

# A theoretical analysis of scoring auctions with a general form of scoring rules

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January 21, 2011

Public sector spends 16 percent of Gross Domestic Product, on average, in OECD member countries. For public funds to be spent efficiently and effectively, value for money is the key principle in public procurement.

Traditionally, low-price auctions have been widely used as a competitive, transparent, and accountable allocation mechanism. However, by growing pressure to seek value for money, more and more procurement buyers introduce mechanisms with which relevant prices and qualities of proposals in the whole procurement cycle are assessed. Scoring auctions, or equivalently multi-parameter bidding, is one of the most prevailing mechanisms that meet their need.

This paper provides a theoretical analysis on scoring auctions with a general scoring rule that is not restricted in the quasi-linear form. The equilibrium properties clarified in this paper show that, if the scoring rule is based on the quality-price ratio, an intense competition may induce undercutting the quality bid, which further drives down the price bid in equilibrium. Furthermore, the existing format of the scoring auction with the price-quality ratio scoring rule results in the lower expected utility and *ex post* inefficient outcome. Finally, using the obtained equilibrium properties, we propose an estimation procedure for the bidder's cost function.

Key words: scoring auctions, procurement, structural estimation of auctions

JEL classification: D44,

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