



Financial Plan

Ms Alexandra Kolishnyick (aka Alexa)

Agenda

- Executive Summary
- Client Background and Objective
- Steps to Achieving your Financial Goal
- Key Findings sector wise
- Recommendations for Client Portfolio
- Appendix:
 - Data Visualizations
 - Data sources
 - Data methodology



Executive Summary

Risk Profile

- Your risk profile has been assessed as **Balanced**.
- Currently, a Balanced investment portfolio could be expected to receive a return of around in range of **18% to 23% per annum**.

Statement of Position

- Huge savings from the money sent by parents for daily expenses till date available for investment.
- You don't have liabilities and recurring income.

Future Goals

- Get in an Ivy League college for Bachelor degree
- Intend to start NGO after words with batchmates
- Your goal is to invest amount in stock market to gain promising returns but should be stable.



Personal Details

- Name: Ms Alexandra Kolishnyick (aka Alexa)
- Savings: Not disclosed
- Education: High school
- Aspiration in Education: Bachelor Degree
- Income: daily expense allowances from parents
- **Assumptions:**
 - You want to start NGO after finishing Bachelor Degree
 - Time in hand is around 5 years
 - Risk free return of 0.75%

Steps to Achieving your Financial Goal

Balance risk on investment

Achieving Financial Goals

**Assessment of your Financial
Position**

Your Acceptable Risk Profile

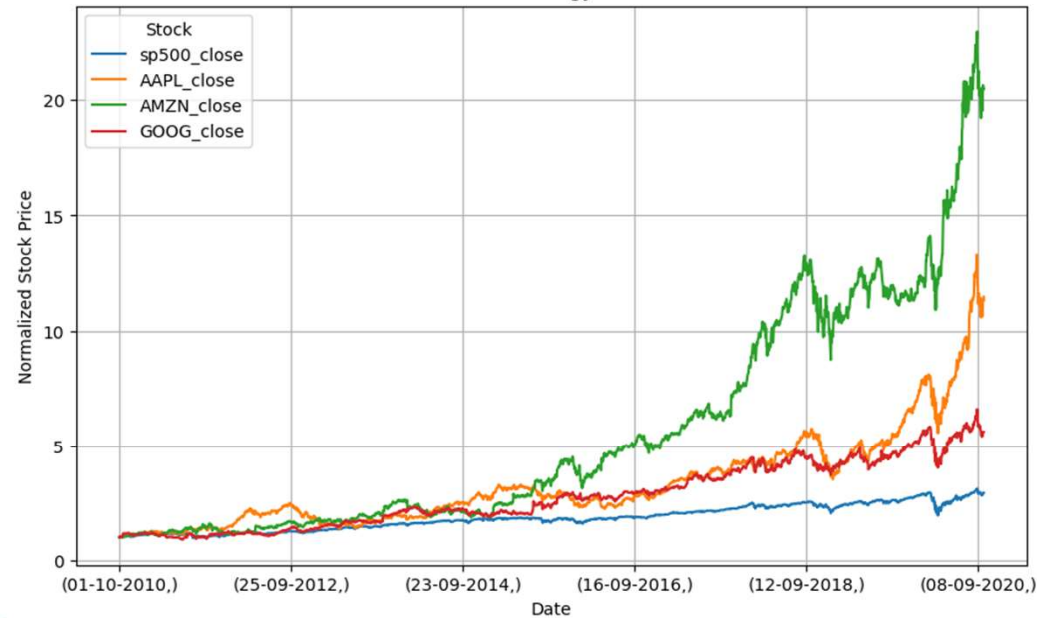
**Analyses and recommendations
based on your financial background**

Your Personalize Portfolio



Key Insights on Sector performance

S&P500 Vs Technology Sector Stocks

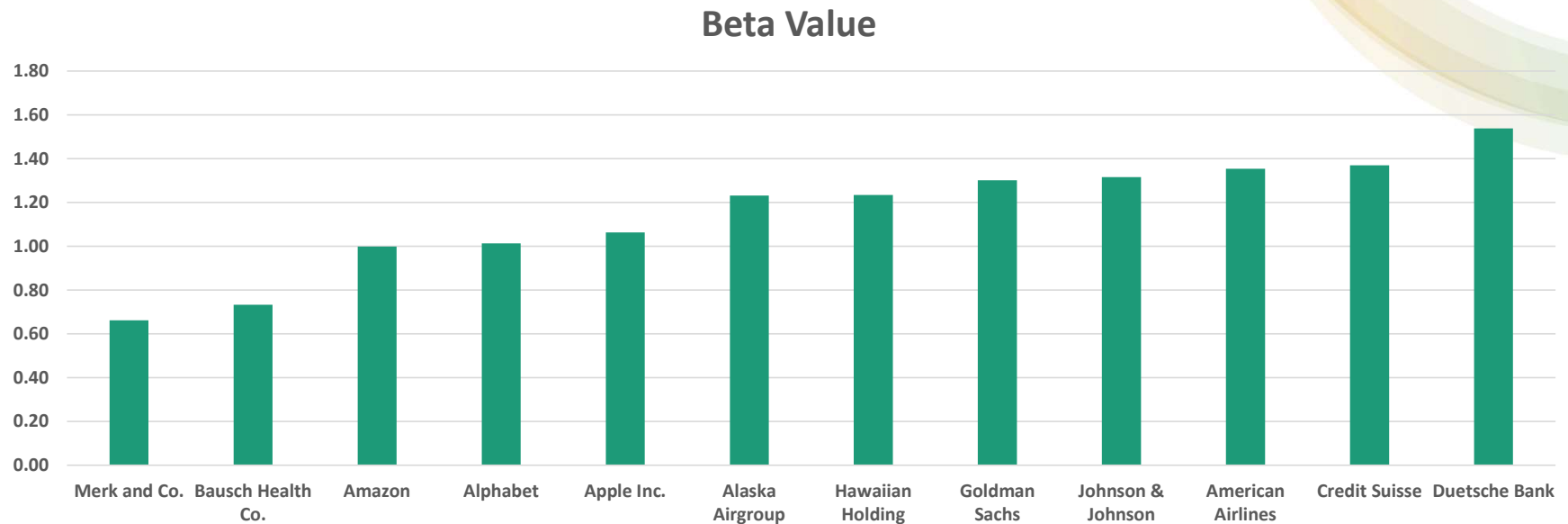


S&P500 Vs Finance Sector Stocks



- Technology sector has consistently outperformed the market index S&P in last 10 years
- Finance sector has been the worst sector with negative growth

Key Insights of Stock volatility



- Healthcare and Pharma stocks are less volatile
- Finance sector stocks are most volatile

Sector overview

Aviation Sector

Low Cumulative Returns / High Volatility

Finance Sector

Negative Returns / High Volatility

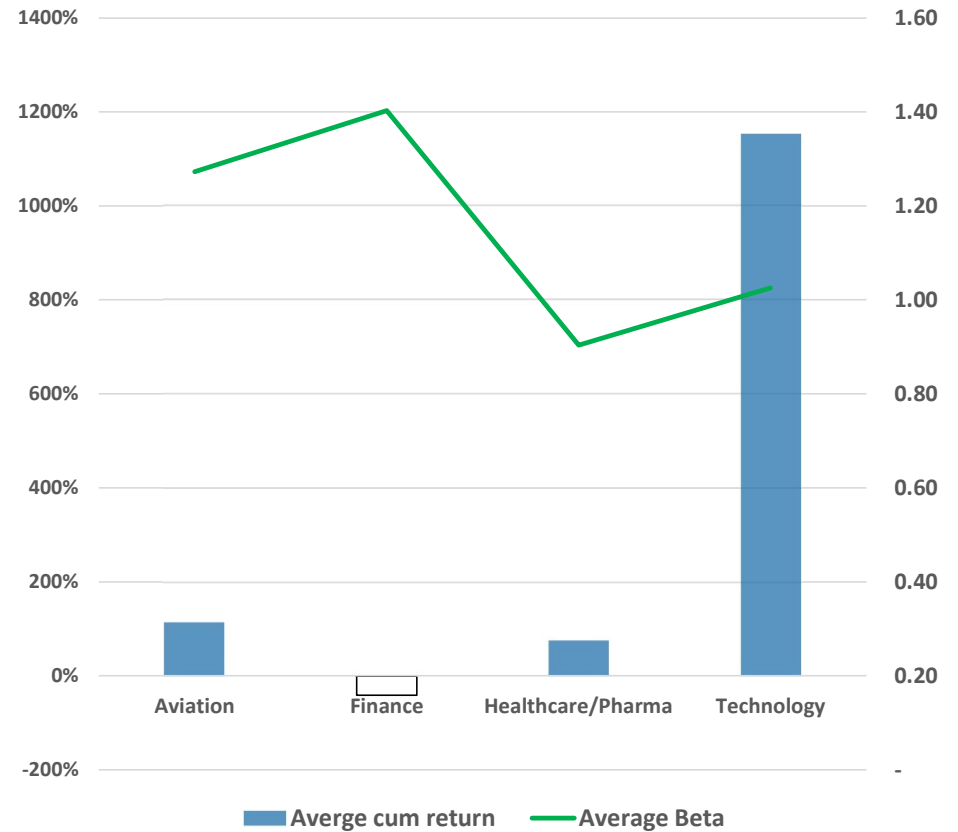
Healthcare Sector

Low Returns / Low Volatility

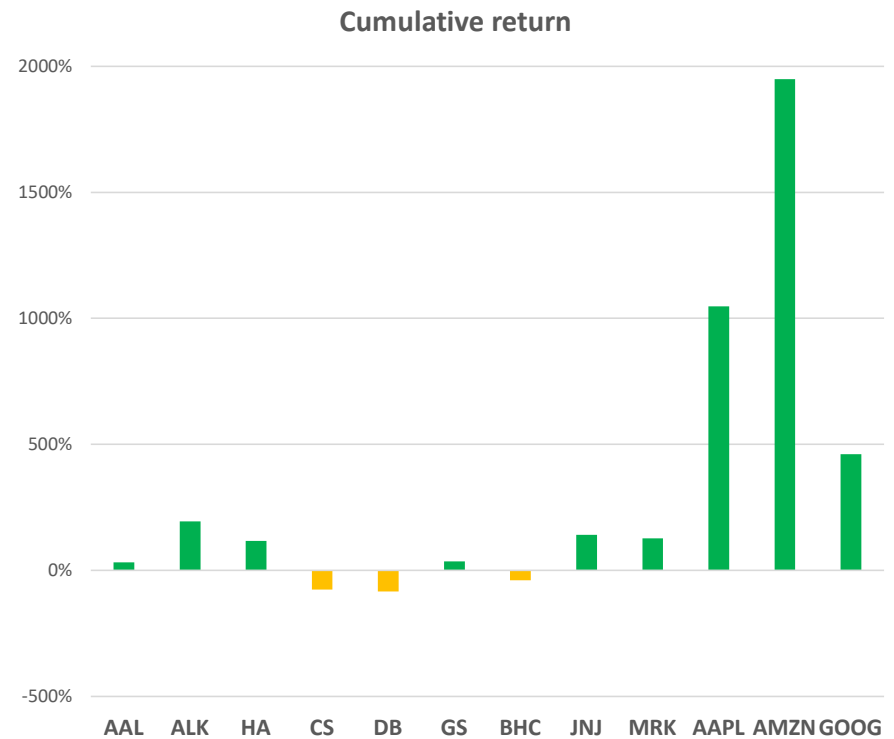
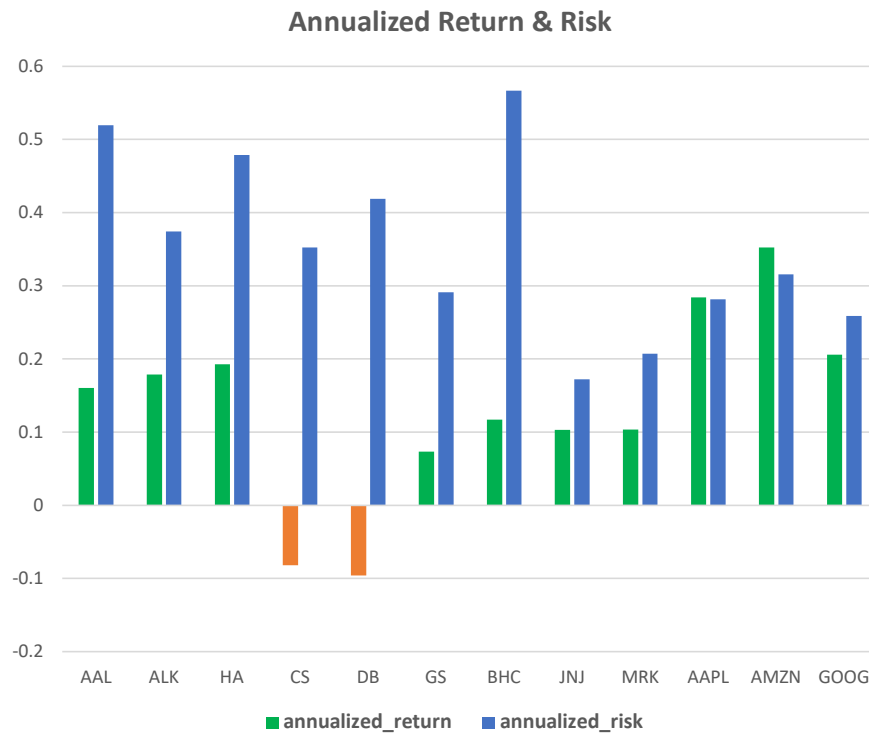
Tech Sector

High Returns / Low Volatility.

Sectorwise Performance



Stock Analysis





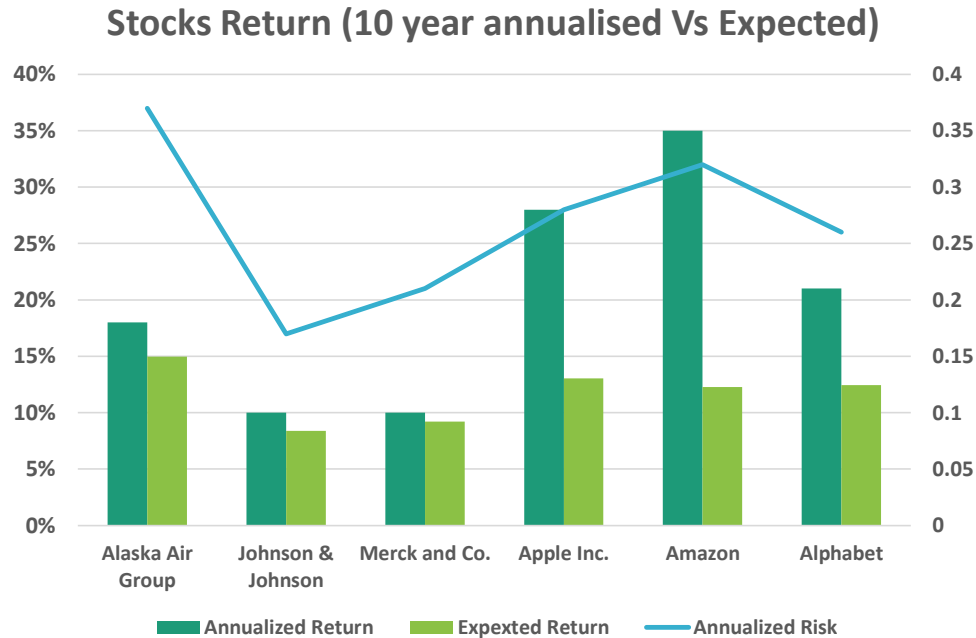
Stock Selection for Portfolio

- Finance sector completely dropped
- Technology sector is most suitable for selection:
 - Select all three stock as return is high, risk is comparable with S&P
- Healthcare:
 - Johnson & Johnson and Merck and Co. are with more than 100% cumulative returns and have lowest volatility
- Aviation:
 - Alaska Air group is good choice into this sector as this has nearly 194% of cumulative return with slightly higher volatility than S&P

Portfolio Performance

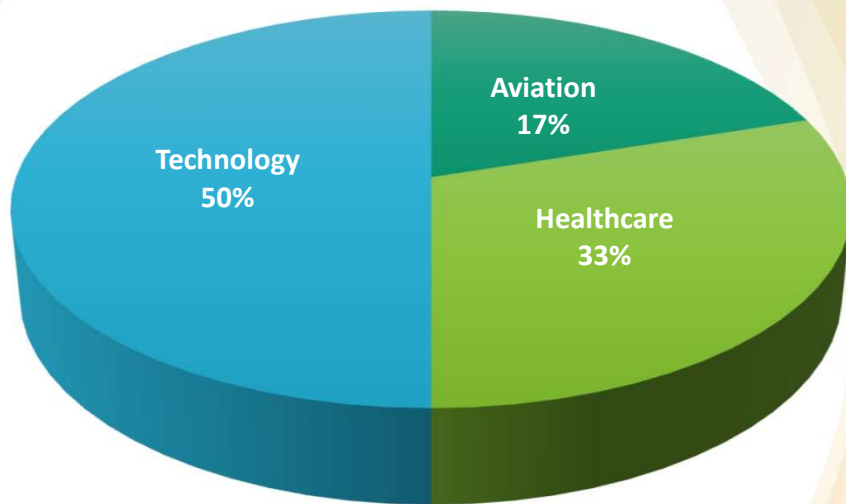
Stock	Annualized Return	Annualized Risk	Cumulative Return	Beta	Weight
Alaska Air Group	18.00%	0.37	194%	1.23	17%
Johnson & Johnson	10.00%	0.17	141%	0.66	17%
Merck and Co.	10.00%	0.21	127%	0.73	17%
Apple Inc.	28.00%	0.28	1048%	1.06	17%
Amazon	35.00%	0.32	1948%	1.00	17%
Alphabet	21.00%	0.26	461%	1.01	17%
	Portfolio Return		20.33%		
	Portfolio Beta		0.95		

Portfolio Diversification



- Technology stocks have highest returns and Amazon being the best performer
- Healthcare/Pharma stocks have low returns but with low risk among other stocks
- Alaska air stock has decent annualized return over 10 years with slightly higher risk

Asset Allocation



Sector allocation strategy

- Technology sector – 50%
 - ✓ With moderate risk and high returns
- Healthcare sector – 33%
 - ✓ With low risk and stable return
- Aviation sector – 17%
 - ✓ With high risk and moderate return

Forecasted Performance of Models Summary

Forecast Model Performance



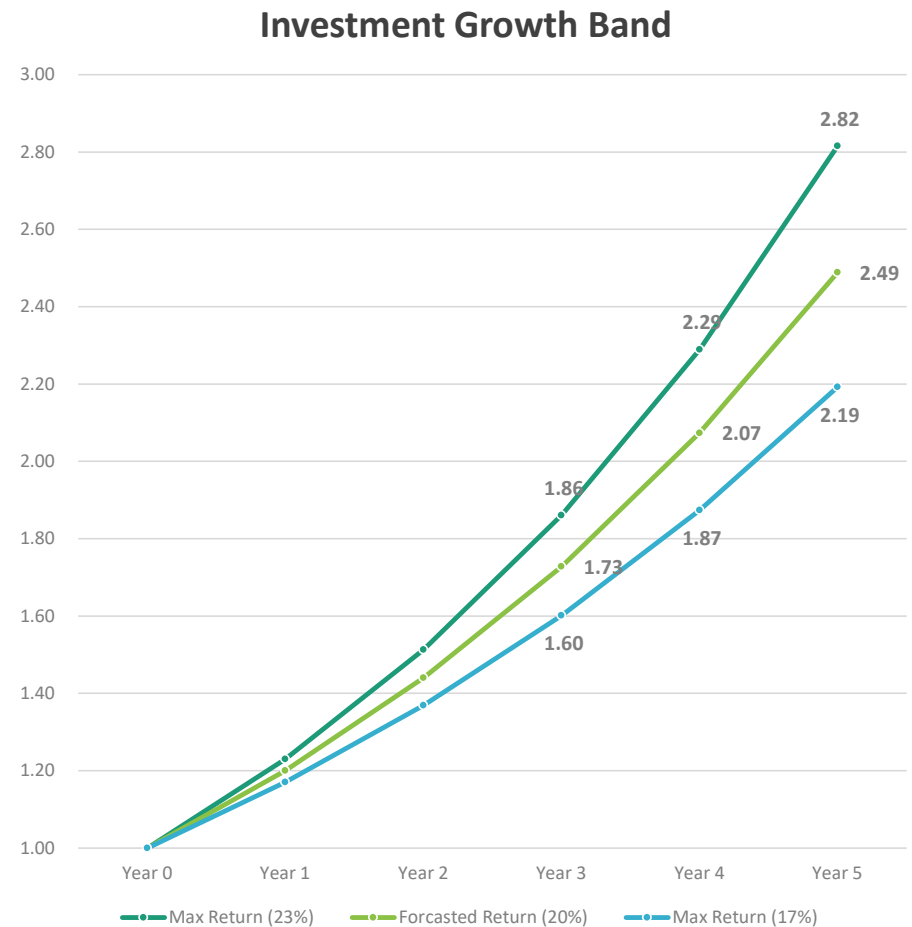
Forecast Model Performance Summary for Portfolio Stocks

Portfolio Stocks	Model Error % (MAPE)	Minimum Forecast Return	Annualised return	Maximum Forecast Return
Alaska Airline	6.9%	16.75%	18.00%	19.25%
Johnson & Johnson	6.2%	9.38%	10.00%	10.62%
Merk and Co.	6.7%	9.33%	10.00%	10.67%
Apple Inc	24.6%	21.11%	28.00%	34.89%
Amazon	11.2%	31.09%	35.00%	38.91%
Google	11.7%	18.55%	21.00%	23.45%
Overall Portfolio Performance		17.70%	20.33%	22.96%

Portfolio Overview

"Do not put all your eggs into one basket"

- Forecasted returns in 5 year will be 2.5x
- Within risk band 2.82x is on high side and 2.19x is on low side.
- 50% of asset allocation is in Technology stocks for their high growth.
- 33% of asset allocation is in Healthcare stocks for their stability and consistent returns.
- 17% in aviation stock for sector diversification.
- The portfolio outperforms S&P annualized return by 10%.

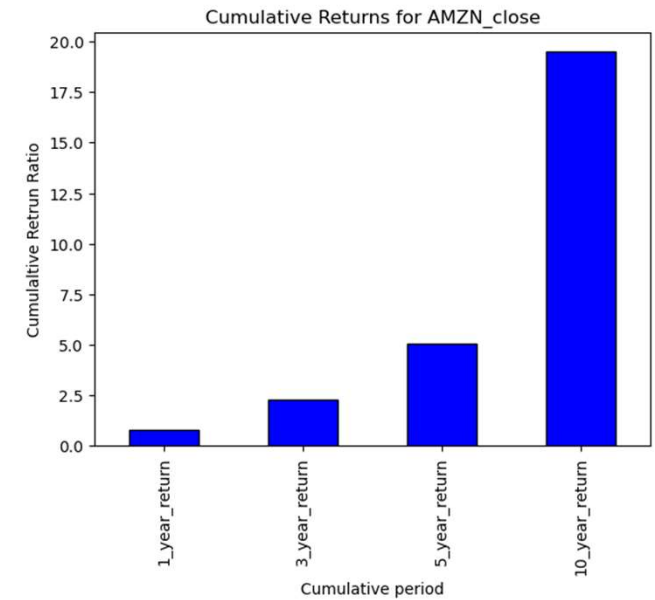
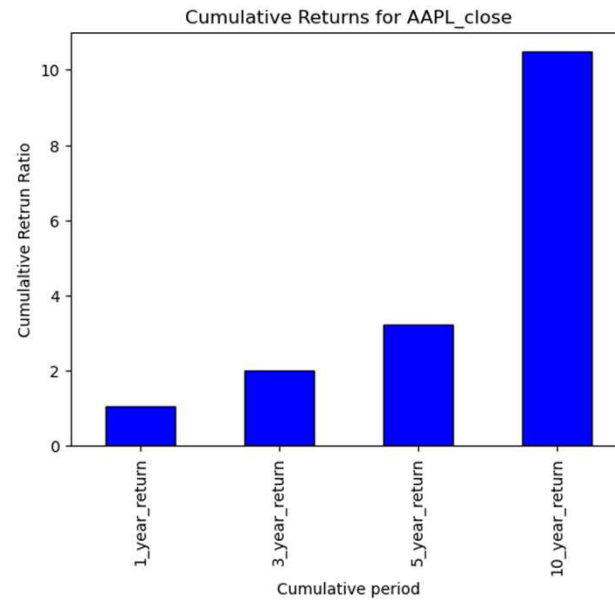
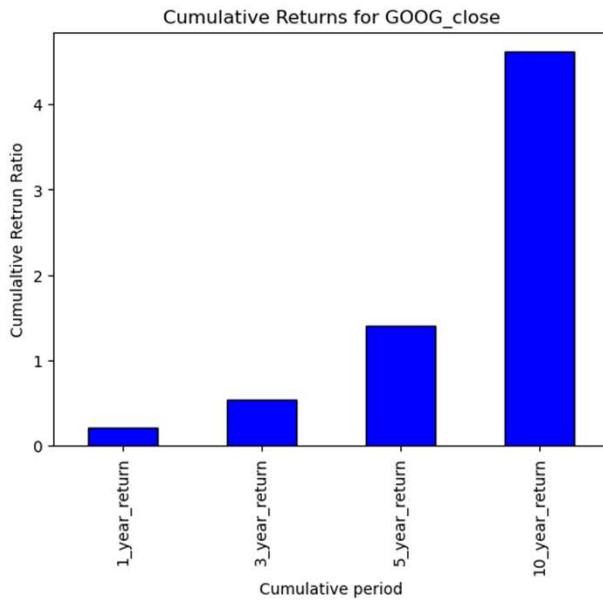


Thank You



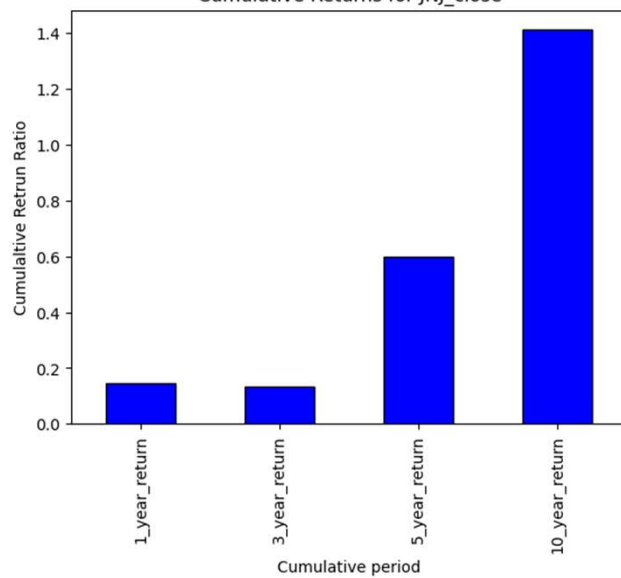
Appendix

Technology Stock Performance

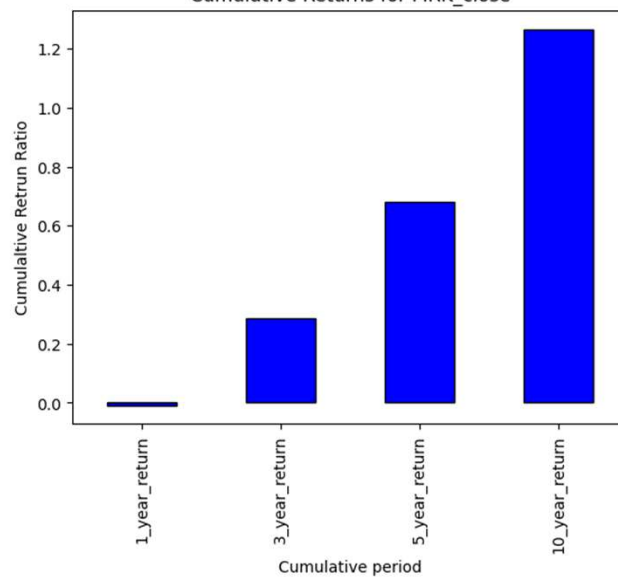


Healthcare Stock Performance

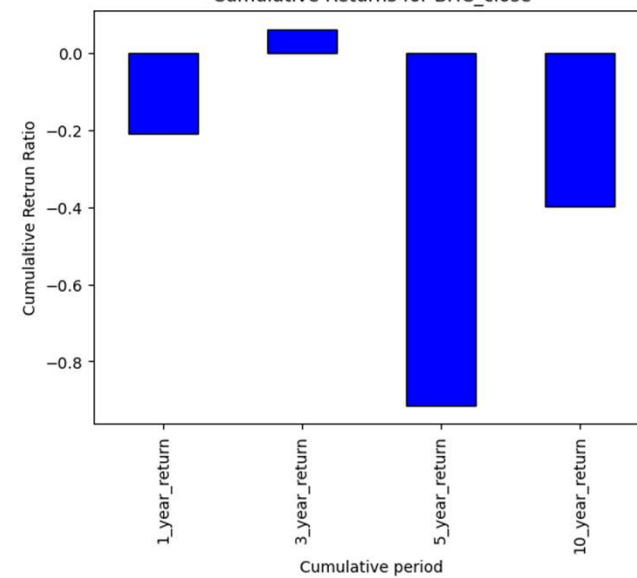
Cumulative Returns for JNJ_close



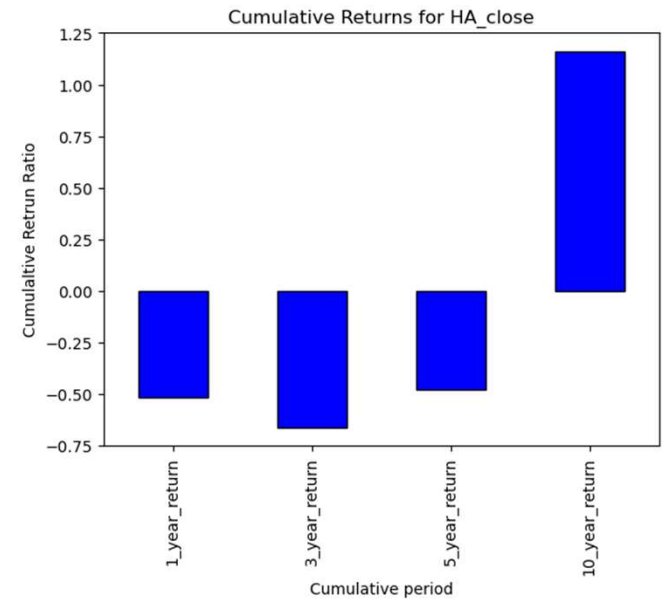
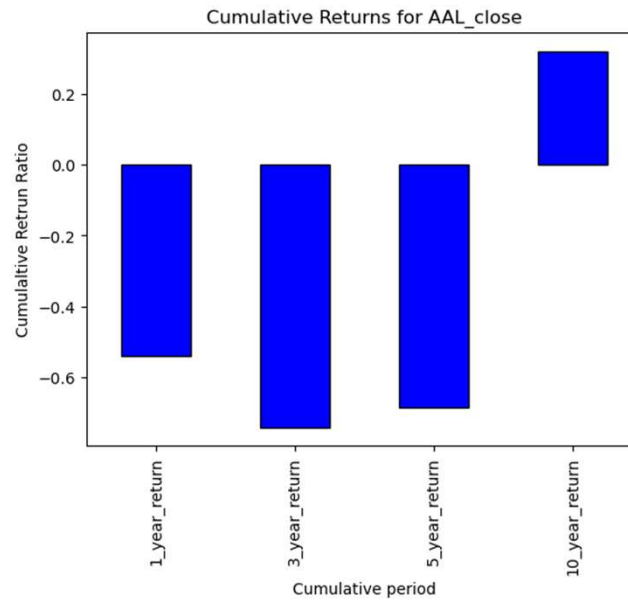
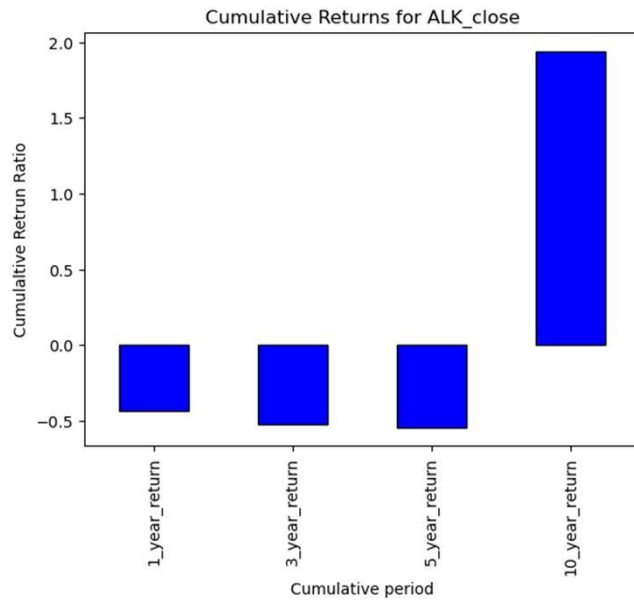
Cumulative Returns for MRK_close



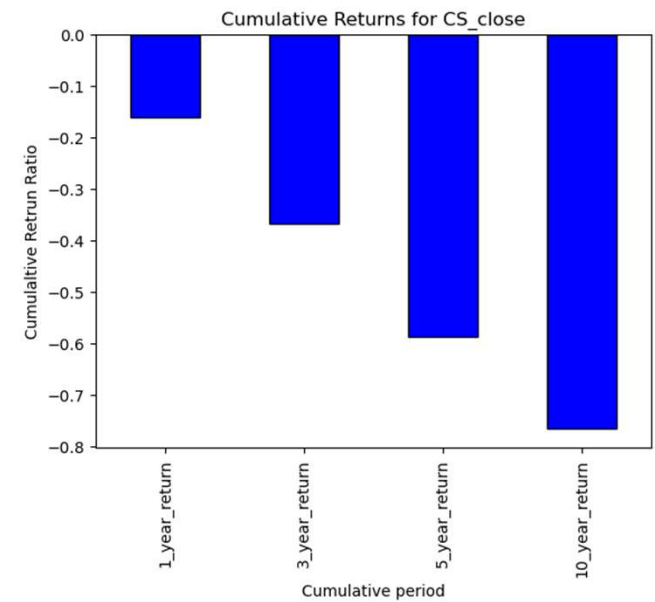
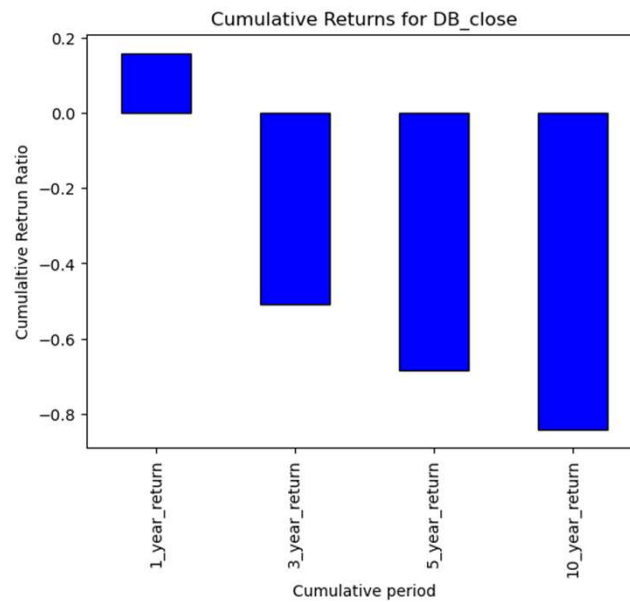
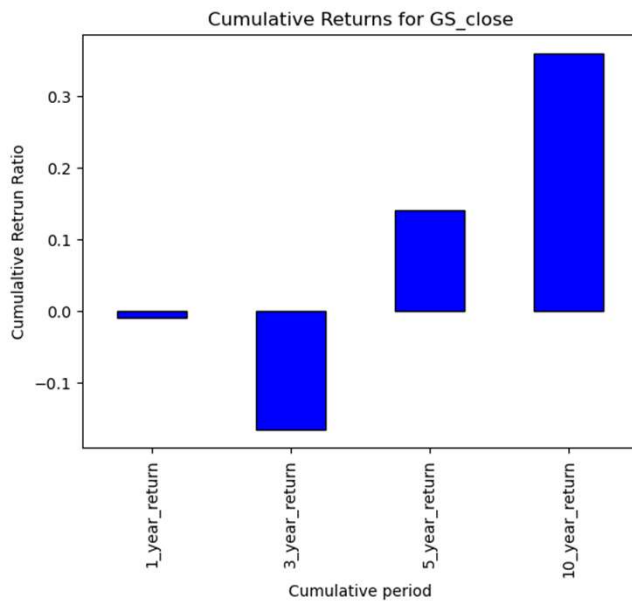
Cumulative Returns for BHC_close



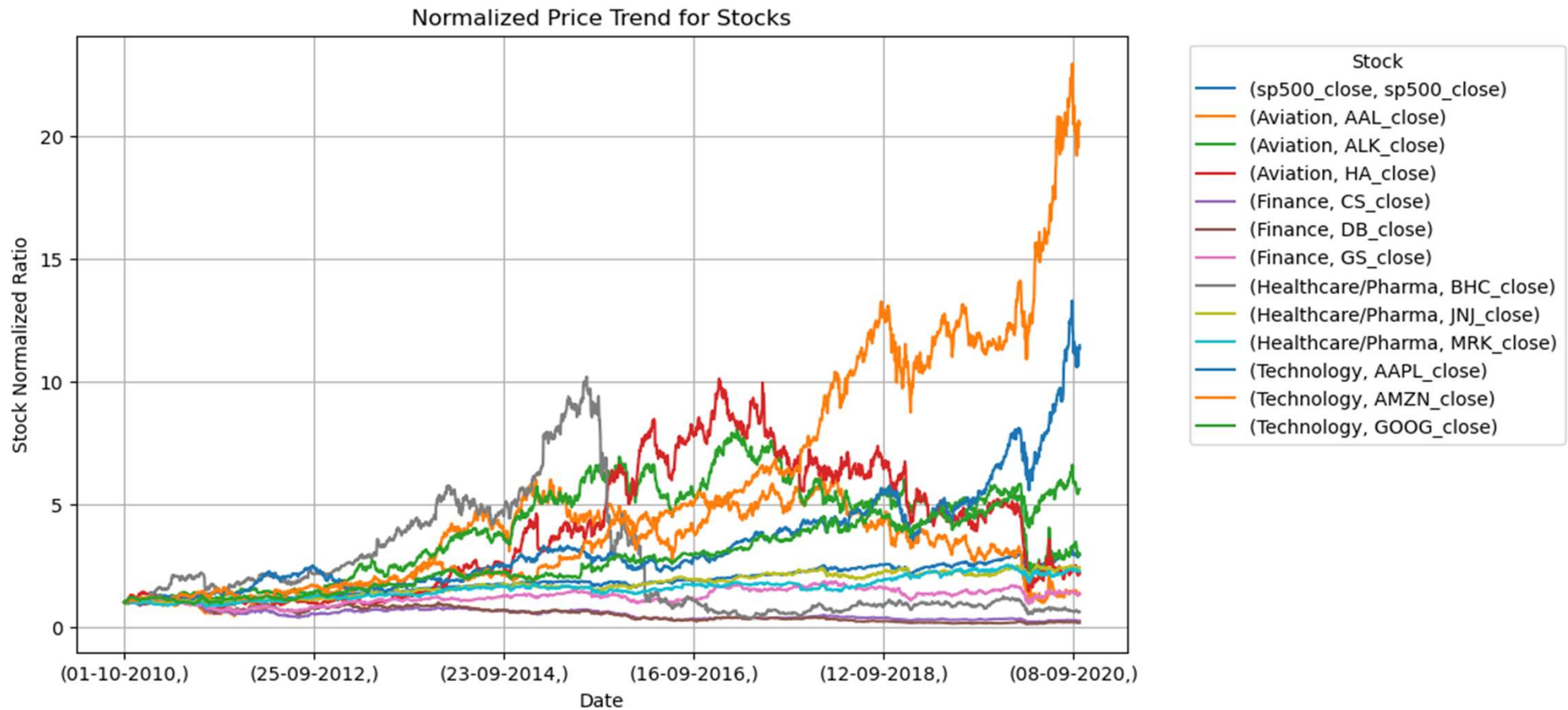
Aviation Stock Performance



Finance Stock Performance

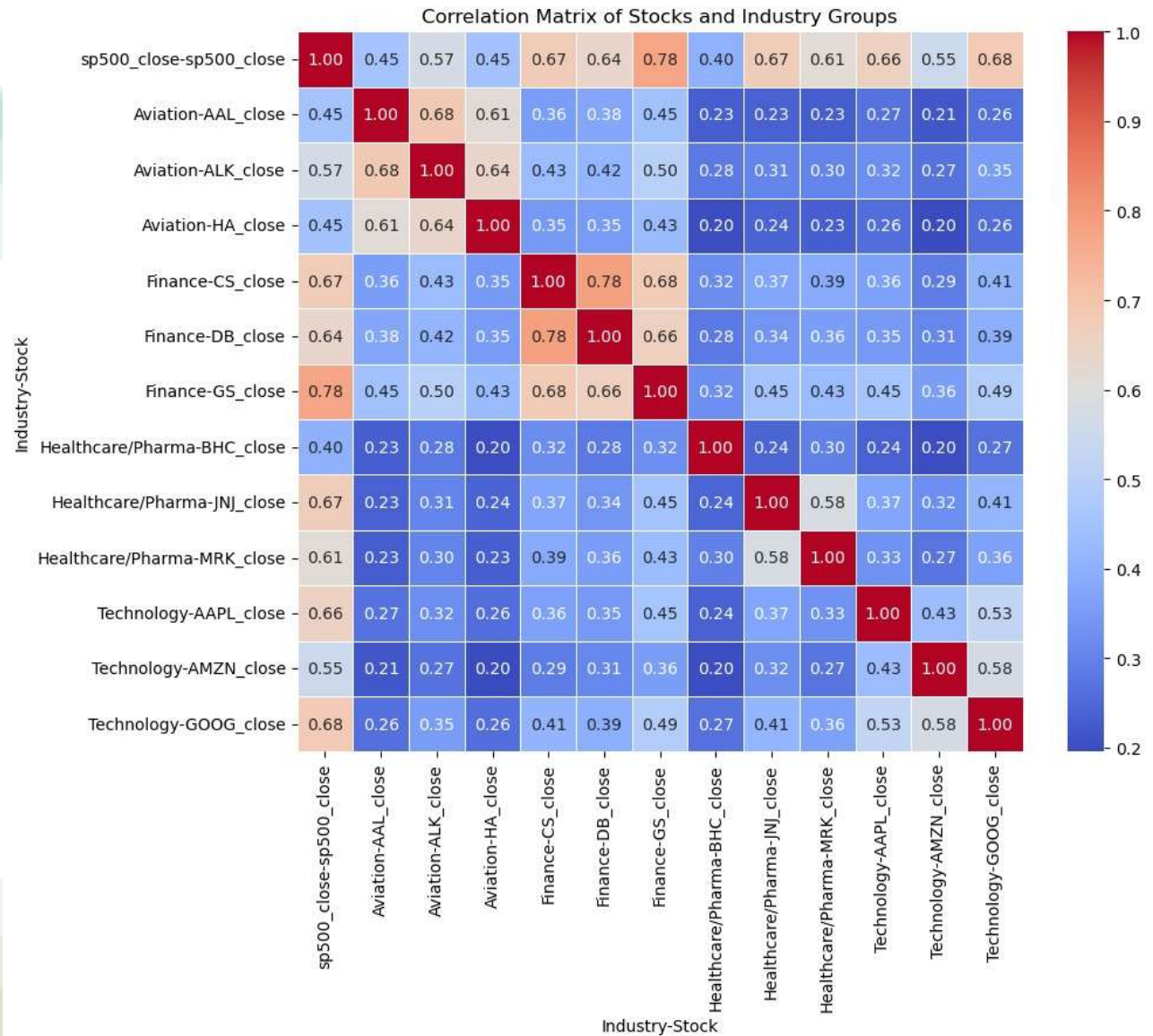


Normalized Price Trend for Stock

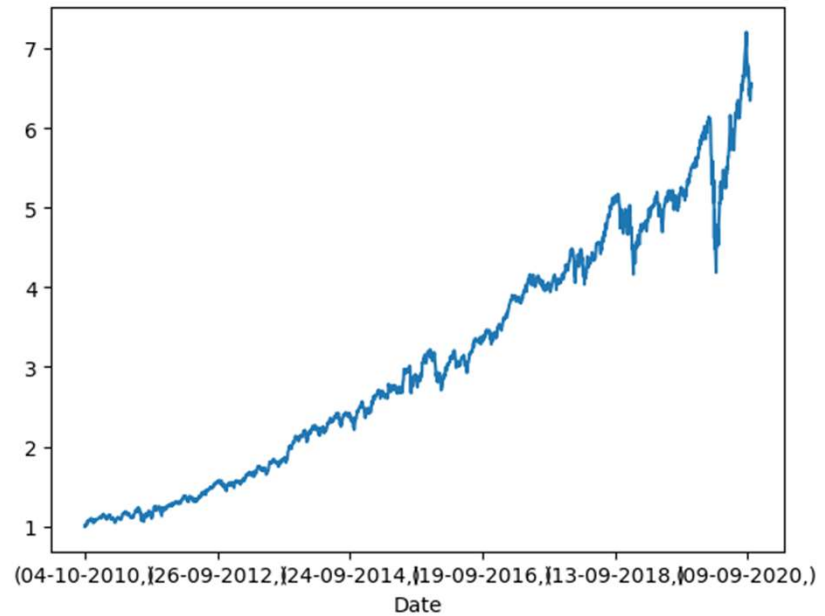
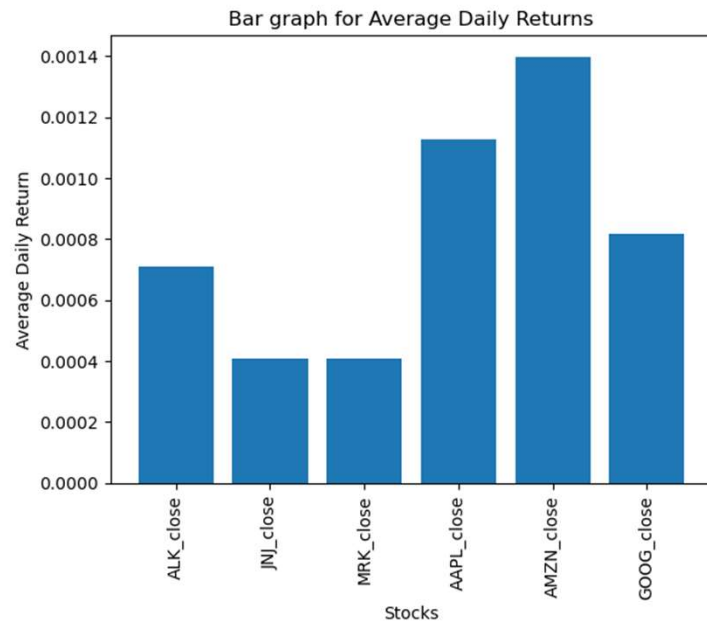


Correlation between Stocks

- Finance sector stocks has most correlation in them
- Healthcare and Pharma are in least intra sector correlation
- No major correlation across the sectors



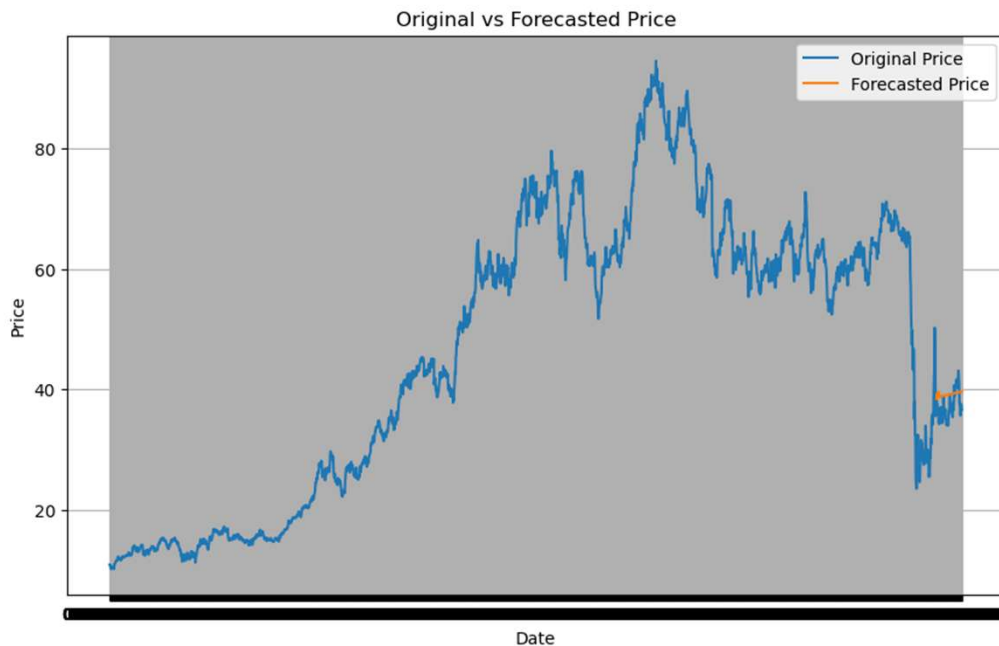
Portfolio Stock Performance



Portfolio performance Analysis

Cumulative return

Alaska Airline Stock Performance and Forecast



Split 0.97

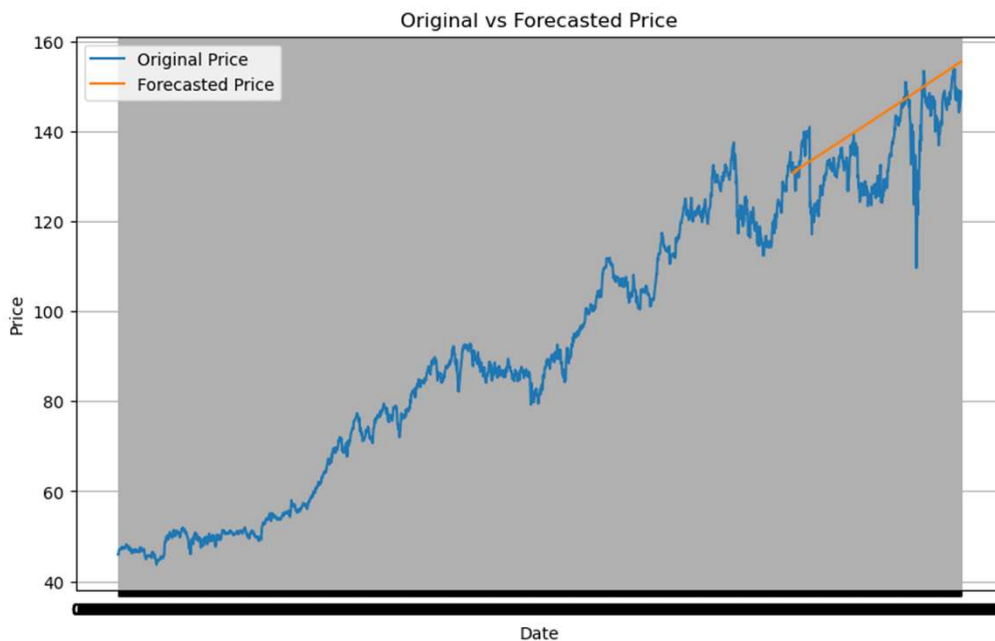
Lag order 12

Selected on account of recency in stock performance

Mean Absolute Percentage Error (MAPE): 6.92%

Root Mean Squared Error (RMSE): 2.83

Johnson & Johnson Stock Performance and Forecast



Split 0.8

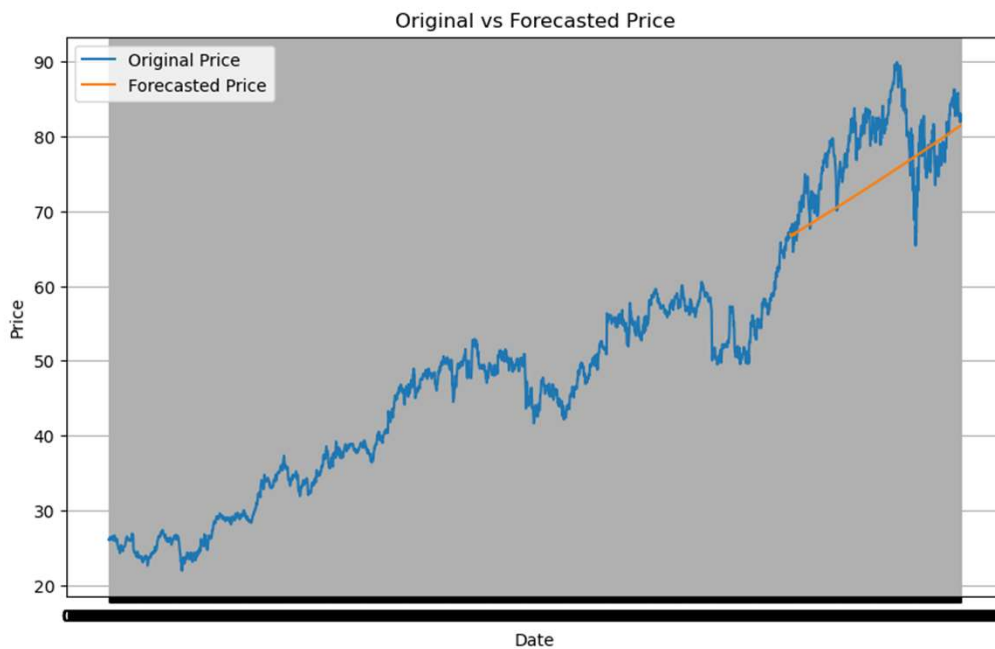
Lag order 20

Selected on account of recency in stock performance

Mean Absolute Percentage Error (MAPE): 6.22%

Root Mean Squared Error (RMSE): 10.05

Merck and CO Stock Performance and Forecast



Split 0.8

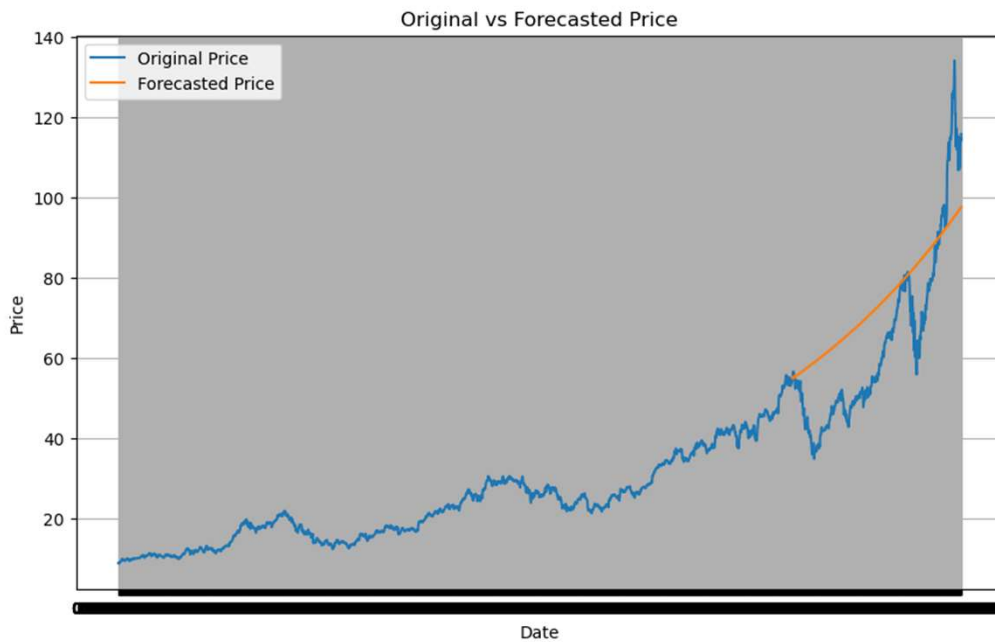
Lag order 21

Selected on account of recency in stock performance

Mean Absolute Percentage Error (MAPE): 6.67%

Root Mean Squared Error (RMSE): 6.36

Apple Stock Performance and Forecast



Split 0.8

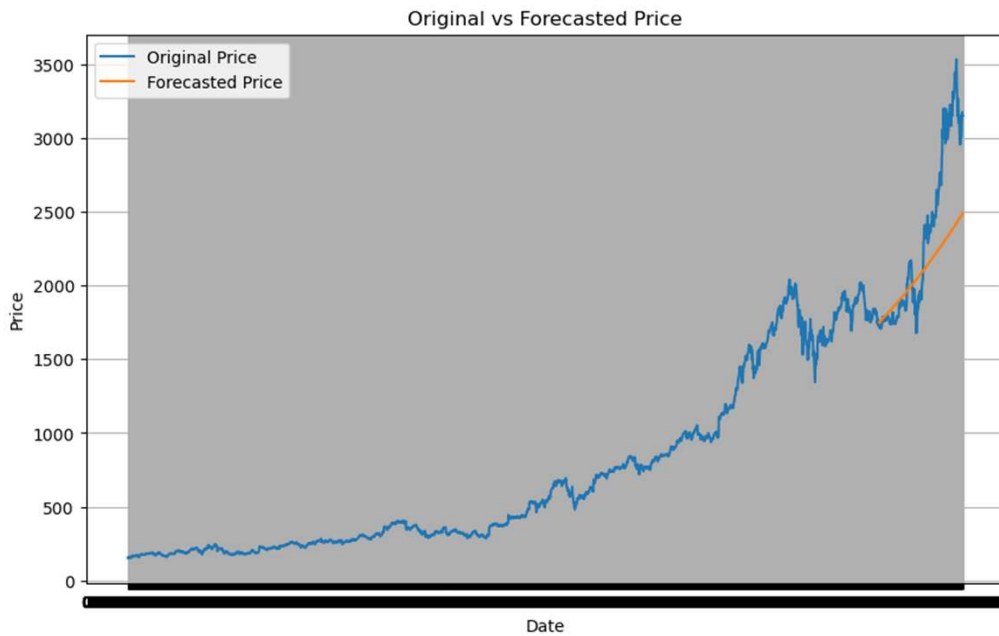
Lag order 12

Selected on account of recency in stock performance

Mean Absolute Percentage Error (MAPE): 24.6%

Root Mean Squared Error (RMSE): 15.32

Amazon Stock Performance and Forecast



Split 0.9

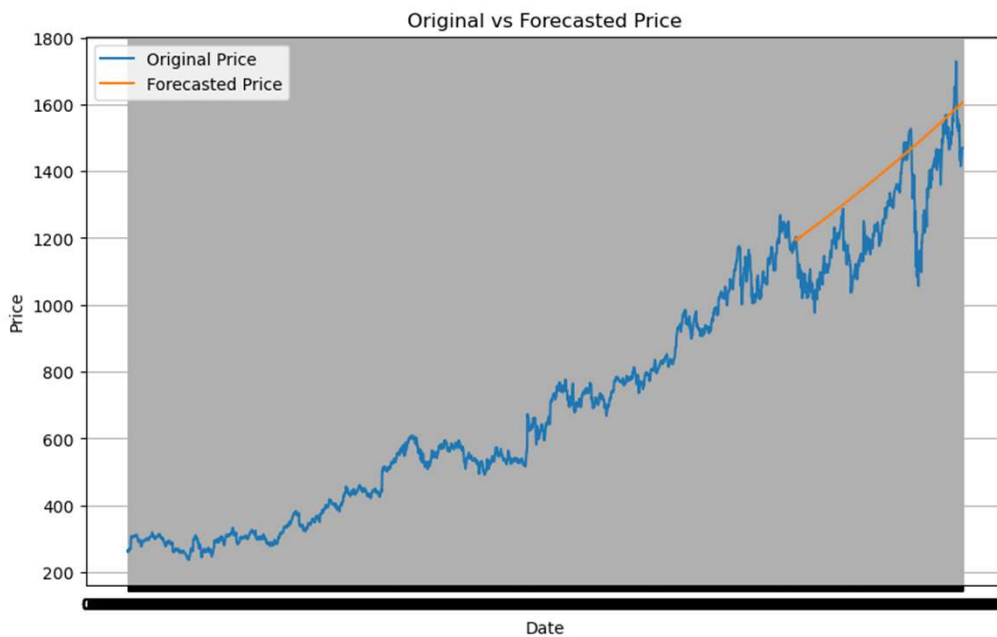
Lag order 12

Selected on account of recency in stock performance

Mean Absolute Percentage Error (MAPE): 11.18%

Root Mean Squared Error (RMSE): 428.23

Alphabet (Google) Stock Performance and Forecast



Split 0.8

Lag order 21

Selected on account of recency in stock performance

Mean Absolute Percentage Error (MAPE): 11.65%

Root Mean Squared Error (RMSE): 158.56



Data Source

- Here is a snapshot of our data dictionary.
 - Stock Opening, Closing, Adjusted Closing and Trade Volume
- The team used the following data sources:
 - S&P 500 Index Performance over 10 Years
 - 3 Stocks Each from 4 Different Sectors
Aviation, Healthcare/Pharma, Finance
and Technology



Data Methodology

We conducted a thorough analysis of the stocks sector wise and then Individual Stocks.

- The process included:
 - Loading and Cleaning the data.
 - Sector Wise Analysis to check sector performance once 10 Years
 - Selecting Individual Stocks based Best Cumulative Performance, Lowest Volatility and Recent Performance.
 - Portfolio Stock Performance Forecasting based on Multivariate Pattern Series Method using VAR.
- Model Building Approach:
 - General requirement for forecasting like Boxcox transformation to reduce variance and Differencing to achieve Stationarity
 - Market Variation due to external factors like Pandemic have been factored in by splitting train and test sets to match the recency in stock performance.
 - This is done to reduce MAPE Error.
- Portfolio Performance band was ascertained based on error of individual stocks in the portfolio