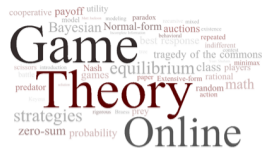




Social Choice: Impossibility of Non-Paradoxical Social Welfare Functions

Game Theory Course:
Jackson, Leyton-Brown & Shoham



[illegible]

W is **Pareto efficient** if whenever all agents agree on the ordering of two outcomes, the social welfare function selects that ordering.

Independence of Irrelevant Alternatives



Definition (Independence of Irrelevant Alternatives (IIA))

W is **independent of irrelevant alternatives** if the selected ordering between two outcomes depends only on the relative orderings they are given by the agents.

Dictatorship



Definition (Dictatorship)

W has a **dictator** if there exists a single agent whose preferences always determine the social ordering.

Arrow's Theorem



Theorem (Arrow, 1951)

Any social welfare function W over three or more outcomes that is Pareto efficient and independent of irrelevant alternatives is dictatorial.