Appendix (3)

Econometric modeling entails the utilization of statistical inference testing. Some of the more popular statistical tests include:

Coefficient of Determination (R^2): A statistical measure of how good the estimated regression equation is; designated as R^2 (read as R-Squared). Simply put, it is a measure of "goodness of fit" in the regression. Therefore, the higher the R-Square, the more confidence we can have in our equation.

$$R2 \ = \ 1 \ - \ \frac{\Re(Y - Y')^2}{\Re(Y - Y_{avg})^2}$$

where Y = the observed value of the dependent variable
$\quad\quad Y'$ = the estimated value based on the equation.

T-Statistic: A measure of the statistical significance of an independent variable in explaining the dependent variable Y. It is determined by dividing the estimated regression coefficient (b) by its standard error.

F-Statistic: (F-Test): In statistics the ratio of two mean squares (variances) often can be used to test the significance of some item of interest. For example, in regression, the ratio of (mean square due to the regression) to (mean square due to error) can be used to test the overall significance of the regression model. By looking up F-Tables, the degree of significance of the computed F-value can be determined. Simply stated, the F-Statistic measures the variance explained by the model to the variance of that not explained by the model or the residual.

Regression Coefficients or Beta Values: When a dependent measure Y is regressed against a set of independent measures X_1 through X_k the analyst wishes to estimate the values of the unknown coefficients by least squares procedures. For example, in a linear regression equation $Y = a + bX$, (a) and (b) are regression coefficients. Specifically (a) is called the y-intercept or constant, while (b) is called a slope. The properties of these regression coefficients can be used to understand the importance of each independent variable (as it relates to Y) and the interrelatedness among the independent variables (as they relate to Y).

Durbin Watson Statistic: A summary measure of the amount of autocorrelation in the error terms of the regression. By comparing the computed value of the Durbin Watson test with the appropriate values from the table of values of the DW Statistic, the significance can be determined. This statistic helps determine whether the residual terms are independent of each other.

Definitions taken from "Strategic Business Forecasting," Shim, Siegel & Liew