To: Professor Titman, Sury, Muthuraman

From: Amrit Sandhu, Rukh Aga

Re: Updates on our stock trading idea; NYSE Delistings

DATE: 20th Feb 2023

# Objective

The correctness of our algorithm is important. This week we spent much of the time verifying that the outputs we generated last week were accurate.

We discovered a bug in the code that was causing abnormally high returns in all the periods.

Whenever we make a single trade for a stock, the returns we calculated were accurate. But when we made more than one trade the returns for subsequent trades were higher than expected. This was because we were using an array to store the daily stock returns from whenever a trade was made. But this array was never reset before making another trade, so when we were calculating the returns for a second trade, they were in fact the returns for the first and second trade combined.

# Generating stock data

To verify that our algorithm was generating returns that were correct, we decided to feed it the dummy data we generated ourselves. We would know the correct returns beforehand (since we made the data ourselves).

# How the data was generated

We started off by making data daily return data for the Fama French three factors and the risk-free. We then use these returns to formulate returns for any fake stock by having random factor loadings on the three factors.

## Daily return for the Fama French three factors

## Stock returns

# Observation

The returns that the algorithm outputs are very close to the expected returns for each stock. They are not exactly similar because when we generate our returns we add some random noise to them.

But when the random noise is removed the algorithm outputs match the expected returns exactly

|  |  |  |
| --- | --- | --- |
| **Ownership Bins** | **E(r) 30-day** | **Algorithm output** |
| 0-20% | 0.742 | 0.742 |
| 20-40% | 0.874 | 0.874 |
| 40-60% | 1.074 | 1.074 |
| 60-80% | 0.676 | 0.676 |
| 80% + | 0.742 | 0.742 |

Results from our tests

# Results from actual stock data

After confirming that our algorithm is calculating returns correctly, we reran it on actual stock data for the $5 threshold.

Table

Description automatically generated

30-day returns by ownership percentage (Returns are in %)

Table

Description automatically generated

90-day returns by ownership percentage (Returns are in %)

Table

Description automatically generated

180-day returns by ownership percentage (Returns are in %)