



ADVANCED FORECASTING METHODS (SM 3)

Forecasting or the task of predicting future values is an invaluable step for decision-making and target-setting. Taking off from where Time Series Analysis and Basic Forecasting left off, this course focuses on Autoregressive Integrated Moving Average (ARIMA) models. Like the exponential smoothing models in the earlier course, ARIMA models give more weight on recent observations, thus it is especially suited for short-term forecasting. These advanced statistical models will be done using the open-source statistical package GRETL, particularly in performing the stationary tests, generating correlograms, and in estimating the ARIMA model.

Purpose

To provide participants with a deeper understanding of the principles and steps of time series analysis and forecasting methods, through the Box-Jenkins (ARIMA) approach in modeling and forecasting.

Benefits to Participants

Hands-on application of the advanced techniques in making statistical forecast using GRETL. The knowledge and skills learned in this training empower the participant to make sound statistical forecasts based on time-series data using the Box-Jenkins (ARIMA) approach

Target Participants

Personnel involved in the analysis of time series data. Understanding of basic time series analysis and forecasting, as well as of basic statistical analysis is required prior to undertaking this course, along with basic computer skills. It is recommended to undertake the following PSRTI courses: Microsoft Excel for Data Management (SW 1), Basic Statistics 1: Descriptive Statistics (BS 1), Basic Statistics 2: Estimation and Hypothesis Testing (BS 2), Regression Analysis (SM 1), and Time Series Analysis and Basic Forecasting (SM 2) as prerequisites.

Course Coverage

- I. Review and Some Preliminaries
 1. Review on Forecasting Concepts
 2. Growth and Trend Models
 3. Exponential Smoothing
 4. Forecast Accuracy Measures
 5. The Box-Jenkins Approach in Modeling

- II. Estimating an ARIMA Model in GRETL
 1. Review: GRETL Basics
 2. Stationarity Tests
 3. Correlograms
 4. Estimating an ARIMA Model
 5. Model Diagnostics
 6. Forecasting in GRETL

III. ARIMA Modeling

1. Stationarity
2. Autocorrelation and Correlograms
3. The Autoregressive Process
4. The Moving Average Process
5. Non-stationary and Integrated Processes
6. Estimating the ARIMA Model

IV. Post Estimation Methods

1. Model Adequacy Checks
2. Diagnostic Tests
3. Forecasting
4. Assessing Forecast Accuracy

Duration: 5 Days – 8:30am to 4:00pm