CENTRE FOR ANALYTICAL FINANCE

ISB

Adaptive Learning in Discrete Choice Dynamic Programming

Sudip Gupta, Indian School of Business

Research Paper No: 10-06

Research Paper Series

Centre for Analytical Finance

Indian School of Business

Adaptive Learning in Discrete Choice Dynamic Programming

Sudip Gupta
Indian School of Business

December 9, 2006

Abstract

A new estimator of discrete choice dynamic problems is suggested where the fixed point is stochastically approximated. The estimation is free from the "curse of dimensionality" and uses a modified version of the Q-learning algorithm. This modification helps to satisfy a very important precondition for the convergence of the algorithm by replacing the updating step with weighting by the conditional choice probabilities. These choice probabilities then can be used to find the structural parameters of the economic problem via a maximum likelihood or a score function method. This algorithm has a nice intuitive interpretation of agents' adaptive behavior. Extensions to multi agent game is suggested.