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Procurement Auctions and Supply Chain Performance

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Abstract

While auction is typically considered a price-determination mechanism, it could also have a significant impact on supply chain performance. This paper analyzes possible auction and market mechanisms and their expected payoffs in a two-supplier, one-buyer system with asymmetric information, where the players' costs are private information and each supplier's cost is known only probabilistically by other players. The results show that the auction mechanism could have a significant impact on the payoffs received by the players and on system efficiency. Channel coordination can be achieved with a *two-part contract auction* where the buyer announces a price-sensitive order function and the suppliers compete in a reverse English auction on the side payment. To achieve the coordination, a market intermediary must prevent the buyer from manipulating the order function by imposing a restriction on the retail price. Thus, the buyer truthfully transfers the market demand function after recovering her unit handling cost to the suppliers. Insights from the analysis allow us to rank different market mechanisms by their impact on expected channel efficiency and the expected payoffs for the buyer and the suppliers.

(Keywords: *Auction, Supply Chain Management, Supplier Competition, Contracting, Game Theory*)

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