1142-91-248 **Remy Wu***, CRG, Cresskill, NJ, and **Richard Kyung**, CRG, Cresskill, NJ. *Study on Stock Market Patterns with Economic Fluctuations Using Statistical and Computational Simulations.*

While both the casual investor and large hedge funds thrive off booms in the stock market, the effect that a crash has on society as a whole is much more extreme. Recently, there have been many historic stock market crashes, such as those in 2002 and 2008. These stock market crashes create wide scale unemployment and send waves of fear through the world of business.

Although depressions have many different causes, they can be predicted through certain patterns in P/E Ratio, Nasdaq, and VIX. We used many different types of statistical and computational theories to find patterns in these data. Time series analysis allows us to account for the dynamic fluctuations in the stock market and analyze the sequential data. If trends from the time series analysis are too noisy, smoothing is used to distinguish the signal and the noise. Curve fitting allows for the extrapolation of data points, therefore calculating return periods that can be used to predict stock market crashes.

This research identifies different return periods for stock market crashes based on their size. These patterns can be used to estimate how often a crash of a certain magnitude occurs, helping mitigate its effect on society. (Received September 05, 2018)