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Study of Matrix Game Solution of Economical Development  
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Abstract-- In this paper, it is shown that Duality is the connection between certain economical development concept and certain aspects of matrix game solution of game theory. In game theory, two players in a zero game relies on the fact that the player’s strategies are always dual, so that the strategy for one of the players is self dual. For more than the two players or in a game that is not zero – sum, the indetermination should be removed by ethical rules. The contribution of matrix game is precious for economical development.

Keywords :- Two players, Non – Zero sum, Matrix game, ethical rule, Duality, payoff matrix.

I. INTRODUCTION
Berge, C(1) and Von – Neumann, (5) are the pioneer workers of the present area. In fact, the present work is the extension of work done by Gale, D(3), Billera, L(2) and Nash, J.F(6). In this paper, we have studied Matrix Game solution of economic development.

Mathematical Treatment Of The Problem :-
Many real problems can be modeled as games. The theory of games has been applied in many fields. Here this theory is the only quantitative approach developed so far for analysis of certain types of real problems of lives. But we are concerned only with the quantitative approach for analyzing certain types of mathematical problems. In this paper we have studied, analysed and developed games mathematically. Here, it has applied game theory to solve the mathematical problems of real lives even with matrix game mixed strategies. These remains the irritating question of games with three players, or non-zero sum games of two players.

In a symmetric zero-sum games the ethical rule is the equality of gains. In the elementary case where three players each lay down a coin, gambling that the side. They put up will be different from that of the other two players, the rule requires each player to choose between the two sides of his coin with probabilities ½ each. But when the game is not symmetric conditions not useful to be implemented but to serve as a measure, to rank the players by their strength of attraction.

For example, we can input to each player minimum he is guaranteed when playing against the coalition of the others for a fixed sum the same for all.

The situation is similar in a non-zero sum game of two players, if we introduce a fictional third player, who is passive but may enjoy certain rights under the ethical rules.

The probabilities in mixed strategies give weights for aggregating the number in the pay off matrices. In this case of a matrix A of payoffs for two players in a zero-sum game. In particular a column of probabilities allows us to calculate a weighted certain distance between rows, which allows us to group strategies using for example Benzecri’s correspondence analysis. This is an aggregation we might also be concerned with aggregation in a matrix.

Indeed, consider the scalar PAQ, when A is a matrix. Q a vector of amounts of the different goods(column vector) and P a vector of prices for raw materials (raw vector) each column of A correspondence to a good and gives the amounts of raw materials together needed to manufacture it. Each row of A corresponds to a raw material and shows how much of one or another of the goods would have to be manufactured to use up the supply of the raw material. The vector AQ is the vector of supplies. The vector PA is the vector of costs of production. There is more duality. The manufacture wants to minimize PAQ (it is an expense). The supplier of raw materials wants to maximize PAQ (it is revenue), but the entries in P and Q are not probabilities. We must normalize them by multiplying by weight. For P, the weights have to be quantities giving a vector M of sample quantities for the raw materials. For Q, the weights have to be prices, giving a vector V of sample prices.

The condition VQ = 1 keeps the production from being zero. The condition PM = 1 keeps the supplies of the raw materials from setting exaggerated prices. We brought back to a game, but in the struggle some P and some Q will come out zero.

This is catastrophe: manufactures unemployed suppliers without sales. This Catastrophe is “failure of full employment” of the manuals means in a real game for arbitrary matrix. There is “unemployment” of certain “suicidal” manuals. The matrix A is independent of our will. But M and V are dependent on it. Choosing then is required as it were. They cannot be adjust any thing.
For this, we consider an example:
Suppose we manufacture only oil and wheat using only two raw materials labour and land. It takes 12 hours of labour and 3 acres of land to produce a ton of “oil”, 8 hours of labour and 2 acres of land to produce a ton of “Wheat”. Labour costs Rs. 30 an hour and land rents for Rs. 300 an acre. Consumers demand 4 tons of oil and 6 tons of wheat.
Then,

\[
P = [30, 300], \quad \mathbf{A} = \begin{bmatrix} 12 & 8 \\ 3 & 2 \end{bmatrix}, \quad \text{and} \quad \mathbf{Q} = \begin{bmatrix} 4 \\ 6 \end{bmatrix}
\]

\[
\therefore \mathbf{PA} = [30, 300] \begin{bmatrix} 12 & 8 \\ 3 & 2 \end{bmatrix} = \begin{bmatrix} 360 + 900 \\ 240 + 600 \end{bmatrix} = \begin{bmatrix} 1260 \\ 840 \end{bmatrix}
\]

Now \[\mathbf{PAQ} = \begin{bmatrix} 1260 \\ 840 \end{bmatrix} \begin{bmatrix} 4 \\ 6 \end{bmatrix} = 5040 + 5040 = 10080.

Hence, the total cost, \[\mathbf{PAQ},\] will be Rs. 10080.

II. Conclusion

Here, we get the duality between profit and full employment aries and the social game is really played. The calculations become too complicated for a literary exposition.

Hence, Duality a kind of dielectric, imputation and a kind of ethics.

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