**Goal:** Replace manual business decisions by scientific decisions on choosing portfolio and buying/selling mutual funds. Trading mutual funds only leverages professional stock traders but keeps minimal risk.

**Assumptions**:

1. Analysis is only for mutual fund.
2. The expected growth and variance for a mutual fund are the same as the average and variance of its last 3 year history.
3. Every buy of a mutual fund should be $2500 to maximize the # of mutual funds. As mutual fund is already not risky, no other risk (covariance matrix) is considered.
4. Income is highly correlated to prediction. The focus of this strategy is predict mean and variance so that we can buy in at low price and sell at high price.

**Strategy:**

Start with empty portfolio and certain cash. Buy the first assert if it’s significantly lower than its past 3 year average performance. If there are multiple asserts that are lower than its average price, choose the best rewarding (relative difference of current price and expected price) one. When there are n assets in the portfolio. Check every asset in the portfolio every day whether it is significantly higher than the expected price. If it is, sell it; otherwise, keep it. Check every asset outside the portfolio whether it is significantly lower than the expected price. If yes, use the remaining cash to buy the most rewarding ones until there is no cash or there is no asset that’s significantly low.

On average, if every fund is traded in and out once per two month with 5% gain, we’d expect 34% annual increase. If it’s 4%, 26.5% annual increase is expected.

**Measure of success:**

The ratio of net income by applying this strategy and the net income by choosing the predicted best rewarding funds. The goal is this value is greater than 1.5.

**Definitions:**

Significantly lower/higher price: Fit 3 year data with linear regression. Assume the difference of price and the linear regression is normally distributed. Any price that’s outside 2 sigma is a significant price. Significant prices are irrelevant to how rewarding it is. It is just a flag to tell that I need to think about selling or buying this stock.

Rewarding index: (expected price – current price – transaction fee) / (current price)

Best rewarding fund: fund with the largest rewarding index

**Experimental results:**

Applying this strategy to 2014 200 funds yields to 17% more income from 7.76% to 9.09%. The problem becomes how to capture the fluctuation