

# EFFICIENCY AND PRODUCTIVITY ANALYSIS

A three-day intensive course presented by the

**Centre for Efficiency and Productivity Analysis  
School of Economics, University of Queensland (UQ)**

This course provides a practical introduction to the three main methods used for performance measurement in multi-input, multi-output organisations: Data Envelopment Analysis (DEA), Stochastic Frontier Analysis (SFA) and index number methods (e.g., Tornqvist and Fisher indexes). Participants will obtain hands-on experience implementing these methods using different software packages and data sets.

## Who should attend?

Economists, statisticians, consultants and managers from:

- Private and public sector organisations
- Regulatory authorities and regulated firms
- Infrastructure industries (e.g., electricity, gas, water, railways)
- Service industries (e.g., education, health)
- Industries with branch structures (e.g., banks, credit unions, franchises, retail chains).

Academics and graduate students (note that some UQ graduate students will be attending the course).

## When and Where?

Wednesday 11 July to Friday 13 July, 2007 (9am to 5pm each day)  
School of Economics, University of Queensland.

## Fees

The fee for the 3-day course is AU\$1,100. This fee covers tuition and study materials.

## Important Notes for Participants

- Participants are asked to bring their own laptop computers (running Windows XP) to the course. Performance measurement software will be provided to each participant.
- Participants will be expected to have a basic understanding of microeconomics and linear regression analysis (at about the level of a first-year undergraduate university student).

## Key benefits

Participants will learn how to:

- Measure performance in a multi-input, multi-output industry
- Decompose performance measures into components (e.g., technical and allocative efficiency)
- Identify role models that can serve as benchmarks for programs of productivity improvement
- Identify the output and input changes necessary for an organisation to achieve best practice
- Critically evaluate a performance study
- Use performance measurement software.

## Course Outline

(Full course details will be provided at commencement of course) The course materials have been developed from Coelli, T.J., Rao, D.S.P., O'Donnell, C.J. and G.E. Battese (2005) *An Introduction to Efficiency and Productivity Analysis*, 2nd Edition. Springer, New York. Participants will receive copies of this book, as well as sets of notes and relevant readings from the literature. Course instruction will take the form of lectures and tutorial sessions. The tutorial sessions will give participants hands-on experience using different data sets and software packages. The course will cover the following topics/modules:

- **The Economics of Production.** This module reviews the basic economic concepts needed for a proper understanding of productivity and efficiency measurement. Participants learn how the production possibilities facing firms can be summarised using input and output sets, production frontiers, distance functions and cost frontiers.
- **Productivity and Efficiency.** This module discusses total factor productivity (TFP) and related performance measurement concepts, including technical and allocative efficiency. Technical efficiency relates to the ability of a firm to produce outputs using as few inputs as possible, while allocative efficiency usually relates to a firm's ability to choose an input mix that minimises production costs.
- **Index Numbers.** This module examines index number methods for computing TFP change. Participants obtain hands-on experience in computing TFP change using the TFPIP software.
- **Data Envelopment Analysis (DEA).** This module shows how different measures of efficiency can be computed using linear programming. Among other things, participants learn how to compute the changes in outputs, inputs and costs that would result if an inefficient firm was to operate according to best practice. Participants examine past studies and obtain hands-on experience in DEA using the DEAP software.
- **Stochastic Frontier Analysis (SFA).** This module shows how efficiency measures can be computed using econometric techniques. Participants are introduced to a range of models underpinned by different assumptions concerning the nature of inefficiency (e.g., time-varying or time-invariant). Participants are also introduced to models that can be used with different types of data sets (e.g. cross-section or panel data). Participants examine past studies and obtain hands-on experience in SFA using the FRONTIER software.
- **Practical Issues in Performance Measurement.** This module focuses on the choice of methodology, the choice of variables, and issues relating to data collection and processing.

## Presenter

Tim Coelli (<http://www.uq.edu.au/economics/index.html?page=15846>).

## Contacts

- For registration enquiries, send an email to Maree Apolloni ([m.apolloni@economics.uq.edu.au](mailto:m.apolloni@economics.uq.edu.au)) who will then send out an invoice. Marie can also provide advice on local transport and accommodation if required.
- For enquires relating to the course content, contact Tim Coelli ([t.coelli@economics.uq.edu.au](mailto:t.coelli@economics.uq.edu.au)).