

# A temporal difference method to solve dynamic discrete choice models with the curse of dimensionality

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## Abstract

To solve dynamic discrete choice models with a large state space is always difficult, moreover sometimes it is impossible. This is because the necessary amount of computation time exponentially increases as the number of dimensions gains. This phenomena is called "The Curse of Dimensionality". To solve the problem, we propose a new approximation method to solve the models. By this method, we approximate value function on whole state space at once, and minimize approximation error by using a temporal difference method. The method enables us to solve high dimensional DDC models with high precision, and shortens its computation time by over 99 percent in high dimensional case. We also prove its asymptotic properties and show the approximated estimator has consistency under some conditions.

JEL Classification : C63, D01.