

Instrumental Variable Quantile Regressions in Large Panels with Fixed Effects

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Abstract

This paper studies panel quantile regression models with endogeneity and additive fixed effects. We focus on static panel model where regressors and instruments are not predetermined. The fixed effect approach causes an incidental parameter bias in the estimates of the parameters of interest, and we characterize this bias under an asymptotic where both panel dimensions become large. We encounter a bias-variance tradeoff when attempting to correct this bias, and we provide bias corrected estimators that balance this tradeoff. The methods used to derive those results are novel, since the existing techniques in the large T panel literature are not applicable here due to the non-smoothness of the sample moment conditions of the quantile model. Once the panel incidental parameter problem is controlled for, then inference on the quantile model with endogeneity is similar to the cross-sectional case, discussed e.g. in Chernozhukov and Hansen (2006). As an empirical application we study the effect of age on the test scores of school children, where the outcomes of multiple students in each school are observed, and we control for school specific fixed effects. When controlling for school fixed effects and correcting for the resulting incidental parameter bias one finds that the age effect is decreasing in the quantiles of the test score.