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Stability Estimating in Optimal Stopping Problem

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Abstract: We consider the optimal stopping problem for a discrete-time Markov process on a Borel state space X. It is supposed that an unknown transition probability $p(\cdot|x)$, $x \in X$, is approximated by the transition probability $\widetilde{p}(\cdot|x)$, $x \in X$, and the stopping rule $\widetilde{\tau}_*$, optimal for $\widetilde{p}$, is applied to the process governed by p. We found an upper bound for the difference between the total expected cost, resulting when applying τ_*, and the minimal total expected cost. The bound given is a constant times $\sup_{x \in X} \|p(\cdot|x) - p(\cdot|x)\|$, where $\|\cdot\|$ is the total variation norm.

Keywords: discrete-time Markov process; optimal stopping rule; stability index; total variation metric; contractive operator; optimal asset selling;

AMS Subject Classification: 60G40;

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