# The Normal Form

The description of a game can be viewed as a listing of the strategies of the players and the outcome of any set of choices of strategies, without regard to the attitudes of the players toward various outcomes. We now indicate how the final simplification of the game – the normal form – is obtained, by taking into account the preferences of the players.

The result of any set of strategies is a probability distribution over the set of possible outcomes. It would be particularly convenient if a given player could express his/her preference pattern in by a bounded numerical function defined on , such that he or she prefers to *iff* . Note that denotes indifference between to . Also the function is such that if for any probability distgribution over we define as the expected value of computed with respect to as

the player prefers to *iff* .

It is remarkable fact that, under extremely plausible hypothesis concerning the preference pattern such a function exists.

Definition (utility function): The function defined for all probability distributions over , is called the player’s ***utility function***.