

Information Pooling Game in Multi-portfolio Optimization

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分野 ゲーム理論

キーワード information pooling, multi-portfolio optimization, perceived fairness

研究概要

In this paper, an information pooling game is proposed and studied for multi-portfolio optimization problem. The financial adviser would proceed as follows:

- Determine the trades by solving the **collusive optimization** problem.
- Invite each client to determine her information pooling strategy, which forms an **information pool**.
- Authorize each client to access her corresponding information pool. Both the manager and client may estimate her **expected net utility** by solving the information pooling problem with SLCP (Sequential Linearly Constrained Programming).
- Determine the **split ratio** of the resulting **market impact cost** by minimizing the variance of dissatisfaction indicators across all accounts.

This approach produces Pareto optimal utilities while also keeping the satisfaction of all accounts at a similar level, complying with the SEC (Securities and Exchange Commission) best execution rules. It outperforms the pro-rata collusive solution in horizontal fairness, and overcomes the pitfall in Cournot-Nash equilibrium with a more tractable approach by introducing the dissatisfaction indicator.

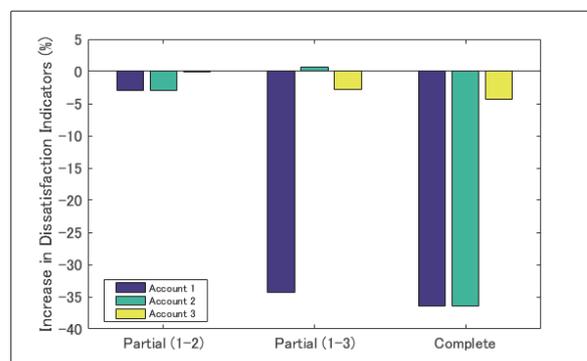


Fig. 1: Increase of dissatisfaction indicators with partial and complete information pools from that with null information pool

利点特徴

- The clients are allowed to decide whether and to what extent their private trading information is shared with others in the same information pool.
- Both horizontal and vertical fairness are incorporated in this novel mechanism, which guarantees that no client is systematically advantaged or disadvantaged.

応用分野

In order to efficiently serve a large number of clients, SEC allows the manager to “bunch orders on behalf of two or more client accounts”. This information pooling approach provides a potential solution to the problematic interaction arising in multi-portfolio optimization because of the inter-dependent market impact cost.