

2016 African Centre for Development Finance Short course: Efficiency and Productivity Analysis of Agro-Enterprises in Developing Economies

Presented by Prof Amin Mugeru, University of Western Australia

Monday, 22 August – Friday, 26 August 2016
Computer Lab, USB campus, Bellville, Cape Town, South Africa

What is the programme about?

This five-day course on postgraduate level will focus on applied Data Envelopment Analysis and Stochastic Frontier Analysis with a healthy balance between the theory and hands on application.

The course will cover the economic theory of efficiency and productivity analysis and its measurement using both parametric and non-parametric analysis. Both basic and advanced DEA and SFA models for measuring efficiency in multi-input multi-output situations will be covered. An illustrative assessment by DEA and SFA will be carried out by course participants. In addition, recent developments in DEA with slack-based models and Stochastic DEA will be discussed. Participants will be introduced to R, and STATA software. Most of the second-stage analysis will be conducted in STATA. (See more about the course lower down in this brochure.)

The course is presented by Prof Amin Mugeru, Assistant Professor of Production Economics University of Western Australia.

The course is presented under the auspices of the African Centre for Development Finance at the University of Stellenbosch Business School (USB) in collaboration with the University of Western Australia, with financial support from Crawford Foundation and USB.

Who should attend?

- Those interested in assessing the performance of organisational units, for instance different regional offices, bank branches, sales outlets, hospitals or schools.
- Aspiring doctoral candidates, post-doctoral fellows and current doctoral fellows and other academics working in this domain will be given priority as well as those working with national institutions of productivity analysis.
- The course is compulsory for current PhD and master's students working in the research area of performance evaluation at the University of Stellenbosch Business School.

What delegates will gain from the course?

An appreciation of the principles underlying DEA and SFA issues arising from using DEA and SFA and some familiarity with the software to implement DEA and SFA assessments.

How to apply

Only 20 participants will be admitted due to logistical reasons. You can apply by completing the online application form. The admission will be on rolling basis until all the position have been filled or until application deadline of Friday, 29 July 2016.

To apply, click here: <http://bit.ly/29xsuaa>





More about the programme

Dates: Monday, 22 August – Friday, 26 August 2016

Course content: See below

Training methods: Lectures, small work groups, case studies, and hands-on use of software.

Course coordinator: Dr Nyankomo Marwa at nyankomo@usb.ac.za.

Fees: No registration fees but participants are responsible for their own accommodation and travel costs. The course is mainly sponsored by an international training grant from the Crawford Foundation and by the University of Stellenbosch Business School.

Venue: Computer Lab, University of Stellenbosch Business School, Bellville, Cape Town, South Africa

Language of tuition: English

On-campus accommodation: Bellvista Lodge on the USB campus offers comfortable accommodation.

See www.usb.ac.za/bellvista, call +27 (0)21 918 4444 or send e-mail to bvista@belpark.sun.ac.za.

More about USB

The University of Stellenbosch Business School, located in northern Cape Town, South Africa, offers a range of postgraduate business management programmes which include an MBA and programmes in Development Finance and Futures Studies.

USB was the first school from an African university to receive all three international accreditations – AACSB, EQUIS and AMBA. USB also has the highest level of EQUIS accreditation in Africa. The school strives to develop responsible leaders through well-grounded business education and research.

CONTACT US

Details about the course content: Contact the course coordinator, **Dr Nyankomo Marwa**, at [✉ nyankomo@usb.ac.za](mailto:nyankomo@usb.ac.za).

Details about study materials, logistics, etc.: Contact Norma Saayman at [✉ Norma.Saayman@usb.ac.za](mailto:Norma.Saayman@usb.ac.za) or on

[📞 + 27 \(0\)21 918 4238](tel:+27219184238).



Efficiency and Productivity Analysis of Agro-Enterprises in Developing

Overview

This is a five-day intensive course on production economics theory and analytical methods for benchmarking the performance of firms in developing countries. Participants will learn about the theoretical foundations of efficiency and productivity analysis. They will also learn how mathematical programming technique - Data Envelopment Analysis (DEA) with a focus on slack based model - and statistical method - Stochastic Frontier Analysis (SFA) - can be used to estimate and draw inferences concerning the different measures of efficiency and productivity. Participants will obtain hands-on experience implementing these methods using the free R statistical language software available at: www.r-project.org.

Expected outcomes

At the end of this workshop participants will be able to conduct empirical studies that benchmarking the performance of firms in the same industry using efficiency and productivity analysis. They will also be able to train others on doing the same. The overall aim is increased empirical studies on firm performances that can help policy makers design appropriate policies to increase productivity in African economies.

Course content

Day 1: Introduction to Efficiency and Productivity Analysis

1. Introduction to efficiency and productivity analysis: Need for efficiency and productivity analysis; definitions of efficiency and productivity; measures of productivity; different measures of efficiency - technical, scale, allocative efficiency, cost, profit and revenue efficiency.
2. Review of production economics theory: Production function, cost function, profit functions and their properties; and returns to scale and elasticities.
3. Hands-on activity: Introduction to R (production theory illustrated using R)

Day 2: Data Envelopment Analysis

1. DEA programming for technical efficiency, cost efficiency, and profit efficiency under variable, constant and non-increasing returns to scale.
2. Review of empirical work on DEA
3. Slack Based and Bootstrapping in DEA
4. Hands-on activity: DEA estimation in Microsoft Excel and using R

Day 3: Stochastic Frontier Analysis

1. Deterministic frontier analysis
2. Stochastic frontier analysis
3. Regularity conditions in SFA models
4. Hands-on activity: estimating deterministic frontier models using R

Day 4: Stochastic Frontier Analysis


1. Review of empirical work on SFA
2. Issues in estimating efficiency and productivity using SFA
3. Hands-on activity: Estimating stochastic frontier models using R (Error component model and efficiency model) for Cobb-Douglas and Translog production functions; imposing regularity conditions.

Day 5: Productivity Analysis and Decomposition

1. Productivity analysis using DEA – the Malmquist Productivity Index and its decomposition
2. Productivity analysis using SFA
3. Productivity analysis using Index Number methods
4. Hands-on activity: estimation of MPI using R; estimation using DPIN

About the presenter

Prof Amin W. Mugera is an Assistant Professor at the School of Agricultural and Resource Economics at the University of Western Australia. He holds a PhD in Economics from Kansas State University and double MS in Agricultural Economics and Agribusiness from Michigan State University. His main area of expertise is in applied econometrics with special interest in efficiency and productivity analysis. Dr Mugera has co-authored over 20 peer-reviewed scientific articles in leading applied economics journals. His publications in efficiency and productivity analysis include the following:



Mugera, A., Langemeier, M. & Ojede, A. 2016 (forthcoming). Do Productivity and Relative Price Changes Contribute to Profitability Change? Evidence from a Sample of Kansas Farms. *American Journal of Agricultural Economics*.

Mugera, A. & Nyambane, G.G. 2014. Impact of Debt Structure on Production Efficiency of Broadacre Farms in Western Australia. *Australian Journal of Agricultural and Resource Economics*, 59: 208-224.

Mugera, A. 2013. Measuring Technical Efficiency of Dairy Farms with Imprecise Data: A Fuzzy Data Envelopment Analysis Approach. *Australian Journal of Agricultural and Resource Economics*, 57(2013):501-519.

Mugera, A. & Ojede, A. 2013. Technical Efficiency in African Agriculture: Is it Catching-up or Lagging behind. *Journal of International Development*, 26: 979-795.

Ojede, A.A. Mugera, A. & Seo, D. 2013. Macroeconomic Policy Reforms and Productivity Growth in African Agriculture. *Contemporary Economic Policy*, 31: 814-830.

Mugera, A., Langemeier, M.R. & Featherstone, A.M. 2012. Labour Productivity Convergence in the Kansas Farm Sector: A Three-stage Procedure using Data Envelopment Analysis and Semiparametric Regression Analysis. *Journal of Productivity Analysis*, 38: 67-79.