A GAME THEORETIC INTERPRETATION OF THE "WIN-WIN", "WIN-LOSE", "LOSE-WIN", AND "LOSE-LOSE" DECISION OUTCOMES IN A COLLEGE'S BUDGET ALLOCATION

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ABSTRACT

In this paper, we consider the problem of apportioning a finite set of resources among a number of involved parties. There may be a number of ways to accomplish this. The question is how to make this operational. One way is to quantify concession. When a party makes a concession, it is accepting a concession procedure in lieu of the procedure that is providing it the maximum payoff. The difference in payoffs between what a party's maximum payoff and the payoff resulting from the concession procedure is the opportunity loss, which we refer to as that party's regret. With the same reasoning as in minimizing the sums of squared residuals, for example, in least-squares estimates of coefficients in regression analysis, our goal is to find a way of apportioning the finite set of resources among involved parties such that the sum of squared regrets for the parties involved is minimized. In other words, we are looking for a procedure that minimizes the variance of "regret" of the parties. Furthermore, it turns out that, when the problem is posed in a game-theoretic framework, the best procedure, as defined above, can be interpreted as the Nash equilibrium. The importance of this study is that it provides a well-structured operational tool for team decision-making based on an analytical framework.

We first present a general algebraic model of the hypothesis for consensus in team decision-making, and show that this hypothesis can be interpreted as a Nash equilibrium involving mixed strategies. We define the solution to this model involving consensus among all parties as the "win-win" decision. We then seek the antithetical model of the problem, and define the antithetical solution as the "lose-lose" decision. Next, we extend the model to solve for situations in which a majority or minority group determines the outcome of the problem, and show the solution outcomes are cases of "win-lose" and "lose-win" decisions. By means of an illustrative but real case example of budget allocation among department chairs in a college of business administration, we show the properties of regret, payoff variance and strategy selected beginning with the case of win-win decision, followed by the intermediate continuum cases of win-lose, lose-win, and ending with the case of the lose-lose decision.

The efficacy of actual team decisions cannot be assessed unless there are standard benchmarks to compare them with. By mapping out the properties of the cases for the "win-win", "win-lose", "lose-win", and "lose-lose" conditions as a continuum of decision outcomes, we now have a continuum of standard benchmarks by which to judge the efficacy of the actual decision selected by a team, by locating its approximate place in the continuum of the decision outcomes developed by our models.