Stock Analysis and Portfolio Management

CAPSTONE PROJECT

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PROBLEM STATEMENT

- A portfolio manager is responsible for establishing the best investment strategy, selecting appropriate investments along with the right allocation.
- The primary objective of the project is to analyze a portfolio of stocks to provide consultation on investment management based on client's requirement as an associate working at an investment firm.
- To understand the problem better, 5W's and How analysis to be used.
- Provide consultation to Ms Alexandra Kolishnyick (aka Alexa) based on her requirements and financial objectives.

INVESTOR

- Ms Alexandra Kolishnyick (aka Alexa) is the client to whom consultation is required for her financial goals
- Alexa is the daughter of a famous Ukrainian business tycoon.
- She lives in US for a quiet long time for her schooling.
- She is reserved and conservative person believes in simple and humble living.
- She aims for Ivy League college for her Bachelors.
- Alexa wants to a form a NGO for Sub-Saharan African region along with her batch mates and is emotionally supported by her family.
- Alexa is having a huge savings from the money sent by her parents for daily expenses.
- She wants invest her savings in stocks that are stable to get good returns.
- Alexa is conservative in disclosing the investment amount and wants a comprehensive report on all the metrics to devise the investment strategy.

PORTFOLIO STRATEGY

When building an optimized portfolio, our main goal is to achieve the highest possible returns while minimizing risk. To do this, we use a careful selection process based on the analysis of cumulative returns and beta values for different stocks. The following are the approaches that we use in the analysis and building a more beneficial portfolio.

1. Maximizing Returns

We prioritize stocks with positive cumulative returns, indicating gains during the analysis period. Choosing stocks with solid performance histories helps position the portfolio to take advantage of growth opportunities and benefit from favorable market conditions.

PORTFOLIO STRATEGY

2. Minimizing Risk
We evaluate stocks' beta values to measure their volatility compared to the market. Stocks with lower beta values tend to be less volatile and can help reduce overall portfolio risk. In contrast, stocks with very high beta values can be subject to significant price swings, potentially introducing unwanted volatility to the portfolio.

3. Optimizing Performance
By thoughtfully selecting stocks with strong risk-return profiles, we aim to enhance portfolio performance. This includes balancing high-performing stocks with acceptable risk levels and stability, positioning the portfolio to achieve steady returns over time.

PORTFOLIO STRATEGY

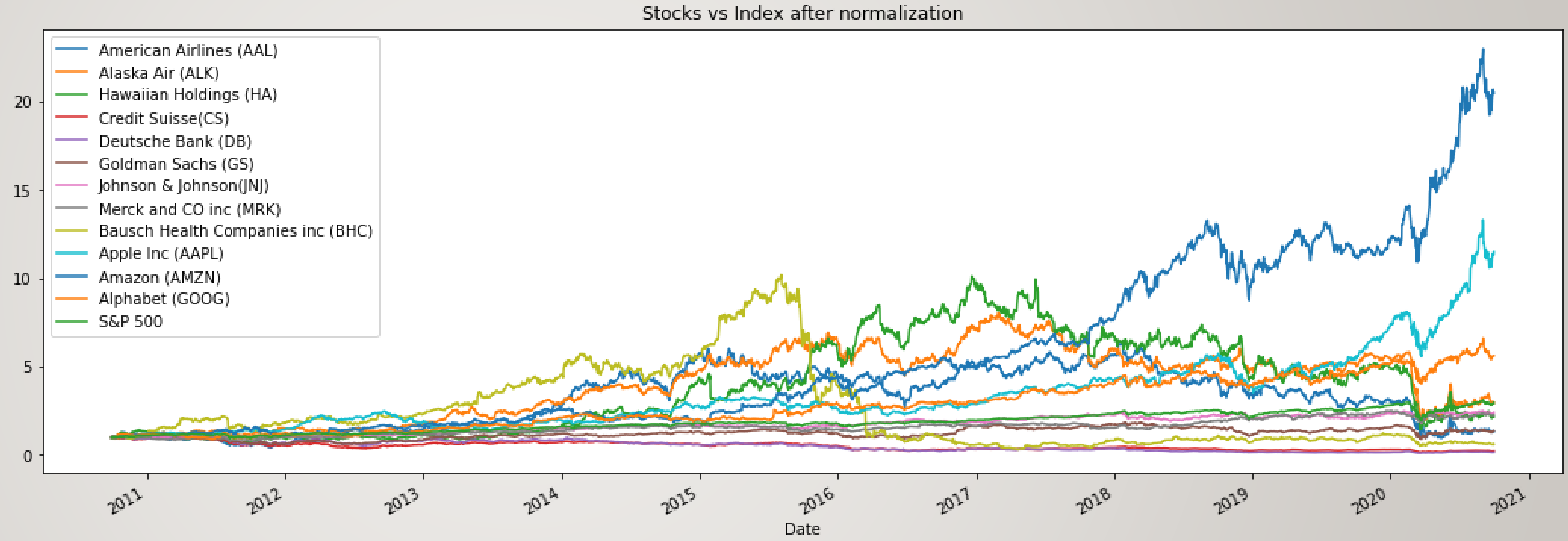
4. Risk Management
Our analysis helps us pinpoint stocks with negative cumulative returns or extremely high beta values, indicating potential risks to the portfolio. By avoiding these stocks, we reduce the chances of losses and strengthen our risk management strategies.

5. Diversification
We understand that diversification plays a key role in decreasing overall portfolio risk. Therefore, we aim to create a diversified portfolio by including stocks from different sectors and industries. This approach distributes risk across a range of assets, reducing the impact of unfavorable market fluctuations on the portfolio's performance.

PORTFOLIO ANALYSIS

	SnP	Avi_AAL	Avi_ALK	Avi_HA	Fin_CS	Fin_DB	Fin_GS	Hl_JNJ	Hl_MRK	Hl_BHC	Tech_AAPL	Tech_AMZN	Tech_GOOG
Average_daily_return	0.0488	0.0637	0.0709	0.0765	-0.0325	-0.0381	0.0291	0.0409	0.0410	0.0464	0.1128	0.1398	0.0818
Risk	1.0934	3.2726	2.3562	3.0147	2.2206	2.6374	1.8331	1.0847	1.3049	3.5700	1.7719	1.9889	1.6288
Annualized_return	12.2966	16.0489	17.8792	19.2824	-8.1888	-9.6102	7.3212	10.3009	10.3385	11.6973	28.4164	35.2201	20.6023
Annualized_risk	17.3574	51.9504	37.4043	47.8573	35.2509	41.8676	29.0996	17.2187	20.7142	56.6714	28.1273	31.5735	25.8561
Cumulative_return	193.3941	32.2928	194.2760	116.2752	-76.3893	-84.0290	36.0664	141.1012	126.6393	-39.6505	1047.7700	1948.4873	461.2832
Beta	1.0000	1.3536	1.2315	1.2335	1.3700	1.5375	1.3013	0.6622	0.7335	1.3160	1.0633	0.9988	1.0133
CAPM	12.2966	16.3796	14.9698	14.9931	16.5689	18.5034	15.7754	8.3965	9.2191	15.9450	13.0281	12.2828	12.4506

PORTFOLIO ANALYSIS



PORTFOLIO – STOCKS TO RETAIN:

Johnson & Johnson (JNJ)

- JNJ has lower risk and beta values relative to the market index, offering stability to a portfolio.
- Its consistent performance makes it a dependable investment, potentially reducing overall portfolio risk.
- The stock's history of steady performance adds to its reputation as a reliable choice for long-term investors.

Merck & Co Inc (MRK)

- MRK also features low risk and beta values, making it an excellent option for inclusion in a portfolio.
- Similar to JNJ, MRK provides a stable foundation and contributes to the overall risk mitigation of the portfolio.
- The stock has shown relatively steady performance, reinforcing its standing as a dependable pick for long-term investment strategies.

PORTFOLIO – STOCKS TO RETAIN:

Apple Inc (AAPL)

- Although part of the technology sector, AAPL has consistently demonstrated stable performance and alignment with market trends.
- Its beta value is close to the market benchmark, yet AAPL's sustained growth and industry leadership offer valuable prospects for long-term investment.
- Including AAPL in the portfolio can enhance diversification and provide access to potential growth opportunities within the tech sector.

In conclusion,

- The analysis highlights three stocks that combine stability, growth potential, and effective risk management, making them strong candidates for portfolio inclusion.
- By thoughtfully evaluating these elements and making well-informed decisions, investors can create a diversified and robust portfolio tailored to achieve long-term financial objectives while maintaining a careful approach to risk management.

PORTFOLIO – STOCKS TO EXCLUDE:

American Airlines (AAL)

- AAL's high beta and elevated risk levels make it an unsuitable choice for portfolio inclusion.
- Its propensity for volatility and vulnerability to market swings can jeopardize the stability of the overall portfolio.

Hawaiian Holdings (HA)

- HA's exceptionally high risk levels make it a poor fit for the portfolio.
- Its pronounced volatility could negatively impact portfolio performance and increase overall risk exposure.

PORTFOLIO – STOCKS TO EXCLUDE:

Credit Suisse (CS), Deutsche Bank (DB), and Bausch Health Companies Inc (BHC)

- These stocks demonstrate negative cumulative returns and high beta values, signaling poor performance and heightened market volatility.
- Avoiding these investments is recommended to prevent potential losses and manage risk more effectively.

To sum up, American Airlines (AAL) and Hawaiian Holdings (HA) carry high levels of risk and volatility, while Credit Suisse (CS), Deutsche Bank (DB), and Bausch Health Companies Inc (BHC) show signs of poor performance and market volatility. As a result, it is advisable to exclude these stocks from the portfolio to manage risk and prevent potential losses.

ADDITIONAL STOCKS TO CONSIDER:

Goldman Sachs (GS)

- GS has a high beta and lower annualized returns compared to the index, indicating potential volatility and underperformance.
- The high beta suggests that GS's stock price is particularly sensitive to market fluctuations, leading to greater price swings and increased risk for investors.
- This higher volatility, combined with potentially lower returns, suggests that GS may lag behind broader market benchmarks over time. Therefore, careful consideration is needed when evaluating GS as an investment option.

ADDITIONAL STOCKS TO CONSIDER:

Amazon (AMZN)

- Amazon, a leading technology company, boasts a strong cumulative return. However, its beta value aligns closely with the market benchmark, indicating a similar level of risk.
- Despite its high cumulative return, AMZN exhibits high Mean Absolute Percentage Error (MAPE) and Root Mean Square Error (RMSE), suggesting inconsistency in stock performance.
- These high error rates may introduce uncertainty and reduce the reliability of the stock's performance, making it less appealing for consistent returns.

Alphabet (GOOG)

- Alphabet, the parent company of Google, has moderate cumulative returns and a higher beta value, reflecting above-average risk relative to the market.
- The stock's elevated RMSE value points to potential volatility and unpredictability in its performance.
- Given these factors, we may choose to exercise caution with this stock and not heavily weigh it in our portfolio decisions.

MODEL PREDICTION & VALIDATION:

	Stock	Method	RMSE	MAPE
0	ALK	SARIMA	63.92	115.32
0	JNJ	SARIMA	20.27	13.02
0	MRK	SARIMA	7.56	9.07
0	AAPL	SARIMA	14.91	13.06
0	AMZN	SARIMA	491.79	20.13
0	GOOG	SARIMA	139.60	6.14

RECOMMENDATION:

Portfolio Optimization

- By carefully choosing stocks with advantageous risk-return ratios and steering clear of those with poor cumulative returns or overly high beta values, we can create a diversified portfolio that aims to optimize returns while managing risk effectively.
- It's important to stress that building a successful portfolio necessitates continuous monitoring and adjustments in response to changing market conditions. Regularly reviewing and realigning the portfolio is key to adapting to shifting economic trends, industry changes, and the performance of individual stocks. Staying alert and proactive enables us to enhance portfolio performance and progress toward achieving long-term investment goals.

THANK YOU