

基于可变供给量的可分离物品拍卖及其应用

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Auction of Divisible Goods Based on Variable Supply and Its Application

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- 摘要
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摘要 本文对统一价格下可分离物品的拍卖问题进行了研究。首先,在买者报价连续、买者和卖者风险中立、卖者采取可变供给量(将供给量看成价格的函数)的策略下,设计了一个新的基于可变供给量的可分离物品统一价格拍卖机制,研究了其信息激励性和分配的有效性,给出了卖者的最佳供给策略和买者的均衡报价策略。然后,将拍卖机制推广到风险中立、风险爱好和风险厌恶三类风险买者共存的情形,并给出了相应的均衡结论,该结论与现有的一些成果相比更具一般性。最后,给出了拍卖机制在环境规划中应用。具体地,结合“十一五”期间获得的“1+8武汉城市圈”环境规划中有关污染物允许排放总量分配数据和统计申报资料,利用拍卖模型来分析和评价了免费分配方案的有效性程度,并据此给出了关于目前排污申报制度和免费分配方法的若干结论和建议。

关键词: 可分离物品 统一价格拍卖 可变供给量 环境规划

Abstract: This paper studies the auction problem of divisible goods. First, a uniform price auction mechanism of divisible goods with variable supply is proposed under three conditions, i.e., every buyer submits a nonincreasing continuous demand function, the seller and all buyers are risk neutral and the seller uses the strategy of variable supply (let the supply as a function of price). Second, the information incentive and effectiveness of allocation are analyzed, and the seller's optimal supply strategy and the buyers' bidding strategies are discussed. Third, this auction mechanism is generalized under the condition of the risk neutral buyers, risk averse buyers and risk seeking buyers coexist in an auction. Meanwhile, several more general equilibrium results are also deduced about auction under a uniform price. Finally, this auction mechanism is applied to analyze and evaluate the validity for the free allocation of total permitted pollution discharge capacity in the environmental planning of Wuhan City Circle in Hubei Province, China. The validity evaluation result of free allocation is obtained by analyzing the statistical data of SO₂ in 9 cities of Wuhan City Circle. Combining with the actual background, several improved strategies on free allocation method and current sewage application system are also given.

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