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TALKING POINTS

Student uses signal processing to analyze investment choices

Taking a page from quantitative financial analysis in the news lately, senior Electrical Engineering major Ivan Bercovich is conducting an experiment for his honors capstone thesis using an engineering technique known as signal processing to compare stock market investment strategies.



The question is whether one can earn more, with lower risk, over 20 years by investing a lump sum all at once or gradually over time, a strategy known as dollar cost averaging, which some say can reduce exposure to risk from market volatility. "It's rare to find numerical support for either strategy," Bercovich says. "My objective is to perform a series of statistical analyses to identify a quantitative reason to choose one over the other."

Rather than using signal processing to analyze more conventional engineering problems such as radio-frequency signal and noise variations, the Jamaica Plain senior is using it to look at about 100 years of stock market closing prices for the Dow Jones Index and 50 years for Standard & Poor's 500. Running the model 10,000 times for each investment strategy, he notes, "we look at market fluctuations as frequency and volatility as the noise," he explains. "In studying volatility I'm really trying to determine how noisy the market is."

In preliminary analyses, Bercovich characterized the volatility (standard deviation) of dollar-cost averaging and found that it is indeed lower, on average, than a lump sum investment. "Now what I hope the analysis will reveal is the significance of this difference in investor risk, along with a way to minimize it while maintaining a good return." Bercovich hopes a clear difference will emerge as he completes the study in May.

Bercovich is advised by Dennis Goeckel, professor of Electrical and Computer Engineering.

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