Regression User's Guide (1 of 2)

What Can Go Wrong?	What Are the Consequences?	How Can It Be Detected?	How Can It Be Corrected?
Omitted Variable			
The omission of a relevant independent variable	Bias in the coefficient estimates (the $\hat{\beta}$s) of the included Xs.	Theory, significant unexpected signs, or surprisingly poor fits.	Include the omitted variable or a proxy.
Irrelevant Variable			
The inclusion of a variable that does not belong in the equation	Decreased precision in the form of higher standard errors, lower *t*-scores and wider confidence intervals.	1. Theory 2. *t*-test on $\hat{\beta}$ 3. $\overline{R}^2$ 4. Impact on other coefficients if X is dropped.	Delete the variable if its inclusion is not required by the underlying theory.
Incorrect Functional Form			
The functional form is inappropriate	Biased estimates, poor fit, and difficult interpretation.	Examine the theory carefully; think about the relationship between X and Y.	Transform the variable or the equation to a different functional form.

Regression User's Guide (2 of 2)

What Can Go Wrong?	What Are the Consequences?	How Can It Be Detected?	How Can It Be Corrected?
Multicollinearity Some of the independent variables are (imperfectly) correlated	No biased $\hat{\beta}$s, but estimates of the separate effects of the Xs are not reliable, i.e., high SE($\hat{\beta}$)s and low *t*-scores.	Pairwise correlations or scatterplots	Drop redundant variables, but to drop others might introduce bias. Often doing nothing is best.
Serial Correlation Observations of the error term are correlated, as in: $\epsilon_t = \rho\epsilon_{t-1} + u_t$	No biased $\hat{\beta}$s, but OLS no longer is minimum variance, and hypothesis testing and confidence intervals are unreliable.	Use residual plots	If impure, fix the specification.
Heteroskedasticity The variance of the error term is not constant for all observations, as in: VAR(ϵ_i) = $\sigma^2 Z_i$	Same as for serial correlation.	Use residual plots	If impure, fix the specification. Otherwise, use robust std. errors or reformulate the variables.