Econometric Analysis of Nonstationary Data

by

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Course Description

These lectures describe some of the author’s recent research in areas that have potential for empirical applications. The lectures emphasize the motivating ideas, provide a conceptual development of the econometric methods and discuss and illustrate some practical implementations. Technical details will be covered at a level that should be accessible to persons with a graduate economics background. The theme of the lectures is econometric methodology for describing and analyzing nonstationary economic data and the course has several distinct but related components.

The first part of the course discusses some new methods of econometric model determination and shows how they can be used to construct vector time series models in an automated way, to generate economic forecasts and to perform policy analysis. The judgmental elements in using these methods for forecasting are minimal and are confined to the choice of variables, the selection of the model classes to be used, and the setting of certain maximal parameters like the maximal lag order in a vector autoregression. The methods provide a simple procedure for finding consistent estimates of cointegrating rank in vector autoregressions and can be used to determine jointly the cointegrating rank and the lag order, thereby facilitating the use of reduced rank regression methods in practice without the use of complicated testing procedures. Some experience that the author has had in using the techniques in practical ex ante macroeconometric forecasting over the last four years for a group of Asia-Pacific countries are reported.

The second component of the course discusses some new methods of description that can be applied to both stationary and nonstationary data. These descriptive tools help to characterize the properties of observed series and to assist in a novel way in making agnostic assessments of such matters as level shifts and trend breaks. The methods also provide a new way of measuring quantities of empirical interest like inflation hazards. Some empirical illustrations to interest rates and inflation are provided.

The third part of the course addresses the longstanding issue of trends and spurious regressions from a new perspective. It is argued that, in spite of serious statistical analysis in recent years, the phenomenon is still imperfectly understood. While the commonality of
trending mechanisms in economic data is well known to make econometric regressions vulnerable to spurious empirical relationships, such relationships will be shown to frequently have their own mathematical justification. In consequence, some new interpretations of the phenomena are put forward and the implications for empirical research are discussed.

The final component of the course is concerned with the econometric analysis of panel data where the time series have nonstationary characteristics, as in most multi-country macroeconomic panels. Some new methods are described that should be useful in various empirical applications like testing growth convergence theories in macroeconomics, estimating long-run relations between international financial series such as relative prices and exchange rates, and testing hypotheses about international capital mobility.

Reference and Reading

1. **Econometric Model Determination: Automated Time Series Modeling and Forecasting**


2. **Spatial Analysis for Nonstationary Time Series Data: Densities and Hazard Functions**


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3. **Trends, Trend Elimination and Spurious Regressions**


4. **Nonstationary Panel Data and Cointegration**

