

A three-day course on

EFFICIENCY AND PRODUCTIVITY ANALYSIS

Centre for Efficiency and Productivity Analysis
School of Economics, The University of Queensland

29 September 2009 to 1 October 2009

About the Course

This three-day intensive course presents methods for performance measurement for multi-input multi-output firms. Among other things, participants will learn how Data Envelopment Analysis (DEA) and Stochastic Frontier Analysis (SFA) can be used to decompose indexes of profitability and productivity change into measures of price, technical and efficiency change. They will obtain hands-on experience implementing these methods using different software packages and data sets. A more detailed course outline is provided overleaf.

Who Should Attend?

The course is aimed at researchers, economists, statisticians and consultants from

- private and public sector organizations;
- regulatory authorities and regulated firms;
- infrastructure industries (e.g., electricity, gas, railways);
- service industries (e.g., education, health); and
- industries with branch structures (e.g., banks, credit unions, franchises, retail chains).

Participants are expected to have an understanding of microeconomics and regression analysis similar to that of a second-year undergraduate university student.

About the Presenter

Chris O'Donnell is a Professor of Econometrics at The University of Queensland. His research specialty is applied production economics and demand analysis. He is an Associate Editor of the *Journal of Productivity Analysis* and a former editor of the *Australian Journal of Agricultural and Resource Economics*. For more details see <http://www.uq.edu.au/economics/index.html?page=15893>.

Registration

	Earlybird (before 31/8/09)	Ordinary
Non students	\$1000	\$1200
Full-time students	\$500	\$600

Registration fees are in Australian dollars and include GST. Participants will receive sets of notes and relevant readings from the literature, including copies of the textbook by 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. Registration includes morning/afternoon tea. Lunch is not included.

To obtain a registration form, please email Louise West: louise.west@uq.edu.au.
For further information, contact Chris O'Donnell: c.odonnell@economics.uq.edu.au

Course Outline

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 introduces the concept of total factor productivity (TFP) and associated measures of efficiency. Input-oriented technical efficiency, for example, relates to the ability of a firm to produce a given set of outputs using as few inputs as possible, while allocative efficiency relates to a firm's ability to choose output and input mixes that maximise profits. Participants learn that profitability change can be decomposed into the product of a TFP index and an index measuring the change in the terms of trade. They also learn that most common TFP indexes can be further decomposed into measures of technical change, technical efficiency change, mix efficiency change and scale efficiency change.
- **Index Numbers.** This module examines index number methods for computing TFP change. Participants learn which common index number formulas can be used to compute TFP change when production technologies exhibit variable returns to scale, and which cannot. Participants examine past studies and obtain hands-on experience computing index numbers using different software packages, including TFPIP.
- **Data Envelopment Analysis (DEA).** This module shows how different measures of efficiency and productivity change can be computed using linear programming methods. 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 experience with the DEAP software.
- **Stochastic Frontier Analysis (SFA).** This module shows how measures of efficiency and productivity change 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.** This module focuses on the choice of methodology, the choice of variables, and issues relating to data collection and processing.