Stochastic control with fixed marginals

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Abstract: We prove the duality theorem for the stochastic control problem where continuous semimartigales under consideration have a variable diffusion matrix. Here we use the fact that value functions are minimal bounded continuous viscosity solutions of a class of HJB equation. As an application, we construct a continuous semimartingale of which the one-dimensional marginal distributions are given by the Fokker-Planck equation with the p-th integrable drift vector ($p > 1$).