

Dynamic Structural Econometrics Summer School, August 5, 2024
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Simulation Based Estimation Methods in Macroeconomics: Method of Simulated Moments

Lecture Overview: This lecture by Dean Corbae and the next by Fatih Guvenen are intended to provide estimation methods used by macroeconomists to take their parameterized dynamic structural models to the data. The first lecture will focus on the Method of Simulated Moments (MSM) which has its statistical foundation in generalized method of moments. Method of Simulated Moments estimates parameters of model simulated data to match analogous moments constructed from observed data. Examples include estimating preference parameters in heterogeneous agent models to match moments of the wealth distribution or technology parameters in firm dynamics models to match entry and exit statistics in the data. The second lecture by Fatih Guvenen will focus on Indirect Inference (II). Unlike MSM, II uses an approximate (or auxiliary) model to form a criterion function which is not required to be an accurate description of the data generation process. These methods are particularly useful for discrete choice problems where the auxiliary model is something like a logit regression.

There will be one problem set in Julia focused on MSM. An office hour to answer questions about the problem set is scheduled for Tuesday, August 6 from 12:30-1:30 with UW PhD student Stefano Lord-Maximilian in room 121 (small auditorium) of the Pyle Center.

Readings:

Andrews, I., M. Gentzkow, and JM Shapiro. 2017 “Measuring the Sensitivity of Parameter Estimates to Estimation Moments”, *Quarterly Journal of Economics*, 132 (4), p.1553-92.

Corbae, D. and F. Guvenen. 2024 “Chapter 22: Method of Moments Estimators” in Quantitative Economics with Heterogeneity: A Guidebook, forthcoming Princeton University Press.

Hansen, L. 1982. “Large Sample Properties of Generalized Method of Moments Estimators”, *Econometrica*, 50, p. 1029-54.

Lee, B.S. and B. Ingram. 1991 “Simulation estimation of time series models”, *Journal of Econometrics*, 47, p. 197-205.

Michaelides, A. and S. Ng. 2000. “Estimating the rational expectations model of speculative storage: A Monte Carlo comparison of three simulation estimators”, *Journal of Econometrics*, 96, p. 231-66.