Robust Dynamic Implementation

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1. What is the question?

Under given game and mechanism, Is the social choice implementation realizable? What is the behavior the players in the game will play? Is the implementation robust if we relax the assumption of the complete-information and common rationality?

2. Why is it important?

By the concept we get from the implementability in the model, we can hence seek social choices(policies) that are Nash equilibriums (accepted by people). And the relaxation of complete-information (yet still close to) and common rationality approximates the real world better.

3. What is the answer the author offered?

i. Any social choice is implementable given initial rationalizability.
ii. The result is immune to the relaxation of complete information as well as common rationality and re-negotiation.
iii. The existence of 2-stage mechanism with transfer system with bounded amount is ensured, for every type profile θ, the social choice function is the unique outcome given initial rationalizability. That mechanism implement f robustly.

4. How did the author get the answer?

They design a dynamic game modified from Moore-Repullo Mechanism, which consists of 2 stages. Firstly, players report his own and his predecessor's payoff type, then pick the first player inconsistent with his successor and get him penalize and report another payoff type. If the payoff type still inconsistent, penalize the successor. Under this framework, they showed that any social choice is implementable. Then the author started to relax the model from complete information and large-amount-of-punishment condition.

Key terms:

Maskin monotonicity: x(θ), x is an allocation of goods; θ is the player's type; continuity and monotonicity of x(θ) are necessity for implementability.

Implementability: if the equilibrium strategy profile is the fixed point under the mechanism, and f is described as a social choice function, where f(θ) equivalent to x(θ), θ is the report type profile which may differ from the real type profile θ.

A: possible outcomes/social alternatives

Θ: A finite set of payoff types.

f: social choice function which is a mapping from the payoff space Θ to social alternative space A (intuition: to put people with different value into an outcome acceptable by all)

H: set of all historic path in the game

M: the set of available messages for player I @history h

Z : the imminent history following history h given strategy set σ

g : a function that maps terminal history M into Cartesian product of outcomes and transfer profile A X T(a,τ)

m^1 : consistent type report profile

Ø: initial history

Reference: for understanding the idea of Implementability & Maskin Monotonicity, I looked through Wikipedia and Allan Feldman's online tutorial of Nash implementation