

Presented by Pious Khemka and Vishesh Shukla

Navigating the Financial Tides

A Year in Stock Market Analysis



Purpose

To unravel the complexities of the financial markets.

Target Audience

Investors, traders, and financial professionals.

Approach

Rigorous data analysis and statistical techniques.

Objective

Provide actionable insights for informed investment decisions.



Goldman
Sachs

Companies

WELLS
FARGO



JPMORGAN
CHASE & Co.

**Goldman
Sachs**



BANK OF AMERICA

**WELLS
FARGO**

**JPMORGAN
CHASE & Co.**

About the Data

- Source : Yahoo Finance library
- Past 1 year Stock prices of 4 Financial firms
- Data includes columns like
 - Company name
 - Opening price
 - Highest price
 - Lowest price
 - Closing price
 - Adjusted Closing price
 - Volume of trade
- Data is already clean.



Sample data for JP Morgan Chase & Co.:

	Open	High	Low	Close	Adj Close	\
Date						
2023-01-03	135.240005	136.740005	133.889999	135.119995	130.404770	
2023-01-04	135.990005	137.679993	135.570007	136.380005	131.620789	

Volume company_name

Date	Volume	company_name
2023-01-03	11054800	JP Morgan Chase & Co.
2023-01-04	11687500	JP Morgan Chase & Co.

Sample data for Bank of America Corp.:

	Open	High	Low	Close	Adj Close	Volume	\
Date							
2023-01-03	33.230000	34.09	33.209999	33.509998	32.270802	35221500	
2023-01-04	33.900002	34.82	33.830002	34.139999	32.877502	41998500	

company_name

Date	company_name
2023-01-03	Bank of America Corp.
2023-01-04	Bank of America Corp.

Glimpse of the Data

Sample data for JP Morgan Chase & Co.:

	Open	High	Low	Close	Adj Close	\
Date						
2023-01-03	135.240005	136.740005	133.889999	135.119995	130.404770	
2023-01-04	135.990005	137.679993	135.570007	136.380005	131.620789	

Volume company_name

Date	Volume	company_name
2023-01-03	11054800	JP Morgan Chase & Co.
2023-01-04	11687600	JP Morgan Chase & Co.

Sample data for Bank of America Corp.:

	Open	High	Low	Close	Adj Close	Volume	\
Date							
2023-01-03	33.230000	34.09	33.209999	33.509998	32.270802	35221500	
2023-01-04	33.900002	34.82	33.830002	34.139999	32.877502	41998500	

company_name

Date	company_name
2023-01-03	Bank of America Corp.
2023-01-04	Bank of America Corp.



Questions

- What was the change in price of the stock over time?
- What was the daily return of the stock on average?
- What was the moving average of the various stocks?
- What was the correlation between different stocks?
- How much value do we put at risk by investing in a particular stock?
- How can we attempt to predict future stock behavior? (Predicting the closing price stock price of JPM using LSTM)

Exploratory Data Analysis

Descriptive Statistics:

	Open	High	Low	Close	Adj Close	\
count	1000.000000	1000.000000	1000.000000	1000.000000	1000.000000	
mean	138.073550	139.450020	136.833420	138.205210	135.177616	
std	122.976737	124.235936	121.893996	123.128558	120.184712	
min	25.320000	25.650000	24.959999	25.170000	24.796028	
25%	36.375000	36.960000	36.235001	36.582500	35.345244	
50%	88.019999	88.225000	86.514999	87.710001	85.799608	
75%	200.862503	202.584999	199.562500	200.202503	198.323601	
max	385.570007	387.760010	383.630005	386.410004	383.690943	

	Volume
count	1.000000e+03
mean	2.014586e+07
std	2.170095e+07
min	4.601000e+05
25%	5.641825e+06
50%	1.290320e+07
75%	3.006100e+07
max	2.184033e+08

Descriptive Statistics

Descriptive Statistics:

	Open	High	Low	Close	Adj Close	\
count	1000.000000	1000.000000	1000.000000	1000.000000	1000.000000	
mean	138.073550	139.450020	136.833420	138.205210	135.177616	
std	122.976737	124.235936	121.893996	123.128558	120.184712	
min	25.320000	25.650000	24.959999	25.170000	24.796028	
25%	36.375000	36.960000	36.235001	36.582500	35.345244	
50%	88.019999	88.225000	86.514999	87.710001	85.799608	
75%	200.862503	202.584999	199.562500	200.202503	198.323601	
max	385.570007	387.760010	383.630005	386.410004	383.690948	

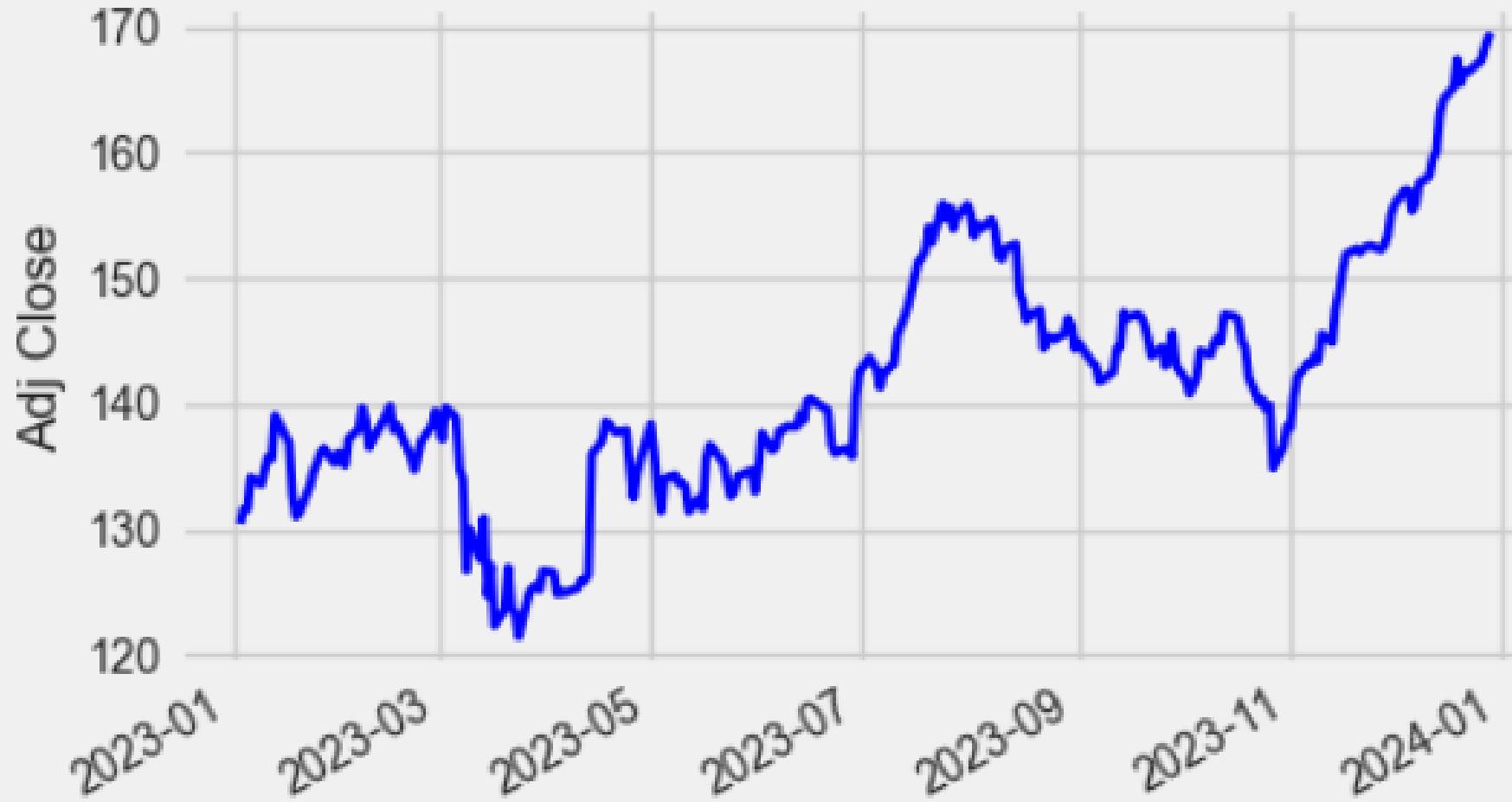
Volume

count	1.000000e+03
mean	2.014586e+07
std	2.170095e+07
min	4.601000e+05
25%	5.641825e+06
50%	1.290320e+07
75%	3.006100e+07
max	2.184033e+08

Change in Stock Price overtime



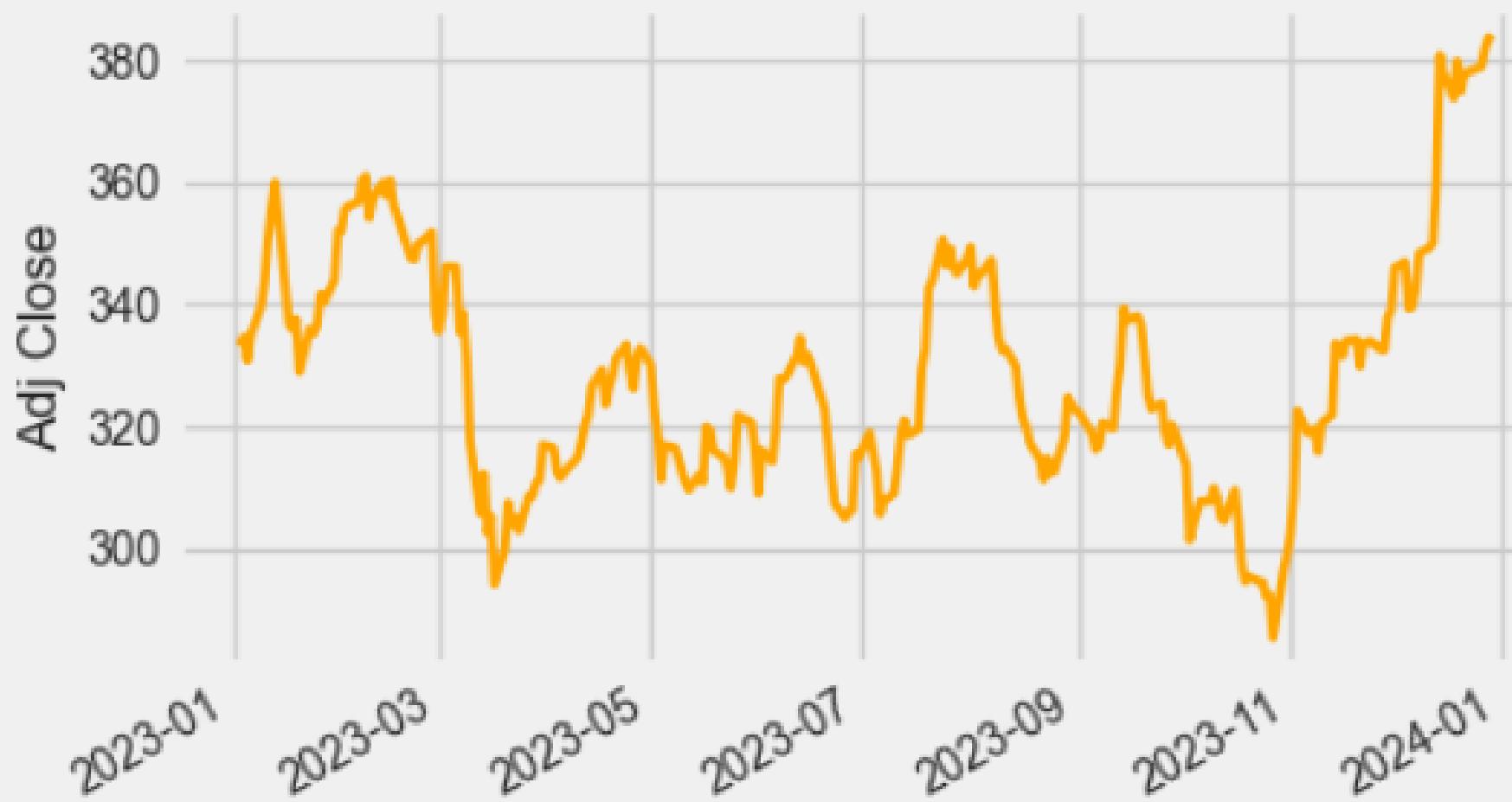
Closing Price of JP Morgan Chase & Co.



Closing Price of Bank of America Corp.



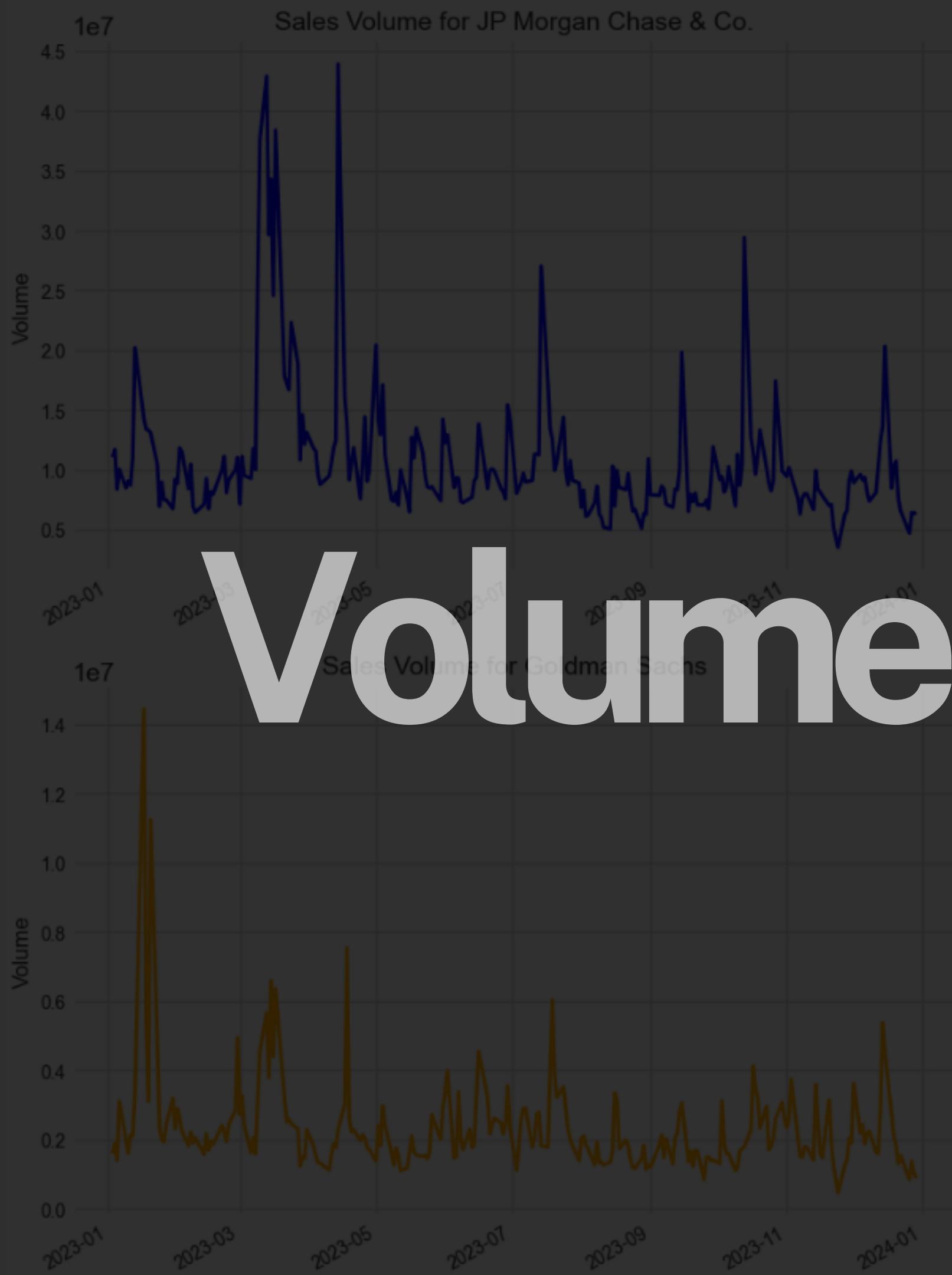
Closing Price of Goldman Sachs

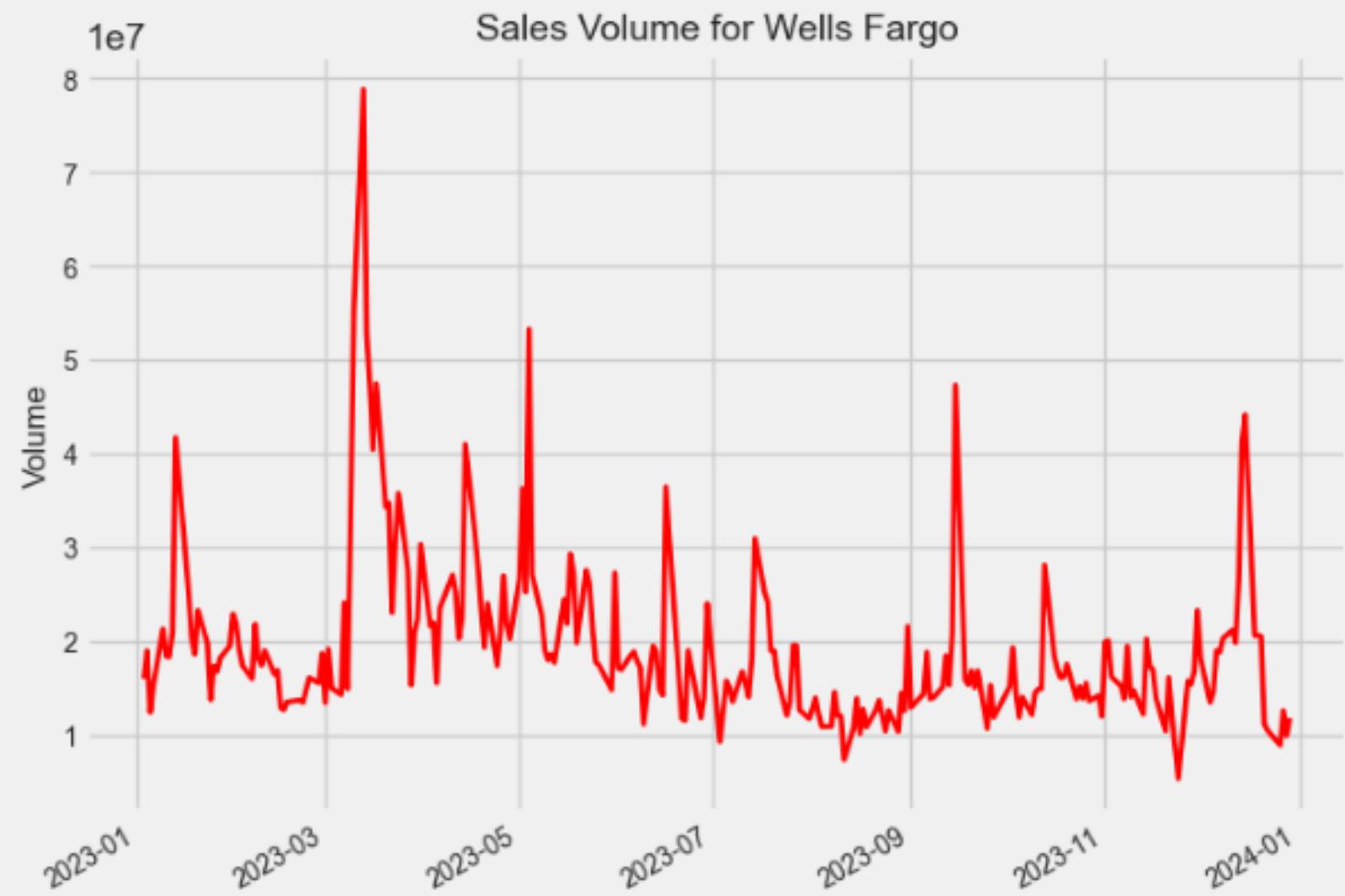
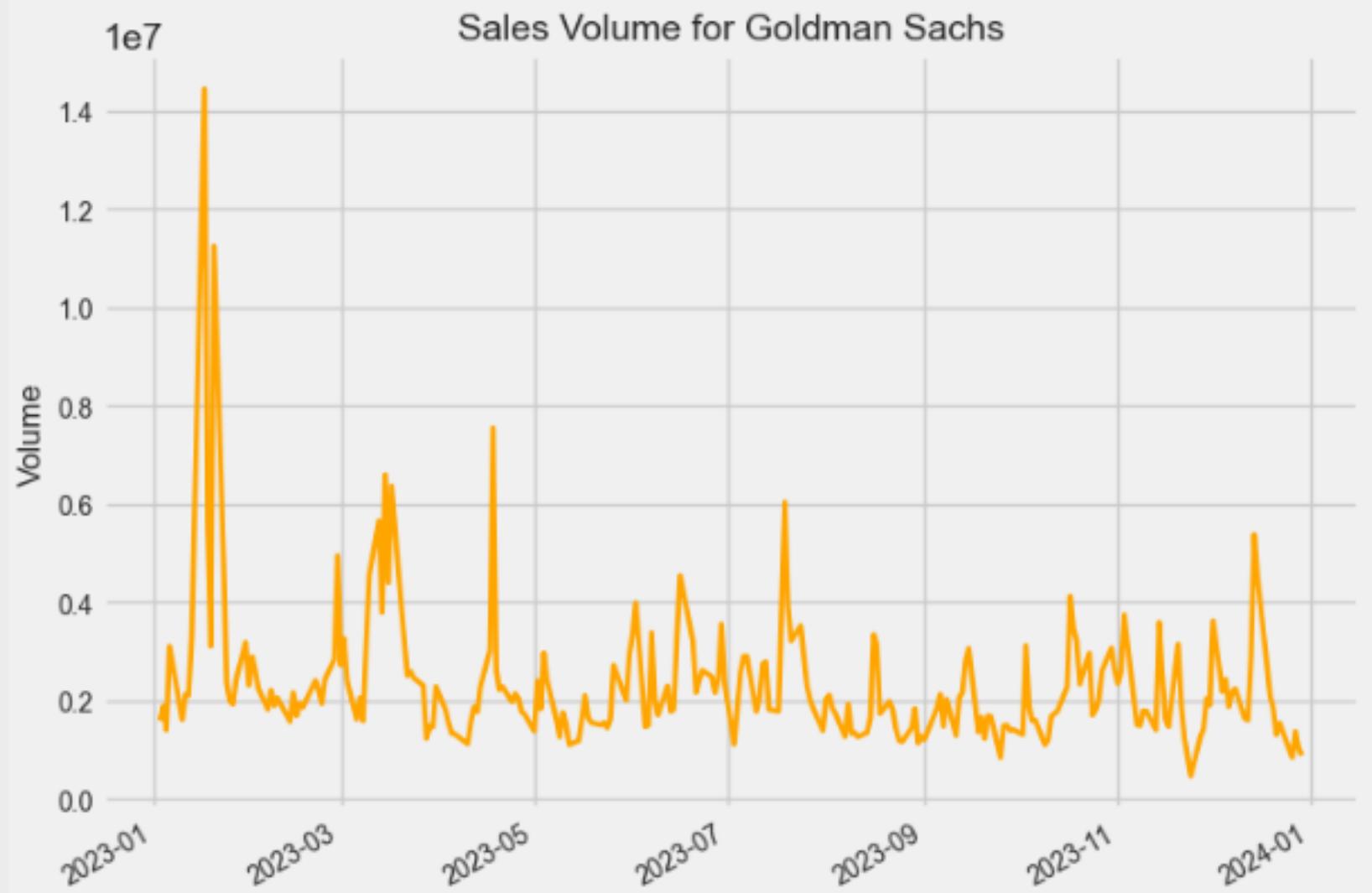
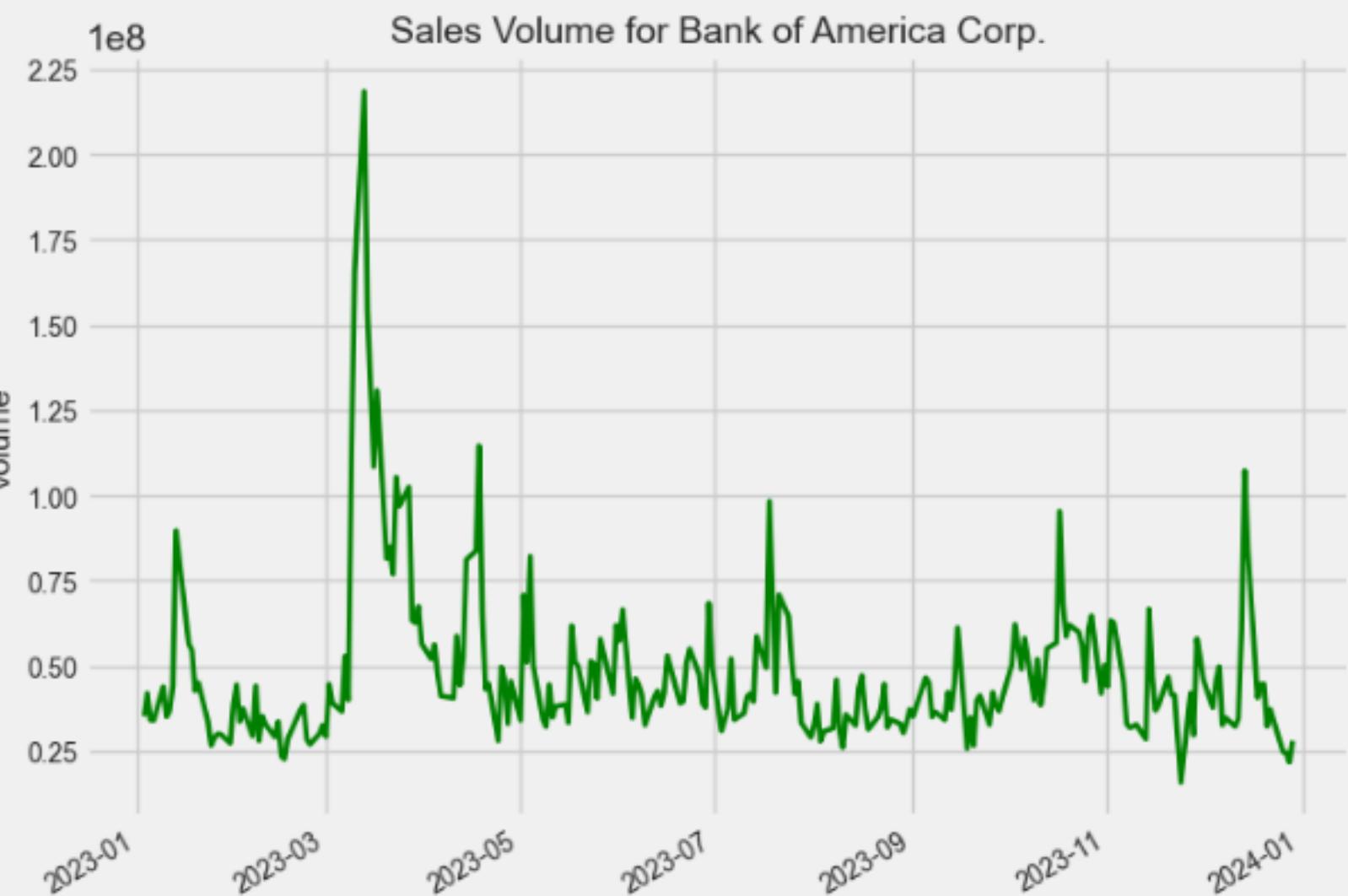
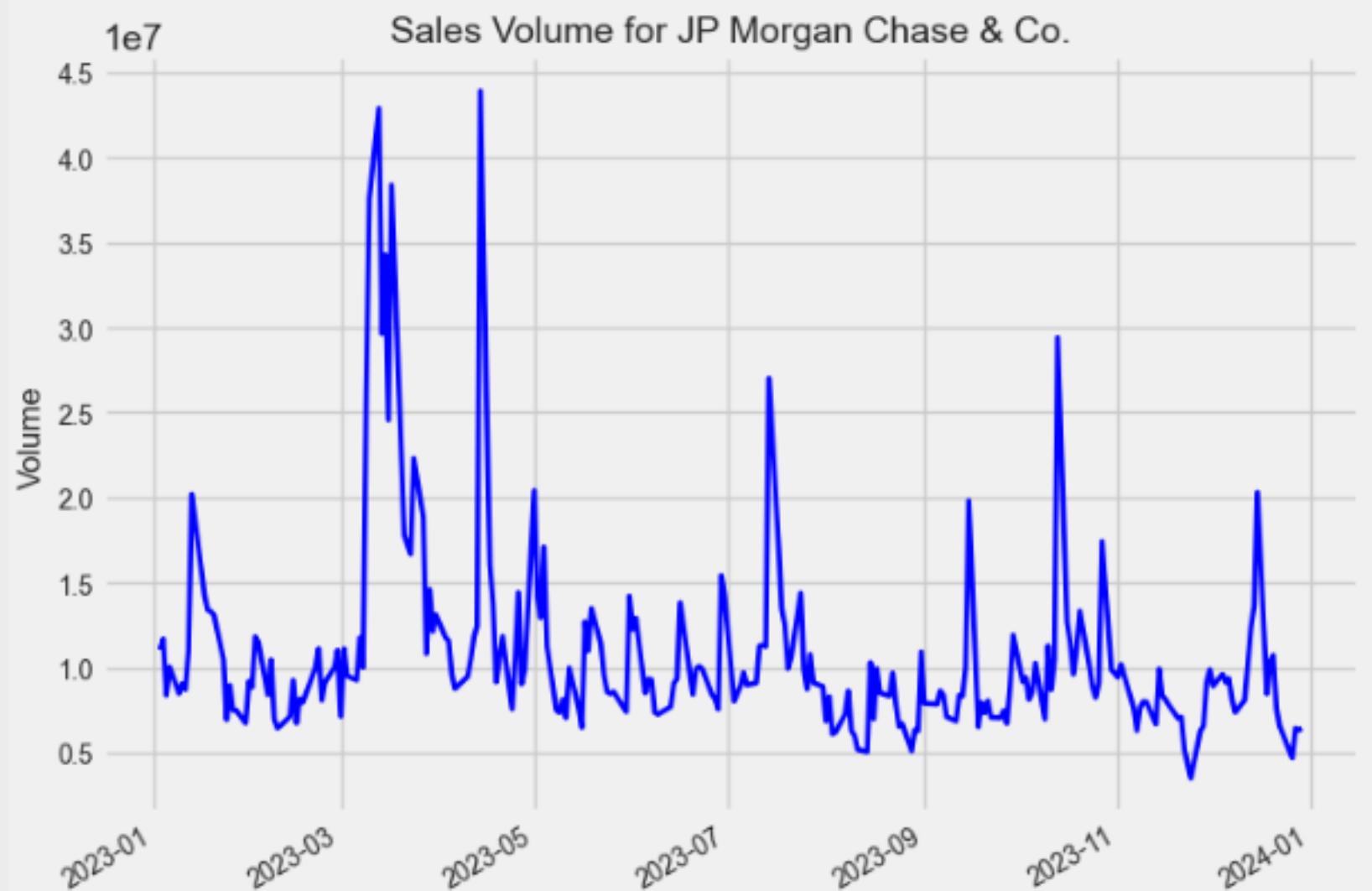


Closing Price of Wells Fargo



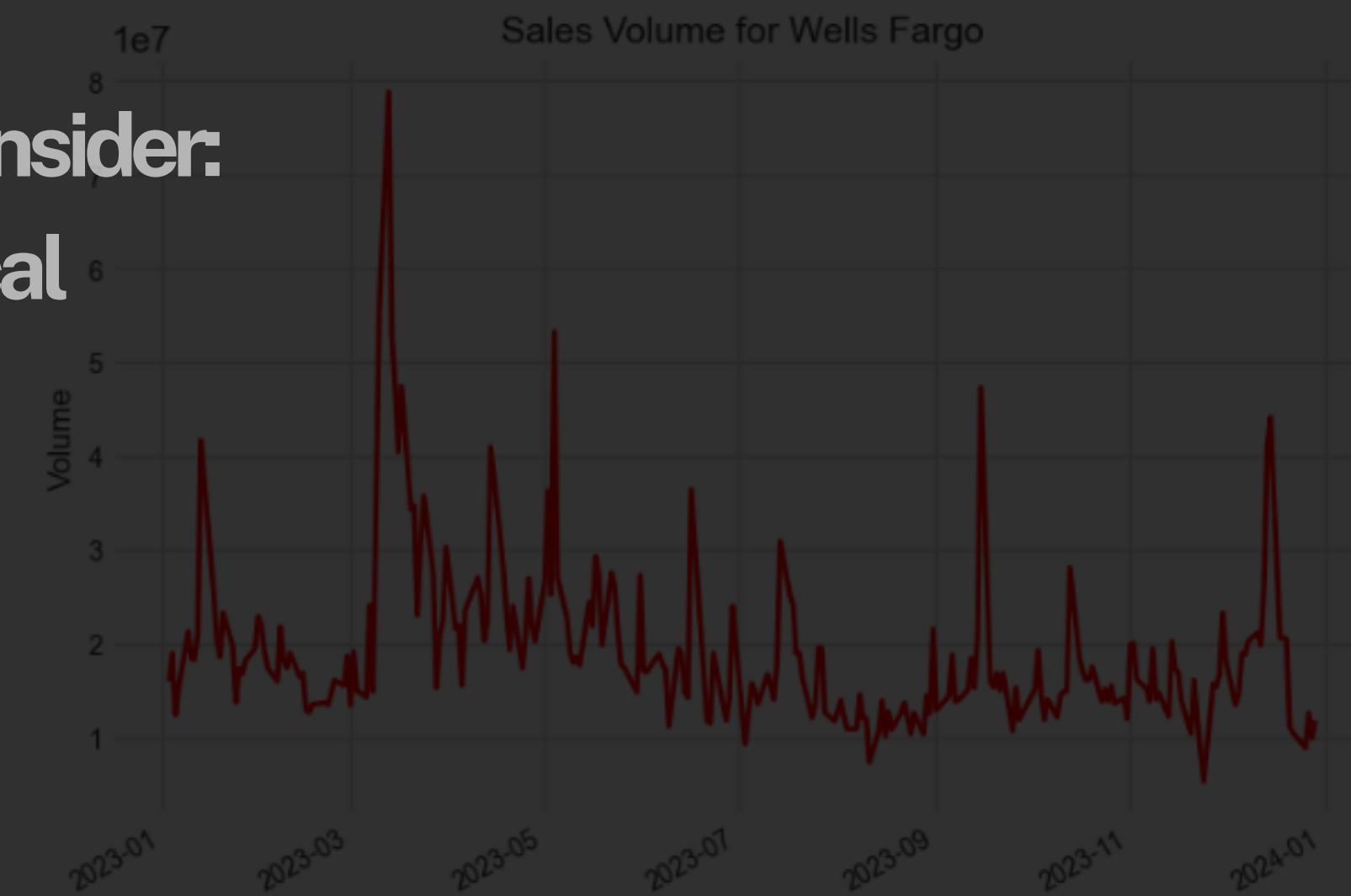
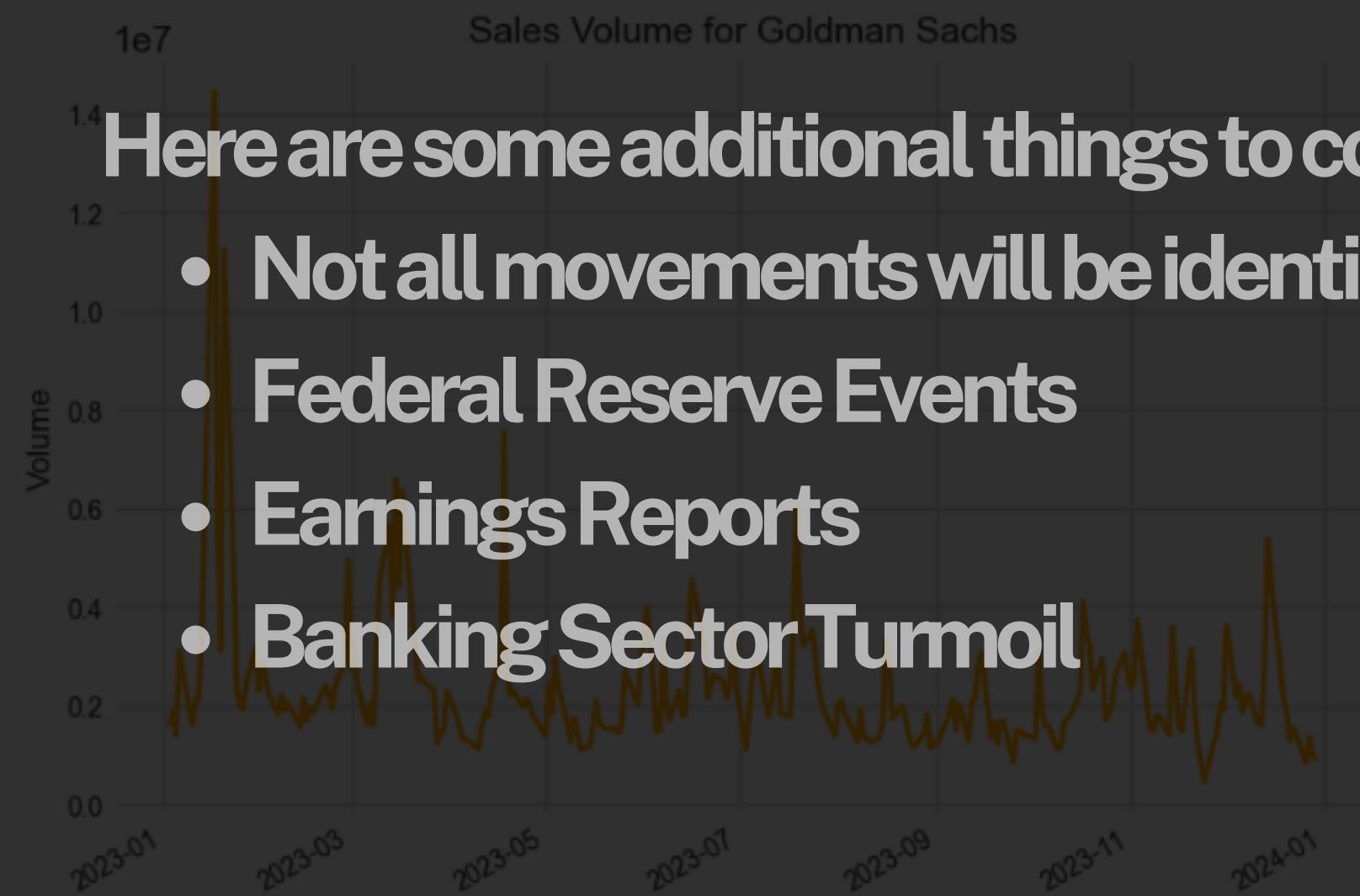
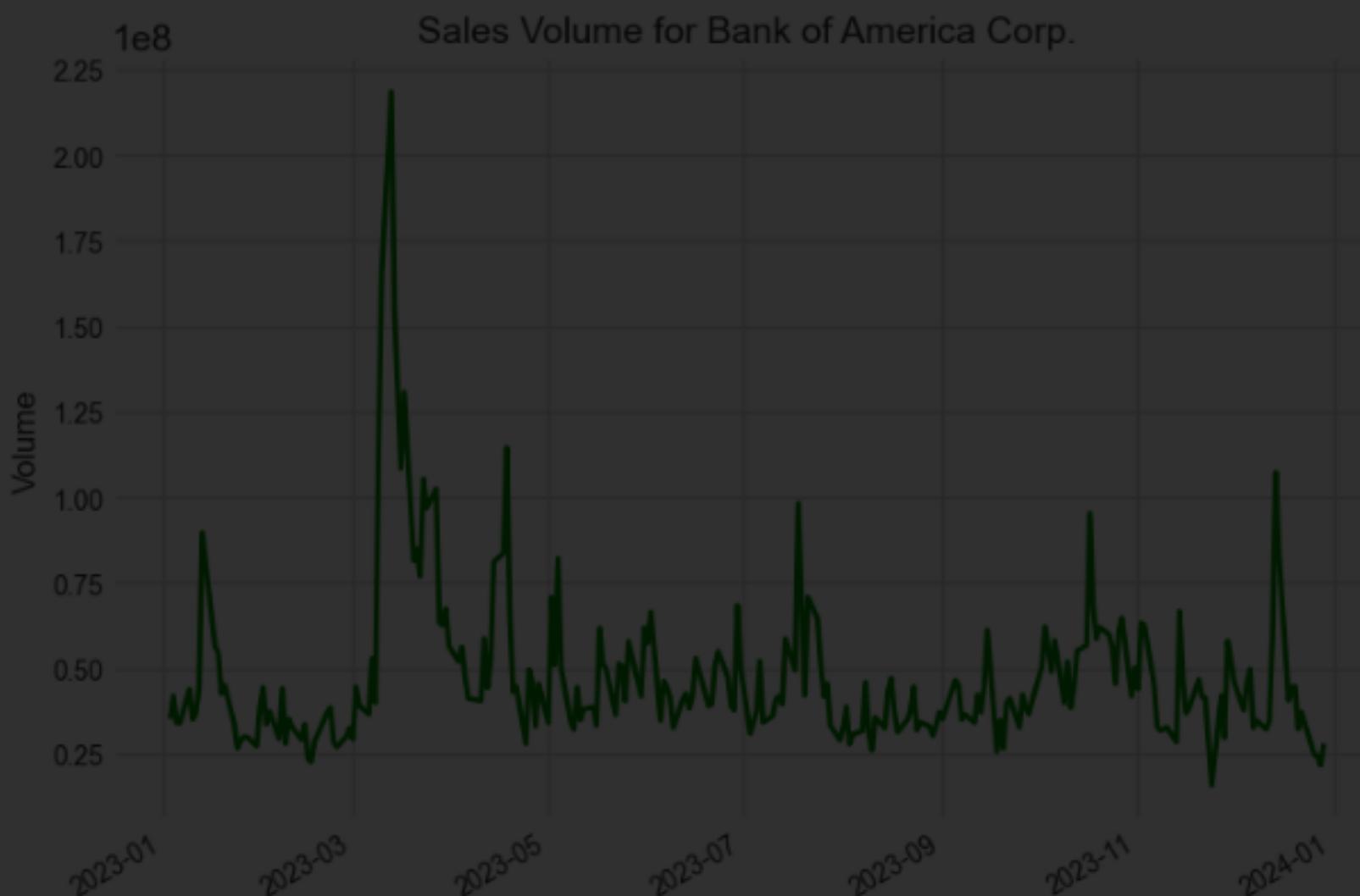
volume of Sales





Analysis

- Market Trends
- Industry Events



Here are some additional things to consider:

- Not all movements will be identical
- Federal Reserve Events
- Earnings Reports
- Banking Sector Turmoil

JP Morgan Chase & Co.

Goldman Sachs

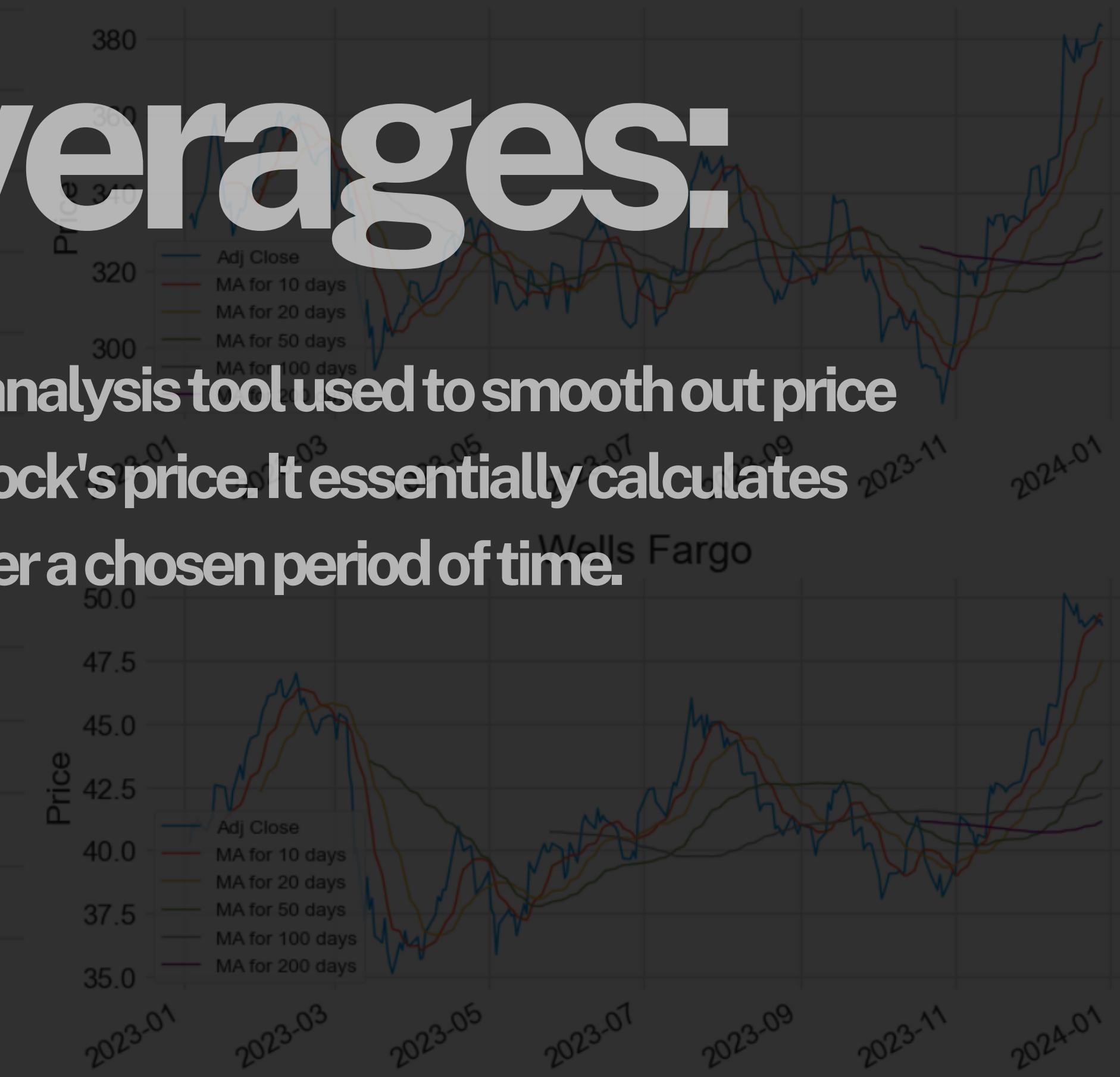
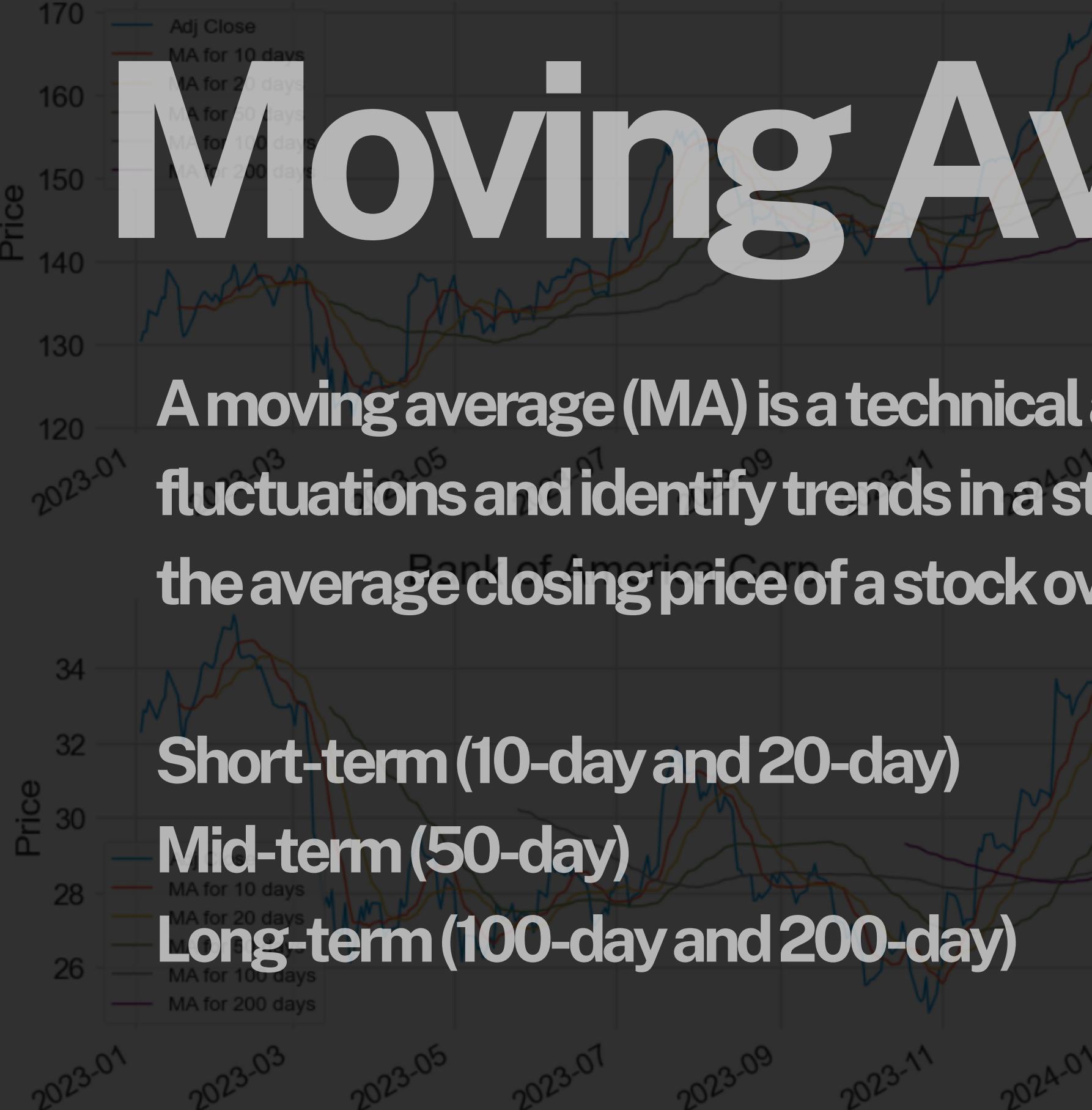
Moving Averages:

A moving average (MA) is a technical analysis tool used to smooth out price fluctuations and identify trends in a stock's price. It essentially calculates the average closing price of a stock over a chosen period of time.

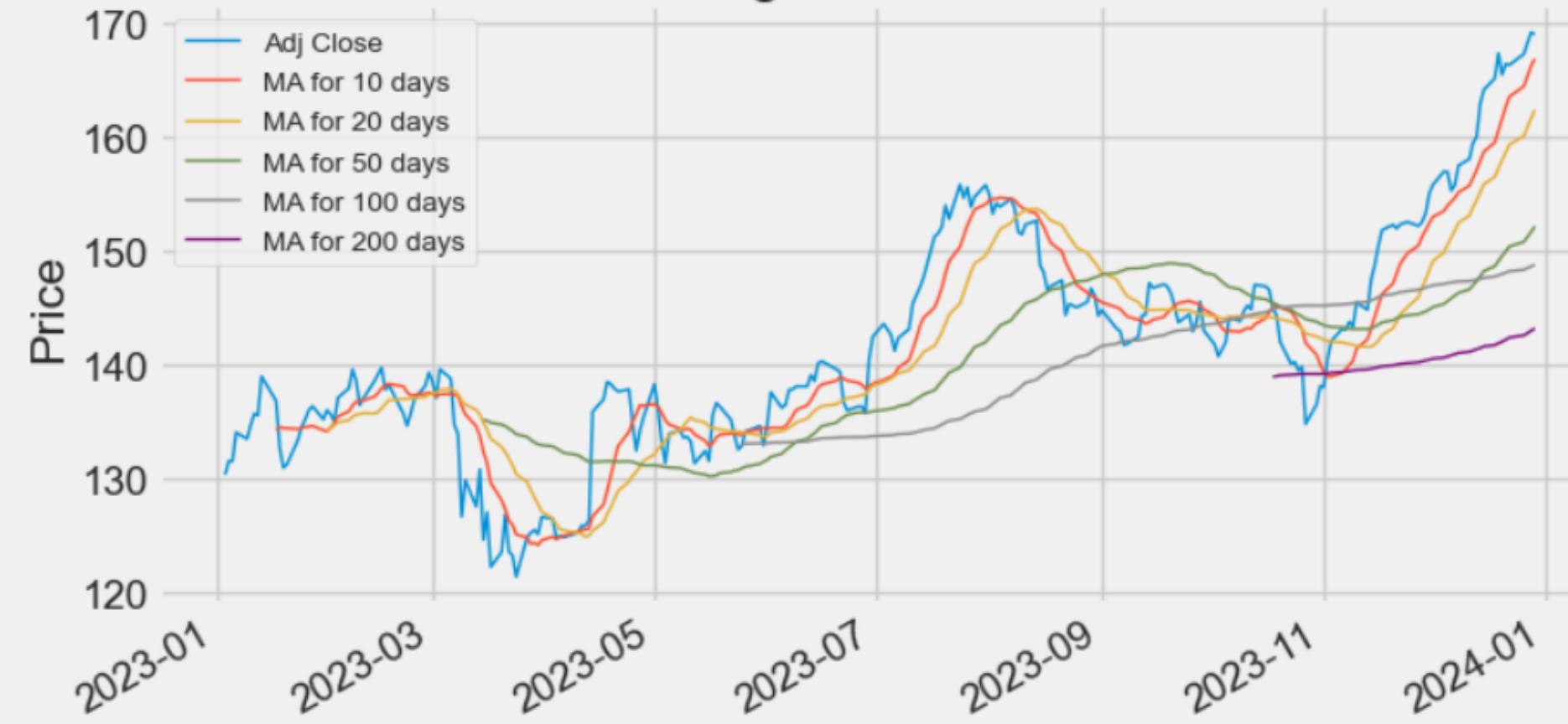
Short-term (10-day and 20-day)

Mid-term (50-day)

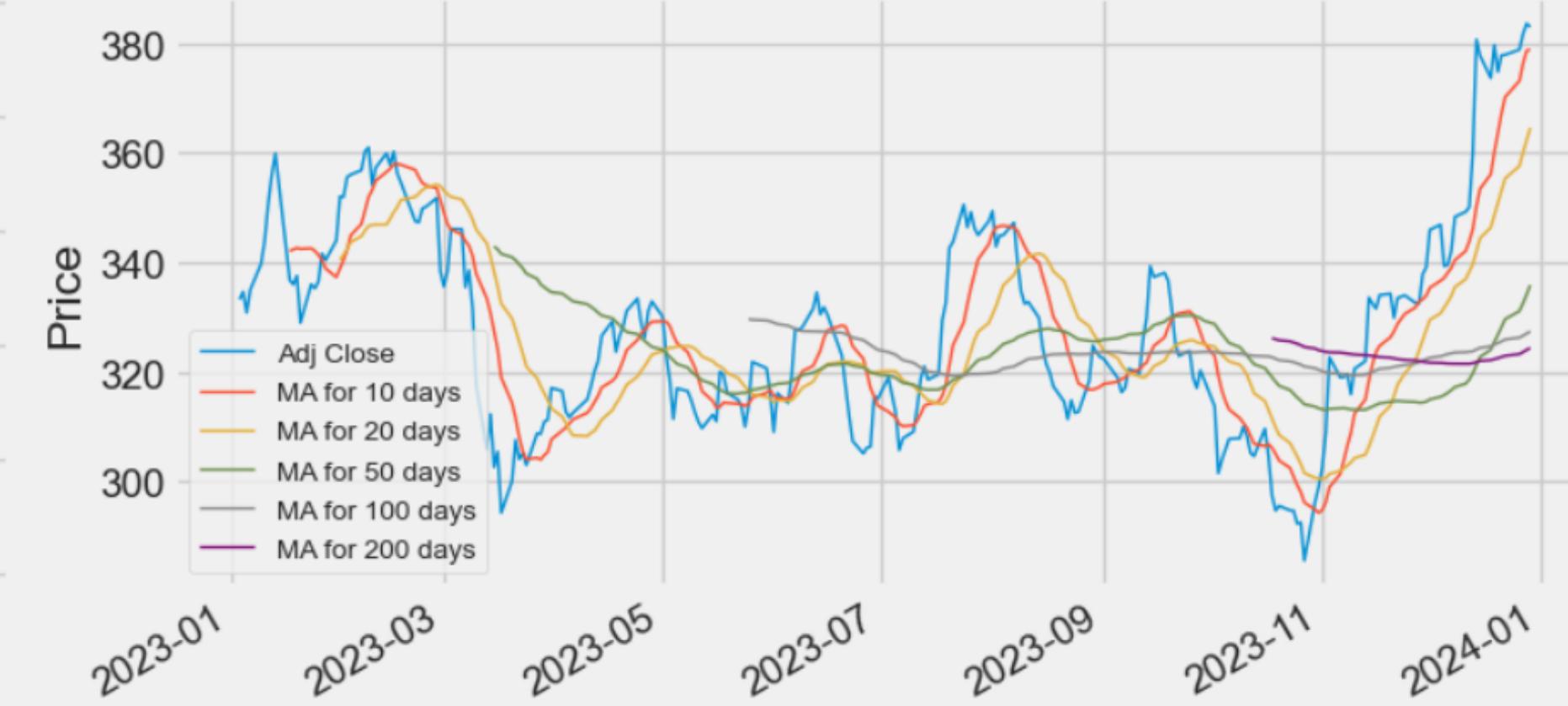
Long-term (100-day and 200-day)



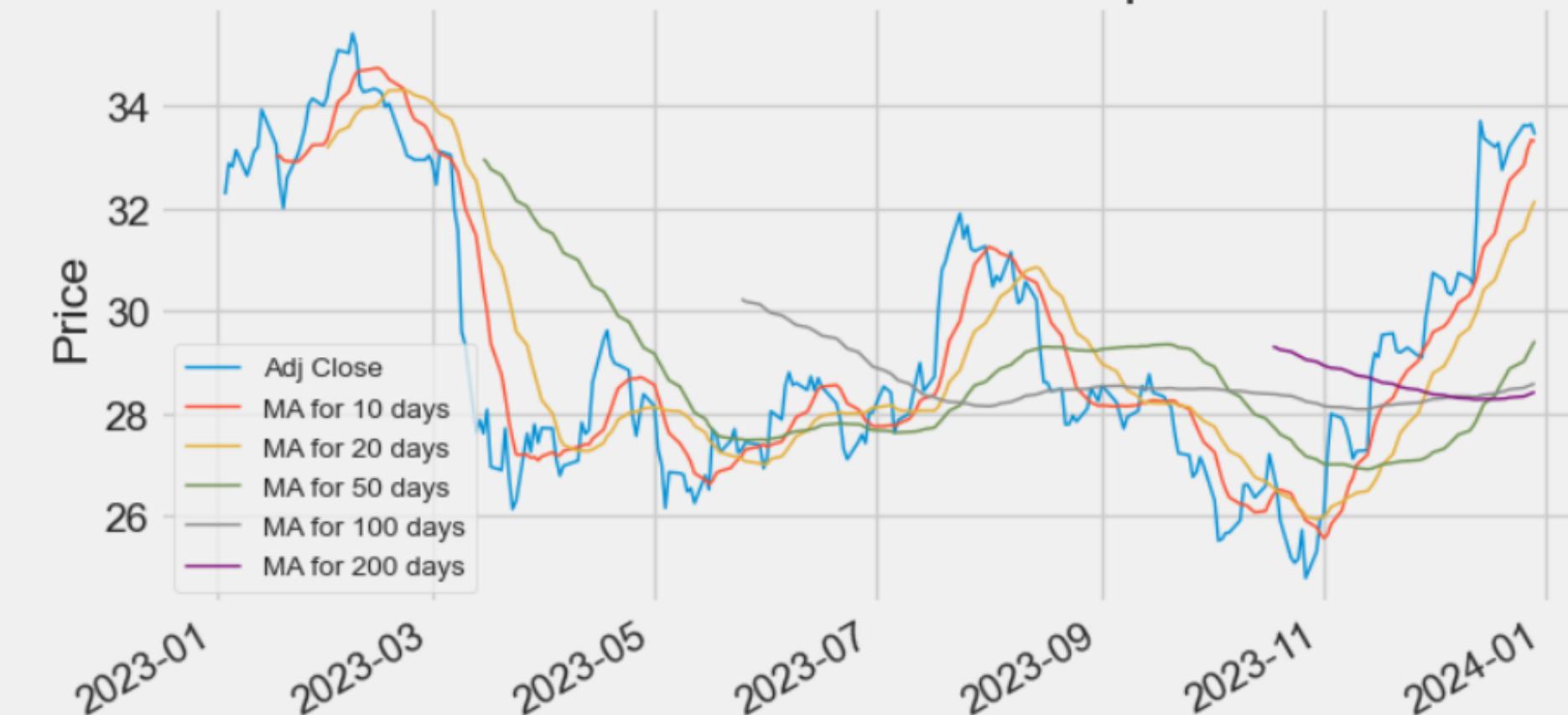
JP Morgan Chase & Co.



Goldman Sachs



Bank of America Corp.



Wells Fargo



JP Morgan Chase & Co.

Goldman Sachs

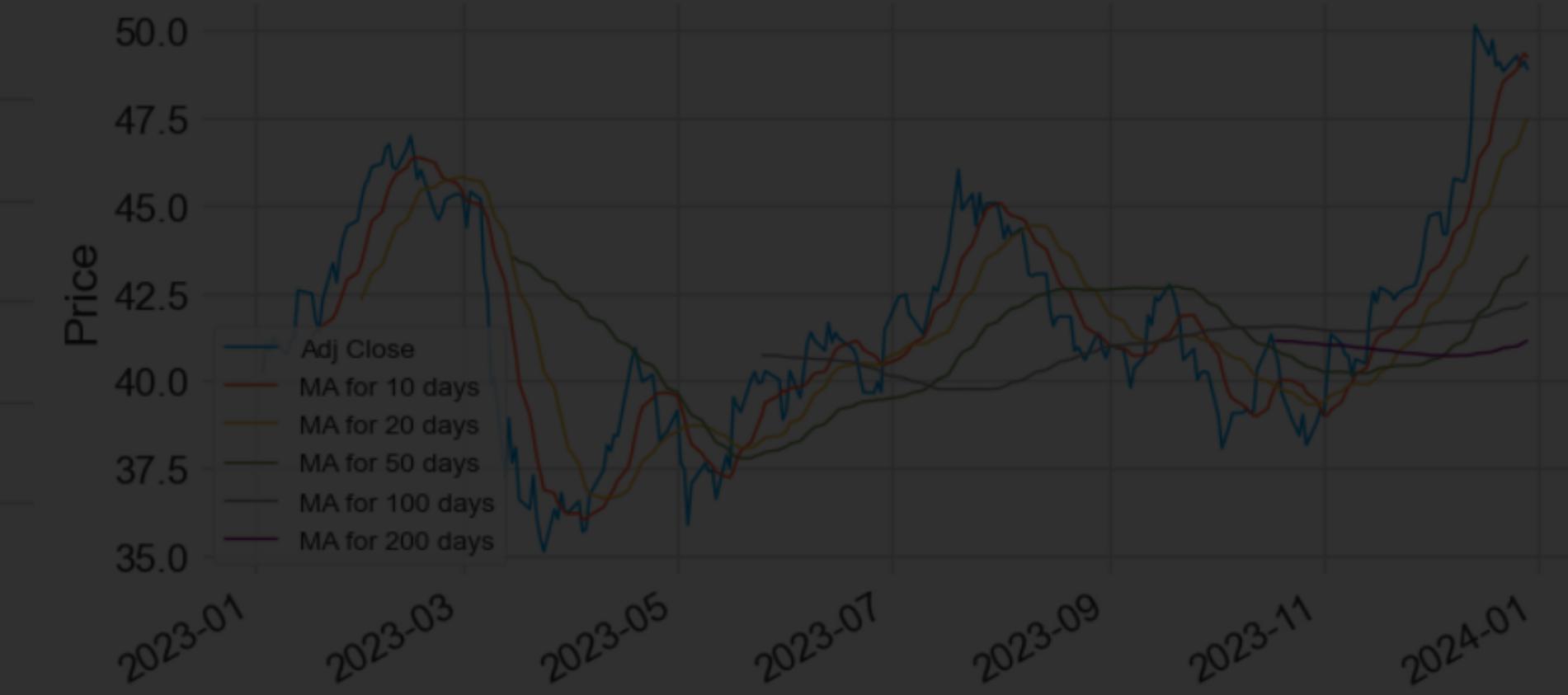
Moving Averages:

Important things to remember about moving averages:

- Moving averages are lagging indicators.
 - Crossovers
 - Not a guarantee

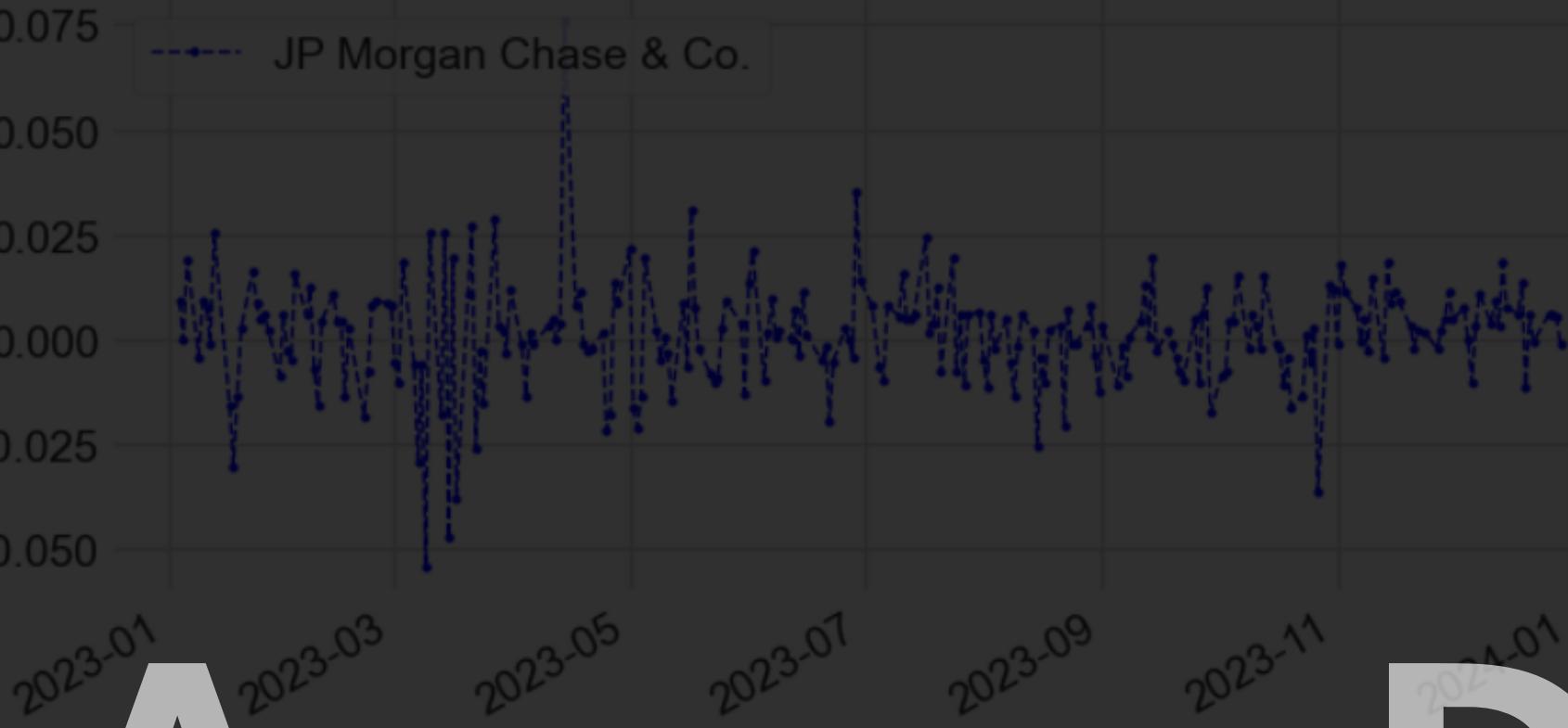
Bank of America Corp.

Wells Fargo



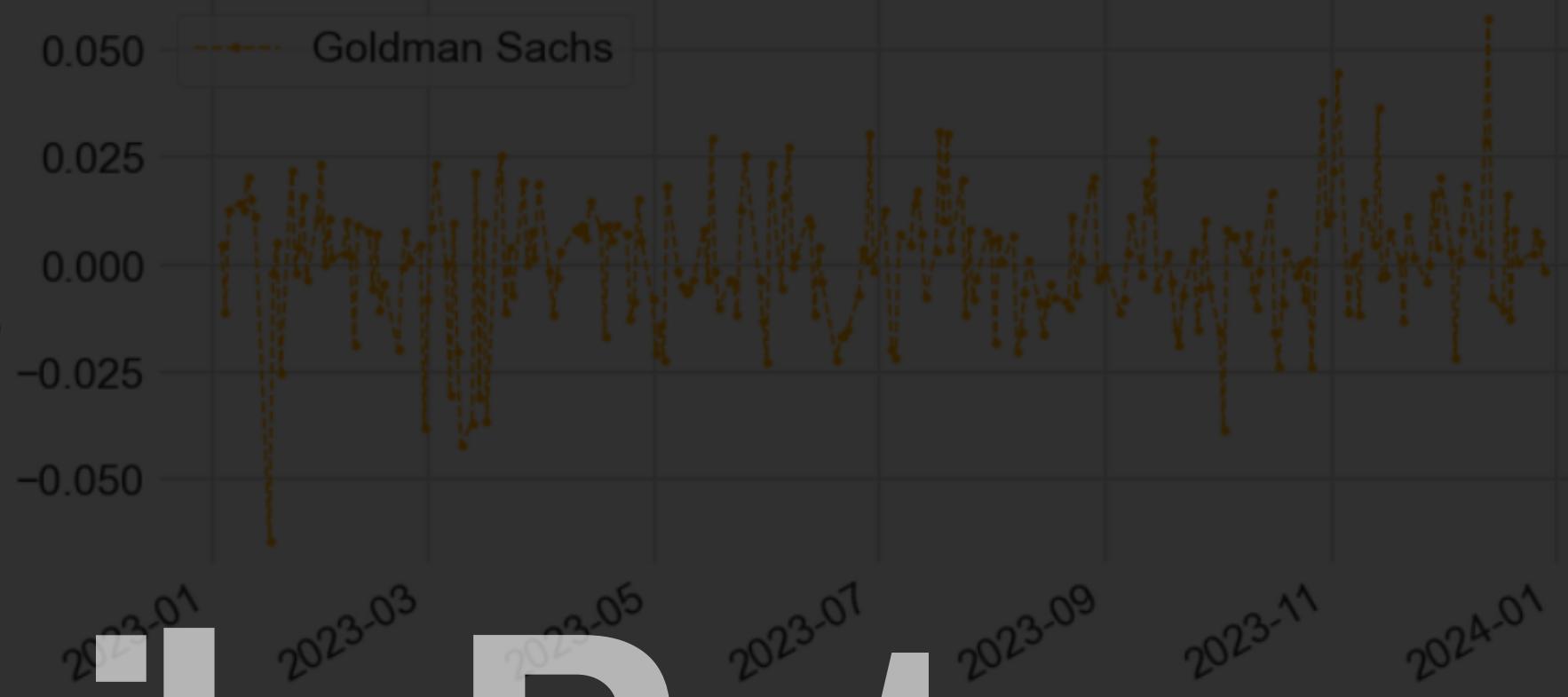
JP Morgan Chase & Co.

Daily Return

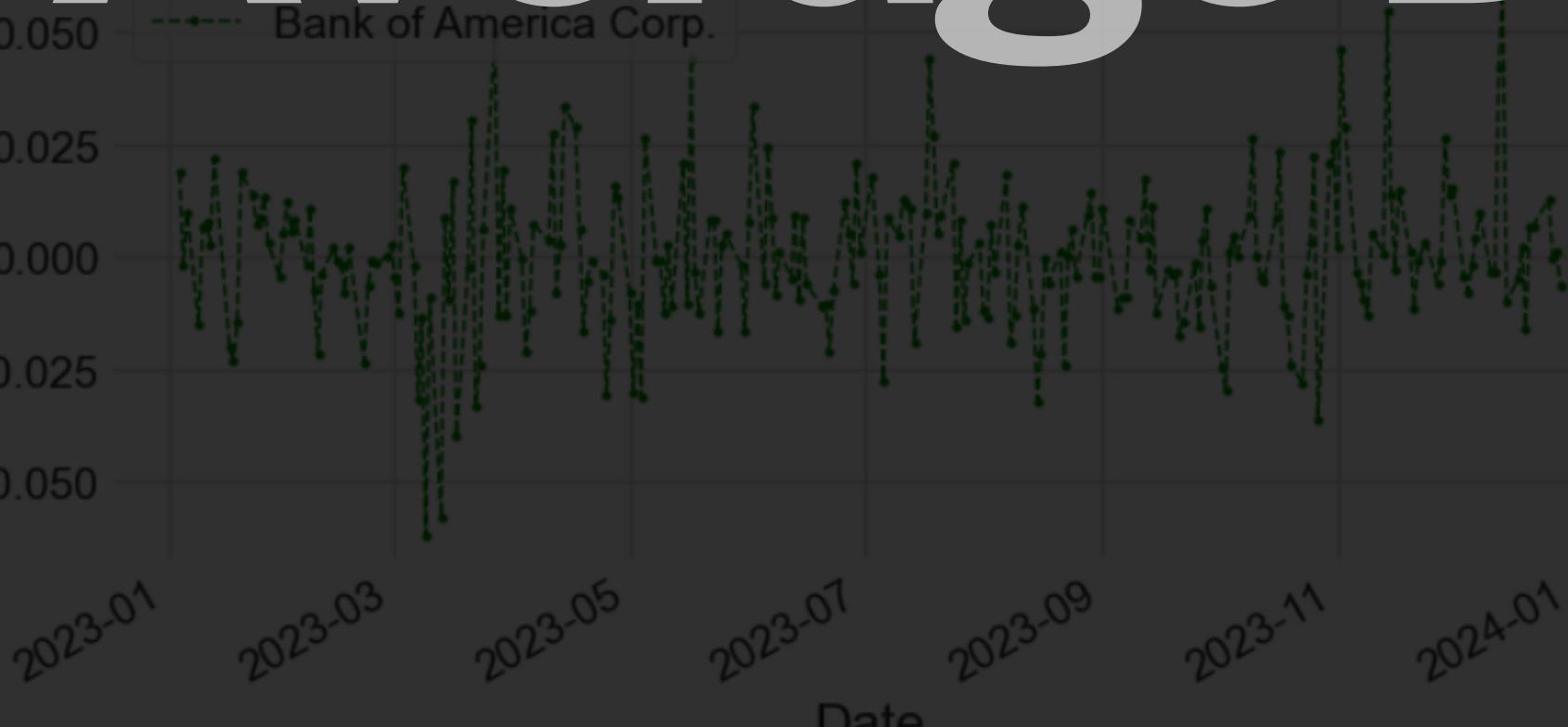


Goldman Sachs

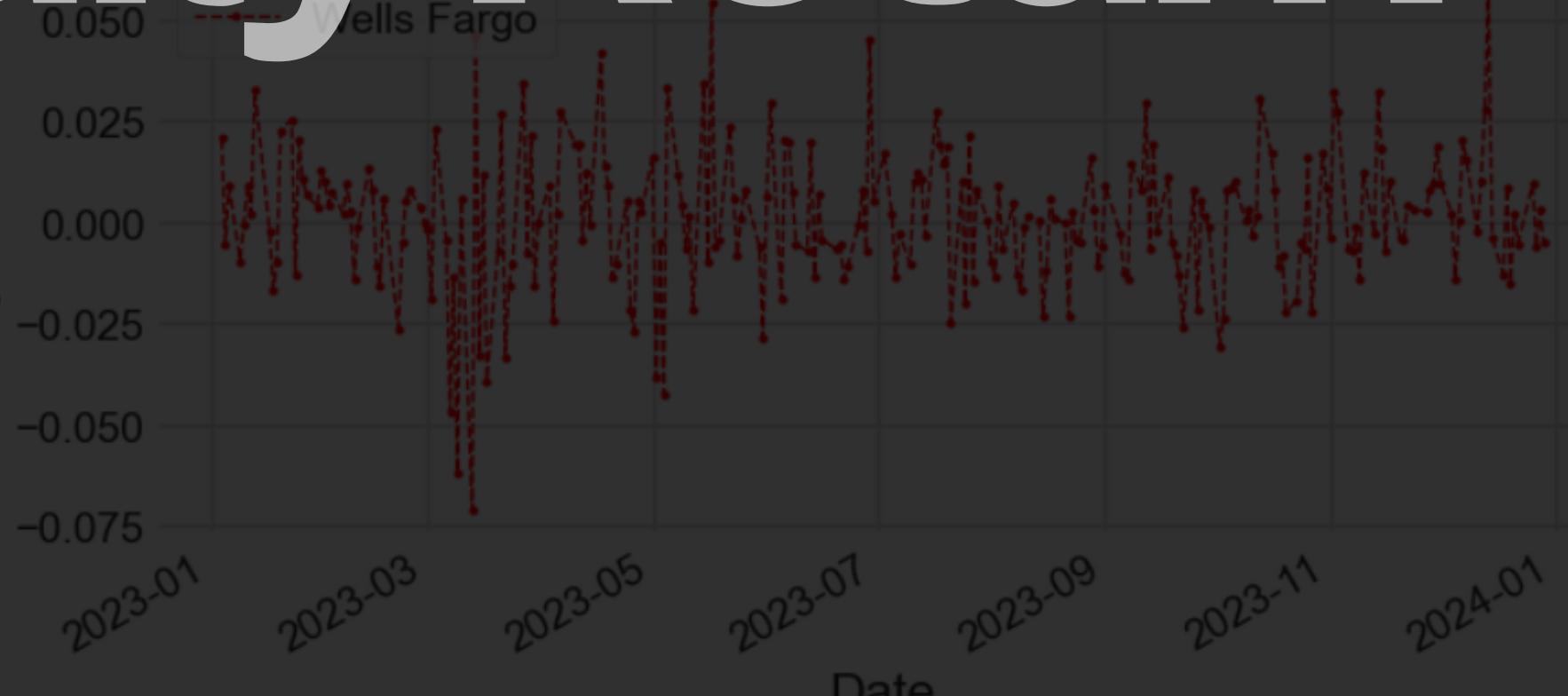
Daily Return



Daily Return

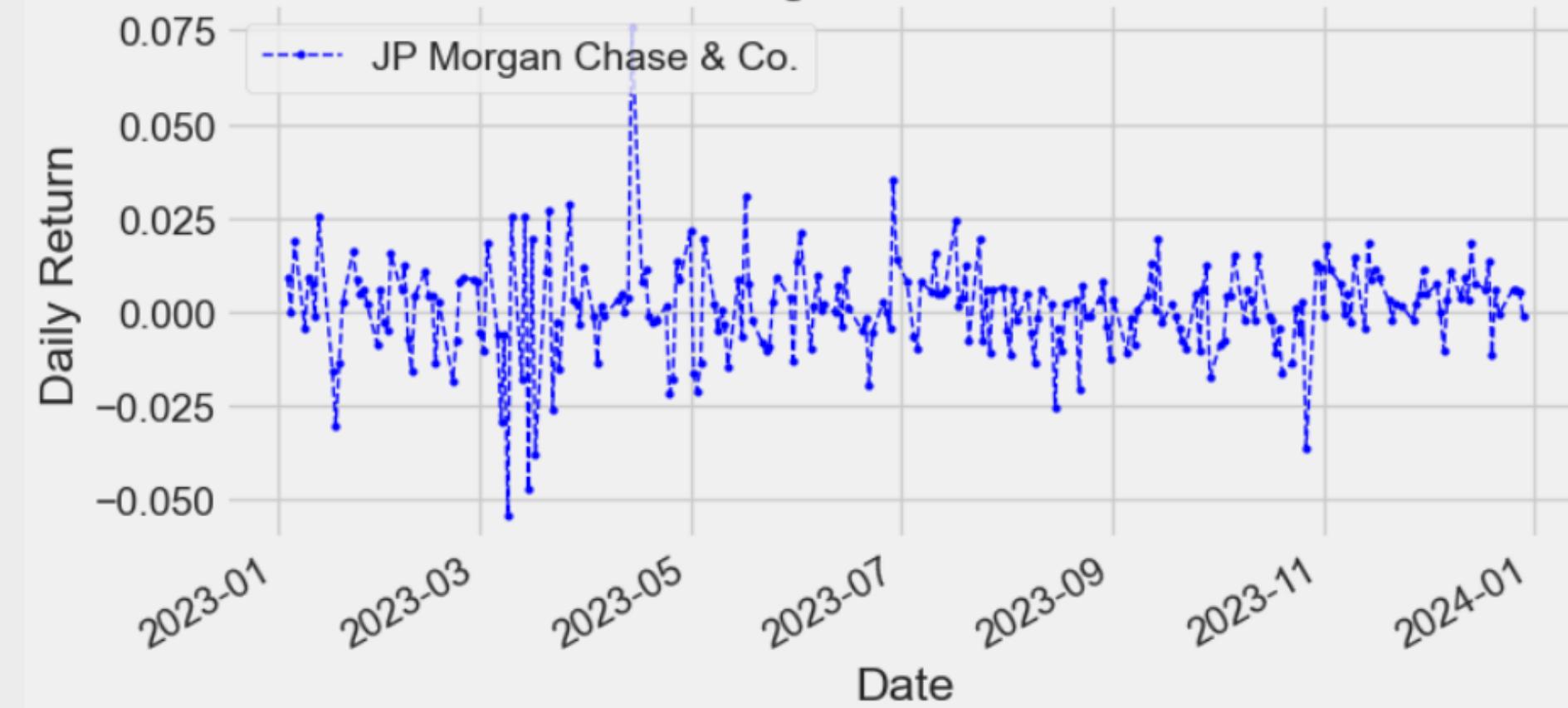


Daily Return

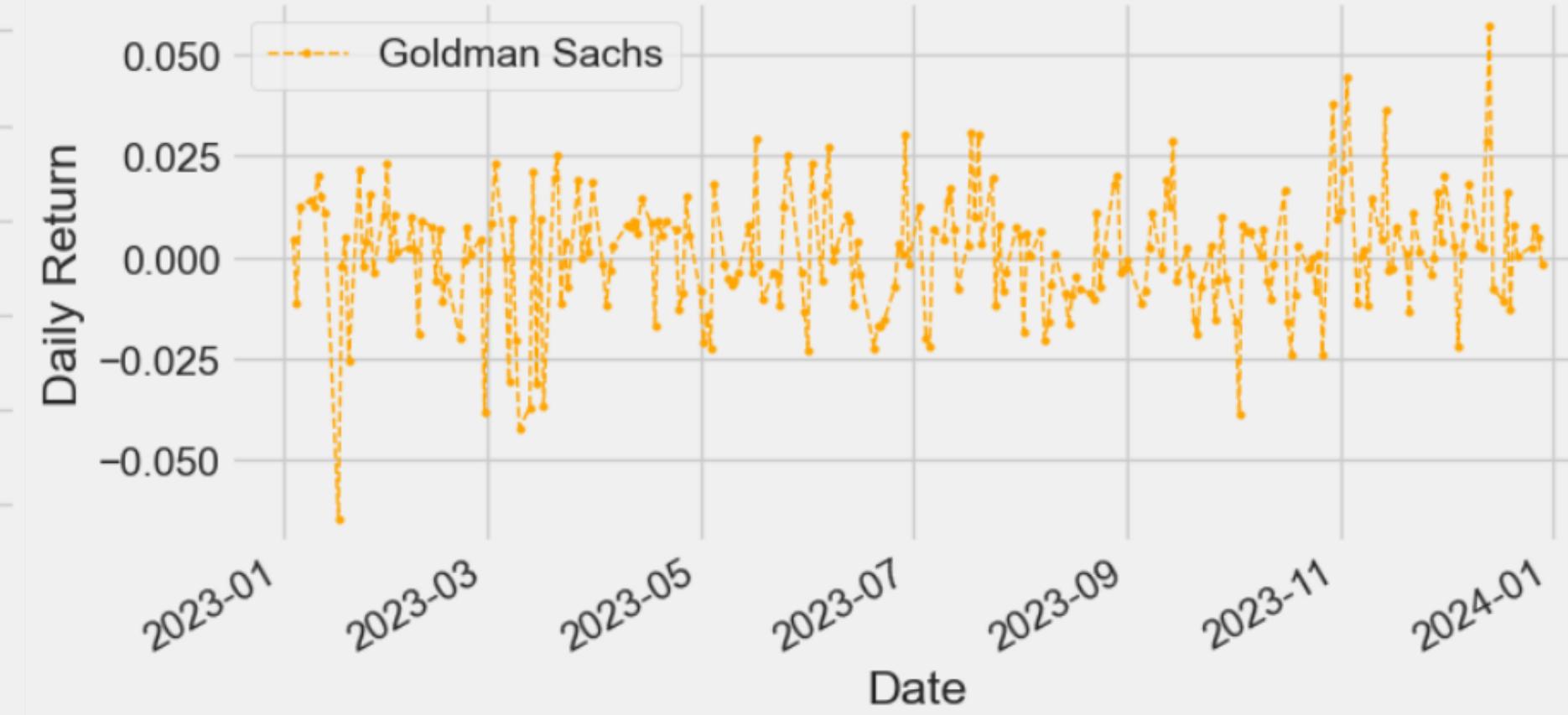


Average Daily Return

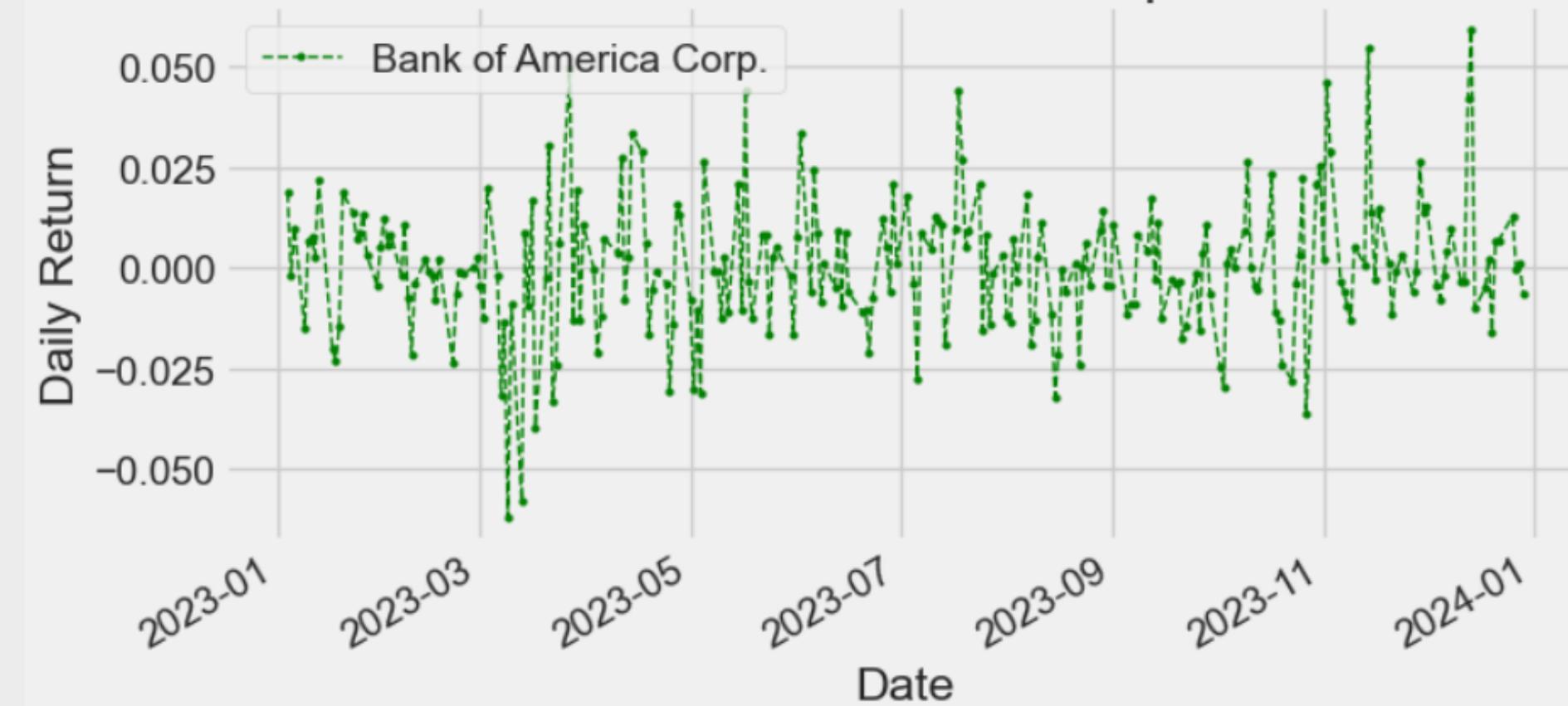
JP Morgan Chase & Co.



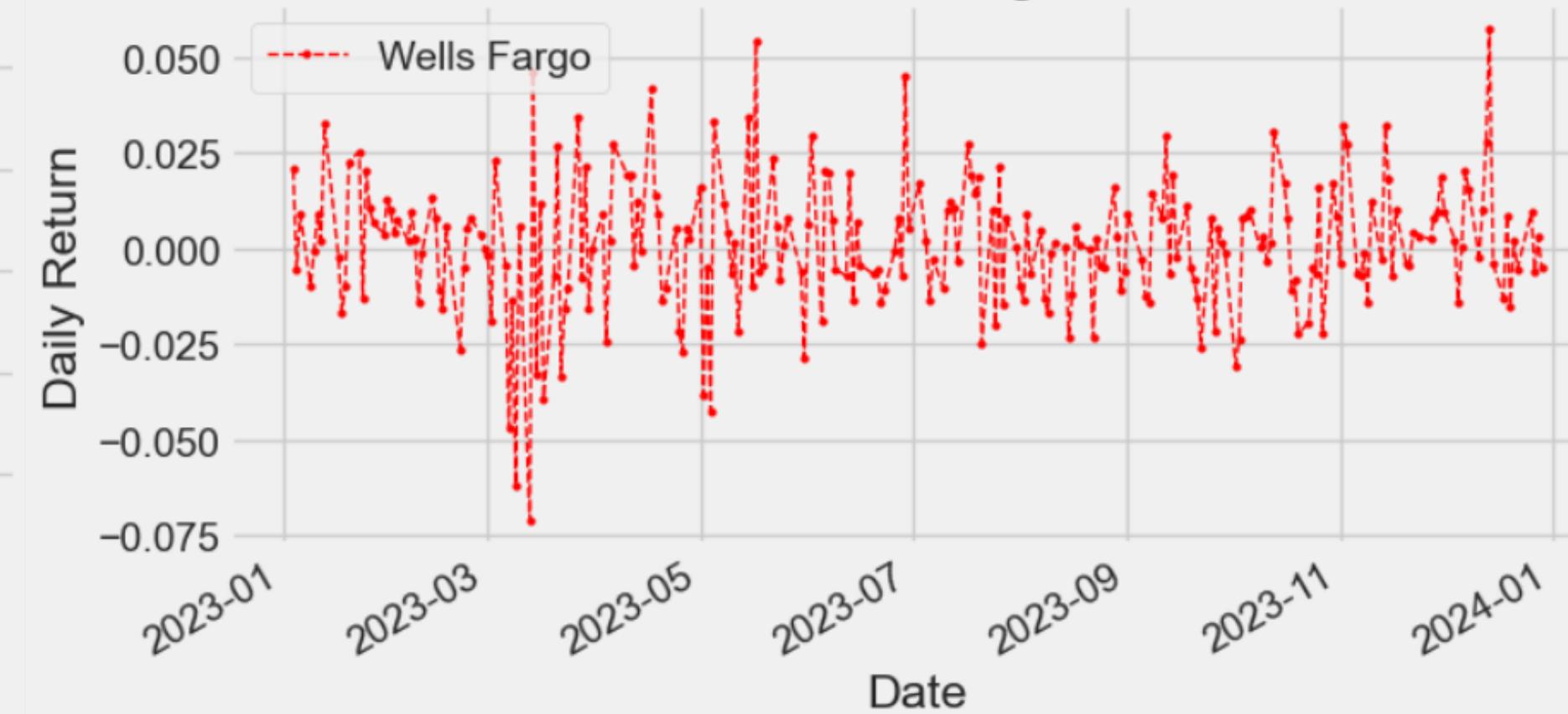
Goldman Sachs



Bank of America Corp.



Wells Fargo



JP Morgan Chase & Co.

Goldman Sachs

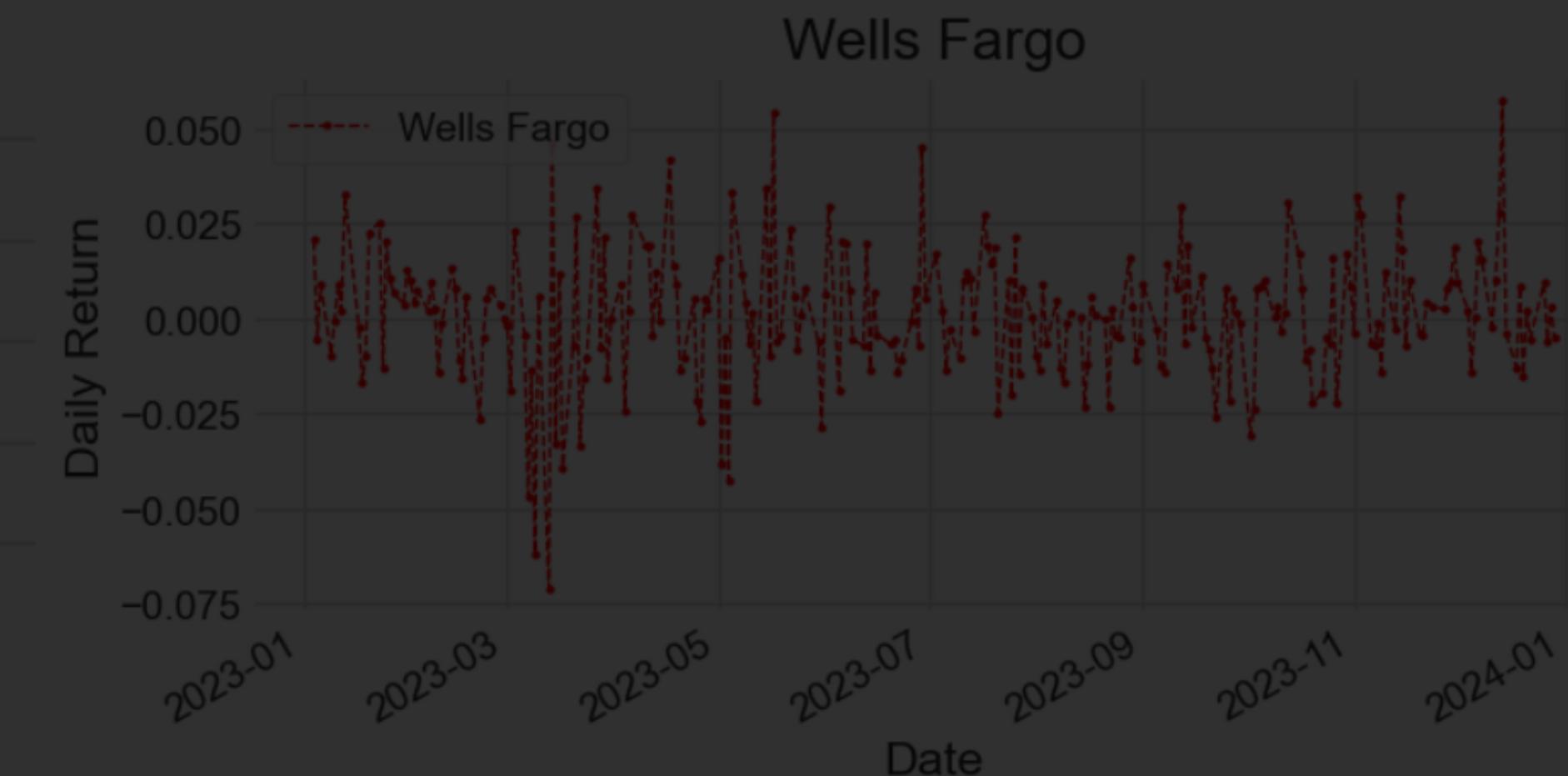
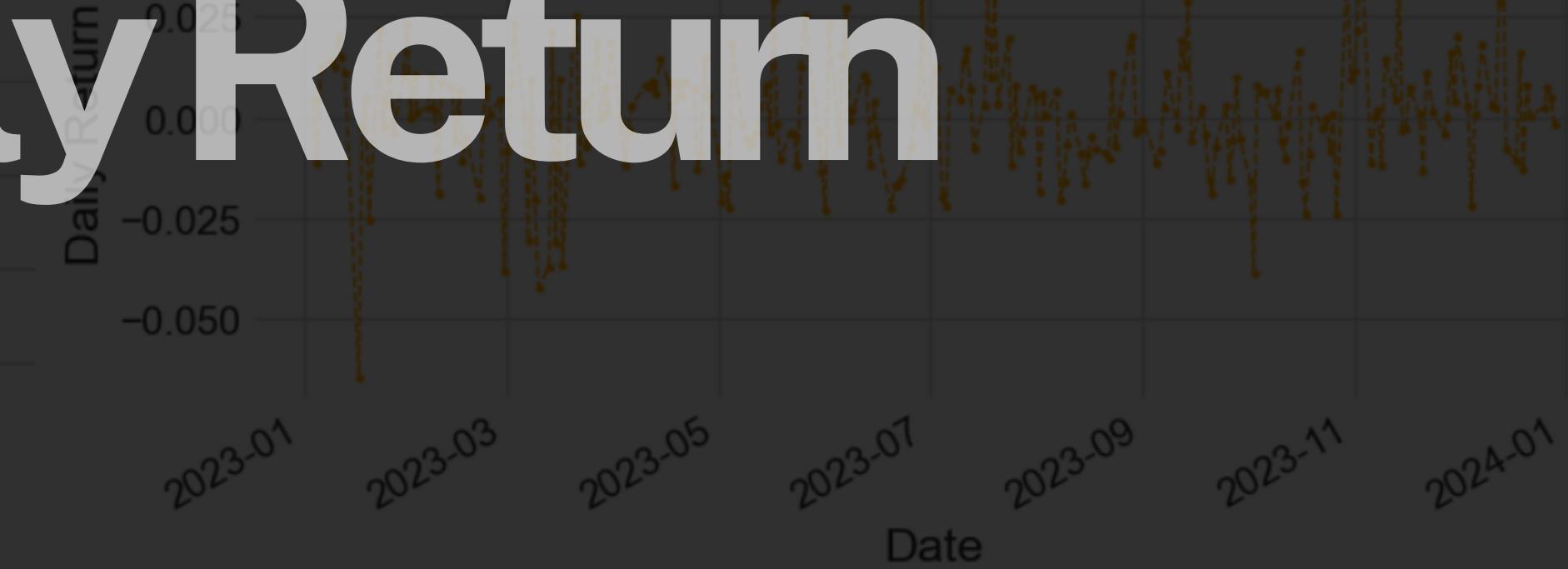
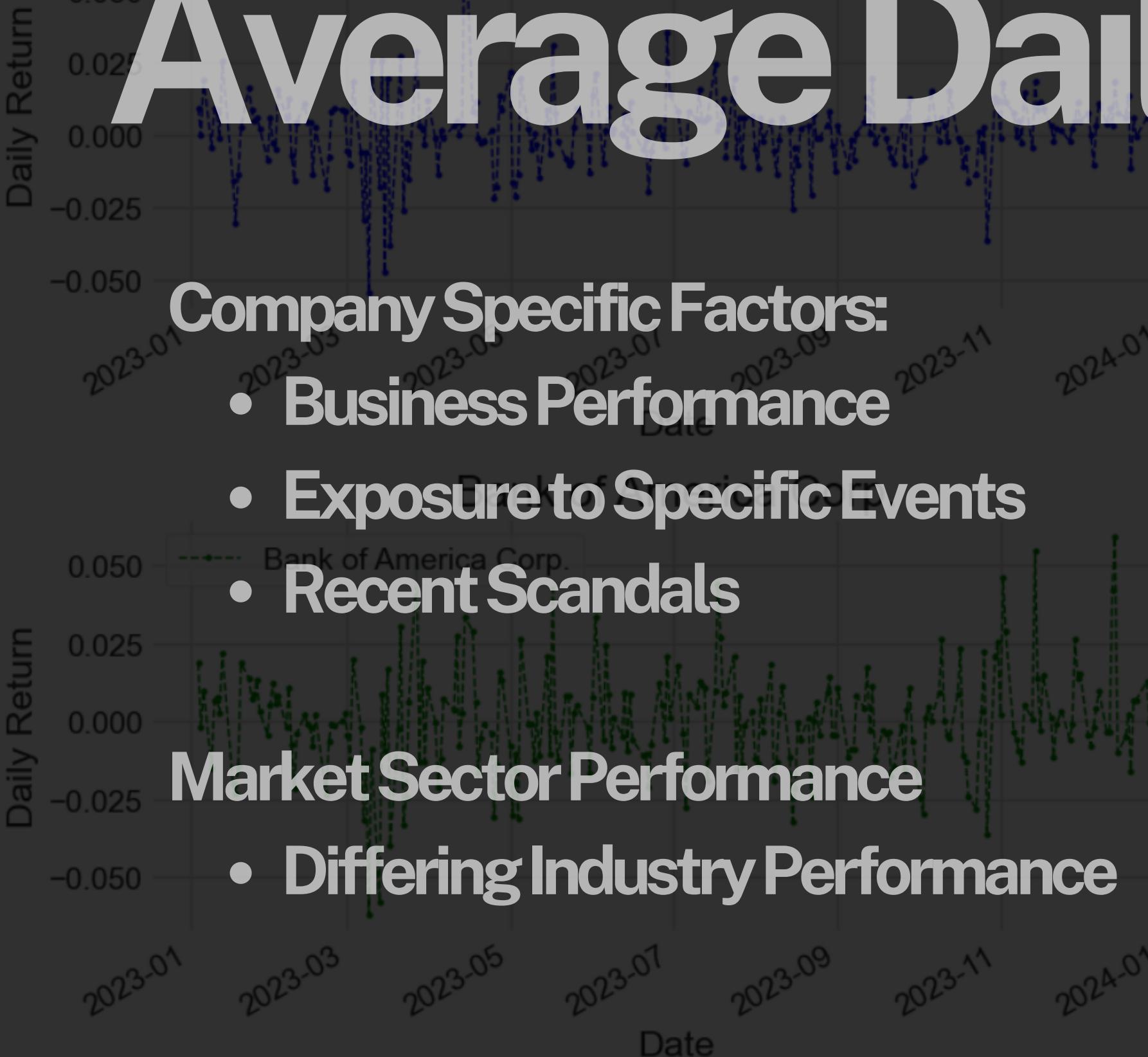
Average Daily Return

Company Specific Factors:

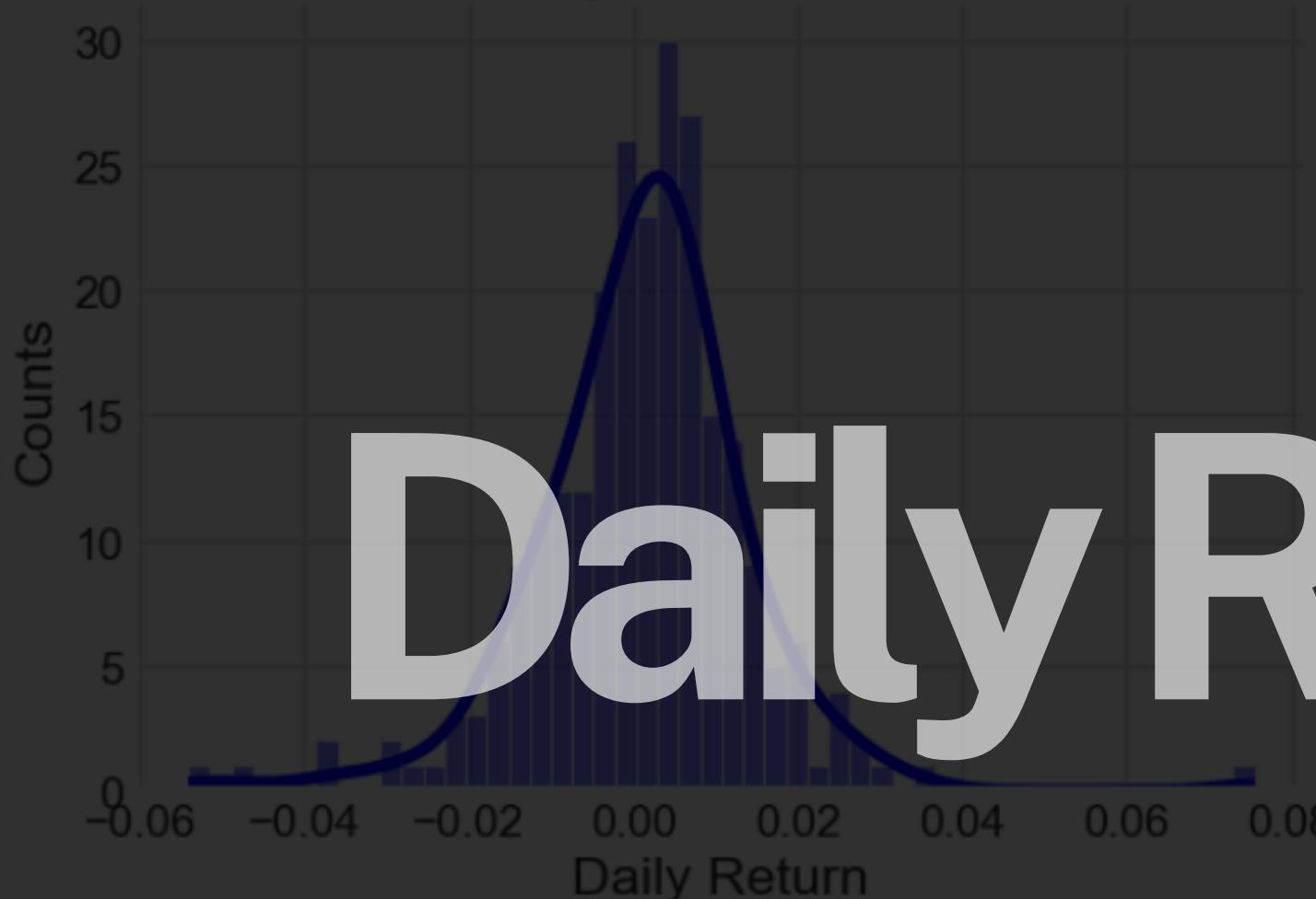
- Business Performance
- Exposure to Specific Events
- Recent Scandals

Market Sector Performance

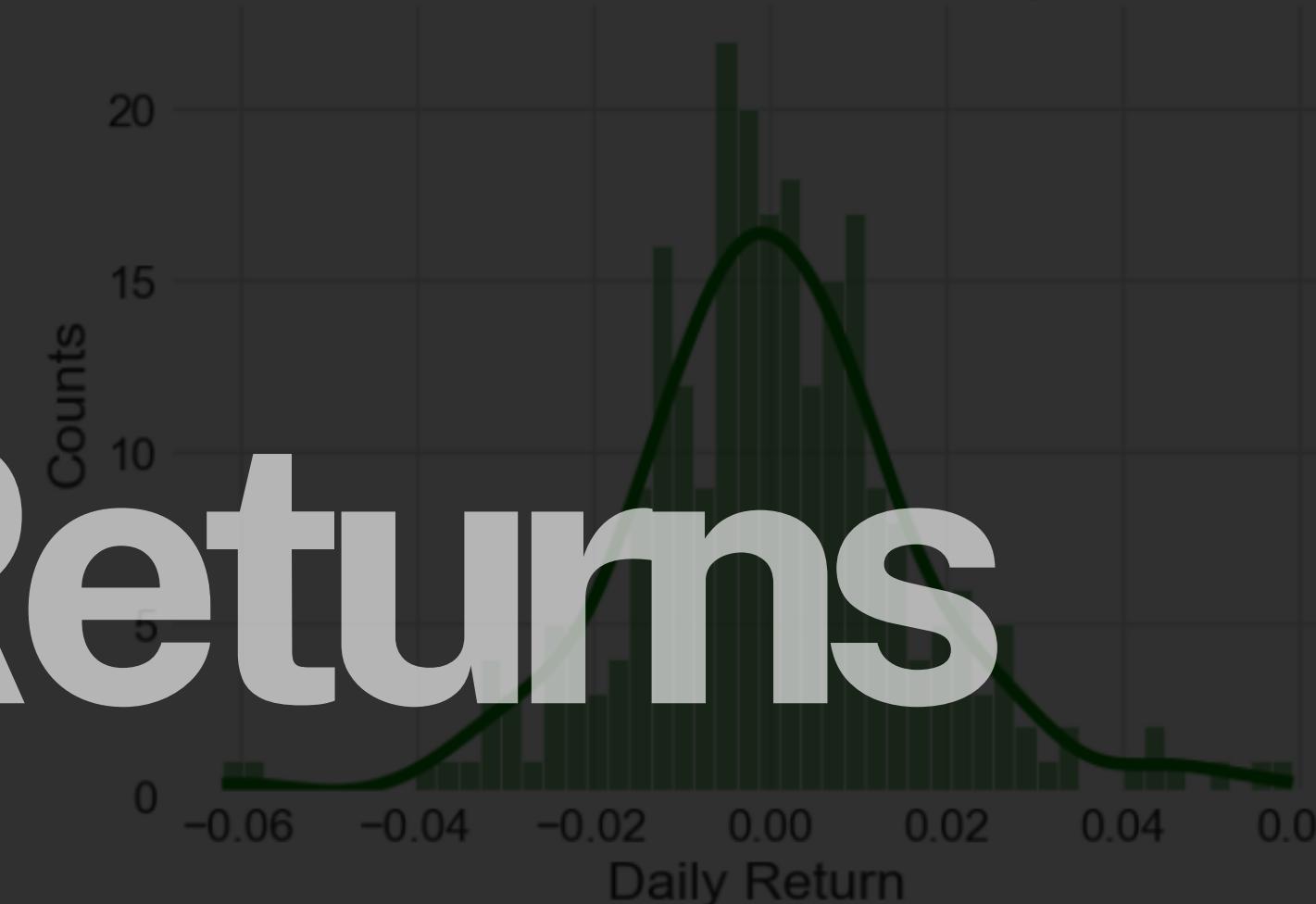
- Differing Industry Performance



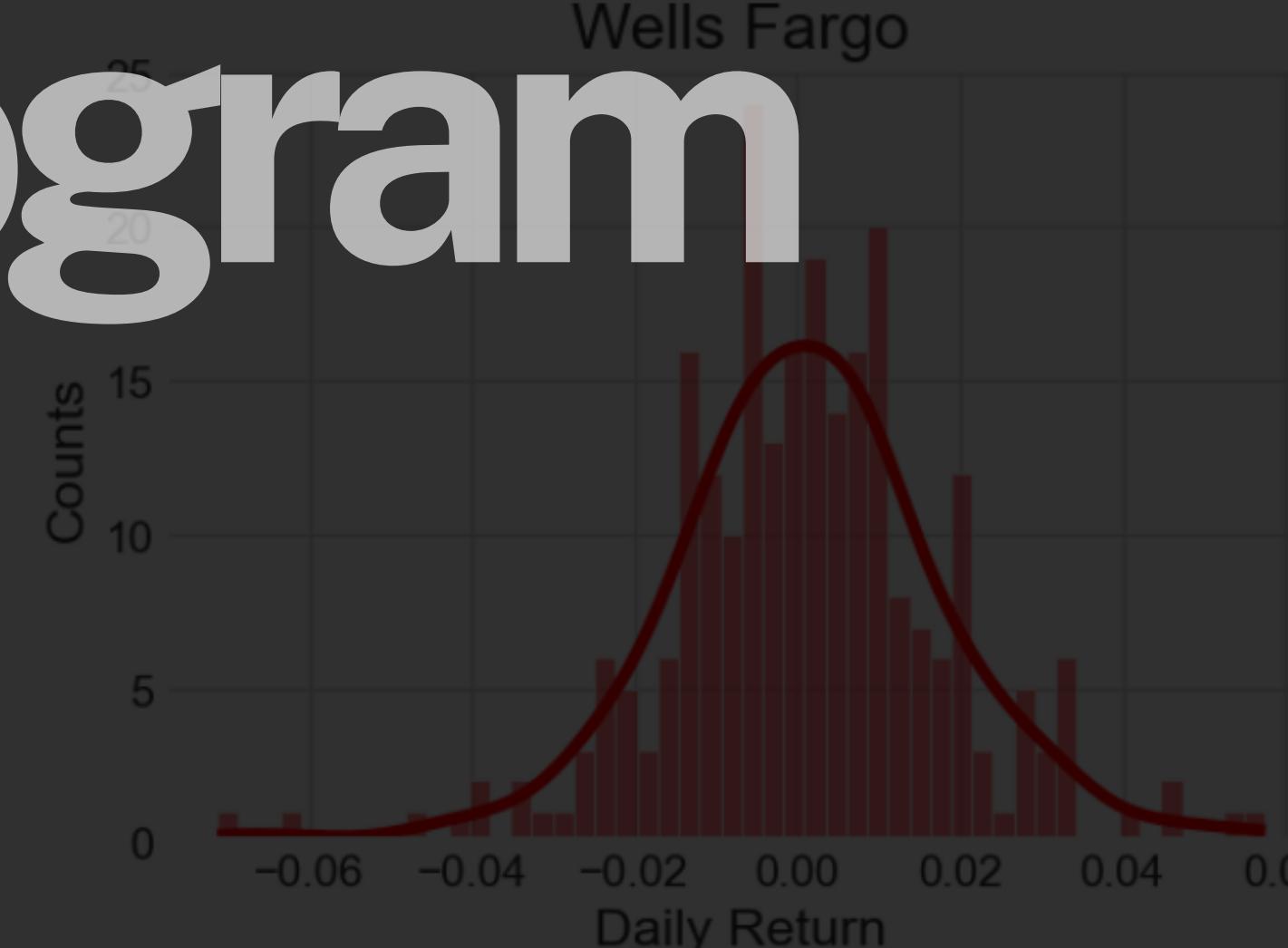
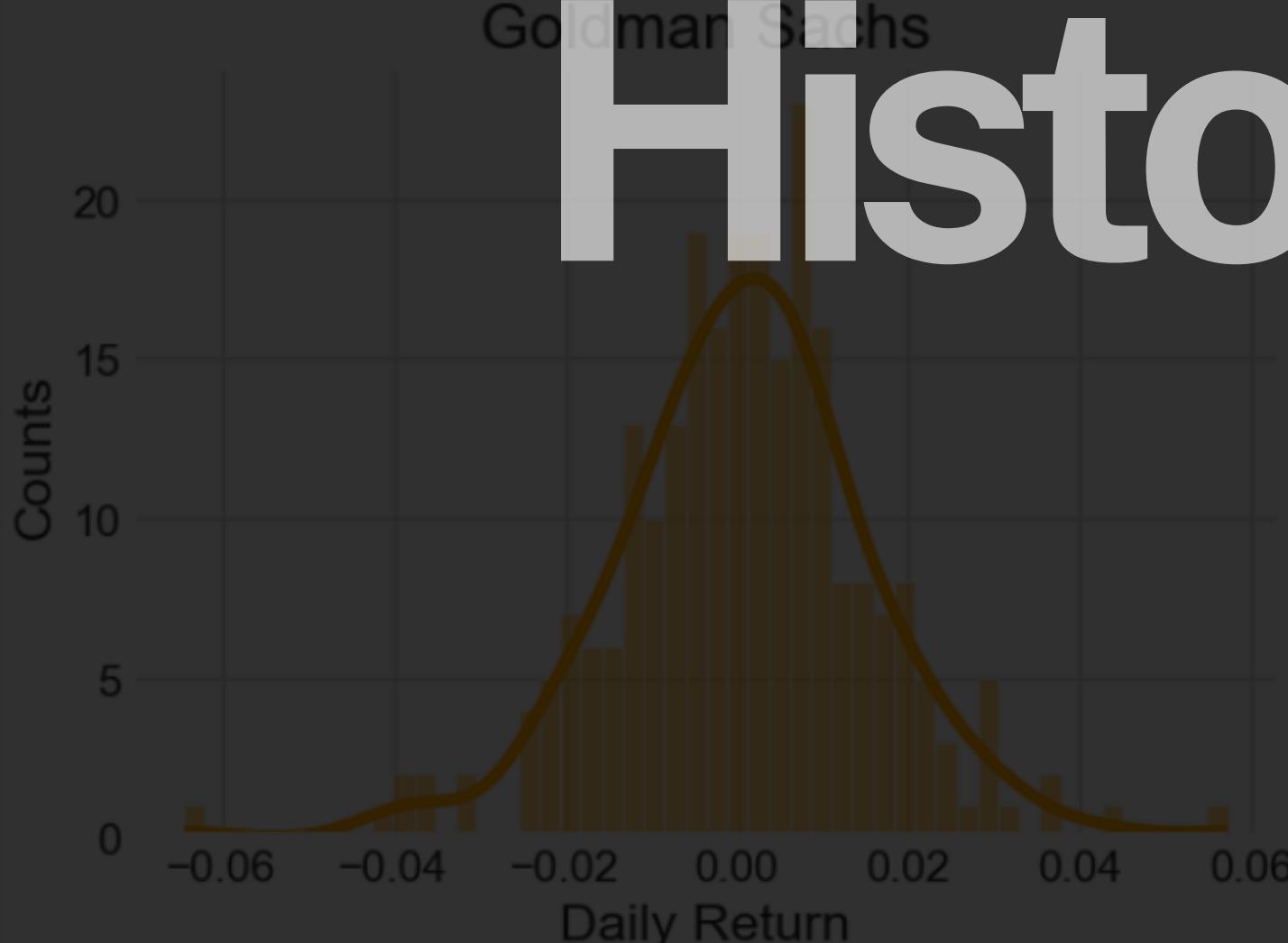
JP Morgan Chase & Co.



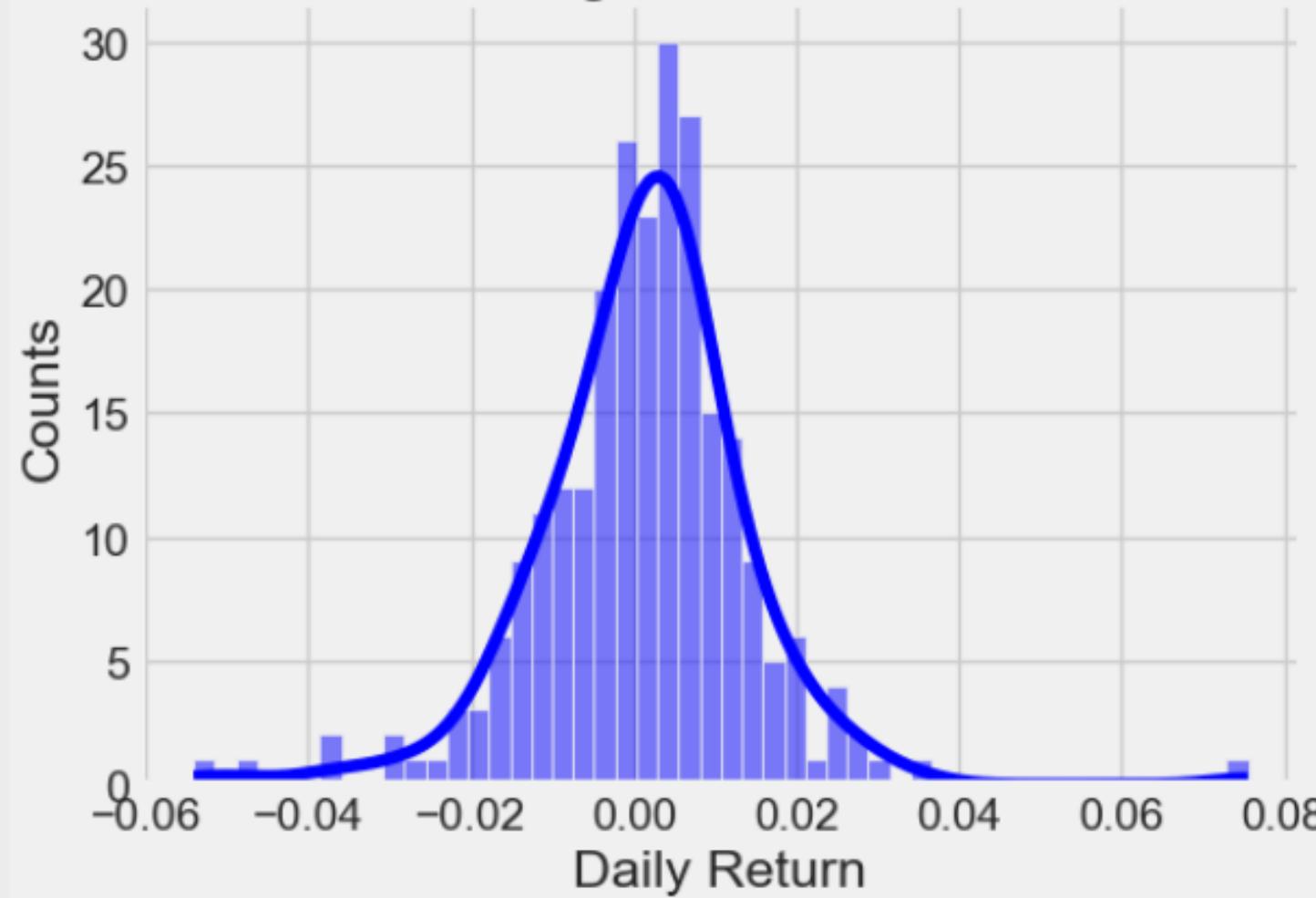
Bank of America Corp.



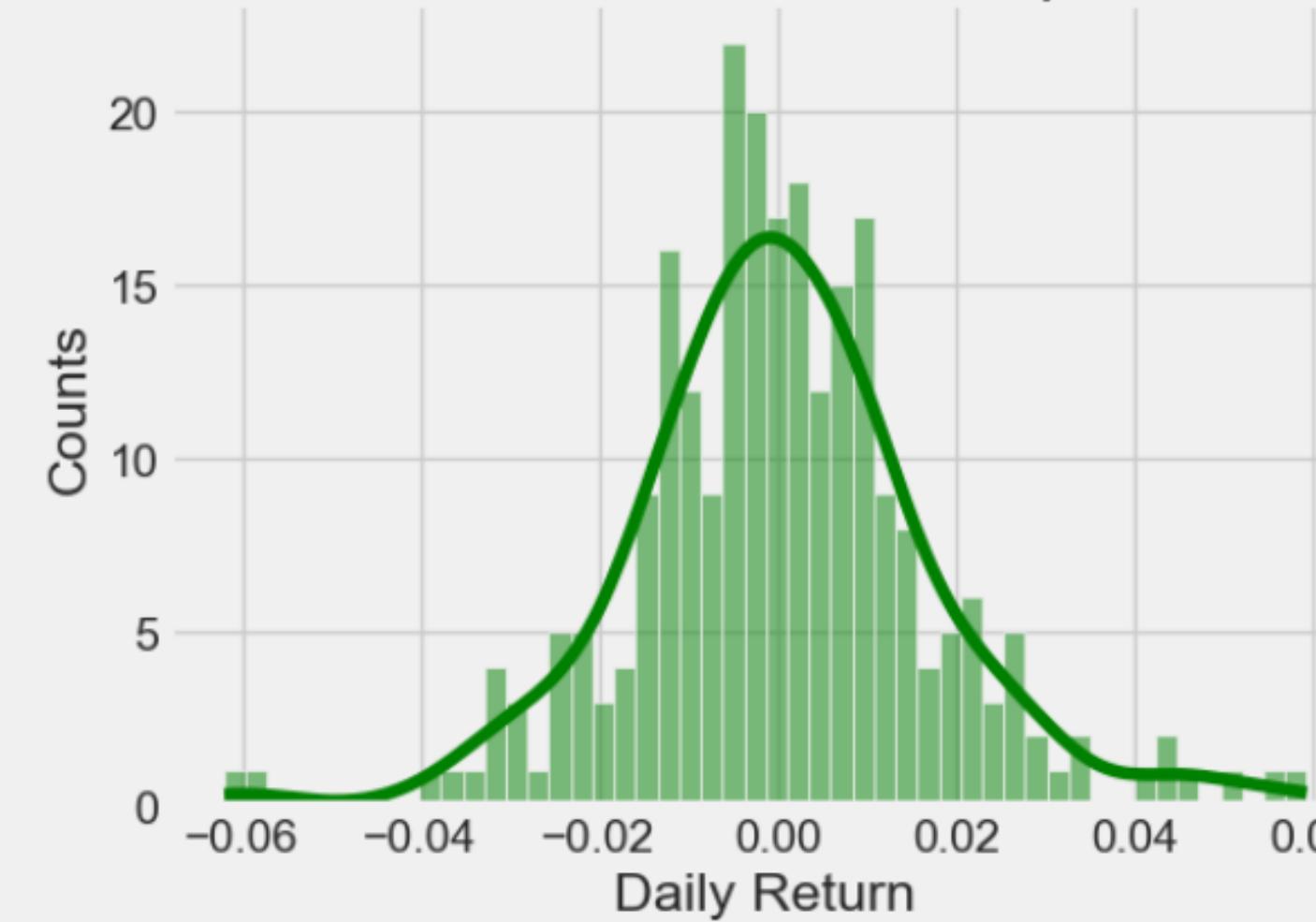
Daily Returns Histogram



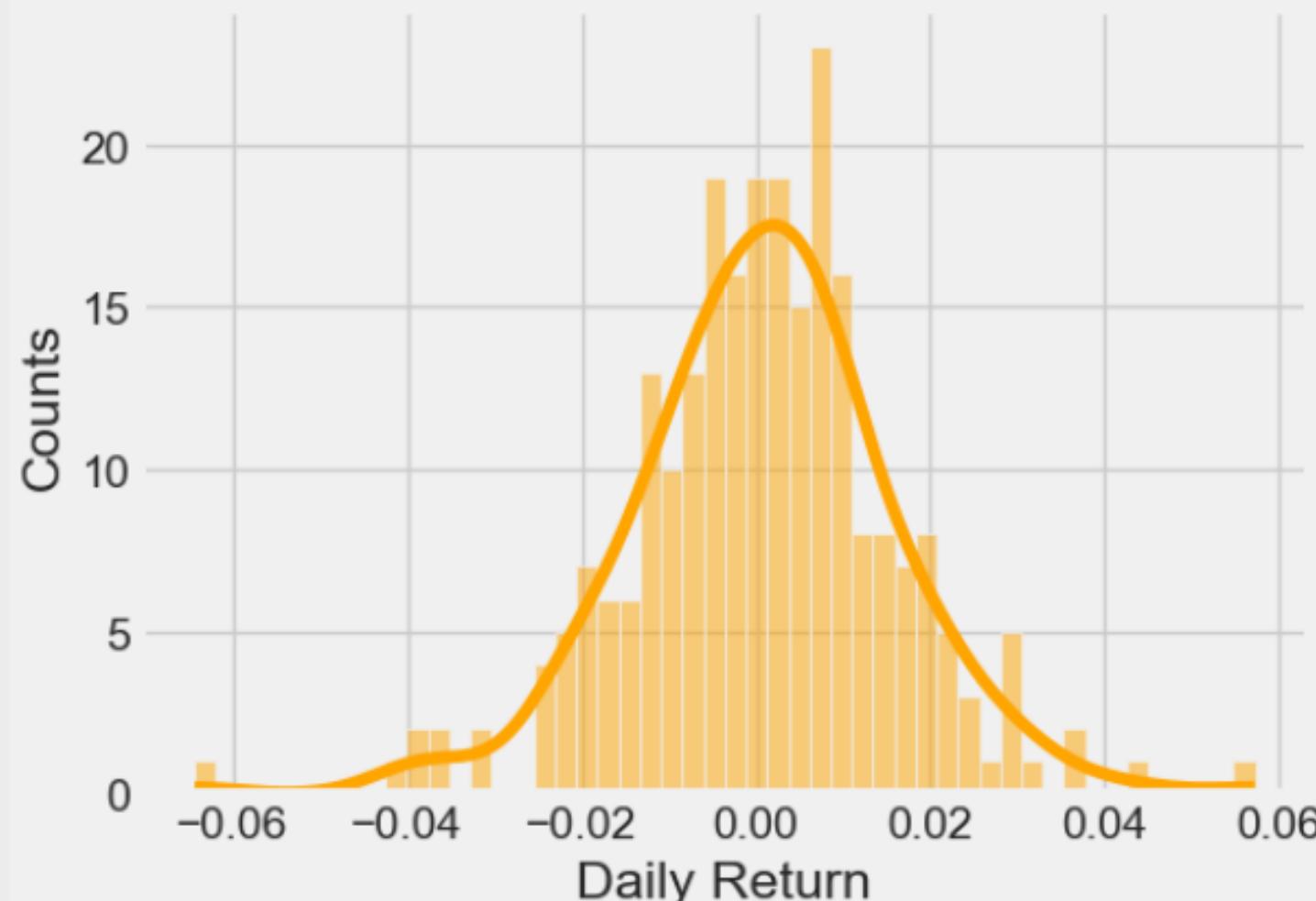
JP Morgan Chase & Co.



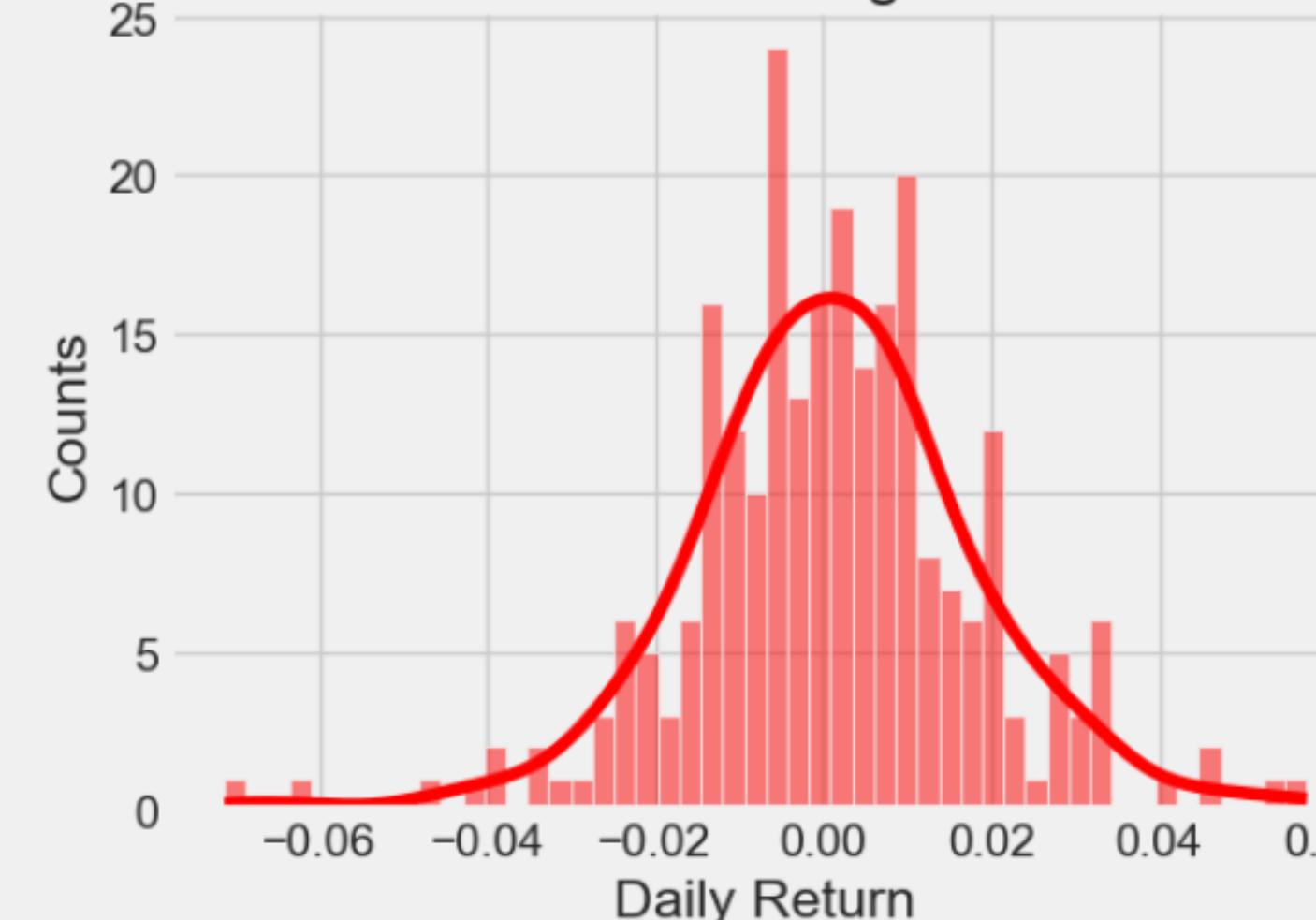
Bank of America Corp.



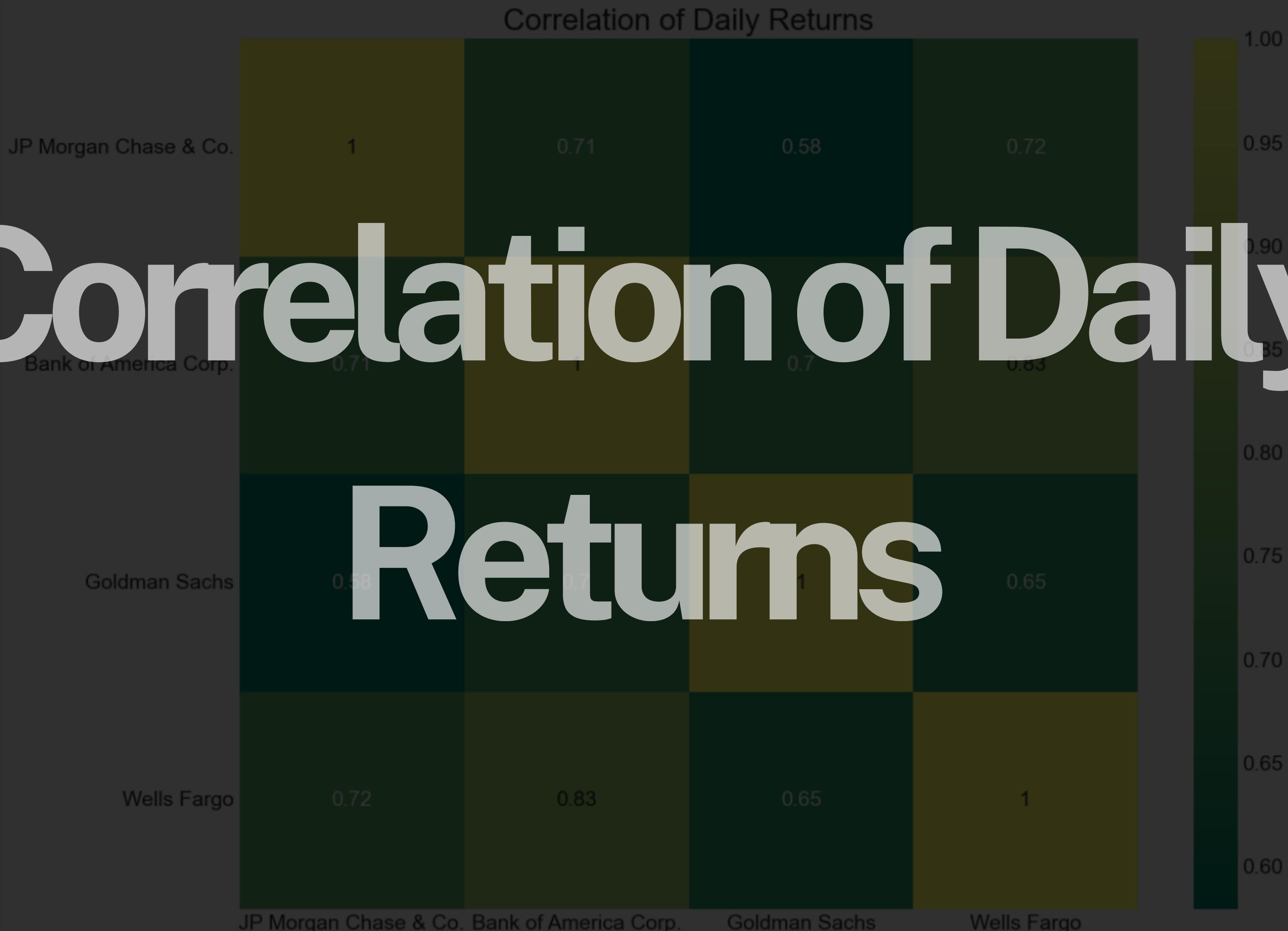
Goldman Sachs



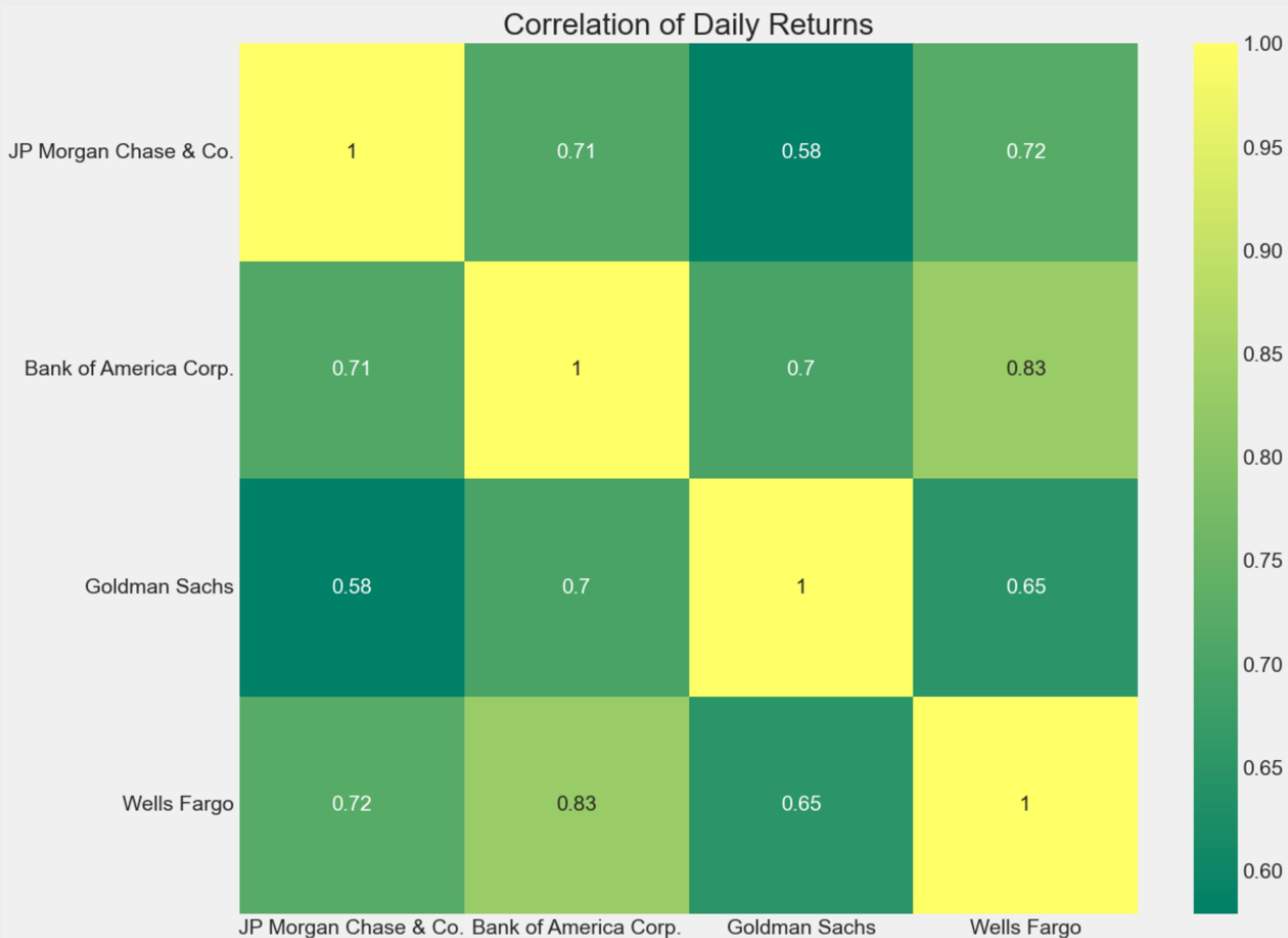
Wells Fargo

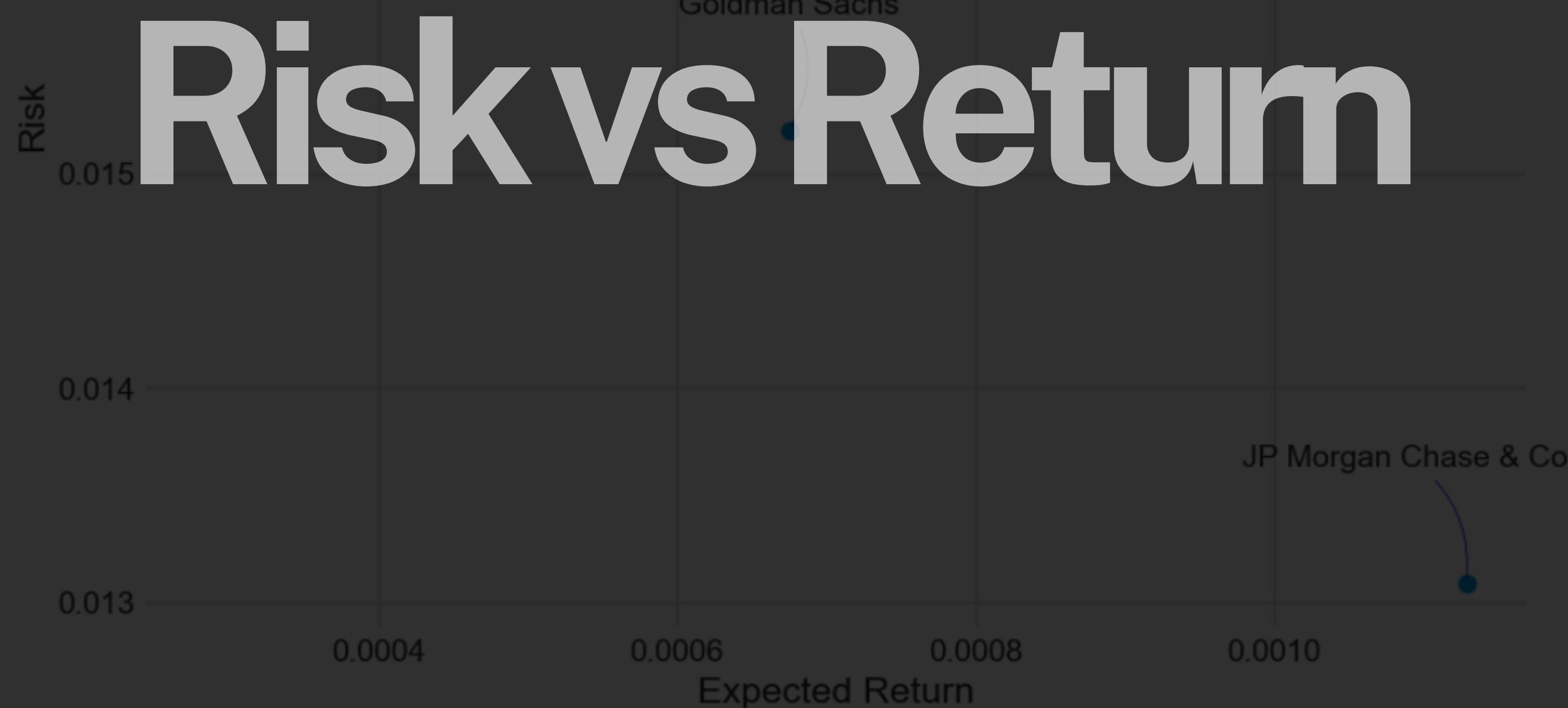


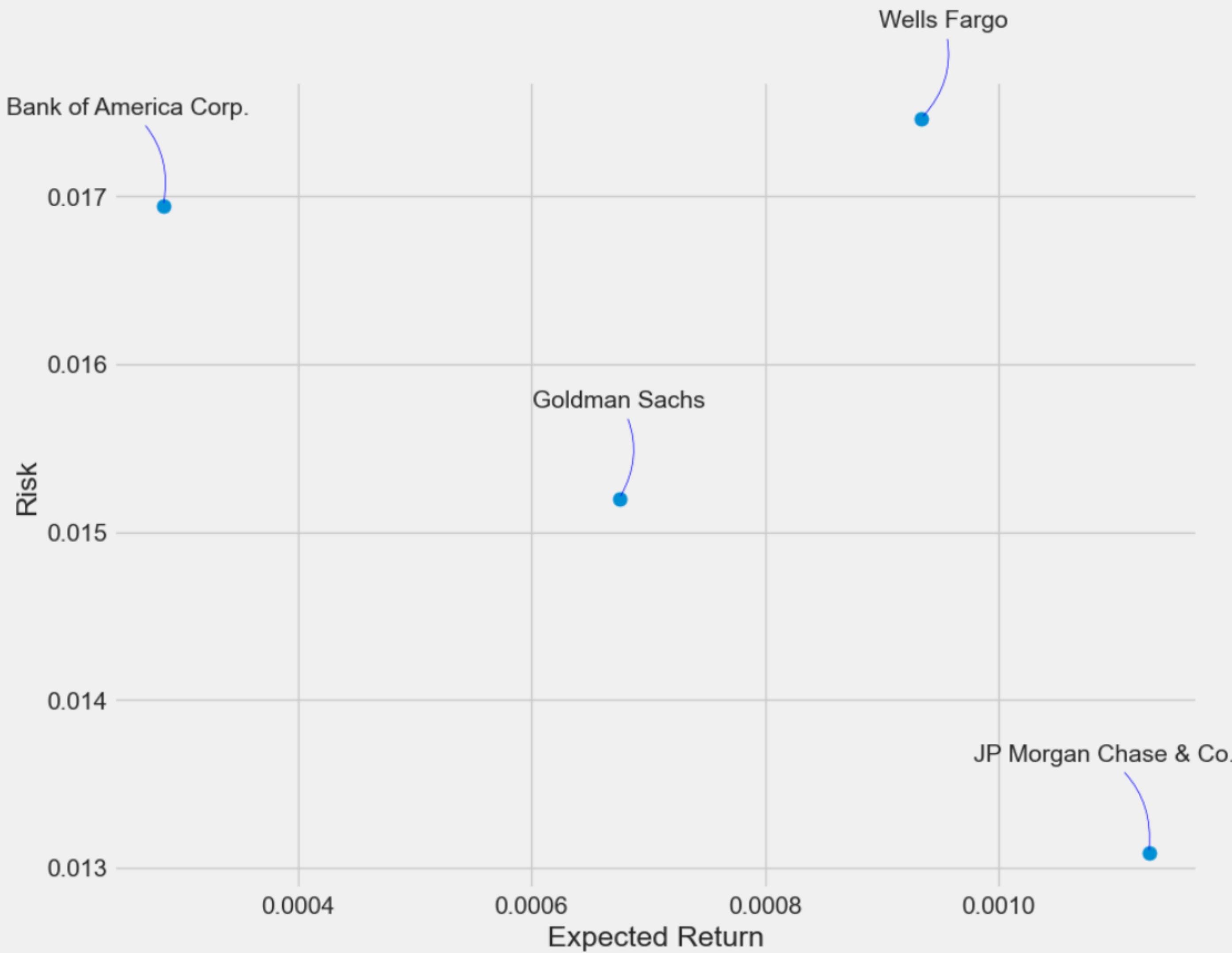
Correlation of Daily Returns



Correlation of Daily Returns

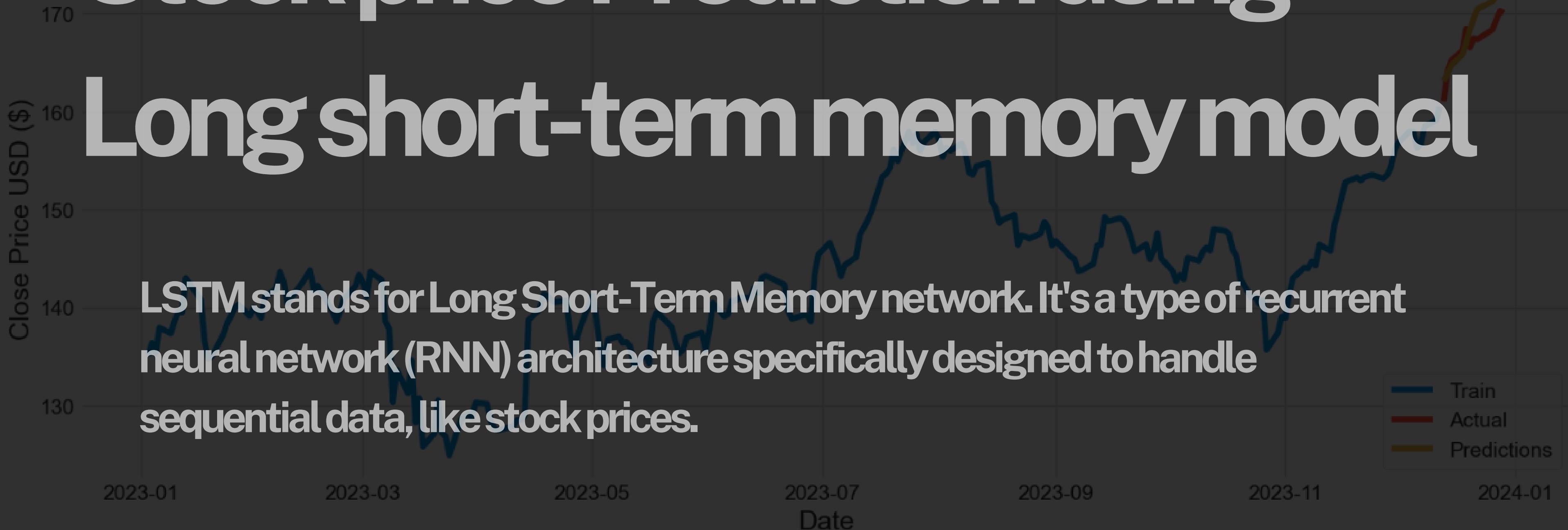






Stock price Prediction using Long short-term memory model

LSTM stands for Long Short-Term Memory network. It's a type of recurrent neural network (RNN) architecture specifically designed to handle sequential data, like stock prices.



Predictions for J P Morgan Chase & Co



Mean Squared Error (MSE):

6.944734370297131

Mean Absolute Error (MAE):

2.0955327351888022





Conclusion





Presented by Pious Khemka and Vishesh Shukla

Thank you very much!

