Solution Methods for Microeconomic Dynamic Stochastic Optimization Problems

2024-05-20

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Note: The GitHub repo `SolvingMicroDSOPs` associated with this document contains python code that produces all results, from scratch, except for the last section on indirect inference. The numerical results have been confirmed by showing that the answers that the raw python produces correspond to the answers produced by tools available in the Econ-ARK toolkit, more specifically those in the `HARK` which has full documentation. The MSM results at the end have have been superseded by tools in the `EstimatingMicroDSOPs repo`.

Abstract

These notes describe tools for solving microeconomic dynamic stochastic optimization problems, and show how to use those tools for efficiently estimating a standard life cycle consumption/saving model using microeconomic data. No attempt is made at a systematic overview of the many possible technical choices; instead, I present a specific set of methods that have proven useful in my own work (and explain why other popular methods, such as value function iteration, are a bad idea). Paired with these notes is Python code that solves the problems described in the text.

Keywords	Dynamic Stochastic Optimization, Method of Simulated Moments, Structural Estimation, Indirect Inference
JEL codes	E21, F41

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PDF:	https://github.com/llorracc/SolvingMicroDSOPs/blob/master/SolvingMicroDSOPs.pdf
Slides:	https://github.com/llorracc/SolvingMicroDSOPs/blob/master/SolvingMicroDSOPs-Slides.pdf
Web:	https://llorracc.github.io/SolvingMicroDSOPs
Code:	https://github.com/llorracc/SolvingMicroDSOPs/tree/master/Code
Archive:	https://github.com/llorracc/SolvingMicroDSOPs

(Contains LaTeX code for this document and software producing figures and results)

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