

**Dynamics and Measurement Error in Panel Data –  
Signal-Noise Pattern, Heterogeneity and GMM:  
FDI Impact on GDP Revisited**

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**Abstract:** Several aspects of GMM estimation of autoregressive panel data equations in error-ridden variables are reconsidered. Signal and noise elements are allowed to have memory and variation in these parameters along with variation in signal and noise variances are discussed with respect to finite sample estimator bias. Also the impact of the degree of individual heterogeneity, the strength of autocorrelation, and the size of the instrument set are discussed. Finite sample bias is explored by Monte Carlo simulations. GMM procedures using admissible IVs in differences on equations in levels, in general perform better in small samples than procedures using admissible IVs in levels on equations in differences. A case-study of the impact of Foreign Direct Investment (FDI) on GDP growth, based on country panel data is given.

**Keywords:** Panel data, Measurement error, GMM, Error memory, Monte Carlo, Foreign direct investment, Economic development, Country panel

**JEL classification:** C21, C23, C31, C33, O11, O14