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THE TIMING AND STABILITY OF REACTIONS TO MARKET STRUCTURE IN A SINGLE PLAYER SIMULATION ENVIRONMENT

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INTRODUCTION

As widely accepted as simulation games are, a persistent issue questions the effectiveness and the validity of this form of learning. Effectiveness has been addressed in dozens of empirical studies while validity continues to be the focus of current research. This paper describes a controlled experiment investigating the adaptive behavior of single-player simulation teams to the environment created in the simulation competition, a necessary condition for simulation model validity.

PURPOSE

The nature of the decisions made during a simulation game can be influenced by the dynamics of the game used, the company's changing state within the context of the simulation, the decisions and the performances of competing companies, the objectives of the game, and the capabilities of the participants. Nevertheless, the simulated environment too must be considered and, *ceteris paribus*, players' decisions should reflect or adapt to the simulation environment. And, if the participants in a simulation game make decisions that are consistent with the environment with which they must contend, when during the simulation does such learning take place and *how stable* is this newly acquired knowledge in a competitive situation which pits players against one another?

To investigate these concerns, a controlled experiment, using the marketing simulation game entitled LAPTOP: A Marketing Simulation (Faria and Dickinson 1987), was carried out in a principles of marketing course. The identified simulation can be parameterized in such a way so as to define, from a marketing perspective, two theoretically meaningful and distinctly different environments necessary for the specified data.

METHODOLOGY

When initializing a new LAPTOP competition, the game administrator can specify the weights of the demand-affecting strategy elements using an index ranging from 1 (low importance) to 10 (high importance). In the present study, the parameter-weighting feature of the simulation was used to define two distinct environments. One environment resulted in a situation that would reward the use of a "pull" strategy while the second environment resulted in a situation that would reward the use of a "push" strategy.

The simulation competition executed in the present study involved 50 undergraduate students enrolled in a one-quarter principles of marketing course. In order to carry out the study, ten industries of five companies each were formed. Six industries (i.e., 30 companies) were randomly assigned to the "push" environment and four industries (i.e., 20 companies) were randomly assigned to the

"pull" environment condition. Each of the students in the class was then randomly assigned to a single-player company. Ten decisions were made in the competition.

DISCUSSION

The overall results of the study indicate that, throughout the game, the participants in the pull environment were not making operational and strategic decisions, which were significantly different from those being made by the participants in the push environment. After Trial Period 1, only 2 of the 99 comparisons are consistent with expectations and 1 is inconsistent with expectations.

The higher request for price research during Real Period LI and the higher print advertising expenditures during Real Period 5 by the pull environment companies versus by the push environment companies would suggest that the companies were correctly adapting to the environments with which they had to contend. However, the fact that the push environment companies spent more on trade advertising during Real Period LI indicates a failure to correctly adapt to the environment.

The fact that no significant differences were uncovered during Trial Period 1 at least indicates that no differential biases existed at the outset of the game.

In total, the results of the study fail to provide support for the general hypothesis that, if marketing strategy formulation in a simulation game is an internally valid experience, then the nature of the decisions should gravitate toward the more important strategy elements. One reason for such an outcome may be due to the fact that single-player teams were used instead of multiple-member teams. The almost total absence of any evidence of adaptive behavior under this type of gaming situation may indicate that single-player teams are ineffective decision-making units. Future research needs to investigate the performance of single-player versus multiple-player teams. It may be that same-team player interaction is an important factor in the decision-making process.

The nonsupportive results of the study may also be a function of the length of the game run, the capabilities of the student participants, and/or the performance objectives of the game. A longer game or the use of advanced marketing students may have led to more positive results. Using different performance objectives might have also led to more positive results. By using earnings per share and market share as the performance objectives, the participants in the game may have focused more on their competition than on the general game environment, since all that was required was for the team to beat the competition versus adapt to the environment, i.e., the game parameters. Further research addressing each of these concerns is underway.