MPhil

Semester-II

Paper: Eco-121

Advanced Micro Economics: Theory and Applications

Group-B

Lecture-I

NORMAL FORM GAMES AND EXTENSIVE FORM GAMES

Strategic Games

A strategic game is a model of interactive decision-making in which each decision-making in which each decision maker hoses his plan of action once and for all, and these choices are made simultaneously. The model consists of a finite set *N* of players and, for each player *i*, a set A_i of actions and a preference relation on the set of action profiles. We refer to an action profile $a = (a_j)_{j\varepsilon N}$ as an outcome, and denote the set $X_{j\varepsilon N} A_j$ of outcomes by A. The requirement that the preferences of each player *i* be defined over A, rather that A_i is the feature that distinguishes a strategic game from a decision problem: ***each player may care not only about his own action but also about the actions taken by the other players.***

Definition:

A strategic game consists of:

- A finite set N (the set of players)
- For each player $i\varepsilon N$ a non-empty set A_i (the set of actions available to player *i*)
- For each player $i\varepsilon N$ a preference relation $\geq i$ on A, $A = X_{j\varepsilon N} A_j$ (the preference relation of player *i*)

If the set of A_i of actions of every player *i is* finite then the game is finite.

A finite strategic game in which there are two players can be described conveniently in a table like that in figure-1.

	L	**R**
T	W_1, W_2	X_1, X_2
B	Y_1, Y_2	Z_1, Z_2

Figure-1

One player's actions are identified with the row and other player's with the columns. The two numbers in the box formed by row r and columns c are the player's payoffs when the row player chooses r and the column player chooses c, the first component being the payoff of the row player. Thus in the game in figure-1 the set of actions of the row player is {T, B} and that of the column player is {L,R} and for example the row player's payoff from the outcome (T,L) is W_1 and the column player's payoff is W_2. If the players' names are "1" and "2" then convention is that the row player is Player-1 and the column player is Player-2.

Ref: A Course in Game Theory: Martin J Osborne and Ariel Rubinstein