Modeling US Stock Market Data With A Superposed Ornstein-Uhlenbeck SDE driven by a Lévy process.

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Abstract

Understanding stock behaviors may benefit not only investors but also help governments to track economic growths of their countries. This speaks to the many existing and ongoing research on forecasting of financial markets. Research works in these areas have shown that in most cases data arising from financial indices usually deviate from normal behavior. Thus, they are best modeled with non-Gaussian processes (Mariani et. al (2020)). In Mariani et. al (2015) and Habtemicael et. al (2014), the background driving process (BDLP) of the SDE was a gamma process. In this work we propose a superposed stochastic differential equation of Ornstein Uhlenbeck (OU) type driven by an Inverse Gaussian process (BDLP). We apply this model on four stock indices from the US stock market and compute error estimates to check the performance of our model.

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