S&P 500 Stock Data Analysis
(2013-2018 Historical Stock Data)

Data Analyst Team:

Nurcan, Kevin and Hamid
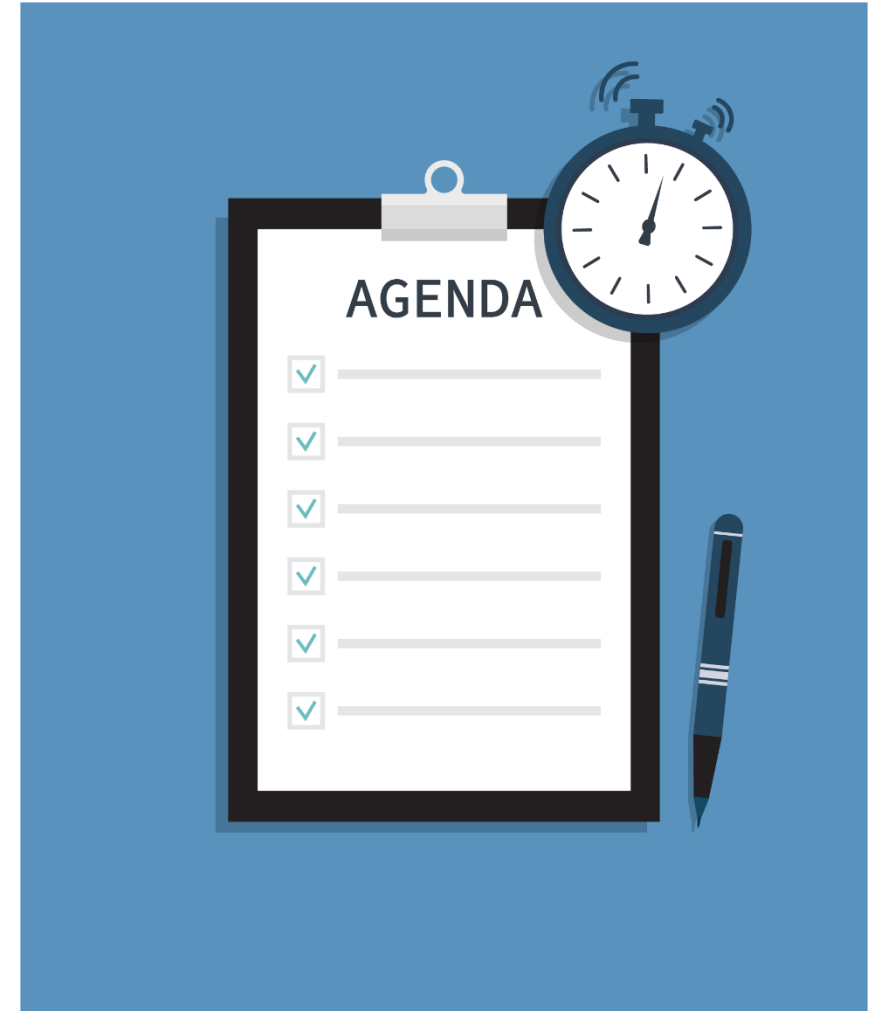
Note for the class

- Our finding are not based on our knowledge of financial analysis
- They are based on our research:
    - https://www.investopedia.com/technical-analysis-4689657
    - https://www.fool.com/investing/how-to-invest/stocks/how-to-research-stocks/
    - https://towardsdatascience.com/statistical-analysis-of-a-stock-price-e6d6f84ac2cd
- The recommendations might not be accurate
- Unnecessary financial definitions in presentation

Agenda

- Assumptions
- Objective
- Stock analysis methodologies
- Analysis outcome and findings
- Recommendations
- Future work

Assumptions

- S&P 500 Stock Data

- Data Period: 2013-2018

- Data Source: https://www.kaggle.com/camnugent/sandp500

- Financial Analysis Tools: Microsoft Excel

Objectives

- Have there any spikes or specific events happened in any stocks?
- If yes, do they really matter for our decision on our company's portfolio?
- Which stocks seem to be more attractive for our investment?
- Which stocks should we be in our portfolio to minimize our risk?

To have a reliable answer to the above questions, we have chose S&P 500 stock data for the past five years.

Stock Analysis Methodologies

- Fundamental Analysis
    - Based on valuation metrics and other information
    - For long-term investment opportunities

- Technical Analysis
    - Based on the stock price history
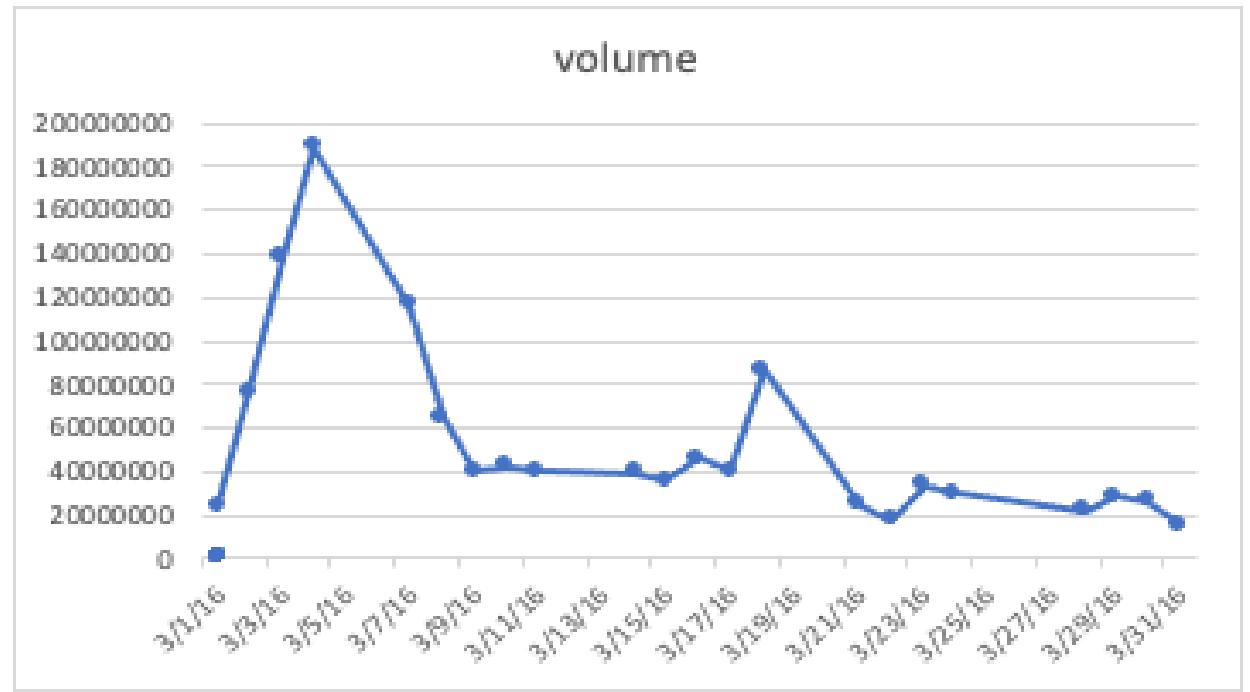   - For short-term investment opportunities

Our findings and recommendations are based on Technical Analysis methodology

Chesapeake Energy Corporation.

- High increase in the CHK opening and closing price on March 2, 2016
- Finding: Aubrey McClendon, former chief executive of Chesapeake Energy, was indicted on march 1st after a federal investigation into price-fixing, bid-rigging and other anticompetitive conduct in the oil and natural gas industry.
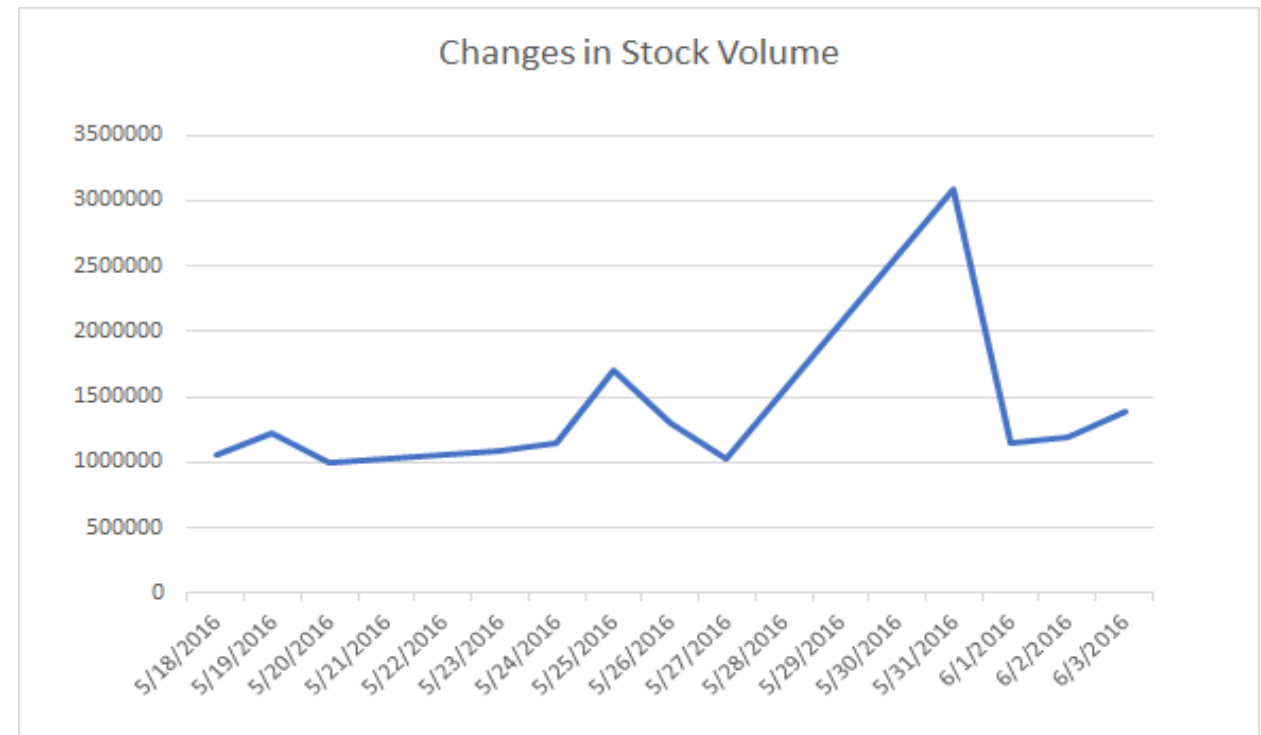
Alliant Energy Corporation Two-for-one stock Split

- High decrease in opening price and closing price of the LNY stock on May 19, 2016

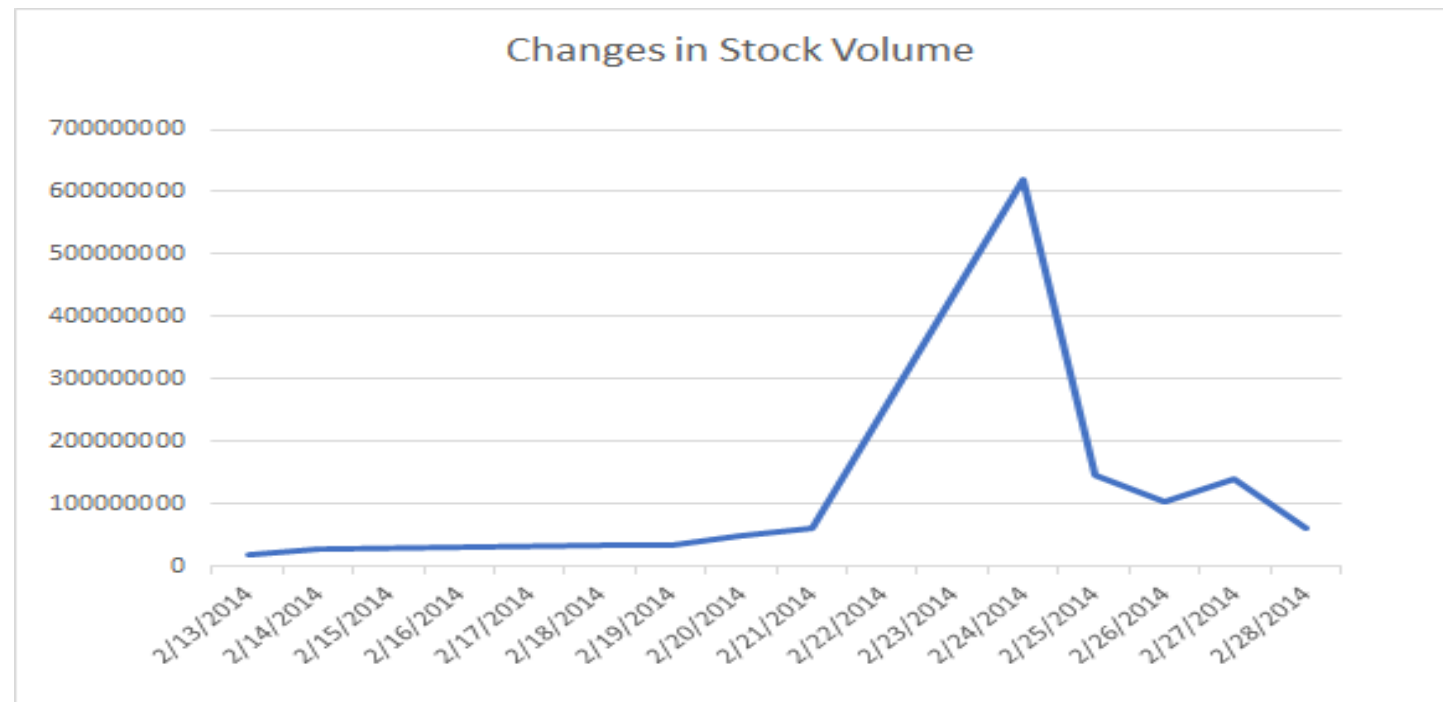- Finding: the company's board of directors declared a two-for-one stock split

https://alliantenergy.gcs-web.com/static-files/2436d22a-ac9c-48ca-bb06-0ad9cd4afecd

Changes in Stock Volume

VODAFONE Group Plc.

- The VZ had the greatest trading volume on Feb 24, 2014
- Finding: Verizon Communications Inc. announced that it had completed its acquisition of Vodafone Group Plc's 45 percent indirect interest in Verizon Wireless in a transaction valued at approximately $130 billion. Which led to an increase in their stock value.
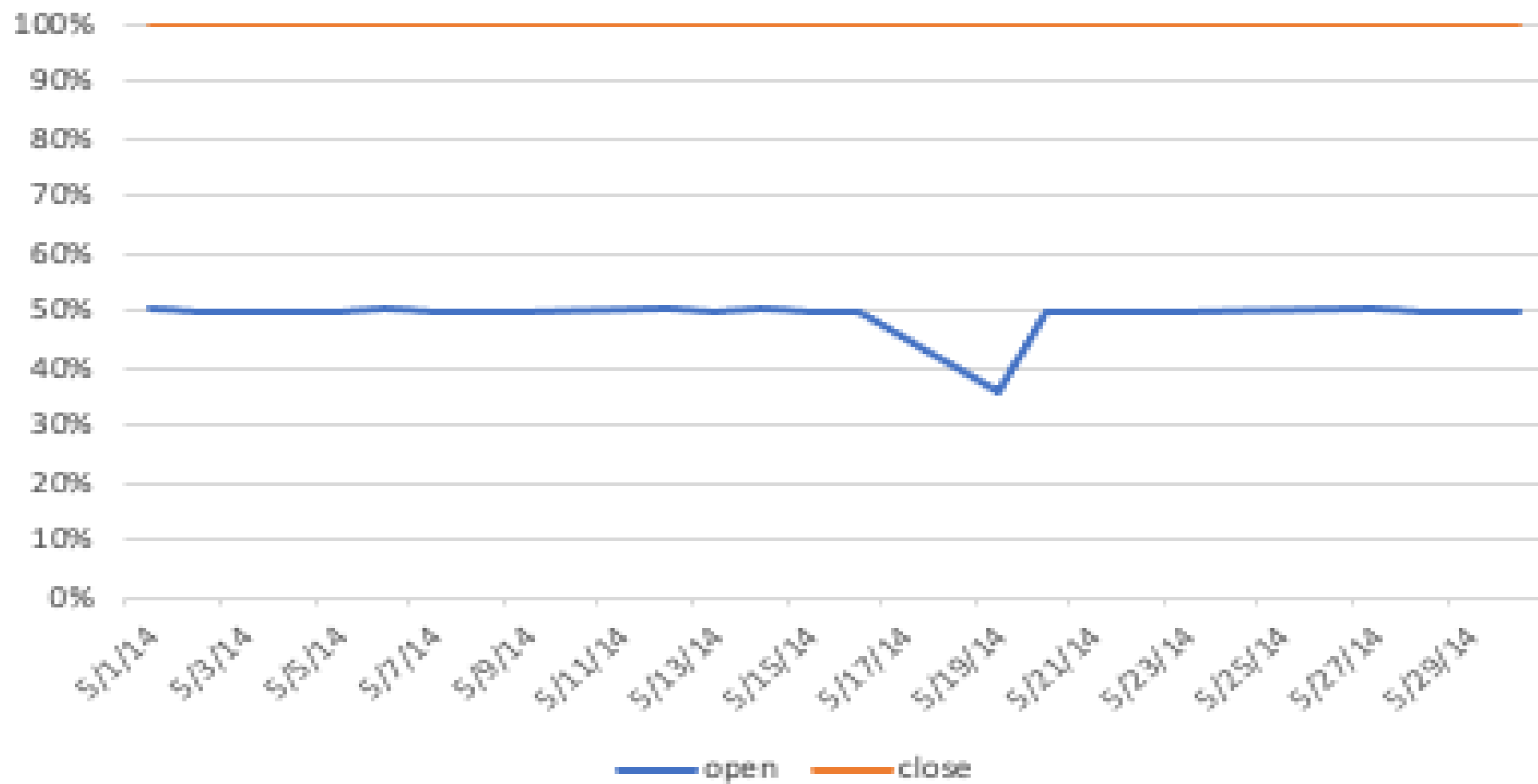
Church & Dwight Co.

- High decrease in the CHD closing and opening price on May 16, 2014 and May 19, 2014 (during the weekend)

- Finding: one of the main shareholder (Dwight) passed away

- But, the price adjusted itself in the next business day

| 5/16/2014 | 33.72 | 33.9 | 33.64 | 33.87 |
| 5/19/2014 | 18.77 | 33.95 | 33.7 | 33.9 |

Changes in Stock Volume

Legend: open, close
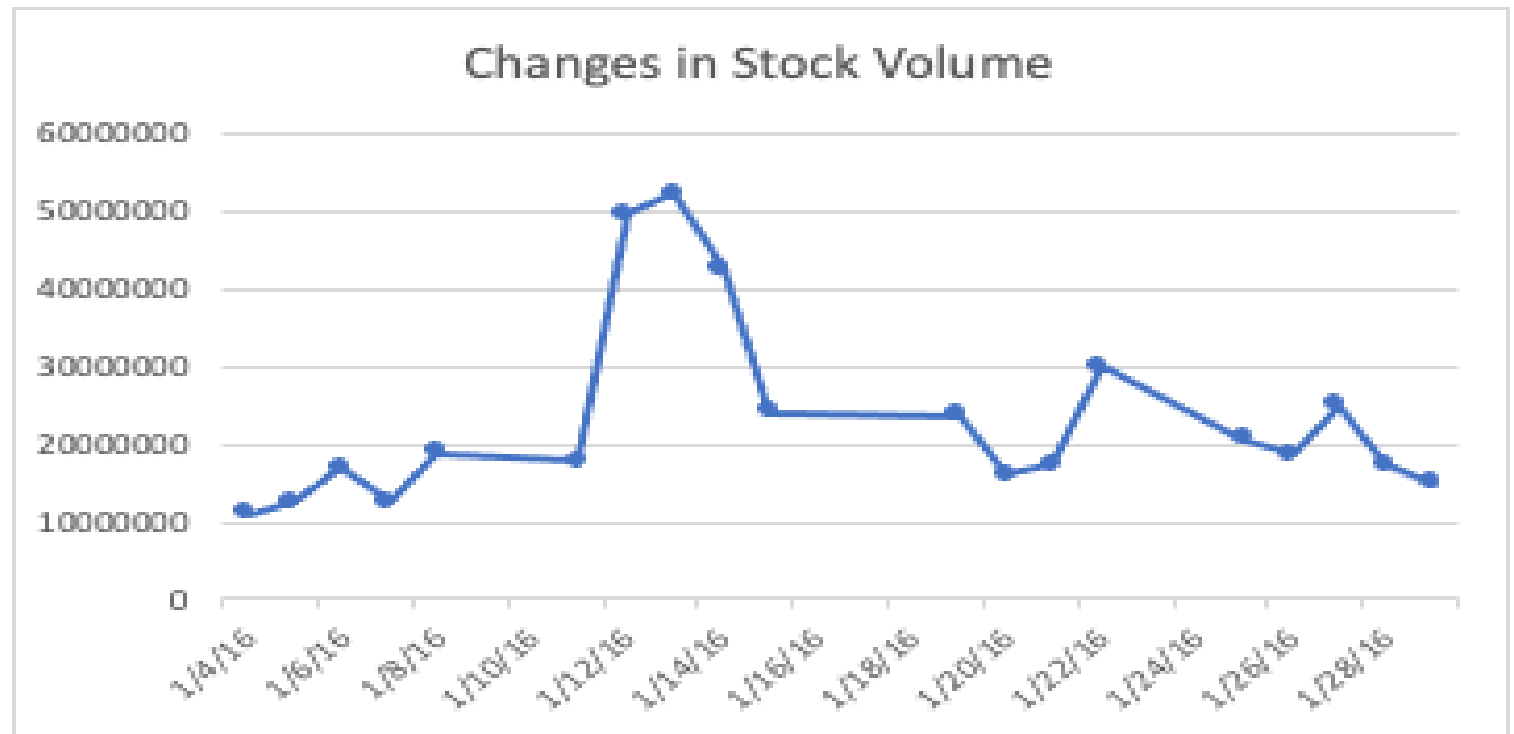
Williams Cos.

- High increase in the WMB opening and closing price on Jan 14, 2016
- Finding: WMB had a merger agreement with Energy Transfer Equity (ETE) that was terminated due to "failure of conditions under the merger agreement".
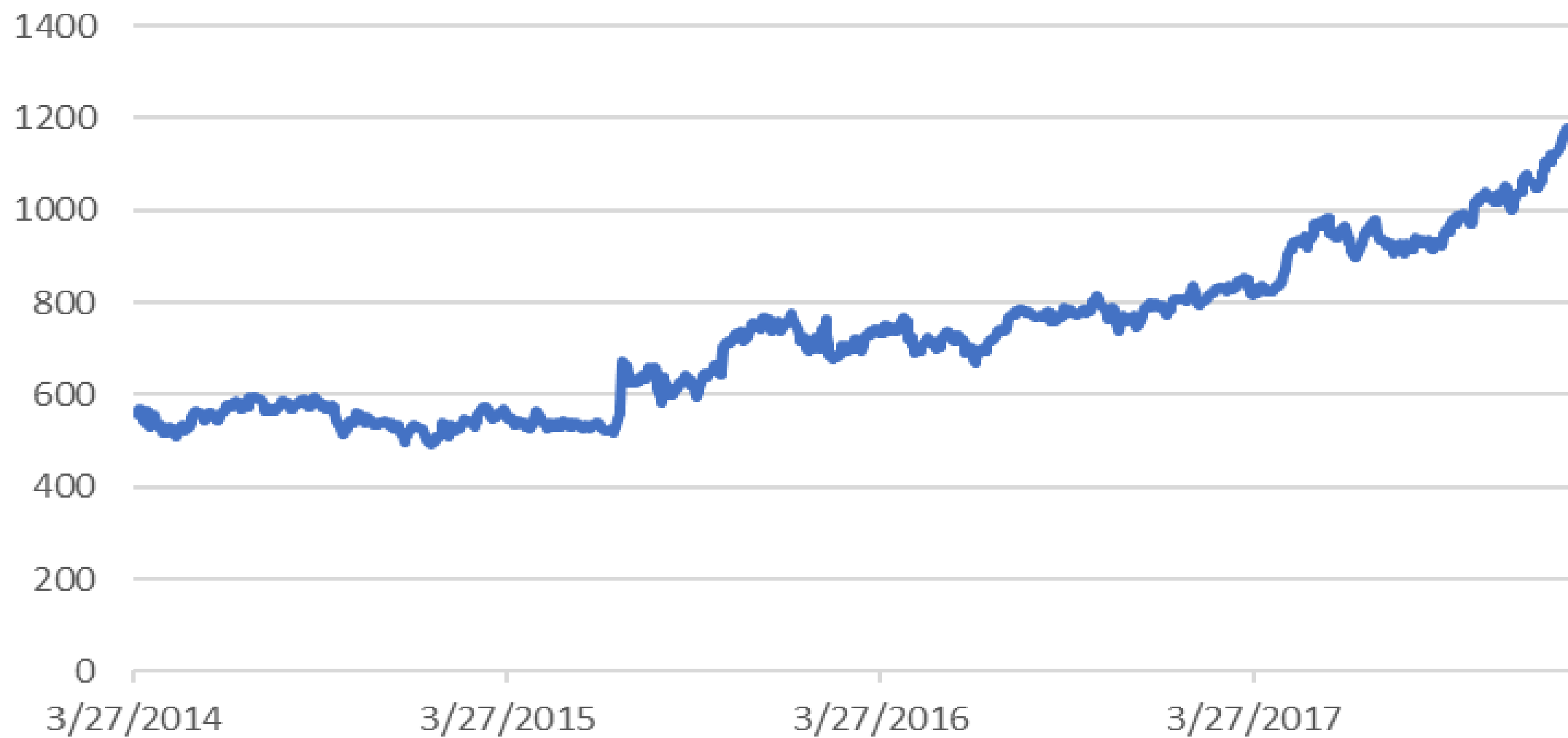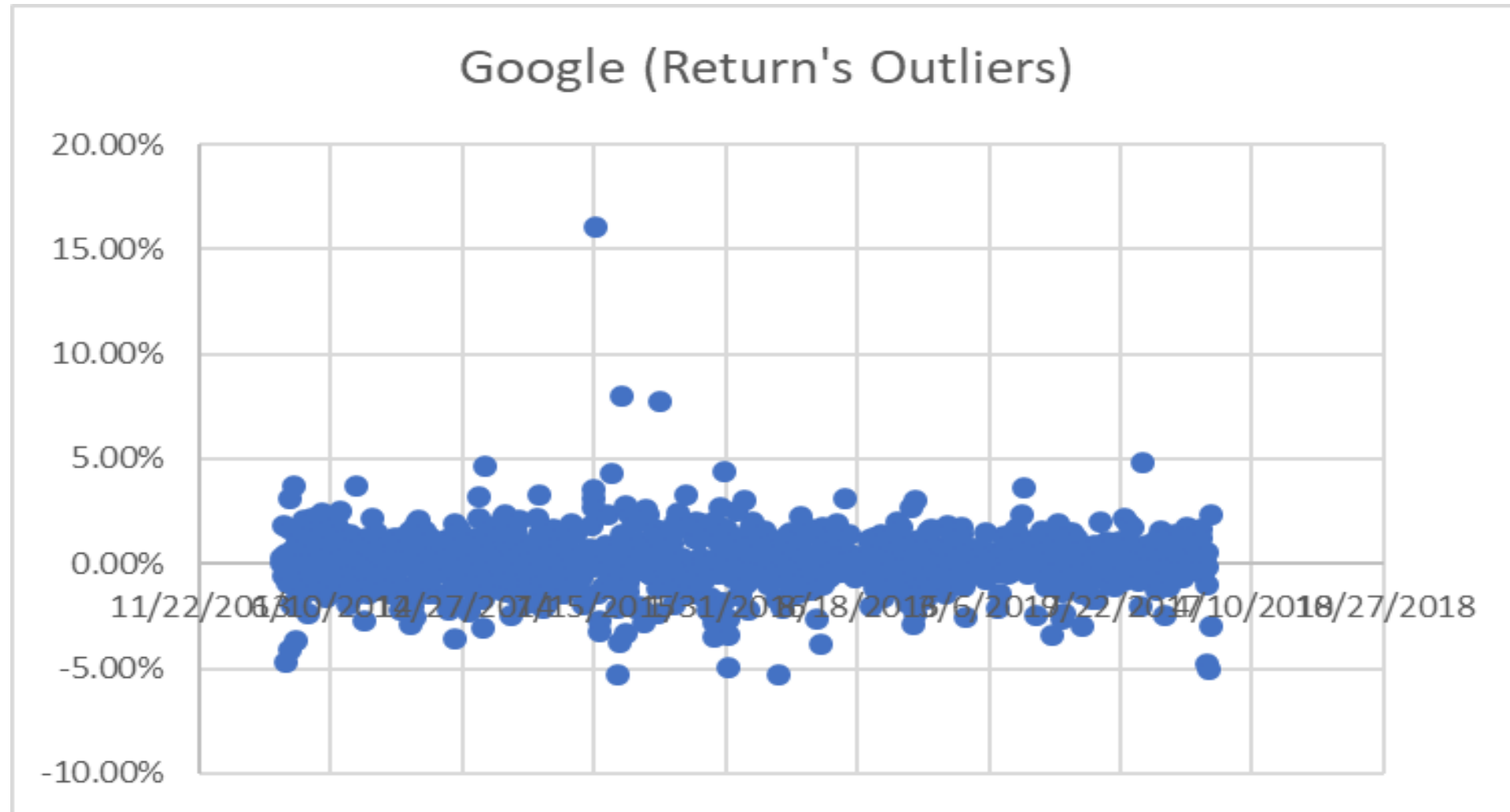- Purchase not recommended

Changes in Stock Volume

Google Stock Analysis

Stock Name	Google (Without Voting Right)	
Statistical Varibles	**Closed Price**	**Return**
Mean	725.40	0.07%
Standard Deviation	166.42	1.41%
Skewness	0.55	155.00%
Minimum	492.55	-5.32%
First Quartile	564.79	-0.57%
Median	720.64	0.05%
Third Quartile	823.33	0.77%
Maximum	1,175.84	16.05%
IQR	258.55	1.34%
Outlier Range (Low)	176.97	-2.59%
Outlier Range (High)	1,211.15	2.79%
Mode	554.90	0.04%
μ - σ (68%)	-	-1.33%
μ + σ (68%)	-	1.48%
μ - 2σ (95%)	-	-2.74%
μ +2σ (95%)	-	2.89%

Google (Closing Price)

Stock Soared 21.8% on July 17, 2015
The new CFO proposed traditional business strategy
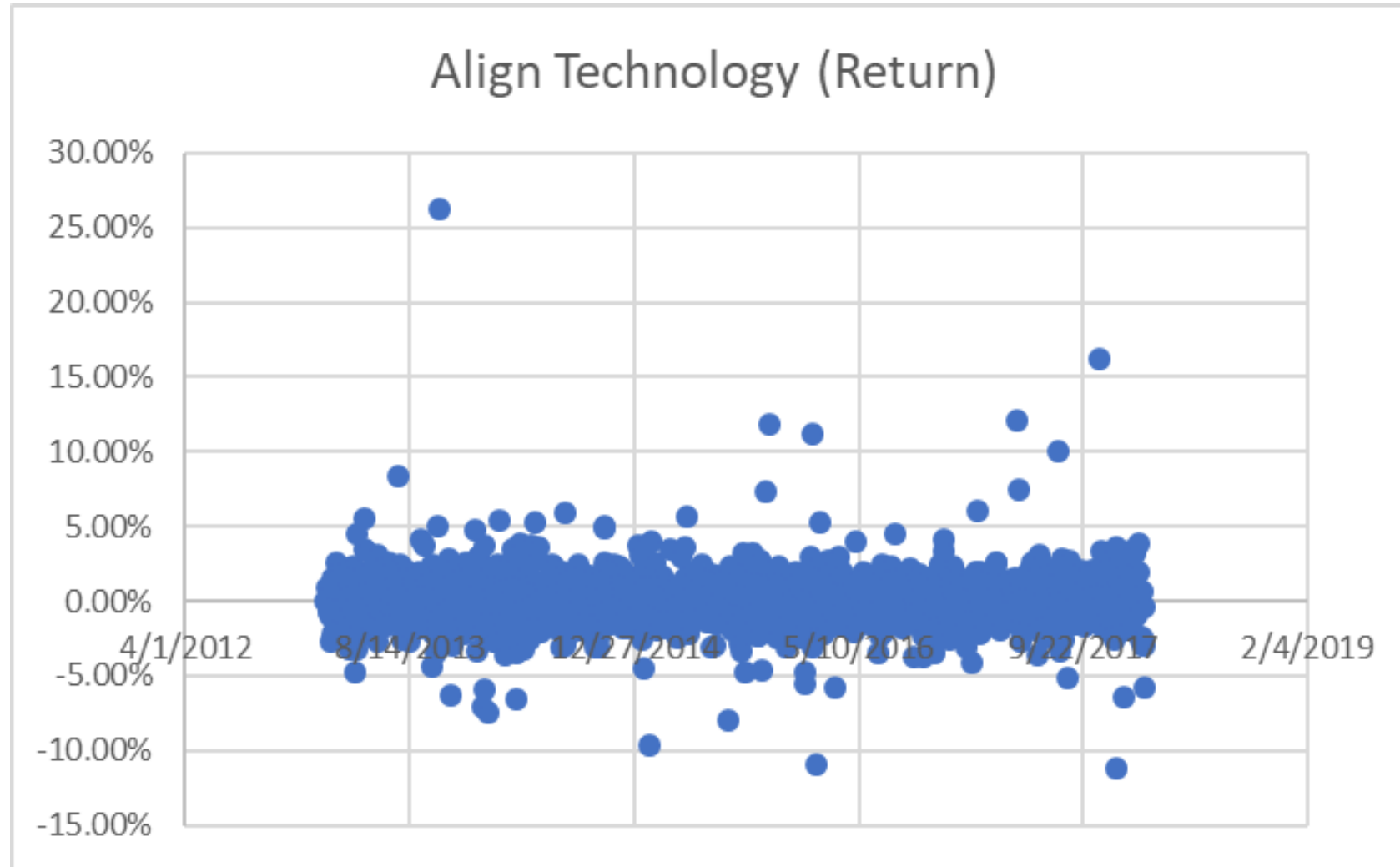keeping experimental projects at 10% budget.

Align Technology Stock Analysis

Stock Name	Align Technology	
Statistical Varibles	**Closed Price**	**Return**
Mean	83.66	0.18%
Standard Deviation	53.71	2.07%
Skewness	1.88	201.43%
Minimum	30.13	-11.13%
First Quartile	53.95	-0.81%
Median	60.88	0.15%
Third Quartile	93.76	1.11%
Maximum	283.97	26.24%
IQR	39.81	1.93%
Outlier Range (Low)	(5.76)	-3.70%
Outlier Range (High)	153.46	4.00%
Mode	55.13	0.04%
$\mu - \sigma$ (68%)	-	-1.89%
$\mu + \sigma$ (68%)	-	2.25%
$\mu - 2\sigma$ (95%)	-	-3.96%
$\mu + 2\sigma$ (95%)	-	4.32%

Align Technology (Closing Price)

Align Technology (Return)

This company owns Invisalign, shipments of Invisalign increased 15 percent while the gross margin increased by 250 points
giving investors confidence on its competitive position in the market.

Future Research and Final Recommendation

- Comparing 500 stocks in Python to find out choosing which stocks would reduce the risk of our portfolio

- As this team are not familiar with Python programming yet

Fire us and hire a new team

of Python Professionals