Interpreting Measures of Error

Scale Dependent Errors

Scale dependent errors, such as mean error (ME) mean percentage error (MPE), n
(MAE) and root mean squared error (RMSE), are based on a set scale, which for us
and cannot be used to make comparisons that are on a different scale. For examp
these error values from a time series model of the sheep population in Scotland a
production forecast in the United States.

- **Mean Error (ME)** shows the average of the difference between actual and fo
- **Mean Percentage Error (MPE)** shows the average of the percent difference
  forecasted values. Both the ME and MPE will help indicate whether the forec
  disproportionately positive or negative.
- **Root Mean Squared Error (RMSE)** represents the sample standard deviatio
  between predicted values and observed values. These individual differences
  when the calculations are performed over the data sample that was used fo
  called prediction errors when computed out-of-sample. This is a great meas
  comparing models as it shows how many deviations from the mean the fore
- **Mean Absolute Error (MAE)** takes the sum of the absolute difference from a
  averages them. It is less sensitive to the occasional very large error because
  errors in the calculation.

Percentage Errors

Percentage errors, like MAPE, are useful because they are scale independent, so t
compare forecasts between different data series, unlike scale dependent errors. T
that it cannot be used if the series has zero values.

- **Mean Absolute Percentage Error (MAPE)** is also often useful for purposes c
  is expressed in generic percentage terms it will make sense even to someon
  what constitutes a "big" error in terms of dollars spent or widgets sold.

Scale-Free Errors

Scale-free errors were introduced more recently to offer a scale-independent mea
have many of the problems of other errors like percentage errors.

- **Mean Absolute Scaled Error (MASE)** is another relative measure of error th
  to time series data. It is defined as the mean absolute error of the model div
  absolute value of the first difference of the series. Thus, it measures the rela
  compared to a naive model. Ideally its value will be significantly less than 1 b
  comparison across other models for the same series. Since this error measu
  can be applied across models, it is accepted as one of the best metrics for er

To read a bit more of the subject, see this 4-page paper by Rob Hyndman, Statisti
Monash University in Australia.

In Alteryx you can find these measures in the ARIMA or ETS tools labelled as In-sa
Example below: