

論文 / 著書情報
Article / Book Information

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Title(English)	Essays on Implementation Theory
著者(和文)	萩原誠
Author(English)	Makoto Hagiwara
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学位種別(和文)	博士論文
Category(English)	Doctoral Thesis
種別(和文)	論文要旨
Type(English)	Summary

(博士課程)
Doctoral Program

論文要旨

THESIS SUMMARY

系・コース： Department of, Graduate major in	経営工学 経営工学	系 コース	申請学位 (専攻分野) : Academic Degree Requested	博士 (工学) Doctor of Engineering
学生氏名： Student's Name	萩原 誠		指導教員 (主) : Academic Supervisor(main)	大和 毅彦
			指導教員 (副) : Academic Supervisor(sub)	

要旨 (英文 800 語程度)

Thesis Summary (approx.800 English Words)

This thesis consists of four essays on implementation theory. We investigate implementation problems under incomplete information; for the allocation of a social endowment of infinitely divisible resources; under the existence of partially honest agents; and under the existence of semi-socially-responsible agents.

First of all, in Chapter 1, we propose a brief history of implementation theory, and we shortly introduce four studies in this thesis.

In Chapter 2, we consider the implementation problem under incomplete information and private values. We investigate double implementability of social choice functions in dominant strategy equilibria and ex post equilibria. We show that the notion of ex post equilibrium is weaker than the notion of dominant strategy equilibrium. Then, this notion of double implementability is not trivial even under private values. We define a new strategic axiom that is stronger than “strategy-proofness,” but weaker than “secure strategy-proofness.” We call it “weak secure-strategy-proofness.” We show that a social choice function is doubly implementable in dominant strategy equilibria and ex post equilibria if and only if it is *weakly securely-strategy-proof*.

In Chapter 3, we consider the allocation problem of infinitely divisible resources with at least three agents. For this problem, Thomson (*Games and Economic Behavior*, 52: 186- 200, 2005) and Doğan (*Games and Economic Behavior*, 98: 165-171, 2016) propose simple but not procedurally fair mechanisms which implement the “no-envy” correspondence in Nash equilibria. By contrast, Galbiati (*Economics Letters*, 100: 72-75, 2008) constructs a procedurally fair but not simple mechanism which implements the no-envy correspondence in Nash equilibria. In this chapter, we design a both simple and procedurally fair mechanism which implements the no-envy correspondence in Nash equilibria.

In Chapter 4, we consider the implementation problem with at least three agents. We study double implementability of social choice correspondences in Nash equilibria and undominated Nash equilibria. We prove that “DZ-invariance,” “weak no-veto-power,” and “unanimity” together are sufficient for double implementability in Nash equilibria and undominated Nash equilibria. If there is at least one partially honest agent in the sense of Dutta and Sen (2012), then *weak no-veto-power* and *unanimity* together are sufficient for double implementability in Nash equilibria and undominated Nash equilibria. If there are at least two partially honest agents, then *unanimity* is sufficient for double implementability in Nash equilibria and undominated Nash equilibria. In addition, we show that if there is at least one partially honest agent and *unanimity* is satisfied, then “LY-condition” is necessary and sufficient for double implementability in Nash equilibria and undominated Nash equilibria. From these results, we obtain several positive corollaries such as in a bargaining problem (Nash, 1950).

In Chapter 5, we assume that each agent is “semi-socially-responsible” and we focus on social choice functions for double implementation in Nash equilibria and undominated Nash equilibria. We show that if there are at least three agents and each agent is semi- socially-responsible with respect to a *unanimous* social choice function, then a simple and procedurally fair mechanism doubly implements this social choice function in Nash equilibria and undominated Nash equilibria.

Finally, in Chapter 6, we conclude this thesis by summarizing the results and discussing three remaining issues in this thesis: (1) irrational choices; (2) repeated implementation; and (3) laboratory experiments.

備考：論文要旨は、和文 2000 字と英文 300 語を 1 部ずつ提出するか、もしくは英文 800 語を 1 部提出してください。

Note：Thesis Summary should be submitted in either a copy of 2000 Japanese Characters and 300 Words (English) or 1copy of 800 Words (English).

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