Minimum Sliced Distance Estimation in Structural Models*

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Abstract

This paper develops a simple and robust method for the estimation and inference in structural econometric models based on sliced distances. Three motivating models considered are asset pricing/state space models, aggregate demand models, and models with parameter-dependent supports. In contrast to MLE and likelihood-based inference, we show that under mild regularity conditions, our estimator is asymptotically normally distributed leading to simple inference regardless of the possible presence of "stochastic singularity" such as in the asset pricing/state space models and parameter-dependent supports such as in the one-sided and two-sided models. Furthermore our estimator is applicable to generative models with intractable likelihood functions but from which one can easily draw synthetic samples. We provide an extensive simulation study to show the efficacy of the proposed methodology and a real data application.

Keywords: Adversarial Estimation; Generative Model; Parameter-Dependent Support; Sliced Cramer Distance; Sliced Wasserstein Distance; Stochastic Singularity.

JEL Codes: C1; C31; C32