Identification and estimation of average effects in dynamic random coefficient models*

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Abstract

This paper studies dynamic linear fixed effect models that allow for unobserved hetero-geneity in individual responses and dynamics in a short panel setting. The model allows 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 mean, variance and the 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 earnings elasticity of consumption and that there is a strong correlation between the two. Calibration of a life-cycle model suggests that heterogeneity in the asset-related factors such as heterogeneity in interest rates or discount rates is required to accurately describe real-world consumption and savings behavior.

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