

Editorial

Günter Fandel · Jan Trockel

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This Special Issue reports on recent research applying game theory to production decisions. It contains five papers which deal with different aspects of this topic. Four papers are more theoretically oriented, one paper presents the result of an empirical study.

Graf and Wirl investigate in their contribution whether an incumbent firm may have an incentive to introduce cooperate social responsibility (CSR) activities only as a response to the entry of a competitor into its market. Thereby the authors assume that the entrant cannot provide CSR activities from the very beginning because of its lack in recognition and high fixed costs for licensing. Nevertheless its entry into the market may be sufficient to motivate the incumbent firm to start CSR activities and to turn—at least temporarily—into a “green firm” due to increasing competition.

In an experimental study Rasmußen and Leopold-Wildburger examine to what extent the reporting behavior of agents in production towards their principal depends on the communication medium, whether the report is presented by computer or via paper and pencil. The results show that the participants of the study have in both cases a preference for truthful reporting. But, agents are willing to report more honestly via paper and pencil than via computer because of the anonymity of digital reporting. In addition, this difference in the reporting behavior becomes larger for individualistic agents reporting their production volumes less

G. Fandel · J. Trockel (✉)
Center for Production Economics and Decision Support, FernUniversität in Hagen,
Universitätsstr. 41, 58084 Hagen, Germany
e-mail: jan.trockel@fernuni-hagen.de

G. Fandel
e-mail: guenter.fandel@fernuni-hagen.de

honestly than cooperative agents. The reporting behavior will also be influenced by the social value orientation of the agents.

Fandel and Trockel discuss in their article whether the strategic behavior of three actors in a modified inspection game can be invaded by mutants under evolutionary perspectives and what risks emerge as a result. It will be shown that in games with three strategies variable mutations can undermine the optimal company solutions. Finally, the model is analyzed assuming monotonic and monotonic positive payment functions. Under these conditions the solution area is divided into octants to which the influences of the mutations are allocated. Simultaneously it is researched under which circumstances a solution can be generated that tends towards optimal corporate behavior.

Fiestras-Janeiro, García Jurado, Meca and Mosquera formulate a centralized inventory problem in a Spanish farming community. Several agents with individual inventory problems are looking for an agreement to coordinate their orders under the objective to reduce costs. Two solution approaches (fixed order fee of the supplier or fixed order fee plus a variable distance depending transportation fee, respectively) are presented and the optimal inventory policies for both are determined. The authors propose allocation rules for sharing the optimal costs among the agents. In the first approach the Shapley value provides a stable allocation. In the second approach the Shapley value may generate an allocation outside the core. So, the authors design a new rule of allocation and study its properties.

Timmer proposes in her theoretical paper a coordination mechanism with fair cost allocation for divergent multi-echelon inventory systems under periodic review and decentralized control. Because total costs in the case of decentralized control, in which every unit decides on its own replenishment policies, are higher than in the case of centralized control a coordination mechanism for removing this cost inefficiency is necessary. Within this procedure downstream units compensate upstream units by side payments for their increasing costs incurred by higher base stock levels. The global optimal policy is a Nash equilibrium.

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