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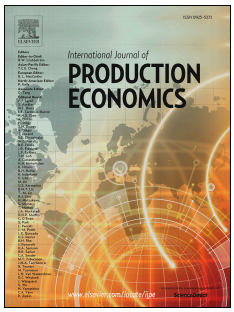

Effect of a lead time-dependent cost on lead time quotation, pricing, and capacity decisions in a stochastic make-to-order system with endogenous demand

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Effect of a lead time-dependent cost on lead time quotation, pricing, and capacity decisions in a stochastic make-to-order system with endogenous demand

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Abstract. The research on lead time quotation in make-to-order stochastic systems with an endogenous demand generally considers a system modelled as an M/M/1 queue with a linear demand that is sensitive to lead time and price, and always assume a constant unit operating cost. It is known that firms can reduce the operating cost by quoting a longer lead time. The idea of this paper stems from this observation. Indeed, we extend the existing works by modelling the unit operating cost, not as a constant, but as a convex decreasing function of the quoted lead time, which significantly rises the analytical difficulty but offers opportunities for many insights. We study three settings: (i) lead time quotation model, (ii) lead time quotation and pricing model, and (iii) lead time quotation, pricing, and capacity decision model. For each setting, we provide the optimal policy and conduct experiments to derive insights. In particular, we analyze the new trade-offs raised by the consideration of a lead time-sensitive cost. Some of our results are not intuitive.

Keywords: Lead time quotation; Lead time-dependent cost; Pricing; Capacity; Endogenous demand; M/M/1 queue.