

INTRODUCTORY ECONOMETRICS: 1993

Lecturer: D.S.G. Pollock

Full Description

This is a half-unit course, taught in the fourth Semester, which is the sequel to the course of *Statistical Methods in Economics*. Its aim is to analyse problems which arise in the course of statistical investigations in economics and to present the methods which are used in overcoming them.

The course begins by reaffirming the basic concepts of multivariate regression with the help of elementary matrix algebra. The classical statistical assumptions which sustain the method of ordinary least-squares regression are reviewed with a view to relaxing and generalising some of these as the course progresses.

We proceed to examine two of the problems which might affect the systematic part of a regression model. These are the problem of multicollinearity and the problem of omitted-variables bias. An awareness of the problem of multicollinearity is helpful in understanding the techniques for handling categorical data, including the dummy variables which are used in econometrics to model the seasonal variation in economic behaviour.

Next we consider a variety of problems arising from the violation of the classical assumptions regarding the disturbance term of a regression equation. We begin by considering the econometric techniques for detecting heteroskedasticity in the disturbances, and we show how to adapt the least-squares estimation procedure to take account of this phenomenon. Then we consider the means for detecting serial correlation amongst the disturbances as well as the methods of estimating a regression model with a simple autoregressive disturbance process.

The penultimate section of the course is devoted to the analysis and estimation of dynamic economic relationships. Models with lagged dependent variables and distributed lags are introduced, and the concepts of the impulse response and the step response of a transfer function are used in characterising dynamic behaviour.

The theories of partial adjustment and adaptive expectations are invoked to explain why an economic agent takes time in adapting to changing circumstances. We also consider the error-correction form of a dynamic econometric equation which is the appropriate formulation to adopt when the explanatory variables follow nonstationary time trends.

The final section of the course is devoted to techniques which are appropriate for estimating a structural or behavioral econometric equation which is embedded in a system of simultaneous stochastic equations.

The lectures are closely coordinated with weekly problem classes where the computer is used to analyse sets of econometric data to which the techniques expounded in the lectures may be applied.

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Short Description

This is a half-unit course, taught in the fourth Semester, which is the sequel to the course of *Statistical Methods in Economics*. Its aim is to analyse problems which arise in the course of statistical investigations in economics and to present the methods which are used in overcoming them. The topics include the following:

1. Matrix Algebra and the Multivariate Regression Model,
2. The Assumptions of the Classical Linear Regression Model,
3. The Problems of Multicollinearity and Omitted-Variables Bias,
4. Categorical Data and Dummy Explanatory Variables,
5. The Problems of Heteroskedasticity and Serial Correlation Affecting the Regression Disturbances,
6. Dynamic Regressions: Lagged Dependent Variables, Distributed Lags and Autoregressive Disturbances,
7. Dynamic Regressions: Adaptive Expectations, Partial Adjustment and Error-Correction Mechanisms,
8. Structural Estimation and the Simultaneous-Equation Model of Econometrics.

The lectures are closely coordinated with weekly problem classes where the computer is used to analyse sets of econometric data to which the techniques expounded in the lectures may be applied. A book which is appropriate to the course is

Maddala, G.S. (1992), *Introduction to Econometrics: 2nd Edition*, McGraw-Hill: New York.