Time-Inconsistent Optimal Control Problems and the Equilibrium HJB Equation

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A general time-inconsistent optimal control problem is considered for stochastic differential equations with deterministic coefficients. Under suitable conditions, a Hamilton-Jacobi-Bellman type equation is derived for the equilibrium value function of the problem. Well-posedness and some properties of such an equation is studied, and time-consistent equilibrium strategies are constructed. As special cases, the linear-quadratic problem and a generalized Merton's portfolio problem are investigated.

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