On the relationship between the stochastic maximum principle and dynamic programming in singular stochastic control

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Abstract

This paper investigates the relationship between the stochastic maximum principle and the dynamic programming principle for singular stochastic control problems. The state of the system under consideration is governed by a stochastic differential equation, with nonlinear coefficients, allowing both classical control and singular control. We show that the necessary conditions for optimality, obtained earlier, are in fact sufficient provided some concavity conditions are fulfilled. In a second step, we prove a verification theorem and we show that the solution of the adjoint equation coincides with the derivative of the value function. Finally, using these results, we solve explicitly an example.

Keywords stochastic maximum principle; dynamic programming principle; singular control.

Link

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