Game Theory-based Investment Strategy vs. Buy-And-Hold: Which Optimizes Profits?

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In this investigation, an active investment strategy based on the principles of game theory was tested against the passive strategy of buy-and-hold to determine which was more effective. Investing is crucial for many demographics; retirees with a limited source of income, or those saving for retirement, often invest in the stock market. Prospective and current college students may invest as a means of increasing their financial resources in order to save for the future. 30 years of daily historical data from the S&P 500 Index was downloaded. In Microsoft Excel, the game-theory investment strategy was implemented, where when the prices were above the 200-day moving average of the prices, the investor “bought and held” the stock, but when the price fell below the moving average, the investor sold the stock, or “got out” of the market. The percent return was calculated for each year. The percent return of the buy-and-hold strategy was calculated in the same way, where the investor held the stock throughout the entire year. Ultimately, buy-and-hold yielded a higher profit both on average for all 30 years and in total. However, the active investment strategy effectively limited loss in four years of economic downturn, or recession. A two-sample t-test was performed on the average yearly profits for the two strategies and it was determined that the p-value was greater than the significance level of 0.05. Thus, there was a high likelihood that the results were due to chance, and should there have been a larger data set, the active strategy might have yielded a more similar return. The null hypothesis was supported and the research hypothesis, that the game-theory based active investment strategy would be more effective, was rejected.

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