

Project 19:

19 Cartels and Cooperative Games

→ Deutsche Version Seite 3 / German version page 3

Within this project we explain cartelization of markets via solution concepts of Cooperative Game Theory. We consider market games (cf. Shapley–Shubik [9]) or totally balanced games represented as minimum games of finitely many measures. In particular markets with separate “corners” are obtained when the representing measures are orthogonal (see [4]). Most solution concepts (the core, the Shapley value, the Walrasian Equilibrium) tend to concentrate the total payoff on the short side of the market when the number of players or agents increases – this is a consequence of the increasing number of blocking coalitions. This can also be seen as a consequence of the equivalence theorems of General Equilibrium Theory.

By contrast we consider concepts which differ markedly: the Stable Set of von Neumann–Morgenstern or the Modiclus of P. Sudhölter assign positive payoffs to the long side of the market as well. It can be seen that this is indeed due to the formation of cartels which exhibit preventive power even when the ability to acquire payoffs is small.

The paper by Rosenmüller–Shitovitz [5] characterizes vNM–Stable Sets for orthogonal market games with a continuum of players that are not exact. We obtain convex combinations of distributions of utilities over the various corners of the market. The dominance relations used in the context of this solution concept exhibit the power of cartels even though they might be located on the long side of the market.

The paper ‘The Endogenous Formation of Cartels’ [3] explains that this procedure can be imitated in finite games provided sufficiently many small players are present.

The two papers ‘Cartels via the Modiclus’ [7] and ‘Formation of cartels in glove markets and the modiclus’ [6] by Rosenmüller–Sudhölter exhibit the peculiar power of the modiclus concept: The external bargaining round between cartels and the internal bargaining inside one of the cartels are clearly distinguished. For the external procedure the preventive power of the various corners of the markets is decisive.

The internal procedure rests on a 'contested garment procedure' as discussed by Aumann–Maschler [1] in the context of their discussion of a Talmudian bankruptcy distribution rule.

The interpretation of vNM–Stable Sets is greatly improved by the power this solution concept exhibits on orthogonal market games. Similarly, the power of the modiclus is exhibited by its internalization of the preventive power as well as of the acquisition power of coalitions: It is the dual game which represents the second type of bargaining power. And the modiclus simultaneously incorporates both, the primal and the dual game.

See page 4 for some literature. References “Cartels via the Modiclus” [6] and “The Endogenous Formation of Cartels” [3] can also be found on this web site.

Projekt 19:

19 Kartellbildung und Kooperative Spieltheorie

Im Rahmen dieses Projektes werden Erscheinungen der Kartellbildung mit Hilfe von Lösungskonzepten der Kooperativen Spieltheorie erklärt. Zugrunde gelegt wird das Modell eines Marktspiels nach Shapley–Shubik, d. h., man untersucht total balancierte Spiele. Neigungen zur Kartellbildung findet man, wenn der beschriebene Markt verschiedene Nischen (“corners”) hat, d. h. Gruppen von Marktteilnehmern verfügen ausschließlich über bestimmte Gütertypen. Dies wird durch eine Güterverteilung mit orthogonale Maßen representiert. “Klassische” Lösungskonzepte (Core, Shapley-Wert, Walras’sches Gleichgewicht) neigen dazu, für große Märkte die gesamte Nutzenverteilung auf der kurzen Seite zu konzentrieren. Die in diesem Projekt erarbeiteten Ergebnisse zeigen, dass nichtkonventionelle (und damit oft komplizierte) Lösungskonzepte wie die Stablen Mengen nach von Neumann–Morgenstern oder der Modiclus nach P. Sudhölter ein auffallend abweichendes Verhalten zeigen: Sie ordnen auch der langen Seite des Marktes Auszahlungen zu und erklären dies mit der durch Kartellbildung etablierten Blockademacht dieser Seite.

Einige Literatur auf Seite 4. Literaturangaben “Cartels via the Modiclus” [6] und “The Endogenous Formation of Cartels” [3] auch auf dieser Website im Literaturverzeichnis.

References

- [1] R. J. Aumann and M. Maschler, *Game theoretic analysis of a bankruptcy problem from the Talmud*, Journal of Economic Theory **36** (1985), 195 – 213.
- [2] S. Hart, *Formation of cartels in large markets*, Journal of Economic Theory **7** (1974), 453 – 466.
- [3] J. Rosenmüller, *The endogenous formation of cartels*, Working Paper 318, Institute of Mathematical Economics (2000), 29pp., to appear in *Review of Economic Design*.
- [4] ———, *Game theory: Stochastics, information, strategies and cooperation*, Theory and Decision Library, C, vol. 25, Kluwer Academic Publishers Boston, Dordrecht, London, 2000.
- [5] J. Rosenmüller and B. Shitovitz, *A characterization of vNM-stable sets for linear production games*, International Journal of Game Theory **29** (2000), 39 – 61.
- [6] J. Rosenmüller and P. Sudhölter, *Cartels via the modichus*, Working Paper 320, Institute of Mathematical Economics (2000), 49pp., to appear in *Discrete Mathematics*.
- [7] ———, *Formation of cartels in glove markets and the modichus*, Journal of Economics **76** (2002), 217 – 246.
- [8] D. Schmeidler, *The nucleolus of a characteristic function game*, SIAM Journal of Appl. Math. **17** (1969), 1163 – 1170.
- [9] L. S. Shapley and M. Shubik, *On market games*, Journal of Economic Theory **1** (1969), 9 – 25.
- [10] P. Sudhölter, *The modified nucleolus as canonical representation of weighted majority games*, Mathematics of Operations Research **21** (1996), 734 – 756.