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An interesting generalization of the well-known Howard model is to allow the returns to be random variables and to consider alternatives to the criterion of maximizing expected discounted return. In [1] Goldwerger considers the case where the random variables are normally distributed and the criterion is to maximize the ratio of the mean to the standard deviation of total discounted return. This is a very difficult problem and cannot be solved by the methods of that paper. Equation (13) is incorrect. To see this suppose that all the variances σ_{ij}^k were zero. (The standard Howard model.) Then (13) would say that the variance of the total discounted return is zero which is not true, of course. The true formula should be quite complex. However, for period 1 things are simple and $\sigma_1^2(1)$ in the example on p. 619 should be $\frac{1}{2}(81 + 5) + \frac{1}{2}(9 + 4) - 6^2 = 13.5$, not 1.75. The main difficulty is that (14) is incorrect. It is not appropriate to apply the principle of optimality either with a correct or the present (13). The best pair $(u_j^k(z-1), \sigma_j^{2k}(z-1))$ to maximize (14) is not necessarily going to be the one that maximizes $(u_j^k(z-1)/(\sigma_j^{2k}(z-1))$, which is what (14) assumes.

Reference

1. GOLDWERGER, J., "Dynamic Programming for a Stochastic Markovian Process with an Application to the Mean Variance Models," *Management Sci.* (February 1977).

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