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Call for Application for Skills Development Training in Econometrics

The ERSA is pleased to invite applications for the Skill Development Training Programme in basic Econometrics for academics and postgraduate students (masters and PhD) with limited training in Econometrics and quantitative methods. The skills development initiative is in line with ERSA's objective to deepen economic research capacity and to train young economists in Southern Africa.

Motivation

A significant number of academics affiliated with South African universities and currently employed as lecturers within Economics departments around the country are inadequately skilled in conducting applied empirical research, where the lack of skills specifically relates to a limited background in econometrics. This may be attributed to the fact that historically, training in economics in South Africa had placed less emphasis on econometrics.

Consequently, these academics are not able to take advantage of the advanced training programmes in economic modelling techniques offered by ERSA on an on-going basis. This project aims to bridge this gap by providing basic econometrics training on a level that would be accessible to a person with a limited background in econometrics. Over time, this may then contribute to the ability of these academics to publish in journals with an interest in applied economic modelling, supervise postgraduate students with an interest in applied econometric research and as such an increase in research capacity in South Africa.

Format of the Programme

The training would be presented in a computer lab at the Department of Economics at the University of Pretoria, with the aim of participants not only acquiring the necessary theoretical background, but also being exposed to hands-on empirical application, using software like EViews and STATA.

The programme will run, in the first instance for three years, with between 10 and 15 participants in a cohort. The three years of training would have a time-series focus in the first year, focus on cross-section techniques in the second year, and finally have a panel data focus in the third year.

Each component of the programme, i.e. time-series, cross-section and panel data will be covered in one week of intensive training. A typical day will start at 8:30 and end at 16:30 with a lunch break of one hour and a mid-morning and mid-afternoon break of 20 to 30 minutes.

Sponsorship:

ERSA will sponsor between 10 to 15 delegates to attend. The sponsorship will cater for course fees, and where needed accommodation and flights.

Who should attend?

Priority will be given to academics in South African universities with limited background in econometrics, mathematics and statistics. In exceptional cases few applications from postgraduate students (masters and PhD) registered in South African universities will be considered. Preference will be given to applications from an institution that intends to send 2 to 3 delegates in a cohort.

Application requirements:

- All applications from an institution preferably should be forwarded by the Head of Department or School with a letter of support for the applicants along with the following documents:
    - A letter of application by each applicant with a clear motivation of how the training will benefit the candidate as well as how he/she intends to apply the knowledge that will be acquired during the programme;
    - The CV of each applicant.
- Within a year after completing the training, each participant will be expected to present a paper where he/she has applied some of the techniques learned in the course at an ERSA Research Workshops and subsequently to be submitted for publication in the ERSA working paper series.
- The closing date for receiving applications is on 22 April 2017. Please send applications with supporting documentation to skillsdevelopment@econrsa.org. All successful applicants will notified by end of May 2017.
- Please send applications and supporting documentation to skillsdevelopment@econrsa.org

Dates and Venue:

The dates and venue for the first training workshop will be:

Date: 3-7 July 2017
Venue: Department of Economics, University of Pretoria

Dates for the second and third workshops on ***Cross-sectional Techniques*** and ***Panel Data Analysis*** respectively will be communicated later.

Programme Contents

The field of econometrics has developed rapidly over the past three decades, and the use of up-to-date econometric techniques has become more and more standard practice in empirical work in many fields of economics. Collectively the three workshops will attempt to lay the foundation to use a subset of these techniques and support the understanding of more advanced material.

As suggested above, three separate training workshops will be offered in time-series, cross-section and panel data econometrics respectively. The topics that will be covered are listed below.

First Workshop: Time-series Techniques

Assumed prior knowledge:

The following rough outline assumes that participants are comfortable with basic statistical methods, such as the calculation of means and standard deviations, as well as hypothesis testing, primarily t, z, and F distribution based tests. A modest understanding of matrix algebra (meaning that the participant can interpret the solution to the OLS problem) is advised. EViews software will be used in practical demonstration, but no prior knowledge of EViews is required.

Topics:

1. Research Orientation and the Econometric Approach to Analysis (1 day)
    a. Research Orientation
    b. The Nature of the Econometric Approach
    c. Purposes of Econometrics
    d. Example in EViews: Model Specification, Estimation, Evaluation and Interpretation
    e. Introduction to the Simple Linear Regression Model
    f. OLS Estimator, Properties
    g. The Classical Normal Linear Regression model (CNLRM)
    h. Goodness of Fit
    i. Hypothesis Testing
    j. Practical Exercise in E-Views

2. Time Series Econometrics (Part 1) (1½ days)
    a. Underlying Data Generating Process and Concepts of Stationarity & Non-stationarity
    b. Unit Root Tests (ADF, PP, DG-GLS, Ng-Peron, KPSS)
    c. Concept of Cointegration
    d. Residual Based Test for Cointegration (Engle-Granger Cointegration Test)
    e. Error Correction Model (ECM) specification
    f. Diagnostic Checking
    g. Model Simulation and Model Response Characteristics
    h. Practical Examples and Hands-on Exercises in EViews

3. Time Series Econometrics (Part 2) (1½ days)
    a. Vector Autoregressive (VAR) Model
    b. Impulse Response and Variance Decomposition Analysis
    c. Multivariate Cointegration Technique (Johansen Maximum Likelihood Method)
    d. Block Causality and Exogeneity Test
    e. Weak Exogeneity Tests and Model Identification
    f. Practical Example and Hands-on Exercise in EViews

4. Volatility Models (½ day – Introduction and demonstration only)
    a. Properties and Theoretical and Empirical Issues
    b. ARCH Processes
    c. ARCH and GARCH Modes
    d. Estimation and Prediction
    e. Interpretation and Evaluation of Results

5. Principal Component Analysis (½ day – Introduction and demonstration only)
    a. Relevant Research Questions (with examples)
    b. Data Requirements
    c. Application in EViews

Second Workshop: Cross-sectional Techniques

Assumed prior knowledge:

The following rough outline assumes all students are comfortable with basic statistical methods, such as the calculation of means and standard deviations, as well as hypothesis testing, primarily *t*, *z*, and *F* distribution based tests. It also assumes a modest understanding of matrix algebra, meaning that the participant can interpret the solution to the OLS problem. Finally, it assumes a modicum of understanding STATA, or at least the structure of programming.

Topics:

1. Principles and methodology of econometric analysis
    a. Fundamental concepts of applying regression analysis
    b. Choosing an appropriate model
    c. The Classical Normal Linear Regression model (CNLRM)
    d. OLS Estimator, properties
    e. Goodness of fit
    f. Hypothesis testing

2. The Linear Model
    a. Various Linear Functional Forms and Marginal Effects
    b. Dummy Variables and Interpretation
    c. OLS Parameter Estimates
    d. OLS Standard Errors, Heteroskedasticity and Clustering
    e. Linear Restrictions and Hypothesis Testing
    f. Estimation Examples

3. Qualitative Dependent Variable Models (1 day)
    a. Maximum Likelihood
    b. Various Functional Forms and Marginal Effects
    (Probit and Logit; Multinomial Logit; IIA and Nested Multinomial Logit; Tobit)
    c. MLE Parameter Estimates
    d. MLE Standard Errors, Heteroskedasticity and Clustering
    e. Linear and Non-linear Restrictions and Hypothesis Testing
    f. Estimation Examples

4. Randomized Controlled Trials and Matching
    a. Structure of Treatment Effects
    b. RCT Estimators and Standard Errors
    c. Matching Estimators and Standard Errors
    d. Estimation Examples

5. Instrumental Variables I
    a. Two-stage Least Squares
    b. Endogenous Dummy Variables
    c. Bivariate Probit
    d. Marginal Effects
    e. Estimation Examples

6. Instrumental Variables II
    a. LATE Interpretation
    b. Regression Discontinuity
    c. Marginal Effects
    d. Estimation Examples

Third Workshop: Panel Data Analysis

Assumed prior knowledge:

The following rough outline assumes all students are comfortable with basic statistical methods, such as the calculation of means and standard deviations, as well as hypothesis testing, primarily *t*, *z*, and *F* and distribution based tests. It also assumes a modest understanding of matrix algebra. Finally, it assumes a

modicum of understanding of the structure of programming. A combination of EViews and STATA software will be used in the demonstration of techniques.

Topics:

1. Introduction to Panel Data Modelling (Topics 1,2,3 = 2½ days)
    a. Benefits and Limitations
    b. Efficiency of Parameter Estimates
    c. Identification of Parameters

2. The Static Linear Model
    a. The Fixed Effect Model
    b. The First-difference (Within) Estimator
    c. The Random Effects Model
    d. Fixed Effects of Random Effects?
    e. One-way vs. Two-way Error Component Models
    f. Seemingly Unrelated Regression with Error Components
    g. Example and Practical Exercise in EViews

3. Hypothesis Testing with Panel Data
    a. Tests for Poolability
    b. Tests for Individual and Time Effects
    c. Hausman's Specification Test
    d. Serial Correlation Tests
    e. Heteroskedasticity Tests
    f. Example and Practical Exercise in EViews

4. Dynamic Linear Models (1 day)
    a. An Autoregressive Panel Data Model
    b. The Anderson-Hsiao (IV) Estimator
    c. The Arelano Bond (DIF-GMM) Estimator
    d. The Blundell and Bond (SYS-GMM) Estimator
    e. Too Many Instruments
    f. Example and Practical Exercise in EViews

5. Panel Time Series (Non-stationary Panels) (1 day)
    a. Heterogeneity
    b. Panel Unit Root Tests Assuming Cross-sectional Independence
    c. Panel Unit Root Tests Assuming Cross-sectional Dependence
    d. Spurious Regression in Panel Data
    e. Panel Cointegration Tests
    f. Example and Practical Exercise in EViews

6. Incomplete Panels and Selection Bias (½ day)
    a. Estimation with Randomly Missing Data
    b. Selection Bias and Some Simple Tests
    c. Estimation with Non-randomly Missing Data