

DERIVING SENSITIVITY RESULTS FOR A PARTICULAR CLASS OF 1-DIMENSIONAL
OPTIMAL STOPPING PROBLEMS RELATED TO OUTSOURCING MODELS

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When a company considers to outsource parts of its operation one of its concerns is the optimal timing of this decision. A model which assumes the profit flow to be geometric Brownian motion and which incorporates benefits and costs of efforts that a firm spends on the project prior to the outsourcing date has been proposed by Y. Moon [2], see also Alvarez and Stenbacka [1]. We extend Moon's model to more general index and profit flow processes. The corresponding optimal stopping problem is reformulated in terms of an infinite dimensional linear program and an auxiliary nonlinear optimization problem. It will be shown how these formulations can be exploited to prove general sensitivity results of the optimal threshold policies. The method will be illustrated by analyzing Cox-Ingersoll-Ross-processes and related processes.

References:

- [1] Alvarez, L. and Stenbacka, R. (2006). Partial outsourcing: A real options perspective. *International Journal of Industrial Organization*, 25, 91–102.
- [2] Moon, Y. (2010). Efforts and efficiency in partial outsourcing and investment timing strategy under market uncertainty. *Computers and Industrial Engineering*, 59, 24–33.