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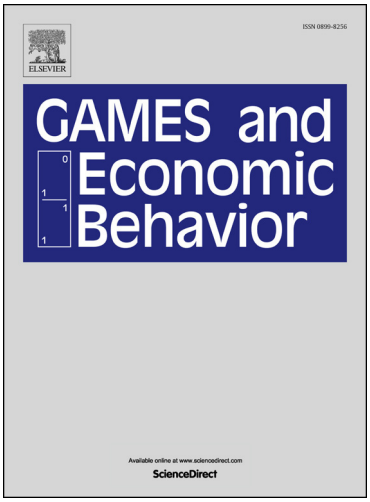

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Shapley's Conjecture on the Cores of Abstract Market Games*

Zhigang Cao† Chengzhong Qin‡ Xiaoguang Yang§

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Abstract

Shapley (1955) introduced the model of an abstract market game as a generalization of the assignment game model, among several other models. He conjectured that abstract market games possess non-empty cores. We analyze properties of abstract market games and provide a proof of this conjecture for cases with four or fewer players. We show by example that, in general, the structure of an abstract market game is not strong enough to guarantee the nonemptiness of the core. We establish supplemental conditions for the conjecture to hold. Our supplemental conditions are satisfied by the assignment games and abstract market games with one side consisting of a single player as with package auction games in Ausubel and Milgrom (2002).

Keywords. Assignment games; complements; substitutes; core; convex games

JEL classification. C71, C78

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