly is devoted to equip the students with theory of econometrics.

Unit I

Introduction and OLS Analysis

Meaning , objectives and Scope of Econometrics, Methodology of Econometric Research. The Simple Linear Regression Model -Ordinary Least-Squares Method, Assumptions and Properties of OLS Estimations, Gauss Markov's Theorem, Numerical Application of Regression Analysis. Goodness of fit: R^2 and Adjusted R^2, Confidence Intervals of the Parameters, Statistical Tests of Significance of the OLS Estimates – t and F test and its importance.

Unit II

Multiple Regression Analysis

Multiple Regression Model with Two Explanatory Variables: An application in Multiple Regression Model (without derivation), Matrix Approach to Linear Regression Model-Numerical Application. Hypothesis testing in Multiple Regression using T test and F -Test. Dummy Variable- Nature, Regression Model with Dummy Variable, Interaction Effects and Seasonal analysis.

Unit III

Problems in Regression Analysis

Autocorrelation, Multicollinearity and Hetroscedasticity: Assumptions, Causes, Consequences, Tests to detect the problem and Remedial steps to solve these problems Errors of Measurement and Solutions for the Case of Errors in Variables.

Econometric Modelling- Model Specification: Criteria and Errors: Types, Consequence, Tests.

Unit IV

Simultaneous Equation Models – Meaning and basic concepts. Consequences of applying OLS to simultaneous model, Recursive models. Problem of identification and Conditions for Identification (Rank and Order Conditions).

Estimation of Simultaneous Equation Models – Indirect Least Square Method (ILS), Two Stage Least Square Methods (2 SLS), The Method of Instrumental Variables (IV), Identification and Choice of Estimation Method. Estimation under linear restrictions, Specification Bias.

Unit V

Time Series Econometrics

Time Serire Analysis- Basic Concepts: Stationary and Non stationary Stochastic Processes, unit root stochastic processes, Trend stationary and Difference stationary stochastic process. Random walk model. The Unit root test- Augmented Dickey-Fuller test. The phenomenon of co-integration-spurious regression. The Granger Causality test.

Time Series Model: Forecasting with ARMA, Forecasting with ARIMA model, Box-Jenkings methodology. ARCH and GARCH Model to measure the volatility.

Reading List:

1. Chow, G. C. (1983) – Econometrics, McGraw Hill, New York.
2. Gujrati, D. (1995) – Basic Econometrics, (3rd Edition), McGraw Hill, New Delhi.
3. Johnston, J. (1985) – Econometric Methods, McGraw Hill, New York.
4. Koutsoyiannis, A. (1977) – Theory of Econometrics, (2nd Edition), The Macmillan Press Ltd., Hampshire.
5. Maddala, G. S. (1993) – Econometrics: An Introduction, McGraw Hill, New York.
6. Madnani, G.M.K. – Introduction to Econometrics: Principles and Applications, Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi. (English & Hindi Version).
7. Rao and Miller- Applied Econometrics, Prentice Hall, New Delhi.
8. Shyamala, S., Navdeep Kaur and T. Arul Pragasam – A Text Book on Econometrics – Theory and Applications, Vishal Publishing Co., Jalandhar.
9. Upender M.-Applied Econometrics, Vrinda Publications, New Delhi.
10. Wooldridge, J.M. (2009). Introductory Econometrics, South-Western Cengage Learning, Mason, USA.