Comparison of Estimators in Regression Models with AR(1) and AR(2) Disturbances: When is OLS Efficient?

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Abstract:

It is well known that the ordinary least squares (OLS) estimates in the regression model are efficient when the disturbances have mean zero, constant variance and are uncorrelated. In problems concerning time series, it is often the case that the disturbances are, in fact, correlated. It is known that OLS may not be optimal in this context. We consider the robustness of various estimators, including estimated generalized least squares. We found that if the disturbance structure is autoregressive and the dependent variable is nonstochastic and linear or quadratic, the OLS performs nearly as well as its competitors. For other forms of the dependent variable, we have developed rules of thumb to guide practitioners in their choice of estimators.

Keywords: Autoregressive; Disturbances; Ordinary Least Squares; Generalized Least Squares; Relative Efficiency.