

Endogeneity in Nonlinear Regressions with Integrated Time Series

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Abstract

This paper considers the nonlinear regression with integrated regressors that are contemporaneously correlated with the regression error. We, in particular, establish the consistency and derive the limiting distribution of the nonlinear least squares estimator under such endogeneity for the regressions with the integrable or asymptotically homogeneous regression function. For the regressions with both the integrable and asymptotically homogeneous regression functions, it is shown that the estimator is consistent and has the same rate of convergence as for the case of the regressions with no endogeneity. Whether or not the limiting distribution is affected by the presence of endogeneity, however, depends upon the type of the regression function. If the regression function is asymptotically homogeneous, the limiting distribution of the least squares estimator has an additional term reflecting the presence of endogeneity. On the other hand, the endogeneity does not have any effect on the least squares limit theory, if the regression function is integrable. Regardless of the presence of endogeneity, the least squares estimator has the same limiting distribution in this case. As an illustration of our theory, we consider the logistic regression with an integrated time series that has contemporaneous correlation with the regression error.

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