

We provide a novel analytic procedure to construct best linear and quadratic moments of generalized method of moments (GMM) estimation for a large class of network and spatial econometric models, which generate a GMM estimator that is asymptotically more efficient than the quasi maximum likelihood estimator when the disturbances are non-normal. We apply this procedure to a high order spatial autoregressive (SAR) model with spatial errors, where the disturbances are heteroskedastic with unknown distribution. Normality tests are proposed for this model. Best moments are also derived for a general high order simultaneous equations SAR model with possible high order multivariate SAR and moving average disturbances, which may have heteroskedastic variances and nests many models in the literature. We apply the high order SAR model and our GMM estimator to local employment data in US counties, which demonstrates spatial interdependence patterns and channels of regional economic growth.