

Title: Regularities of Viscosity Solution for Impulse Control Problems
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This paper studies the continuity of the value function of an impulse control problem within a given possibly unbounded set. The controlled process is assumed to be a time homogeneous Markov process having a Feller semigroup and strong Feller property. In order to solve this problem, we reduce it to iterated optimal stopping problems and show that their value functions are continuous; the latter enables us to show that the value function of the main problem is continuous. Moreover, we prove that it is the unique viscosity solution of an elliptic partial differential equation. Finally, we apply the obtained results to study optimal dividend policy for an insurance company.

Key words: Impulse Control; Viscosity Solution; Feller semigroup

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