Identification and estimation of dynamic random coefficient models[*]

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Abstract

This paper studies dynamic panel data linear models that allow for multiplicative and additive heterogeneity in a short panel setting, by allowing both the coefficients and the intercept to be individual-specific. I show that the model is not point-identified and yet partially identified, and I characterize the sharp identified sets of the mean, variance and distribution itself of the partial effect distribution. The characterization applies to both discrete and continuous data. A computationally feasible estimation and inference procedure is proposed, which is based on a fast and exact global polynomial optimization algorithm. The method is applied to study life-cycle earnings and consumption dynamics of U.S. households in the Panel Study of Income Dynamics (PSID) dataset. The estimation results suggest that there is large heterogeneity in earnings persistence and the earnings elasticity of consumption and that there is a strong correlation between the two. Calibration of a life-cycle model suggests that heterogeneity in asset-related factors such as interest rate or discount rate is required to accurately describe real-world consumption and savings behavior.