Forecasting & Smoothing

The Forecasting and Smoothing VISA procedures allow the user to perform analysis of problems involving the forecasting and smoothing of historical time series data. Data is entered for up to 60 historical observations in worksheet ED. Once the data is entered, the user is able to view the historical graph with the associated forecasting and smoothing technique. The associated MAD and MSE are automatically calculated and displayed in each.

The worksheets for these procedures are:

- **N** – Displays the Naïve forecast and historical data on the same graph.
- **MA** – displays the Moving Average smoothed forecast for a user selected number of periods (between 2 and 5) and historical data on the same graph.
- **WMA** – displays the Weighted Moving Average smoothed forecast for a user selected number of periods and with associated weights for each period. The Weighted Moving Average smoothed forecast and historical data are displayed on the same graph.
- **ES** – displays the Exponential Smoothing smoothed forecast and historical data on the same graph for a user selected Smoothing Factor.
- **LT** – displays the Linear Trend forecast and historical data on the same graph. The user can select a number of periods for a future forecast.
- **SALT** – displays the Adjusted Seasonal Relative and shows a graph of the historical seasonal data with the seasonal forecast for up to 12 future periods.
- **CC** – displays the Forecast Control Chart for the Naïve, Moving Average, Weighted Moving Average, Exponentially Smoothed and Linear Trend forecasts.

**Example:** Consider 60 periods of housing starts by month.
ED worksheet
Displays the time series data as entered.
A beginning period can be selected (e.g. 1948)

N worksheet
Displays the Naïve forecast (red) with the MAD and MSE
MA worksheet
Displays the Moving Average forecast (red) with the MAD and MSE
Between 2 and 5 moving average periods can be selected.

WMA worksheet
Displays the Weighted Moving Average forecast (red) with the MAD and MSE
Between 2 and 5 weighted moving average periods can be selected.
Weighting factors are required for the number of periods selected.
**ES worksheet**

Displays the Exponential Smoothing forecast (red) with the MAD and MSE

**LT worksheet**

Displays the Linear Trend forecast (red) with the MAD and MSE

Up to 12 future periods can be forecasted.
SALT worksheet

Entering a seasonality label (in this example months) automatically create the Adjusted Seasonal Relative with a graph of the seasonal pattern by label.

SALT worksheet (continued)

Creates the seasonal forecast based upon the Adjusted Seasonal Relative for 12 periods in the future.
Based on the selection from an “option box” the user can view the 3 sigma forecast control chart the previously discussed examples (exception SALT).

If the values are within the control limits, the “In Limits” is signified by “YES”. If not it is signified by “NO”. Two “Runs Tests”: Above-Below (AB) and Up-Down (UD) are automatically calculated. This example shows that the MA forecast has more “Above” errors than “Below” errors creating an undesirable forecast situation.