頻譜拍賣制度之理論回顧、
政策經驗與模擬研究

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　　本文比較國際電信頻譜釋照最常用的兩種拍賣制度：SMRA（simultaneous multi-round auction）與 CCA（combinatorial clock auction）。從學術分析與政策經驗看來，這兩種拍賣制度各有優劣。SMRA 簡單易懂，但無法投組合標，故可能降低效率。CCA 之組合標設計可改善此缺點，但操作複雜，由電腦算出之拍賣結果難以用直觀解釋，成交價格不具備穩定性也違反單一價格法則。本文以模擬方法研究綜效係數與 SMRA 效率之關係，建構多種評價架構之全綜效與部分綜效模型，就不同綜效係數值各進行五千組隨機評價之模擬分析。模擬結果顯示當綜效係數不超過 0.20 時，SMRA 制度之效率比不會大幅降低，仍然是適當的拍賣制度。

關鍵字：頻譜拍賣、多回合上升標拍賣、組合價格鐘拍賣、綜效

Theoretical Review, Policy Experience and Simulation Study of Spectrum Auction System

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ABSTRACT

This paper compares two spectrum auction systems: SMRA (simultaneous multi-round auction) and CCA (combinatorial clock auction). Besides theoretical studies, we also discuss the relative merits of these two systems demonstrated by policy experiences of various countries. SMRA is considered efficient except when there exists a high degree of positive synergy factors. CCA allows bidders to bid on any package that suits their needs. However, the calculation of VNC (Vickrey nearest core) price seems like a black hole for bidders, and also violates the law of one price.

We conduct a simulation to study the relationship between synergy factors and efficiency level. Our simulation covers six valuation structures, and two synergy structures, each with 101 factor levels and 5000 groups of random values. The simulation results show that for synergy factors below 0.20, SMRA can achieve a relatively satisfactory efficiency level, and hence, it is still a satisfactory auction system.

Key Words: spectrum auction, simultaneous multi-round auction,
　　　　　　 combinatorial clock auction, synergy effect