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RELIABLE INSPECTION STRATEGIES

Mathematical Systems in Economics
Verlag-Anton Hain, Meisenheim am Glan, 1975

The author presents two-person zero-sum games describing special conflict situation called inspection games, which can be considered as generalization of the games analysed by Dresher ("A Sampling Inspection Problem in Arms Control Agreements: A Game-Theoretic Analysis" Rand Corp; RM-2972-ARPA 1962).

The first player caleed *aggressor* wants to alter an existing economic or politic status by aggression during a given time space. The second player called *inspector* is interested in maintining the existing status.

In the first chapter a discrete-time inspection game with a finite number of stages is treated. A play starts with a stochastic determination of the inspector's budget V_0 where V_0 is a discrete random variable with the distribution R.

$$P(V_0 = r) = R_r, \qquad (r \in C = \{0, 1, ..., N\})$$

$$R_r \geqslant 0 \text{ and } \sum_{r=0}^{N} R_r = 1$$

This distribution is known to both players. Only the inspector knows the achieved budget $\hat{V}_0 \in C$.

The solution of the One-Stage and the Two-Stage Inspection Game is presented. Optimal calendar strategies of the Inspector for the N-stage inspection game, is determined.

In the second chapter, a discrete-time inspection game with an infinite number of stages is analysed. The author proves that under certain conditions the game has a value and both players have optimal strategies and gives the conditions for the existence of a reliable inspection strategy.

In the third chapter a two-person zero-sum game between aggressor and inspector over a continuous time space is presented. The model is a generalization of the time continuous model considered by Höpfinger ("A Game-Theoretic Analysis of an Inspection Problem" Karlsruhe, 1971, internal publication). An appropiate carrying over of optimal or ε — good strategies of the discrete-time models is defined so that the continuous time model can be solved.

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