

Accepted Manuscript

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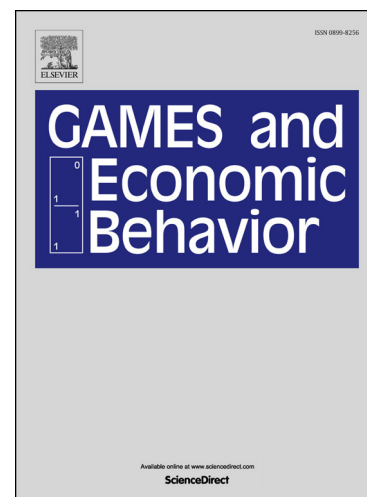
PII: S0899-8256(16)30013-6
DOI: <http://dx.doi.org/10.1016/j.geb.2016.03.008>
Reference: YGAME 2527

To appear in: *Games and Economic Behavior*

Received date: 28 July 2014

Please cite this article in press as: Deckelbaum, A., Micali, S. Collusion, efficiency, and dominant strategies. *Games Econ. Behav.* (2016), <http://dx.doi.org/10.1016/j.geb.2016.03.008>

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Collusion, Efficiency, and Dominant Strategies

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April 27, 2016

Abstract

Green and Laffont proved that no collusion-resilient dominant-strategy mechanism, whose strategies consist of individual valuations, guarantees efficiency in multi-unit auctions. Chen and Micali bypassed this impossibility by slightly enlarging the strategy spaces, yet assuming knowledge of the maximum value a player may have for a copy of the good, and the ability of imposing high fines on the players. For unrestricted combinatorial auctions, efficiency in collusion-resilient dominant strategies has remained open, with or without the above two assumptions. We fully generalize the notion of a collusion-resilient dominant-strategy mechanism by allowing for arbitrary strategy spaces; construct one such mechanism for multi-unit auctions, without relying on the above two assumptions; and prove that no such mechanism exists for unrestricted combinatorial auctions, with or without any additional assumptions. Our results hold when the mechanism does not know who colludes with whom, and players in the same coalition can perfectly coordinate their strategies.

*Supported by Fannie and John Hertz Foundation Daniel Stroock Fellowship.

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