Abstract: We prove that an (S, S) policy is optimal in a continuous-review stochastic inventory model with a fixed ordering cost when the demand is (i) a diffusion process and a compound Poisson process with exponentially distributed jump sizes, and (ii) a mixture of a constant demand and a compound Poisson process. The proof uses the theory of impulse control. The Bellman equation of dynamic programming for such a problem reduces to a set of quasi-variational inequalities (QVI). An analytical study of the QVI leads to showing the existence of an optimal policy as well as the optimality of an (s, S) policy. Finally, the combination of a diffusion and a general compound Poisson demands is not completely solved. We explain the difficulties and what remains open. We also provide a numerical example for the general case.

Key Words. Stochastic inventory model, EOQ model, impulse control, quasi-variational inequalities, (s, S) policy, diffusion process, compound Poisson process.

Date: Tuesday, November 16, 2004

Time: 2:00 PM
Coffee will be served in ECSN 3.106 at 1:30 p.m.

Room: GR 4.428

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