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16. Applications

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Rationality of players and credibility of strategies in leader-follower games.

We consider a two persons game in $[0,T]$ descirbed by the cost functtionals $J_1(u,v)$ and $J_2(u,v)$ for leader (L) and follower (F) respectively, u and v are the decisions of the two players.

$$\gamma(v) = \begin{cases} u^d \text{ if } v = v^d \\ u\hat{} \text{ if } v \neq v^d \end{cases} \quad \text{is the threatening strategy of } L \text{ where}$$

(u^d, v^d) is the L's desired pair. IR$=$ $[(u,v) : J)2(u,v) < q]$ is the set of playable pairs. The game is repeated N times to give a dynamic structure. Often in letterature optimality and credibility are too much restrictive.

We want to show that under a weaker definition of rationality of F and suitable definition of credibility, there exists a sequence $T_0, \cdots T_n$ such that $(\gamma(v^d), v^d)$ minimizes J_1 over IR and so it is acceptable also by F. Some applications to conflict in finance are given.

References: Y. Zheng and Y. Ho, Credibility in Stackelberg games, Syst. and Control Lett. 5, (1984). V. Bure and O. Malafeyev, Some game-theoretical models of conflict in finance, Nova J. of Math., **6**, (1996).