On the deduction of optimal stopping problem with incomplete data

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We consider the optimal stopping problem with incomplete data for the partially observable stationary wide sense random sequence $(\theta, \xi) = (\theta_n, \xi_n), n = 0,1, \ldots$, where θ is the nonobservable random sequence and ξ is the observable random sequence. This problem is reduced to the optimal stopping problem of random sequence $\tilde{\theta} = (\tilde{\theta}_n), n = 0,1, \ldots$, with complete data:

$$\tilde{\theta}_{n+1} = -b_1 \tilde{\theta}_n + P(n) Q^{-\frac{1}{2}}(n) \eta_1(n+1),$$

$$P(n) = (b_2 - b_1)\varepsilon_1^2 + (b_2 - b_1) b_1^2 \gamma_n,$$

$$Q(n) = (b_2 - b_1)\varepsilon_1^2 + (b_2 - b_1)^2 b_1^2 \gamma_n + (\varepsilon_1 + \varepsilon \varepsilon_2)^2,$$

where $|b_1| < 1$, $|b_2| < 1$; $\eta_1 \sim N(0,1)$; $\varepsilon, \varepsilon_1, \varepsilon_2$ are small coefficients and γ_n is the error of filtration.

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References

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