TIME SERIES ANALYSIS AND BASIC FORECASTING
(SM 2)

Based on time-period of collection, statistical data may be classified into two types: cross-sectional and time series data. The former is gathered in a single period, while the latter is collected over regular intervals or equally spaced time-periods. This course will focus on analysis of such time-bounded data through statistical modelling, as well as a secondary goal of time series analysis, which is forecasting or the prediction of data points beyond the time horizon of the dataset. The course will tackle basic forecasting techniques, with focus on exponential smoothing.

Purpose

To provide participants with an understanding of the principles and steps in making statistical forecasts from time-series data.

Benefits to Participants

Hands-on application of the basic techniques in making a statistical forecast using GRETL, an open-source statistical package popularly used in econometrics. The knowledge and skills learned in this training empower the participant to make sound statistical models and forecasts based on time-series data.

Target Participants

Personnel involved in the analysis of time series data. Knowledge on computing and basic statistical concepts related to foundational concepts in model building, i.e., regression analysis, is required prior to undertaking the course. The equivalent recommended PSRTI courses are Microsoft Excel for Data Management (SW 1), Basic Statistics 1: Descriptive Statistics (BS 1), Basic Statistics 2: Estimation and Hypothesis Testing (BS 2), and Regression Analysis (SM 1).

Course Coverage

I. Some Preliminaries
   1. Basic Concepts in Forecasting
   2. The Time Series Data
   3. Addressing Data Gaps

II. Introduction to GRETL
   1. The GRETL Interface
   2. Basic Data Management in GRETL
   3. Graphing in GRETL
   4. Time Series Decomposition
   5. Exponential Smoothing

III. Descriptive Analysis of Time Series Data
   1. Line Graphs
   2. Time Series Decomposition

IV. Basic Forecasting Techniques
   1. Naïve Methods
   2. Simple Moving Averages
   3. Forecasting Using Growth Rates
   4. Trend Models
   5. Assessing Forecast Accuracy

V. Forecasting Using Exponential Smoothing
    1. What is Exponential Smoothing?
    2. Single Exponential Smoothing
    3. Double Exponential Smoothing
    4. Holt-Winters 2-Parameter Exponential Smoothing
    5. Holt-Winters 3-Parameter Exponential Smoothing with Additive Seasonality
    6. Holt-Winters 3-Parameter Exponential Smoothing with Multiplicative Seasonality

Duration: 5 Days – 8:30am to 4:00pm