



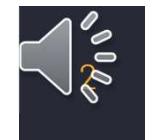
Share Price Volatility

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9/27/20



Agenda

- Problem and Hypothesis
- Data
- Weekly Volatility
- Correlations
- Cluster Analysis
- Conclusions





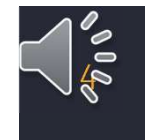
1. Background

Hypothesis and Problem Statement



Share Price Volatility

Two key components of many options pricing models include intrinsic value and time value.



Three Investigations

Relation to the VIX

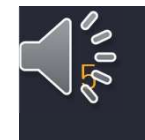
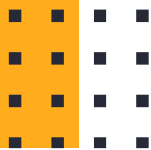
How did stock's weekly volatility change with respect to a common volatility index?

Correlated Stocks

Which pairs of companies exhibit similar volatilities?

Potential Clusters

Which shares exhibited similar volatility characteristics over the six-week period?





2. Data

Retriveal and Structure



Half Hourly Prices via Alpha Vantage

Methodology

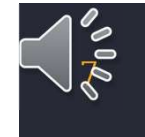
- Write Python code and run in PyCharm to pull data from Alpha Vantage's API.

API Restrictions

- Data for 5 stocks can be pulled per request.

Cautionary Note

- Pulling over 100 share prices without upgrading from the free Alpha Vantage account is TIME CONSUMING!





Data Structure

14 price points per day
6 weeks of data
120 companies

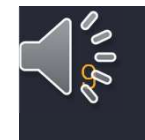
	A	F	G	H
1	date	AAL	AAP	AAPL
2	8/10/2020 10:00	13.9286	152.6933	112.4269
3	8/10/2020 10:30	13.98	152.1642	111.9189
4	8/10/2020 11:00	13.8803	151.8297	110.33
5	8/10/2020 11:30	14.12	152.264	111.4475
6	8/10/2020 12:00	14.1481	153.1925	112.0592
7	8/10/2020 12:30	13.865	153.4222	112.0125
8	8/10/2020 13:00	13.925	153.3323	112.685
9	8/10/2020 13:30	13.95	153.1825	112.765
10	8/10/2020 14:00	13.9601	152.7532	112.4887
11	8/10/2020 14:30	14.005	152.5935	112.7768
12	8/10/2020 15:00	13.983	152.1392	113.1325
13	8/10/2020 15:30	14	152.3339	112.495
14	8/10/2020 16:00	13.9981	153.0727	112.735
15	8/10/2020 16:30	13.92	153.0727	112.6125



Descriptive Data for the Companies

Web Scrape

- Symbol
- Name
- Sector
- Price
- Price/Earnings
- Dividend Yield
- Earnings/Share
- Market Cap
- EBITDA
- Price/Sales
- Price/Book





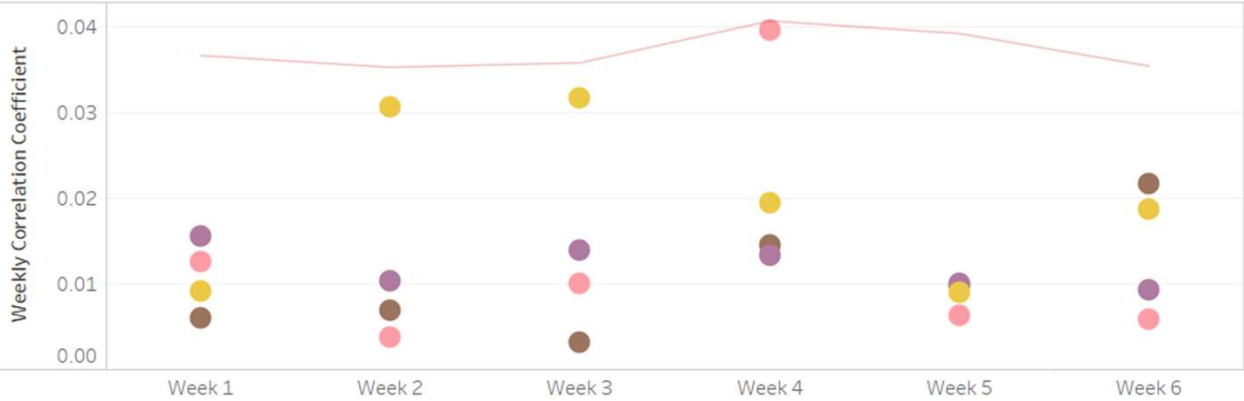
3. Weekly Volatility

How did vary from their mean price over 6 weeks compared to the VIX?

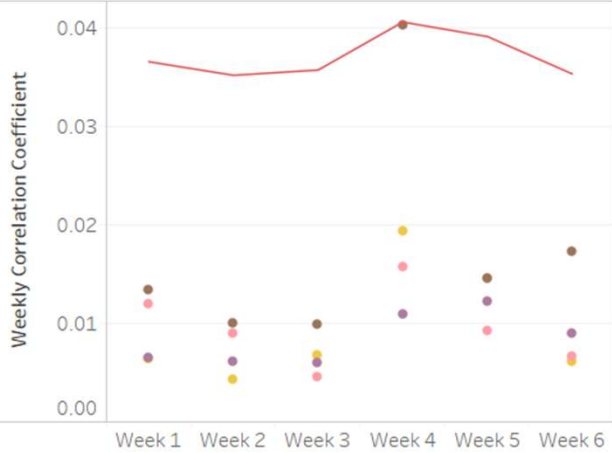




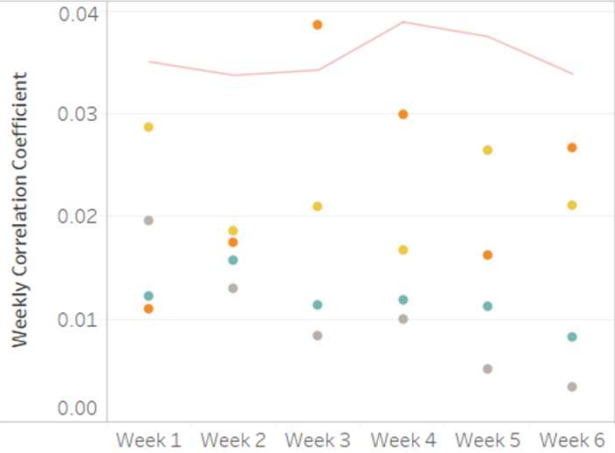
BKR, CDW, CPB, TMUS



ABBV, ABMD, ADP, A

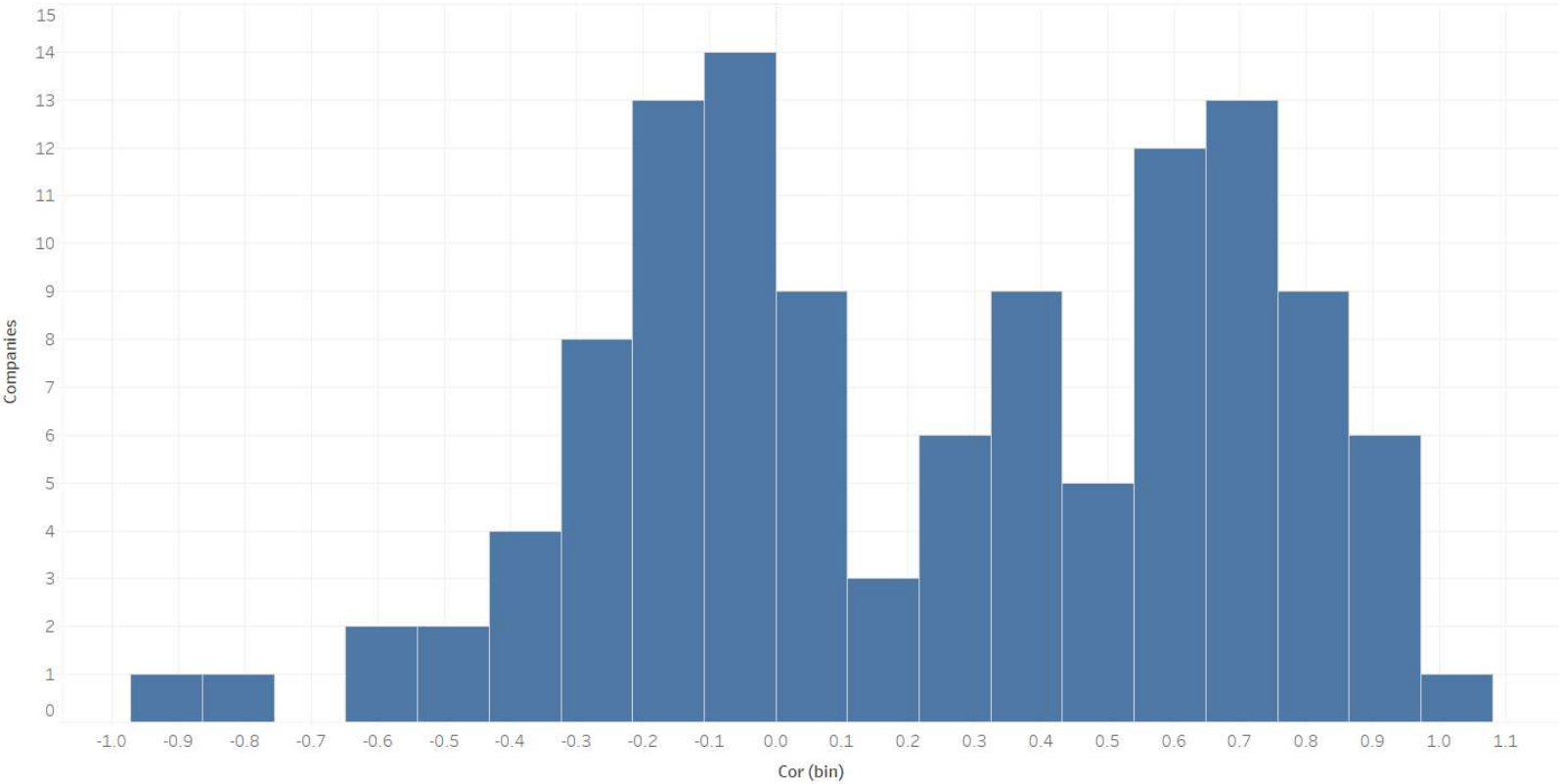


AAL, ADBE, AEP, IAU





Correlation Histogram



The trend of count of Cor for Cor (bin).





4. Correlated Stock

Which pairs of companies exhibit similar volatilities?



Highly Correlated Stocks

ABMD & ADSK & AMD

- ABIOMED Inc
- Autodesk Inc.
- Advanced Micro Devices Inc

APH & AFL & CL

- Amphenol Corp
- AFLAC Inc
- Colgate-Palmolive

AMZN & ACN

- Amazon.com Inc.
- Accenture plc



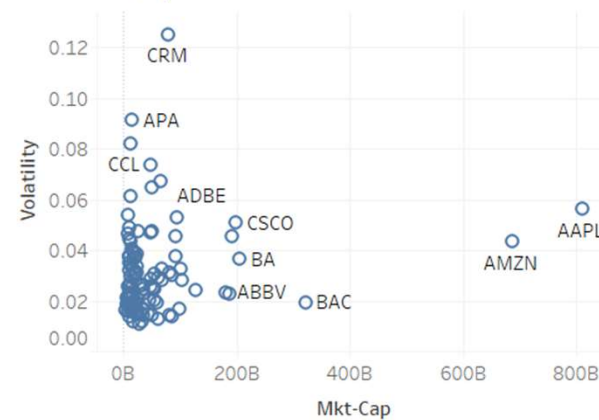


4. Cluster Analysis

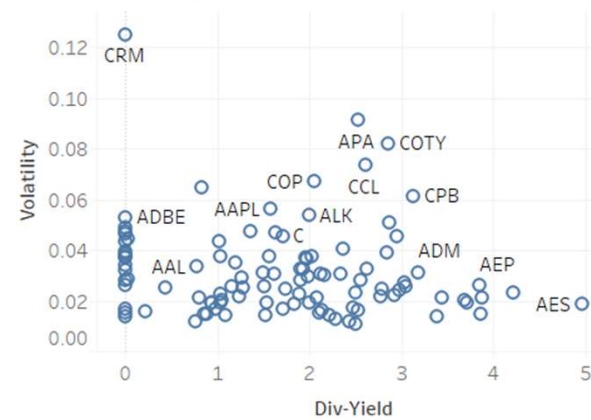
What kind attributes can be used to group these companies by volatility?



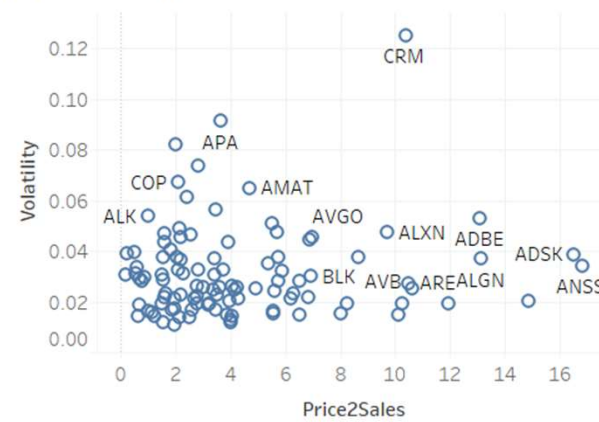
Market Cap



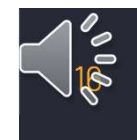
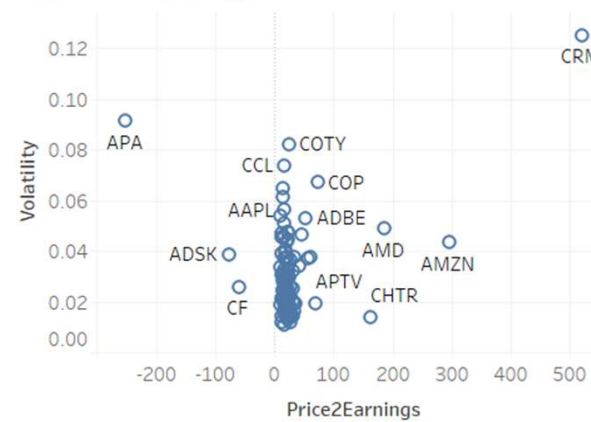
Dividend Yield



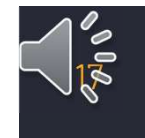
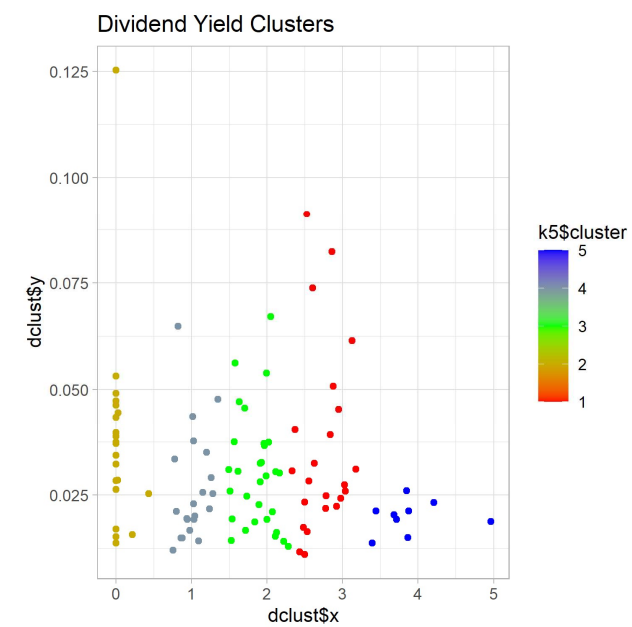
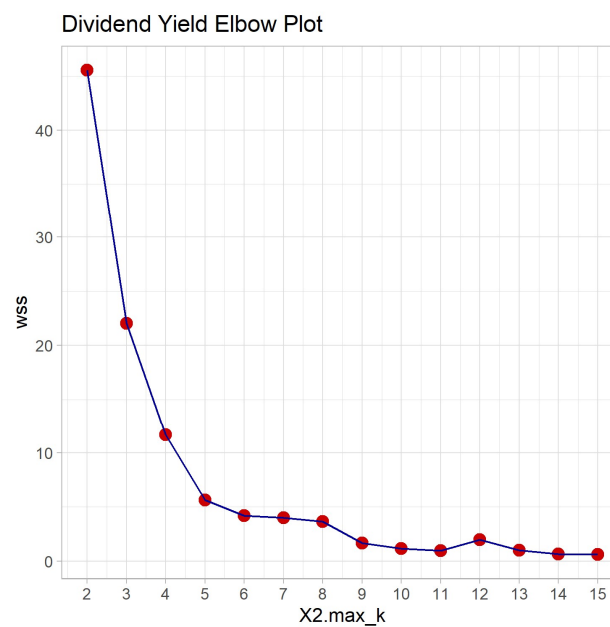
Price to Sales



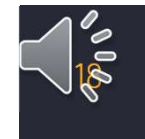
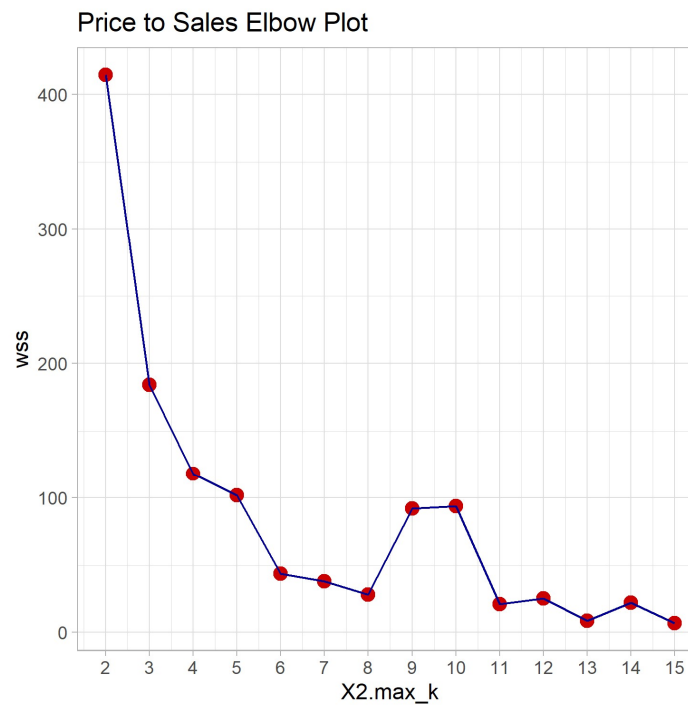
Price to Earnings



Clustering by Dividend Yield



Clustering by Price to Sales





5. Conclusions

What did we learn



Let's review some concepts

Weak Correlation Between Stocks

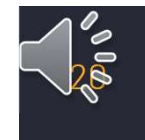
Stocks' volatility are not strongly correlated with each other.

Few Stocks Correlate with the VIX

Few stocks have a correlation with volatility indexes.

Clustering is Feasible

Clustering by Price-to-Sales ratio and Dividend Ratios is feasible.



Credits

Special thanks to all the people who made and released these awesome resources for free:

- Presentation template by [SlidesCarnival](#)
- Photographs by [Unsplash](#)

