

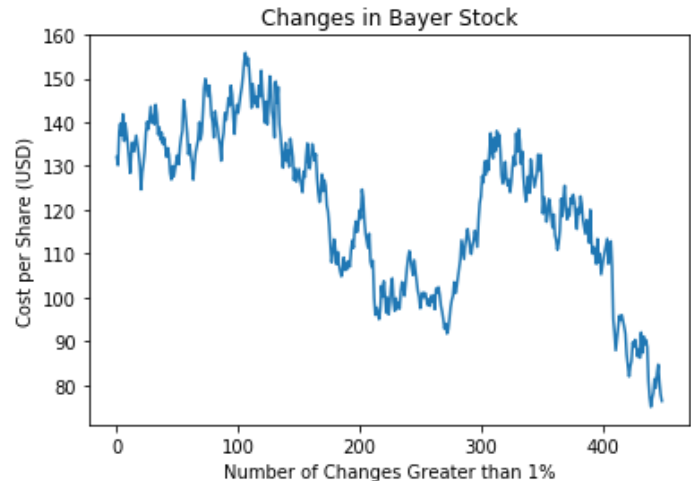
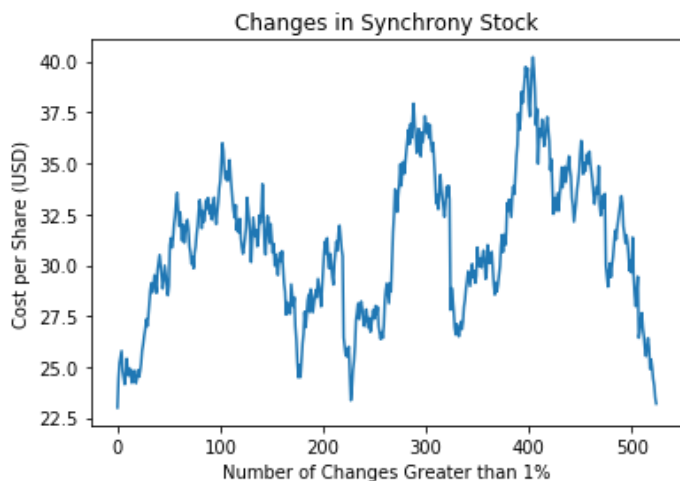
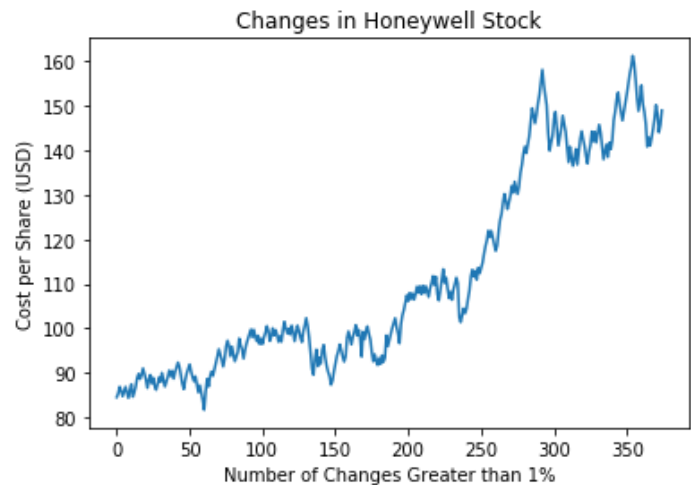
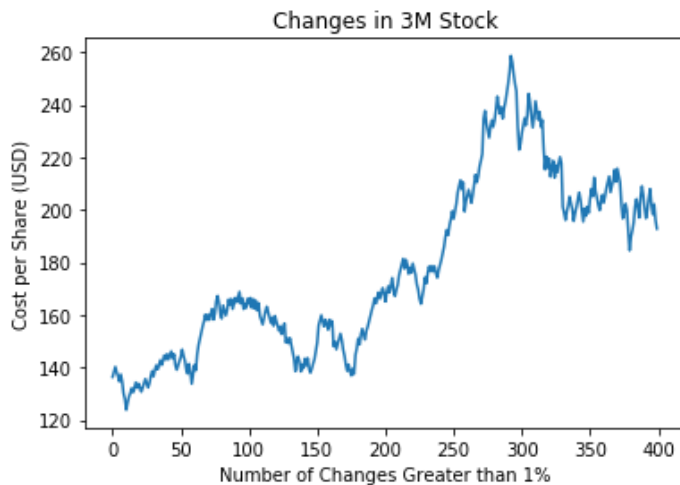
Team 20 Business Thesis

Based on the results, it is recommended to invest in **Synchrony** because of the stock's low volatility to date, its consistent cycling and current position on the cycle, and the tested model accuracy to this stock.

Looking at data going back five years from January 1st, 2019, the standard deviation for the four companies can be seen below in the table, along with their means and how much the variance weights over the mean. From this table, Synchrony is seen to have the least volatility over the past five years as the variance around the average value of the stock was about 12%.

Company	Mean	Variance	Variance/Mean*100
3M	176.79	30.02	16.98%
Synchrony	30.99	3.66	11.81%
Honeywell	113.73	21.66	19.05%
Bayer	23.35	4.34	18.87%

Looking at data from all four of companies for the closing rate between 2014 and 2019 and plotting the closings that were greater than 1% from the previous closings, the Honeywell stock is seen to be the one that grew the most over the past four years. However, this implies that it is too late to invest into the Honeywell company. Instead, it would be better to invest in **Synchrony** as the company is cycling regularly between the highs and lows of their stock. For Synchrony, the company is at a valley or peak every 100 changes greater than 1%. With 500 being the next low, a peak is expected to occur at around 100 more changes. The tables are below.



After training a Geometric Brownian Motion (GBM) model on data from the past four years, the model was used to extrapolate on what is expected to occur in the first six weeks of 2019. The model's prediction was measured against the actual results from the first weeks of 2019 and verification of the accuracy of the model was measured by calculating the RMSE value between the GBM model and the actual values. The smaller the RMSE value translated to a more accurate representation of the predicted model and the actual data. Below are the graphs that were generated with the predicted model and the actual values, as well as the RMSE values for each of the graphs. As it can be seen, the RMSE value of Synchrony and Honeywell are low and would allow for the conclusion that the predicted model would be a good match for what happened. It would be recommended to invest in **Synchrony or Honeywell** for these reasons as they are the better two of the four that can be tracked with the GBM model that was used.

Company	RMSE with Unmodified Data
Bayer	12.46
3M	12.58
Synchrony	7.79
Honeywell	7.21

