STAT 251 Project Proposal: IPO Stock Return

Spencer Allgaier

Hudson Downs

There have been countless individuals and companies, humans and robots, who have attempted to predict the returns on the stock market over the years in search of financial gain, albeit unsuccessful. Even if the individual stock values cannot be precisely predicted, assumptions on the average return for a homogenous group of stocks can be made with Bayesian statistics. An Initial Public Offering (IPO) is the first opportunity the public has to buy stock from a company and is particularly volatile in price, meaning that the variance is high and therefore similar across most IPOs, even being unknown. The average return for the first day of an IPO stock is also unknown which creates a high risk, high reward opportunity *if* the average return is positive. This model will compare the means and variances of two populations: first day return on IPO stocks in 2019 (%) and single day return of non-IPO stocks in 2019 (%). By using Bayesian methods to determine the mean and variance for the return on this specific class of stock, we can successfully create a plan to return consistent yields (based on the law of large numbers) on the short-term stock market.

**Problem of Interest:**

Random Variables:

Parameters:

**Define the Model:**

Likelihood:

Prior Distribution:

The average return on the stock market historically has returned an average of about 10% annually (0.0027% daily), but year-to-year returns are highly variant, which is why we chose these prior parameters.